Chubb Limited
Annual Report
2018

Financial Summary

In millions of U.S. dollars
except per share data and ratios

	Year Ended Dec. 31, 2018	Year Ended Dec. 31, 2017	Percentage Change
Gross premiums written	$37,968	$36,376	4.4%
Net premiums written	30,579	29,244	4.6%
Net premiums earned	30,064	29,034	3.5%
P&C combined ratio	90.6%	94.7%	NM
Current accident year P&C combined ratio excluding catastrophe losses	88.0%	87.6%	NM
Core operating income	4,407	3,784	16.5%
Net income	3,962	3,861	2.6%
Diluted earnings per share – net income	8.49	8.19	3.7%
Diluted earnings per share – core operating income	9.44	8.03	17.6%
Total investments	100,968	102,444	-1.4%
Total assets	167,771	167,022	0.4%
Shareholders' equity	50,312	51,172	-1.7%
Book value per share	109.56	110.32	-0.7%
Tangible book value per share	65.89	65.87	0.0%
Core operating return on equity	8.7%	7.8%	NM
Core operating return on tangible equity	14.6%	13.4%	NM

This document contains non-GAAP financial measures. Refer to pages 50-52 for reconciliations to the most directly comparable GAAP measures.

NM–not meaningful

Evan G. Greenberg
Chairman and Chief Executive Officer
Chubb Limited/Chubb Group

To My Fellow Shareholders

Chubb performed well in a challenging year for the insurance industry, marked again by elevated natural catastrophe losses, underlying underwriting margin pressures, improving but overly competitive commercial property and casualty pricing conditions globally, and rising but still historically low interest rates, which began to benefit insurers' investment returns. Our company produced very good financial results in 2018 including standout underwriting profitability and record investment income. We provided distinguishing service to our customers, advanced our strategic priorities and competitive profile, and made good progress in transforming ourselves to thrive in a digital age. The investments we are making to further strengthen our capabilities will enable us to grow profitably and take advantage of opportunity in many places around the globe long into the future.

Chubb is the world's largest publicly traded property and casualty (P&C) insurer with market cap of $63 billion at the time of this writing and such a unique company that I would like to begin, as I have done in the past, by describing who we are and what we do.

We write gross premiums of $38 billion, 65% of which come from commercial lines and 35% from consumer lines, including Asia life insurance. On the commercial side, we serve companies of all sizes globally, from the largest industrial corporations for virtually all of their coverage needs through brokers, to middle-market companies and small businesses with the broadest array of coverages of any insurer, principally distributed through independent agents. In the United States, we are the only company with this combination of product capability and distribution reach.

On the consumer side, we are a major personal lines writer, serving customers ranging from the affluent to the emerging middle class, depending on the country. For individuals and families, we insure their lives and their health, protect their homes and the contents, their automobiles and other valuable assets, from yachts, jewelry and art to cell phones. We are a truly global insurer, one of only a few in the world, with substantial operations in 54 countries and territories. About 40% of our business originates outside the United States and is growing faster than our U.S. business. This local presence globally enables us to compete for local business while serving the needs of multinationals.

Chubb has a portfolio of simply outstanding businesses that are difficult or next to impossible to replicate, and many are market-leading. Each is a multibillion-dollar business with substantial scale and scope for future growth. In the U.S., we are the largest commercial insurer and the leader in casualty products and risk management services for large global corporations, the fourth-largest commercial insurer serving the middle and small business market, the #3 excess and surplus (E&S) lines writer, the leading crop insurer for America's farmers, and, by far, the #1 provider of personal lines coverage and service for affluent individuals and families. Globally, we are the leaders in financial lines such as directors and officers (D&O) and errors and omissions (E&O)

coverage for companies, a market leader in new coverages such as cyber risk insurance, and a top personal accident and supplemental health insurance (A&H) provider for consumers. In addition to brokers and independent agents, our products and services are distributed through exclusive agents, retail financial institutions, sponsoring organizations and various forms of direct marketing. With $63 billion in total capital and $50 billion in equity, our balance sheet is backed by ratings of AA from S&P and A++ from AM Best.

The macro environment in 2018

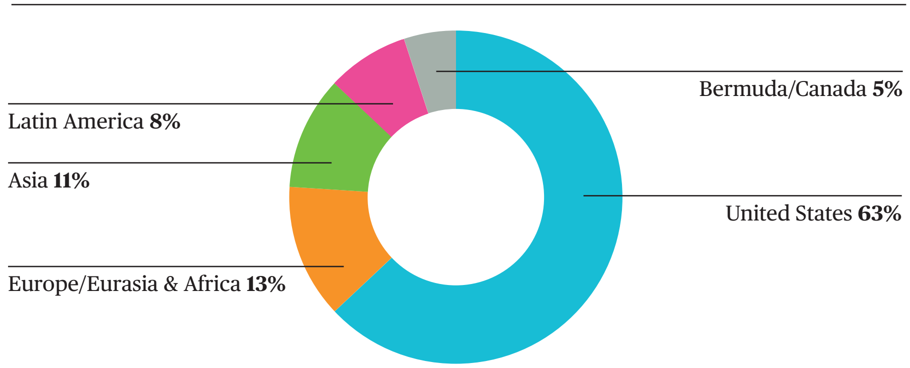
For most of 2018, the macro operating environment was generally favorable, with positive economic conditions globally, particularly in the U.S. Political and geopolitical developments across the globe became a source of tension and uncertainty, and economic conditions outside the U.S. weakened, contributing to financial market volatility by year-end. Observe: the economic slowdown in China, with its political and economic policy objectives in conflict; the inability of major democracies to govern and solve problems; U.S.-China trade and geopolitical tension; tensions between the U.S. and its traditional allies; Brexit; and, in the latter half of the year, concern in financial markets over the pace of rising interest rates by the U.S. Federal Reserve and other central banks.

In the global P&C industry, we experienced an improving rate environment, particularly in the latter half of 2018. Fourth quarter pricing, tone and momentum were materially better than at the same period a year ago and continued into early 2019. While the underwriting environment has improved and continues to do so, it varies by country and class of business. Prices in many important classes remain below what is adequate to earn a reasonable return for the risk taken. Frankly, our industry needs rate. A continuous rise in loss costs, the pace of which varies by class and country; a more difficult risk environment in some important classes; and rates charged remaining flat or rising at a subdued pace over an extended period – these create industry margin pressures. With elevated natural catastrophe losses, revenue collected for catastrophe coverage no longer subsidizes mediocre or lousy results for many insurers. At the same time, industry capital remains abundant and balance sheets are in reasonable shape overall, moderating the trend toward improved pricing. With that said, it appears momentum is building.

While the natural catastrophes of last year did not reach the same magnitude as the record-setting levels of 2017, it

Geographic Sources of Premium

2018 gross premiums written



Premium Growth by Geography

Percentage change in gross premiums written in 2018 versus 2017 in constant dollars

- United States **2.6%**
- Latin America **10.3%**
- Europe/Eurasia & Africa **2.7%**
- Bermuda/Canada **6.0%**
- Asia **9.0%**

was a major year for CATs nonetheless, with insured losses estimated in the range of $80 billion, likely the fourth highest in 50 years. To me, as notable were the sheer number of natural events, which exceeded '17's total, the almost biblical range – wind, fire, flood, quake – and the diversity of places from which they originated – the U.S. (hurricanes, floods, wildfires and winter storms), Japan (typhoons and earthquakes) and Hong Kong, China and Australia (typhoons), to name a few. For Chubb, pre-tax net catastrophe losses were significantly lower this year – $1.6 billion compared to $2.7 billion in 2017 – but about $700 million more than we planned for when calculating our "expected" CATs for the year. Nevertheless, the losses were within our risk tolerance, which accepts a certain amount of volatility. This is the business we are in and we purposely take this risk, so we have no regrets as long as our underwriting is good and we are properly paid.

Even with the elevated CATs, we produced core operating income of $4.4 billion, or $9.44 per share, up 18% on a per share basis from 2017. For perspective, with an expected or average level of annual catastrophe losses, we would have earned $5 billion.

The craft of underwriting

A major distinguishing characteristic of our company is the focus we place on operational excellence and execution around our underwriting and service culture, which are hallmarks of the company, and our relentless commitment to underwriting discipline and profitability. For total clarity of purpose, Chubb is an underwriting company – everything starts with underwriting and it is the wellhead of our culture. Through careful portfolio construction and discipline, we maintain an exceptional level of underwriting profit. On the other side of the coin, the craft of underwriting informs how we grow. We measure ourselves first by underwriting income and the combined ratio. Last year we produced $2.6 billion of pre-tax P&C underwriting income, compared to $1.4 billion in 2017. We generated a 2018 calendar year P&C combined ratio of 90.6%, compared to 94.7% prior year – a very good result overall and particularly distinctive when compared to the 99.2% average combined ratio of a cohort of major or peer companies we compete against.

Our underlying underwriting performance, which unmasks the impact of catastrophes, was simply excellent. The P&C combined ratio for our '18 business exposure (known as the current accident year before catastrophe losses) was 88.0%, compared with 87.6% prior year. By the way, simply for clarity, the published calendar year and current accident year combined ratios with expected annual CAT losses were 88.1% and 91.4%, respectively. Again, I think this is the convention investors in the industry ought to insist upon versus the current accident year excluding CATs, because excluding catastrophes eliminates losses but retains the premium, prettying up results. Later in this letter, I'll have more to say about our underwriting culture, and how we maintain industry-leading margins.

"We are in the risk business, we work at it every day with an underwriting ethos and high-performance culture. We have an extraordinarily high level of talent and leadership, groomed over many years with a shared set of values, work ethic and discipline. And we do all of this on a global scale."

For the year, total gross premiums written for the company were $38 billion while net premiums written, which are the premiums we retain on our balance sheet, were $31 billion, up 4.6%. Global macro conditions notwithstanding, we expect at a minimum to maintain a rate of annual growth in this range in constant dollars, though with some natural variability quarter to quarter given the nature of our business. There is a lot of optimism and belief in the company about our capabilities, and I will provide some general insight into that.

Record investment income

The other and equally important source of earnings, next to underwriting, is investment income, which is a derivative of our basic business. We take most of our risk on the liability side of the balance sheet, with our capital leveraged against insurance risk exposure. We are predominantly fixed income investors and have built a well-balanced and diversified global portfolio. As long-term savers, rising rates are a good thing for insurers since it means growth in investment income. Last year, off the back of strong cash flow ($5.5 billion in '18), rising rates and returns on our illiquid investments, our pre-tax adjusted net investment income of $3.6 billion was up 2.8%, a record result.

During the year, we took steps to shorten duration to 3.7 years, which partially immunizes us from the mark-to-market impact of rising rates. As the Federal Reserve raised interest rates, our reinvestment rate increased from 2.9% to 3.7% by year's end – still low in historic terms but better. Outside the U.S., economic conditions are softening and central banks are reacting by maintaining a low interest rate policy. While we cannot predict the timing, driven ultimately by supply and demand, and likely higher future inflation, we expect U.S. Treasury rates will rise further while the yield curve will steepen, impacted by rising deficits. In time, rising rates coupled with our strong operating cash flow will accelerate investment income growth. Keep in mind, every 100 basis points of portfolio yield equals over $950 million of additional pre-tax investment income and 1.6% accretion to our core operating ROE.

Book Value & Book Value Per Share Growth

Chubb has outperformed the average of North American and global peers over the last three and 10 years in terms of book value growth on both a dollar and per share basis.

[1] Includes AIG, Allianz, AXA, CNA, HIG, QBE, RSA, TRV, XL, Zurich. XL's 2018 results are as of June 30, 2018.

Source: SNL and company disclosures

Book value, shareholder returns and capital

Chubb is a growth company as measured by book value. Book and tangible book value per share growth over time are our primary measures of wealth creation for shareholders. Last year, both were impacted by the mark-to-market effect of rising interest rates on the investment portfolio. Don't get distracted by the mark. We are buy-and-hold fixed income investors so the mark amortizes to maturity over a reasonably short period of time given the short duration of our invested assets. In 2018, book value per share declined 0.7% while tangible book value per share was flat; excluding the impact of the mark, they grew 2.7% and 5.8%, respectively. These measures have increased 13.2% and 29.2%, respectively, since the closing of The Chubb Corporation acquisition in January of 2016. Tangible book value per share, which was down just over 29% at the merger closing, has recovered 23 points of the dilution as of this writing. Our core operating ROE of 8.7% last year reflects the impact of the CATs; with an expected level of CATs, or an average amount in a normal year, it was 9.8%. If we included private equity gains in core operating income, as most competitors do, the core operating ROE would be 10.6%.

Over the last 10 years, our book value has more than tripled and grown at a compound annual rate of 13.3% while tangible book value has grown 11% annually; over the past three years, annual growth has been 20% and about 9%, respectively. As the nearby charts illustrate, Chubb's book value growth on both a dollar and per share basis has significantly outperformed that of our peers.

Insurance is a long-term business and I believe attractive long-term shareholder returns are a derivative of doing our job well. Our strategy includes the careful construction of our product portfolio and geographic mix, the cohorts of customers we pursue and the distribution we engage to reach them, our expense structure, the size and strength of our balance sheet, and our culture, including the quality, character, leadership and collective energy of our people. These are all important factors and distinguishing characteristics of our company that drive long-term sustainable book and tangible book value growth.

Superior financial performance ultimately finds its way into the stock price and market capitalization. It was not a great year for equities in general, particularly financials including insurance stocks, and Chubb was no exception. Our stock price declined 11.6% in the year and is cheap by almost any measure. The -9.6% total return on Chubb's common stock in 2018 compares reasonably with the S&P 500/Financials (-13%) and S&P 500/Insurance (-11.2%) indices – hardly something to brag about. Over the past three and five years, Chubb has produced a total shareholder return of 18% and 41%, respectively, and our market cap has increased 56% and 69%, respectively. Taking a longer-term perspective, our 10-year TSR is 209% and our market cap increased 237%.

"A major distinguishing characteristic of our company is the focus we place on operational excellence and execution around our underwriting and service culture, which are hallmarks of the company, and our relentless commitment to underwriting discipline and profitability."

Chubb's long-term investors believe in and appreciate our company. They know that we have been good stewards of shareholder capital. We have followed a clear and consistent capital management strategy, retaining capital for risk and growth, and using M&A only when it furthers what we are doing organically and generates superior returns. We have made $36 billion in acquisitions over the past decade and produced good financial returns (including an IRR of 20%). More importantly, we made ourselves better by adding substantial capability to our company that will contribute to superior returns well into the future.

To me, many of the transactions that have taken place recently in our industry make little strategic sense – the prices paid were excessive and the deals seem to be either about size for size's sake, or motivated by a short-term desire to dress up results and deflect away from the core issues the companies are wrestling with. Most asset classes globally, in my opinion, are overvalued as a consequence of extraordinary liquidity, a product of central bank accommodation. Low rates have encouraged investors to seek absolute rather than risk-adjusted returns. That won't last forever. Stress and volatility will create opportunity and we are patient.

Beyond what we need for risk and growth including M&A, we return surplus capital to shareholders. We have a 25-year track record of annual dividend increases with a target payout ratio of approximately 30%. In 2018, we returned to shareholders over $1.3 billion in dividends and over $1 billion in share repurchases for a total payout of $2.3 billion, or 54% of our earnings. We repurchased our shares at an average price of $132, which equals a price-to-book of 1.2 – a bargain.

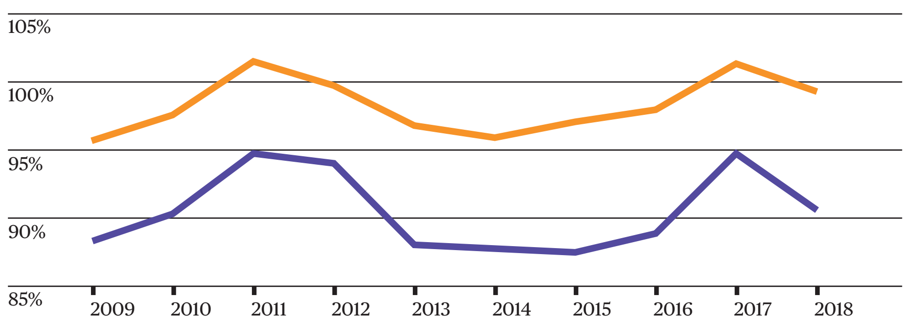
Growing profitably while preserving margins

Chubb is focused on growth while preserving underwriting margins. We balance our global command and control discipline with an aggressiveness and nimbleness toward market opportunity – a real trick – that together with our local presence and capability provides us great advantage. Further, portfolio management, including a willingness to trade market share for underwriting profitability, along with relentless expense management, contributes to our competitive profile. This is our craft of underwriting and no one does it better than Chubb.

As I said earlier, generally speaking, loss costs rise every year, and if pricing remains flat or declines even modestly, loss ratios come under pressure. Rising loss costs across the industry, both casualty and property related, are pressuring loss ratios and impacting a number of important short-tail lines,

P&C Combined Ratio versus Peers

The company's underwriting results have outperformed the average of North American and global peers over the last 10 years.



Averages:	1 year	3 year	5 year	10 year
Peers[1]	99.2%	99.4%	98.2%	98.1%
Chubb	90.6%	91.3%	89.8%	90.4%

[1] Includes AIG, Allianz, AXA, CNA, HIG, QBE, RSA, TRV, XL, Zurich. XL's 2018 results are for the AXA-XL division of AXA.

Source: SNL and company disclosures

such as homeowners and commercial property. They also affect certain long-tail lines such as primary and excess general casualty and professional lines, from public company D&O and medical malpractice to employment practices liability.

Growing and writing business profitably on a global scale is about understanding individual risk cohorts, structuring and pricing them properly across dozens of products and geographies. It's about the discipline to walk away from business and shrink when necessary, which is difficult for managers to do. Over the years, Chubb has proven its mettle in this regard as we have demonstrated that we will shrink entire businesses if pricing is not adequate to earn a reasonable margin. For example, our London wholesale business at Lloyd's, our U.S. E&S business and our global reinsurance business all shed as much as a third of their size over the last 10 years due to inadequate pricing.

Sometimes our active portfolio management is not "visible." For example, our North America mid-market and small commercial business grew about 3.5% last year. In reality, core P&C lines grew almost 5% while financial lines were flat due to underwriting actions. Sure, on the surface, this discipline can result in more modest growth. But premiums aren't always a proxy for earnings. Oftentimes, insurers dress up their top line to indicate a short-term image of strength when, in fact, it's weakness.

At the beginning of this letter, I characterized commercial P&C insurance market conditions last year as improving, with pricing in aggregate around the globe in the fourth quarter better than what we saw in the third quarter, and materially better than the prior year fourth quarter. Going into '19, market tone is improving and the momentum is building for the most part in an orderly fashion in a number of major markets – the U.S., London and Australia, for example. I was and remain encouraged by what I see. In other markets where rates were declining, pricing for the most part at least went flat, which is a start. The improvement in pricing is welcome and needed to ameliorate margin pressure. Again, the industry needs rate, and pricing in the U.S. and many other markets has not been keeping pace with loss cost trends.

I might add that it isn't simply about rate. As important, deductibles or retentions and attachment points have also not kept pace. They have remained static for years. A million-dollar deductible 10 years ago is worth a fraction of its value today. From cohorts of businesses with modestly rising loss costs, to those exposed to a more hostile risk environment where loss costs are rising more rapidly, most classes of business are contributing to industry margin pressure. We have also begun to see some signs of dislocation in the market – carriers curbing their appetite for certain lines of business with reduced limits or exiting from markets altogether – a natural reaction to poor underwriting results. Chubb's risk appetite has not changed – it remains robust and stable. We have an exceptionally strong balance sheet, risk-taking capability and appetite we are willing to deploy.

"Chubb is focused on growth while preserving underwriting margins. We balance our global command and control discipline with an aggressiveness and nimbleness toward market opportunity – a real trick – that together with our local presence and capability provides us great advantage."

A competitive advantage of Chubb is our expense management, which contributes toward a lower combined ratio. We are significantly more efficient than our peers with an expense ratio that's four-to-six percentage points lower than most U.S. commercial P&C insurers regardless of size. We expect our scale plus expense initiatives, including those produced by our digital efforts, will drive our expense ratio lower over time. This will make us even more compelling in the marketplace by giving us the freedom to offer more competitive prices and operate at higher loss ratios without sacrificing profitability.

Our expense discipline has contributed to the industry's best combined ratio. As you can see from the chart nearby, over the last 10 years our combined ratio has outperformed that of our peers by about eight percentage points. While past performance is no guarantee of future results, and we are in the risk business, we work at it every day with an underwriting ethos and high-performance culture, which encompasses our management discipline, organization structure, and command and control processes, including the checks and balances, rewards systems, organizational transparency and management information across the company. We have an extraordinarily high level of talent and leadership, groomed over many years with a shared set of values, work ethic and discipline. And we do all of this on a global scale – frankly, what other insurer in the world does this as well as Chubb?

Seizing growth opportunities against market realities

Given our extensive capabilities, global presence and clarity of mission, we have plenty of growth opportunity even when economic or insurance market conditions are not universally favorable. One reason is our well-diversified spread of businesses around the world. For example, when one business is down due to local conditions, another is most certainly up somewhere else.

As an organization, we are ready and well positioned to deliver the power of today's Chubb. For the past few years, from our strategies on down, we have put in place so many more capabilities to grow. Today, instead of building and creating capability, our people in most important businesses and countries are simply outward-focused, executing, and my management team and I can feel the momentum building. We are nimble, flexible and always hungry – we strive to pounce on opportunity when we see it. The external environment is extremely dynamic – markets and product lines within markets can soften or harden quickly, economic conditions can improve or decline quickly. Our ability to react rapidly and opportunistically is a hallmark quality of Chubb, and rest assured we know we can always improve – we are a self-critical, frank culture.

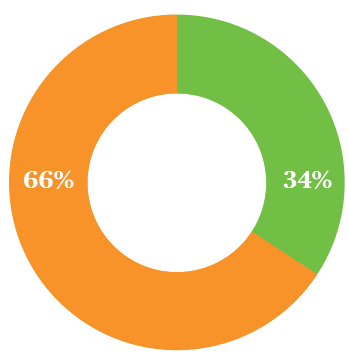
Growth Opportunity Snapshot Today

2018 net premiums written: $31 billion

Developed Segments / Stable Earnings Generators

Low-to-mid single-digit expected growth

- U.S. Large and Specialty Commercial P&C
- U.S. Mid-Market Commercial P&C
- U.S. Agriculture
- U.S. High Net Worth Personal Lines
- International Large Commercial P&C
- U.K./Europe Commercial P&C



Growth Segments / Increasing Earnings Contributors

Double-digit expected growth

- Small Commercial Globally
- International Mid-Market Commercial P&C
- A&H Globally
- International Personal Lines
- Asia and Latin America
- Asia Life Insurance

As you can see from the chart nearby, more than a third of our businesses today can be characterized as growth segments with double-digit growth potential, while our other major developed businesses have more stable, low-to-mid single-digit potential – which is pretty darn good given their size and market conditions. But remember, conditions can change quickly, turning businesses that were treading water, or had even shrunk, into double-digit growth performers. Earlier, I mentioned our London wholesale business shedding a third of its size over the past 10 years. In the fourth quarter of last year and continuing into '19, that business started growing double-digit on the back of a stronger underwriting environment. Similarly, market conditions in Australia for most commercial P&C lines improved rapidly at the end of '17 and growth there is registering at a double-digit pace. These are examples of how conditions change quickly and, by being nimble, Chubb taking advantage. I want to highlight a few of our businesses for you from each category, starting with several divisions in North America, where net premiums written overall grew low-to-mid single digits last year.

For serving the insurance needs of large domestic and multinational corporations, Chubb is the clear leader in the U.S. and has significant capabilities and presence, including offices, people, products, technology and distribution in 53 other countries throughout Asia, Latin America and across the continent of Europe. We have longstanding relationships with nearly every member of the Fortune 1000. With over 200 distinct products ranging from primary risk management casualty to property, political risk, D&O, cyber and environmental, our ability to serve these large sophisticated organizations through our global network, and with superior technology, is unmatched. We produced mid-single digit growth in our $7.6 billion North American major accounts business and even better growth internationally.

Complementing our large corporate capabilities in the U.S. is our commercial P&C franchise that serves the middle-market business community. We have an extensive local presence on a national basis and an ability to serve these companies as they manage their business inside the U.S. and beyond its borders. Our product breadth ranges from basic package plans to broad specialty coverages – the same as our large corporate division. We have nearly two dozen industry practices that bring deep knowledge and an ability to meet the coverage needs of specific industries like life sciences, healthcare and advanced manufacturing. With the benefit of a well-oiled field organization, and armed with the broadest array of products and service capability for this segment, our $5.3 billion middle-market business grew low-single digits last year and by year-end began to accelerate on the back of an improving price environment.

Our global excess and surplus lines (E&S) wholesale businesses, which include Westchester in the U.S., Chubb Global Markets in London and Chubb Bermuda, write about $4 billion in

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gross premiums annually and have about a 2.5% share of the $160 billion global E&S market. E&S insurers specialize in hard-to-place or unusual risks that require tailored coverages standard companies cannot or won't write. We have a very broad product lineup – from specialty property and liability offerings to product recall, and railroad and airlines liability, as examples. For several years now, our E&S companies have been shrinking, driven by soft prices and irrational behavior by competitors. This is a market that needs rate, and we are definitely seeing a more positive environment, and consequently growth has begun to pick up as more risks move toward adequate pricing.

I would be remiss if I didn't mention Chubb is the leading crop insurer in the U.S. with a $2.3 billion agriculture insurance business and an agribusiness serving the commercial P&C needs of farmers and ranchers. This is a distinctive franchise for the company with a 19% share of the $9 billion crop insurance market. With superior technology and a nationwide field organization of 5,600 independent agents, this business is all about how we serve farmers and the government, and the processes of risk selection and claims management. We had another very good year in 2018 in this business, highlighted by a current accident year combined ratio of 82.9% and $385 million in underwriting income. This is a great franchise for Chubb.

Growth isn't our number one priority at the moment in our $5 billion U.S. personal lines business for affluent clients, although it certainly is and will remain an important dimension. I believe there is plenty of opportunity to grow over time. We are focused on addressing the elevated loss ratio we have been experiencing in our homeowners book, a trend we began to spot almost two years ago and an industrywide issue. We are on track with a number of coverage, pricing and underwriting strategies to address the loss ratio and, at the same time, customer needs without cheapening the product, and it will take some time to show through in the results on a run-rate basis. In the meantime, we continue to distinguish ourselves in the marketplace with the industry's finest protection and claims service for our discerning clients. We continue to invest in and expand our product offerings and services, including meeting clients' global coverage and service needs and enhancing their digital experience with the company. We are employing highly targeted digital marketing channels to generate thousands of potential client leads monthly, as well as reach clients and agents with timely and relevant insights on how to prevent losses and protect their families.

Growth segments – increasing earnings contributors

Turning to the other side of the growth prospects chart, we have a number of businesses that represent significant opportunity over the short and long term. Our $10.8 billion international P&C business in aggregate grew in the high single digits last year and has numerous double-digit opportunities across both commercial and consumer lines. In particular, our operations in the Asia Pacific and Latin America regions have significant presence and capabilities. These two regions led all other parts of the world in growth and I believe they will continue to do so for Chubb in the foreseeable future. Adding to our emerging markets growth potential, we announced major distribution agreements in the last 12 months with Grab, the leading ridesharing firm in Southeast Asia; Citibanamex, the number two financial group in Mexico; and Banco de Chile, the country's largest domestic bank. These are in addition to the agreement we have with DBS Bank, one of Southeast Asia's largest banks based in Singapore, among others in Asia and Latin America. In aggregate, these agreements give us access to tens of millions of potential new customers.

Building on our leadership serving the U.S. middle-market community, we have exported our knowledge, know-how and technology to a number of our operations around the world and have an excellent opportunity for consistent, high single- to low double-digit growth in our middle-market business outside the U.S. We have the on-the-ground presence, people and capabilities, including distribution and technology, to succeed in this segment and we are focusing on a targeted group of countries, with particular focus on developing economies where much of the growth is coming from small and mid-sized businesses.

Cyber insurance is a growing business and Chubb has become a top provider of coverage. Exposures are growing as a result of a digitized world and we are responding to the needs of businesses and individuals. We distinguish ourselves not only with our insurance coverage – our promise to pay claims – but with a suite of services that clients need. We help them identify, address and potentially prevent a cyber risk event. When an incident occurs, we provide services ranging from legal and forensics to customer-based call center activity and public relations – all of which, when done quickly, limit the damage.

In 2018, we continued to make significant progress with our small commercial business initiative globally. Starting from a relatively small base in ’17, we produced strong double-digit growth throughout the year, achieving an annual run rate of over $1 billion in premium, and project this business to exceed several billion dollars over time. In the U.S., this is a highly automated digital experience, where 80% or more of the submissions are not touched by humans after they leave the agent’s office. Technology is a competitive weapon. We have over 4,000 agents in the U.S. on our Chubb Marketplace℠ platform quoting, issuing and servicing clients. Internationally, we are expanding product and distribution, both traditional and digital, through easy-to-use technology.

On the consumer side, we expect stronger growth in our large $4.6 billion global A&H and $2.2 billion international personal lines businesses. In the U.S., we are achieving rapid growth in our worksite marketing division called Chubb Workplace Benefits. This business takes advantage of our extensive nationwide broker and agent relationships to offer a suite of voluntary benefits for the employees of mid-to-large companies – a great example of cross-sell in action. We have been incubating this business quietly and it’s now growing double-digit and producing $150 million in premiums. Outside of North America, we are growing our consumer lines with the emerging middle class in Asia and Latin America as one of our key targets. Supplementing our primary telemarketing, agency and broker channels, new digital distribution partners are becoming major contributors to growth.

Lastly, revenue in our Asia-focused life business was $2.4 billion. We have 37,000 captive agents in the six Asian countries with life operations, plus another 43,000 in China, where we have a 36% stake in Huatai Life. Our life business earned over $100 million of income last year and is on track to growing to $250 million within a reasonably short period, and that doesn’t include our Chinese life company investment, Huatai Life. We announced in early 2019 that we are increasing ownership in Huatai Insurance Group Company Limited, the holding company of Huatai Life, Huatai Property & Casualty and Huatai Asset Management. With our increased stake, Huatai Group becomes the first

> “Digital and the use of data to improve risk selection and pricing are the industry’s arms race and they will determine the future industry winners while making our industry more vital and relevant. At Chubb, we intend to be one of those winners.”

domestic Chinese financial services holding company to convert to a Sino-foreign equity joint venture and is a major and necessary milestone towards our goal of majority and beyond ownership. Huatai Group's insurance operations have more than 600 branches and 11 million customers.

Ensuring Chubb is compelling in a digital age

I'm encouraged by the digital trend of our industry. A number of carriers are investing in and embracing the use of data, both sources and tools, to improve risk selection and pricing along with technology to streamline the value chain and internal costs while improving the customer experience. This is the industry's arms race and it will determine the future industry winners while making our industry more vital and relevant.

At Chubb, we intend to be one of those winners. We are continuing to execute on our strategic plans to transform ourselves to ensure Chubb is compelling in a digital age. We are making good progress and our transformation is already contributing to revenue growth and expense reduction opportunities. These will continue over the medium term while redefining or modernizing what insurance does and how it does it.

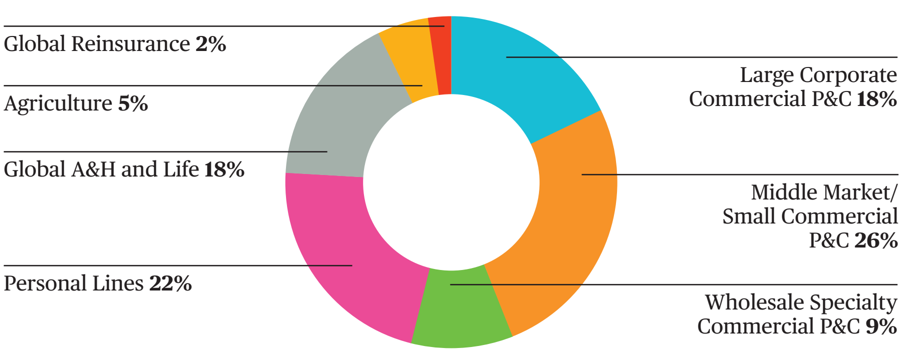
Our vision is to offer a best-in-class customer experience with an omnichannel capability that gives customers anytime-anywhere access to Chubb through the channel that suits them best. Using data, analytics and technology, we are building API connections to apps, mobile-friendly sites and portals that focus on the customer to enhance outcomes and broaden the value we provide.

Our investments in new technologies and digital innovation are contributing to our risk selection and pricing capabilities. By unlocking the significant power of internal and external data analytics, machine-learning and web-scraping, we are gaining greater insights at the micro-risk cohort level, powering product innovation and, overall, improving our cycle of change across the organization. These technologies also enhance the customer experience at the point of sale with two-question quoting in small commercial and quote-to-bind in a matter of minutes as near-term objectives. In terms of efficiencies, the use of robotics and artificial intelligence will allow our underwriters to spend more of their time on higher value, portfolio-level activities and our claims handlers on more time-sensitive, complex claims. By eliminating low-value activities and their expense, we project hundreds of millions of dollars in savings over the course of the next five years.

Our expanding digital capabilities are giving us new distribution opportunities where we live in our partner's digital ecosystem, offering intuitive product placements and customer value propositions to millions of new customers in e-commerce sectors such as ridesharing and the gig economy, as well as more traditional sectors such as retail, travel and banking. We are winning significant distribution agreements like the ones I mentioned earlier as a result of our brand, product and service capability, and technology that integrates with our partners' digital channels, both mobile and web.

Premium Distribution by Product

2018 net premiums written



Our insurance products and services are changing as we move from a model of "repair and replace" to "predict and prevent." Our recently announced partnership with Hartford Steam Boiler is advancing this value-added service proposition for our consumer and commercial customers in the U.S. By using IoT sensors and other devices to actively monitor the home or workplace for water leaks, changes in temperature, humidity or even vibration, we can anticipate and prevent damage. Ultimately, such technology has the potential to fundamentally change the relationship customers have with their insurers.

The dynamic external risk environment

Our industry has a duty and an opportunity to help society manage a risk environment that is both dynamic and changing due to natural and man-made activity. Three areas I am going to highlight with emerging or evolving risk exposures are climate change, privacy and litigation.

Climate change is a reality and its effects can be seen by an increased frequency and severity of natural catastrophes. Climate change is contributing to higher sea surface temperatures, rising sea levels and an increasing trend in extreme weather events, including floods, droughts, winter storms, heat waves, wildfires and hurricane intensity. These weather events are colliding with the realities of urbanization – the growing exposures from the concentration of people and values created by the long-term shift from rural to urban living, including suburban sprawl – and so many located near water and wilderness because that's where people want to live. Add to that government social policies that insulate people and society from the true costs of their decisions. Hurricanes Florence, Michael and Harvey were significant events causing record flooding in the U.S. Meanwhile, 2018 was the deadliest and most destructive wildfire season on record in California following '17's record-setting wildfires. Given the long-term threat and the short-term nature of politics, the failure of policymakers to address climate change, including these issues and the costs of living in or near high-risk areas, is an existential threat.

As an underwriting company, our job is to understand, structure and assume climate change-related risk for a fair price, and only do so to the extent of our balance sheet wherewithal and our ability to spread the risk to third-party capital. Our approach to underwriting is fact-based and relies on both our own experience and scientific expertise, and that of the expert network we engage outside our organization. Climate risk is complex and requires a deep and evolving understanding of the physical processes causing weather extremes. These tools are improving and are providing better insights to aid in how we think about these perils, but much

"Our industry has a duty and an opportunity to help society manage a risk environment that is both dynamic and changing due to natural and man-made activity."

remains unknown. For example, what were traditionally non-modeled risks can now be better analyzed, but flood models, for instance, are more advanced than those for wildfire, which remain relatively crude. We also recognize that no matter how good, there is still much basis risk in our conclusions. However, keep in mind that natural catastrophes are a short-tail risk, so losses are understood relatively quickly, and we can in most cases react to what we observe.

As tools evolve, so does our appetite. Last year, I suggested that the U.S. could benefit from the expertise and capacity of private insurers to help solve the growing flood exposure problem, aside from what the essentially bankrupt National Flood Insurance Program provides. At Chubb, we are going from viewing flood on solely a defensive basis to taking a cautiously offensive approach. We have launched a flood center of excellence and are beginning to offer greater flood protection to businesses and consumers. Stay tuned.

As for wildfires, we, like other insurers, are willing to take the risk as long as we get paid for it. That means the political and regulatory environment has to cooperate or they will have an availability of insurance problem, which, by example, we are beginning to see signs of in the state of California. If the kinds of wildfire events we have seen the last two years continue, that problem is going to grow. We must face the reality that there is a greater cost citizens must bear to remain protected. Insurers don't have a printing press.

Concerning privacy in a digital age, the General Data Protection Regulation, or GDPR, is a European law on data protection and privacy that gives rights to individuals to have access to their data and provides them a right to be forgotten. Discussions are now taking place in the U.S. about consumer privacy legislation, and I'm in favor of the principle. The implementation of privacy legislation, however, has major implications for consumers and American business including the insurance industry.

Legislation should be in keeping with our American social and cultural values – after all, the right of privacy and the protection of the individual are intrinsic to our democracy. We need a national standard, not fragmented state-by-state, that takes a principles-based approach so that companies and organizations adopt privacy protections appropriate to specific risks without impacting their continued innovation and economic competitiveness. A national privacy law should give individuals transparency and control of their data, but at the same time provide flexibility and impose reasonable limitations on the data collection burden of companies.

Lastly, we should be thoughtful about unintended consequences, such as data protection enquiries being used as a shortcut to avoid discovery rules in a legal dispute.

Finally, litigation activity continues unabated, driven by both the legal and social environments. Exposures are increasing, particularly in markets such as the U.S., U.K. and Australia. Securities class action (SCA) litigation is having a material impact on corporate directors and officers (D&O) and certain errors and omissions (E&O)-related coverages where suits are filed for any corporate misfortune that impacts the share price – almost an operational risk type cover. At the same time, the causes of potential misfortune are increasing. For instance, product liability exposure automatically becomes a D&O suit. So does a cyber breach or an M&A transaction. All of these cases, whether meritorious or not, result in substantial legal and, often, settlement expenses. Societal changes are also increasing exposures and suits, such as the #metoo movement and sexual abuse claims, and that includes reviver laws which reopen and extend the statute of limitations – a development that may produce similarly adverse impacts on insurers.

Excessive litigation is a tax on Corporate America and costs continue to rise for both public and private companies as the frequency and severity of litigation from securities class actions and M&A objections have worsened. Nearly 10% of the

Fortune 500 last year was a target of a class action. The number of federal SCAs filed last year was the highest on record and more than double the number in 2014. Another consequence: the number of public companies is less than half of what it was in 1996, and excessive litigation is a contributing factor.

The legal profession is a profit-making industry like any other, but our terribly inefficient system benefits lawyers at the expense of shareholders. For example, in the case of most D&O SCAs and M&A objection litigation, instead of shareholders getting compensated for actual damages, the primary beneficiary was the legal profession. Based on our data, about half of the money paid in securities claims, including legal expenses and settlements, in the last five years has gone to the lawyers, both plaintiff and defense, and in the case of M&A objections, over 65%. In fact, 85% of settled M&A claims provide no monetary benefit to shareholders – all of the money goes to lawyers.

Our job is not simply to aid and abet this system, which drains our economy of time and money. It's to help lead American business to advocate for reforms such as requiring fees paid to plaintiffs' attorneys be proportional, barring fees for frivolous disclosure suits, and requiring disclosure of all relationships between plaintiffs and their lawyers – and that includes any third-party funders. Litigation funding is a growing problem in the U.K., and it's wreaking absolute havoc in Australia. As members of a broad coalition, which includes the U.S. Chamber of Commerce's Institute for Legal Reform and a number of our underwriting and brokerage peers, and in collaboration with Stanford Law School, we are at the early stages of an effort that will require federal legislation once again to address this. We are realists – this will be a long battle.

The need for American leadership

I expect '19 will be more challenging from a macroeconomic perspective with global growth slowing. The U.S. economy remains the brightest spot among major economies. Geopolitical conditions will remain volatile, fed by a number of powerful forces – rising nationalism and populism, inability of major democracies to effectively govern, trade tensions, Brexit, the U.S.-China relationship, and the unsustainability of China's current economic model and growth. Business thrives in an environment of certainty, and while a global recession is unlikely in 2019, we are beginning to talk ourselves unnecessarily into one in the next few years.

Of late, I have added my voice to raise concern about the rise of populism. Growing populism is likely the consequence of a period of relatively rapid change brought about by globalization and technology, leading to an increase in overall global prosperity, particularly in the developed world. They have also led to increased stress

> "Excessive litigation is a tax on Corporate America and costs continue to rise for both public and private companies as the frequency and severity of litigation from securities class actions and M&A objections have worsened."

and declining living standards for many and created enormous wealth for a few. Many feel vulnerable, frustrated and disillusioned and long for a return to the past. They feel their local and national identities are threatened, and this produces a growing sense of intolerance.

Our country's brand of nationalism, as articulated by our leadership, has impacted our policies and relationships and, in turn, our image and standing in world trade and geopolitics. America's reputation for reliability and its credibility on the world stage have been damaged. We are a growing source of instability and uncertainty for our allies, who struggle to understand our nation's views versus our leadership's, and that's not in our national interest. We are undermining the liberal world order we constructed, including a system of strategic alliances we built and supported for over seven decades. These alliances are a force multiplier for America's values and power in the world. Other countries are beginning to seek alternatives, and rivals for global influence fill the leadership vacuum we create with an image of global order that hardly mirrors our own values and beliefs.

At the same time, democratic governments around the world are failing to govern, incapable of delivering on the promises they make to address their people's needs. Alternatives such as authoritarian rule begin to look more efficient. It's an illusion and it's dangerous.

Leadership comes from strength, confidence and a belief in our values. That means running our own race well, addressing our own state of competitiveness, including infrastructure, skills training and education to equip a greater percentage of our population to flourish, government investment in R&D, military modernization, and fiscal discipline including entitlement reform needed to tackle an out-of-control federal deficit. We have enormous inefficiency in government and growing political polarization. We tolerate behavior in political leadership unheard of in the private sector. We must have a modern, practical yet humanitarian immigration policy that responds to both our needs and the values of who we are as a nation of immigrants – a policy that secures our borders, provides us with the large numbers of foreign skilled and unskilled labor our economy requires, and welcomes with open arms those who seek a better life.

America is more than just a nation; it is an ideal, a beacon for the democratic principles that underpin the liberal world order that has, in turn, served us and other nations so well. The irony is that we have never lived in a better time – more people around the world have been lifted out of poverty, more diseases have been eradicated, more wealth has been created, and more of us have enjoyed the benefits of innovation, good health, and relative peace and prosperity than at any other time in human history. As Americans, we should remember who we are – the keepers of a grand experiment in democracy. We should feel confident to promote our values and not be insecure about defending them.

Leading with our vision of global trade

Global trade relies on the notion of comparative advantage. Self-sufficiency is not possible for a modern nation in a globalized world. For global trade to work, major countries must play by substantially similar rules as they pursue their interests. And here lies the core issue with today's U.S.-China trading relationship.

Discussions to resolve, or more likely ameliorate temporarily, issues surrounding our trading relationship with China are occurring at a time when each country is assessing the relationship and intentions of the other from a broader context. The conclusions each reaches will determine how best to engage in the longer term given our respective national interests. Both sides have constituents that are beginning to frame the relationship as one of enemies. Arriving at that conclusion, however, would be a major strategic mistake and would create the wrong future.

We have moved from a period marked more by strategic engagement to one of strategic competition in the areas of trade, security and political ideology. Trust and honest communication at official levels are lacking. China views the U.S. as attempting to hold back its natural rise, while the U.S. views itself as simply defending its interests against organized predatory behavior. With a deep-seated sense of insecurity that is part of our national psyche, we tend to underestimate the strengths of our economic and political system, characterized by a belief in markets, rule of law, and rights of the individual. In comparison, we overestimate, almost in mythical terms, the strengths of China and the threats they present.

China has deep structural issues. They have reversed direction in terms of market-oriented reforms and have moved toward greater party control and industrial policy – a mix of competing priorities to continue to grow and create prosperity for their people while exerting greater central and authoritarian control over their economy and society. The economic consequences of this approach are beginning to show as evidenced by inefficient capital allocation, excessive leverage and speculation, declining investment and returns on investment, a stagnating private sector and capital flight. In time, China will recalibrate priorities and return to a path of greater market-oriented reforms.

The United States and China, the two largest economies in the world, have benefited enormously from trade and investment ties over the years. The U.S. and U.S. companies have benefited and continue to benefit from access to a sizable and growing Chinese market, while China has benefited from access to the U.S. market and U.S. commercial support going back many decades, and this has supported China's rise. On the trade front, U.S. business seeks a constructive U.S.-China relationship. How we find a path of accommodation in each of our own interests, recognizing the differences between our systems and cultures, is the question. We don't support a retreat by both nations to a more nationalistic model of self-sufficiency. That's not a path to greater prosperity. We don't support tariffs as a strategy – that's counterproductive. We do, however, support efforts to defend our economic interests.

China should begin by taking the necessary steps to implement the structural reforms that it has already publicly acknowledged and which are in their own interest. We advocate for a practical, results-oriented dialogue, with progress that can be monitored and measured. If implementation is done comprehensively, private sector confidence, both Chinese and foreign, will be lifted and those advocating for constructive engagement will begin to gain greater political support. Without reciprocal access to each other's markets and protection of rights and property, other nations will naturally deny China the same opportunity.

Turning to our relationship with Mexico and Canada, deeper economic integration in North America is vital. The new United States-Mexico-Canada Agreement (USMCA) modernizes the original NAFTA agreement in some important ways; it substantially preserves the original agreement but includes some revised and new terms that are troubling and not in our interest, such as the renegotiated investor dispute settlement provision. However, it is important that Congress ratify the USMCA. Strategically, with the election last year of a new left-leaning and populist government in

"Good corporate citizenship lies at our core: how we practice our craft of insurance, how we work together to serve our customers, how we treat each other and how we work to help make a better world for our communities and our planet."

Mexico, it is in our national interest that we increase our engagement with Mexico and maintain a path of deeper North American economic integration. Our southern neighbor's leadership agenda is moving the country back toward 1960s style socialist and populist economics and politics, which are clearly not in the long-term interests of their people or the prosperity of North America.

To sum up, we must lead with our vision of global trade and investment in line with rules-based and market-oriented liberal values. We should support multilateral agreements such as the Trans-Pacific Partnership while in parallel we do the hard, long-term work of modernizing and renovating the World Trade Organization. In December, the U.S. Congress passed the Asia Reassurance Initiative Act. It started with a core bipartisan group of senators who felt the need to reaffirm America's commitment to traditional western values. The Act restates those values and outlines a new set of programs designed to strengthen ties with friends and allies in Asia. Congress stepped in to underline the continuing need for American leadership, and while the Act is a modest step, it's welcome by our friends and partners in Asia. I hope we will follow through and match pronouncements with real action. An open trading system has been the great engine of global prosperity during the past 50 years. The world needs a forward-leaning American agenda to support the next 50 years of prosperity.

Our commitment to citizenship

Good corporate citizenship lies at our core: how we practice our craft of insurance, how we work together to serve our customers, how we treat each other and how we work to help make a better world for our communities and our planet. Citizenship is about responsibility and we express our responsibility in a way that reflects our core values and our mission to protect the present and build a better future. We accomplish our mission by providing the security from risk that allows people and businesses to grow and prosper; by sustaining a culture that values and rewards excellence, hard work, integrity, inclusion and opportunity; by working to protect our planet and assist less fortunate individuals and communities in achieving and sustaining productive and healthy lives; and by promoting the rule of law. This is what citizenship means to us.

We act on this promise of responsibility through a wide range of activities that include our contributions of time and money:

• As a corporate citizen, we recognize our responsibility to assist less fortunate individuals and communities in achieving and sustaining productive and healthy lives in geographic areas where we operate. We do this through the Chubb Charitable Foundation, which addresses actionable problems and contributes to helping alleviate poverty, improve the health of at-risk populations, provide access to quality education and protect the environment. To give a few examples, for many years, our Foundation has supported the good work of the International Rescue Committee, including its efforts to help refugees get settled and establish productive lives. The Foundation has helped build schools in China and Vietnam, fund micro-finance projects in Mexico and Colombia, and serve as a major partner for Teach for America and Teach for All programs in the United States and around the globe. In total, we have contributed more than $100 million over the last 10 years to support three core areas – education, poverty and health, and the environment.

• As a corporate citizen, we recognize the reality of climate change and the substantial impact of human activity, and our environmental activities reflect our desire to do our part as a steward of the Earth. We support important environmental projects through our Foundation including the protection of biodiversity and saving land. For example, since 2005, our unique Chubb Land Legacy Fund has supported The Conservation Fund, one of America's top environmental preservation organizations, which has protected 8 million acres of vital land and water habitats across the nation. Our Foundation has supported the work of The Nature Conservancy (TNC) in the repair and protection of the unique and critically important Mesoamerican Reef along Mexico's Yucatan Peninsula, which helps protect the local coastal infrastructure and economy against storm surge. In 2018 the Foundation made a major grant to TNC for a wetlands restoration and resilience project in Miami-Dade County designed to serve as a model to be replicated in other urban coastal areas. We are also actively engaged in reducing our own operations' greenhouse gas emissions and in the last three years have reduced our GHG footprint by 21%.

• As a corporate citizen, we recognize the rule of law as the foundation of a liberal world order we embrace, essential to the proper functioning of markets and the protection of personal freedoms. We promote its preservation and advancement through our unique Chubb Rule of Law Fund, which has sponsored nearly 50 projects across the globe to improve access to justice, strengthen courts, fight corruption and create the conditions of security and freedom in which our customers, employees and fellow citizens can thrive.

• As a corporate citizen, we also recognize our responsibility to ensure opportunity within our own organization, where we foster a diverse and inclusive meritocracy. We can't succeed unless we give everyone the opportunity to thrive and advance in our company, and we hold our leaders accountable for improving the advancement of women and people of all races, nationalities and religions around the globe. We are making good progress on this front, which we closely monitor, and will continue to make strides.

In short, our commitment to global citizenship is unwavering. It is who we are.

Stronger, smarter, more efficient and more capable

I want to thank all of my fellow employees and my senior management team for their outstanding effort last year. They never cease to amaze me – they are craftsmen of insurance, technically proficient and so dedicated to our clients and business partners, and they are truly the best representatives of our stellar brand. They love our company and being a part of our journey. I also want to thank my active and supportive Board of Directors – I appreciate their counsel and commitment to our mission. I would like to acknowledge the contributions of James Zimmerman, who is retiring from the Board this year after more than 10 years of service, including serving as Chubb Corporation's lead director. It has been a pleasure to work with Jim. With such a team around me, I must be one of the luckiest business leaders.

I am convinced, and I hope you are too, that Chubb is a proven long-term shareholder value creation story. Our presence and capabilities are so compelling, and we are not finished with this story by any stretch. In fact, we are getting stronger, smarter, more efficient and more capable every day. While we face many challenges in the world around us – some of which are out of our control – we are optimistic about our future and passionate about the pursuit and execution of our desire to outperform.

On behalf of the entire organization, thank you for your investment and trust in us.

Sincerely,

Evan G. Greenberg
Chairman and Chief Executive Officer

A Global Leader in Property and Casualty Insurance

A local presence in 54 countries and territories around the world

Chubb has operations in the countries and territories listed here and can help clients manage their risks anywhere in the world.

Argentina	Chile	France	Japan	Pakistan	Saudi Arabia	Tunisia
Australia	China	Germany	Korea	Panama	Singapore	Turkey
Austria	Colombia	Gibraltar	Macao	Peru	South Africa	United Arab Emirates
Bahrain	Czech Republic	Hong Kong	Malaysia	Philippines	Spain	United Kingdom
Belgium	Denmark	Hungary	Mexico	Poland	Sweden	United States
Bermuda	Ecuador	Indonesia	Netherlands	Portugal	Switzerland	Vietnam
Brazil	Egypt	Ireland	New Zealand	Puerto Rico	Taiwan	
Canada	Finland	Italy	Norway	Russia	Thailand	

Chubb Senior Operating Leaders

Paul J. Krump
Executive Vice President
Chubb Group;
President
North America Commercial
and Personal Insurance

John Keogh
Executive Vice Chairman
Chubb Limited/Chubb Group;
Chief Operating Officer

John Lupica
Vice Chairman
Chubb Group;
President
North America Major
Accounts and Specialty
Insurance

Juan C. Andrade
Executive Vice President
Chubb Group;
President
Overseas General Insurance

Chubb's senior operating leadership includes the company's Chief Operating Officer and the leaders of North America and Overseas General insurance operations.

North America Insurance

Key Financial Results

Dollars in millions

Total North America P&C Insurance

2018	
Gross premiums written	$23,957
Net premiums written	$18,736
Combined ratio	88.4%
P&C current accident year combined ratio excluding catastrophe losses	85.5%

North America Commercial P&C Insurance

2018	
Gross premiums written	$16,336
Net premiums written	$12,485
Combined ratio	87.0%
P&C current accident year combined ratio excluding catastrophe losses	87.3%
Segment income	$3,665

North America Personal P&C Insurance

2018	
Gross premiums written	$5,330
Net premiums written	$4,674
Combined ratio	96.6%
P&C current accident year combined ratio excluding catastrophe losses	81.9%
Segment income	$378

North America Agricultural Insurance

2018	
Gross premiums written	$2,291
Net premiums written	$1,577
Combined ratio	75.5%
Segment income	$383

Chubb's insurance businesses in North America serve clients ranging from the largest multinationals, mid-size companies and small businesses to successful individuals and families, and the agriculture community. The company is the largest commercial lines insurer in the U.S., with market-leading positions in several customer segments.

In 2018, two trends in the operating environment stood out. First, throughout the year, P&C pricing in the U.S. began to improve in many product lines and accelerated in the second half. For Chubb, this was an opportunity to demonstrate leadership in driving for rate adequacy in an industry that needs it. Chubb's underwriting discipline in all market conditions – including a dynamic one where rates in many product lines are beginning to achieve better levels of adequacy – enables it to provide a stable and steady market for agents, brokers and clients.

The second trend was the continued elevated level of natural catastrophes, including Hurricane Michael, Hurricane Florence, and another year of record-breaking wildfires in California. In response to the catastrophes of 2018, Chubb once again demonstrated its industry-leading claims capabilities and delivered on its service commitment to customers during their time of need.

"Chubb is an underwriting company, and we know we don't operate in one big, monolithic general insurance market. We're present in many markets and we survey them constantly, allowing us to be nimble and seize on opportunities as local market conditions change," said John Keogh, Executive Vice Chairman, Chubb Group and Chief Operating Officer. "We're very clear-minded about what rates we believe are adequate – by product, by industry and by region – for us to take the risk."

"When it comes to claims and risk engineering, Chubb continued to be there for our clients," said Paul Krump, Executive Vice President, Chubb Group and President of North America Commercial and Personal Insurance. "The investments we have made in our claims operation and our people enable us to continue to set the standard for the industry."

While underwriting and claims excellence are proven Chubb strengths, the company remained focused on pursuing growth opportunities in its North American businesses. To seize those opportunities, the company executed a range of strategies focused on both customers and distribution partners.

Total net premiums written for the company's North America P&C insurance businesses were $18.7 billion, up 3.7% from 2017. Chubb's focus on carefully managing its risk exposures is evident in its P&C underwriting results for all of North America. In a year with elevated natural-catastrophe losses, Chubb reported a world-class combined ratio of 88.4% for its North America P&C insurance operations.

Chubb's North America Insurance Business Units

Major Accounts	Commercial P&C insurance products for the large corporate market sold by retail brokers
Commercial Insurance	Commercial P&C insurance products for middle-market companies sold by independent agents and retail brokers
Small Commercial	P&C insurance products for small commercial clients sold by independent agents and retail brokers
Personal Risk Services	Personal lines coverage, including home, auto, valuables, umbrella and recreational marine insurance, for successful individuals and families sold by independent agents and brokers
Westchester	Commercial P&C excess and surplus lines sold through wholesale brokers
Chubb Bermuda	Liability, property, political risk coverages and captive programs sold by large international brokers
Agriculture	Crop insurance from Rain and Hail and farm and other P&C coverages, sold by agents and brokers

The depth and strength of Chubb's management team was evident in 2018, as several North American business units underwent leadership transitions. In those divisions – Major Accounts, Field Operations, Agriculture and Chubb Bermuda – the succession was seamless, with experienced and capable Chubb leaders, each with long tenure, moving into the new division president roles.

"Chubb has a deep bench of leadership talent, and each of these transitions was planned and implemented seamlessly," said John Lupica, Vice Chairman of Chubb Group and President, North America Major Accounts and Specialty Insurance. "It's gratifying to see our trusted, experienced colleagues take on new leadership responsibilities. There's a great Chubb story behind each of these executive moves."

North America Commercial P&C Insurance

Chubb is the largest commercial lines insurer in the U.S., offering a full range of traditional and specialty products for businesses of all sizes. Net premiums written for North America Commercial P&C Insurance increased 3.9% to $12.5 billion from prior year. The combined ratio for the segment was 87.0%. Excluding catastrophe losses, the P&C current accident year combined ratio was 87.3%. Segment income was $3.7 billion.

"For our major accounts and specialty businesses, 2018 was another strong year," said Mr. Lupica. "We set out to deliver a more coordinated Chubb for

"We don't operate in one big, monolithic general insurance market. We're present in many markets and we survey them constantly, allowing us to be nimble and seize on opportunities as local market conditions change."

– John Keogh

our distribution partners and clients. New business growth was strong year over year, and we had solid retentions in both accounts and premium. While our excess and surplus business was impacted by the active CAT season, this is a market that moves quickly, and the fourth quarter was strong in terms of rate, premium and new business."

Major Accounts, Chubb's P&C business unit that serves large companies, is recognized for the breadth and depth of its product and service offerings. It's a high-touch business where Chubb, with its strong client- and broker-centric culture, has developed long-term, enduring relationships. Serving this market requires not only strong technical underwriting but also a global platform able to execute a complex, bespoke insurance program in many territories around the world. Major Accounts serves more than 90% of the Fortune 1000.

"Clients need the capabilities that Chubb provides – from underwriting and claims, to fronting, sophisticated collateral arrangements, audit, and third-party administered claims and risk management services, both bundled and unbundled," said Mr. Lupica. "No one in the marketplace does this better than Chubb."

To meet these complex needs, Major Accounts clients have access to a Global Client Executive, who serves as a single point of contact and knows the insured and its insurance needs closely. The Global Client Executive is there to help navigate the Chubb network across the globe. For claims handling, customers also have access to a Claims Client Executive. Chubb's commitment to make the company accessible to clients is also evident in Worldview®, the award-winning proprietary portal that enables client risk managers and brokers to manage and track all aspects of their insurance program in real time. Some 10,000 clients and brokers utilize the system.

In 2018, the retention rate for Major Accounts was more than 90%, and cross-selling services to existing customers accounted for more than 75% of new business. Key areas of focus during the year included further strengthening priority industry practices, including transportation, private equity, real estate and construction. For private equity firms, for example, Chubb introduced a comprehensive solution that combines four coverages focused on management, outside directorship, professional services and employment practices liability into one policy.

In the excess and surplus lines, or E&S market, **Westchester** specializes in hard-to-place casualty, property catastrophe and specialty lines for large corporate, middle-market and small businesses. For retail brokers that do not have the capability or expertise for E&S products, Westchester is an important channel to access Chubb. Westchester also exemplifies the company's commitment to underwriting discipline. In a challenging

North American
Business Unit Leaders

(From left)

James Williamson
Vice President
Chubb Group;
Division President
North America Small
Commercial Insurance

Frances D. O'Brien
Senior Vice President
Chubb Group;
Division President
North America Personal
Risk Services

C. Scott Gunter
Senior Vice President
Chubb Group;
Division President
North America
Commercial Insurance

Christopher A. Maleno
Senior Vice President
Chubb Group;
Division President
North America Field
Operations

(From left)

Matthew Merna
Division President
North America
Major Accounts

Scott Arnold
Division President
Chubb Agriculture;
President
Rain and Hail

Judy Gonsalves
Vice President
Chubb Group;
Division President
Chubb Bermuda

Bruce L. Kessler
Senior Vice President
Chubb Group;
Division President
Westchester

"For our major accounts and specialty businesses, 2018 was another strong year. We set out to deliver a more coordinated Chubb for our distribution partners and clients. New business growth was strong year over year, and we had solid retentions in both accounts and premium."

– John Lupica

operating environment in 2017, Chubb shrank the E&S property business by approximately 8% to maintain underwriting profitability. In 2018, the market shifted, and Chubb moved quickly to seize the opportunity, growing its E&S property business by 14%.

Westchester had another successful year growing wholesale small business. The book grew 30% year over year on the strength of our offerings, new distribution channels and the growth of our microdigital platform. Building out APIs with key distribution partners was a focus on the digital front.

In 2018, **Chubb Bermuda** remained focused on its core excess businesses, including property, excess casualty and financial lines, as well as its political risk business. The operation, which complements the Major Accounts business, remained relevant on a global scale, delivering Chubb's high severity/low frequency business model to clients and brokers around the world. In 2018, the political risk group experienced a record year in terms of revenue and profitability.

Commercial Insurance, the P&C business unit that serves middle-market companies, is distinguished by its more than 20 industry practices, each handled by teams of experienced underwriting, claims and risk engineering professionals who understand the particular exposures of that industry. Commercial Insurance's core package product is complemented by an extensive range of standard and specialty coverages.

In recent years, the business has focused on expanding and deepening its industry practices, and 2018 was no exception. One industry receiving increased focus was manufacturing, where companies in North America face growing risks in their operations from increasingly complex automation, technology and cyber exposures. For middle-market businesses, the experience and insights of underwriters and risk engineers who can assess those risks and offer actionable steps to mitigate potential losses is a benefit of insuring with Chubb.

Chubb's extensive product offerings also create opportunities for cross-selling. "About half our new business comes from selling additional coverages to existing clients," said Mr. Krump. "Our ability to meet the needs of middle-market customers is also due to the strength of our extensive network of branches, which delivers service locally. We have 1,000 Chubb colleagues servicing our Commercial Insurance customers in North America."

One example of cross-selling – and of the power of the Chubb organization – can be found in the manufacturing practice, where underwriters are successfully offering product recall coverage to middle-market companies – a specialty product underwritten by the company's Westchester affiliate.

Another example is using the Chubb branch network to bring the company's accident and health insurance products to middle-market customers.

More broadly, the Chubb branch network in North America, which has 48 offices, had a strong year, with cross-selling through retail agents and brokers accounting for 62% of new business. "We have solid growth strategies with our top brokers and agents, and the comfort level of our branch team with our expanded product offering, and with working together as colleagues, is at an all-time high," said Mr. Lupica.

For Chubb's **Small Commercial** division, 2018 was a year of significant progress and achievement. Growth in net premiums written accelerated throughout the year, and the business unit ended 2018 with an annual run rate of $400 million. The opportunity in this highly fragmented market segment is vast – some 33 million small businesses that spend $100 billion on insurance. Chubb has approached this market with a clear vision: delivering an exceptional experience to our agents through technology that is simple and efficient, enabling them to spend more time on advising their small business customers and building their businesses.

The company has differentiated itself with Chubb Marketplace℠, an intuitive digital platform that makes it easy for agents to quote, issue and service all of their small business accounts. Designed in partnership with our agents, Chubb Marketplace was first introduced to a few hundred agencies in late 2017. Adoption has been rapid and accelerating. By the end of 2018, more than 4,000 agencies had requested and received access to the platform. Each day, an average of 1,000 agents log in to the platform to transact business. More than 80% of submissions for the core package product are processed on a straight-through basis, where the agent receives a fast answer from the system without having to interact with an underwriter.

The company continues to enhance Chubb Marketplace, including adding products and increasing the threshold of clients that it can service. For example, in 2018, Chubb introduced a suite of property and liability insurance products focused on the specific needs of small life sciences firms and artisan contractors. Dental malpractice insurance is also now available through Chubb Marketplace. New suites of coverages for restaurant owners, religious groups and veterinarians will be launched in the coming months.

"We're going to continue to focus on the agent experience by further enhancing our technology and the use of third-party data that makes it even easier to do business with us," said Mr. Krump. "At the same time, we will continue to build our team to service this growing business. With our industry-leading capabilities and rapid growth, we're finding it easy to attract the very best talent to join our Small Commercial team."

North America Agricultural Insurance

Chubb's Rain and Hail subsidiary is the leading crop insurance managing general agency in North America. The business serves approximately 125,000 farmers, insuring more than 100 different crops over 65 million acres. In addition to Rain & Hail, the North America Agricultural Insurance segment includes farm, ranch and P&C commercial agriculture coverages. In 2018, the segment produced a combined ratio of 75.5% and segment income of $383 million. Net premiums written were $1.6 billion, up 4.0%.

Crop insurance is a successful public-private partnership that operates with a proven model. Chubb distinguishes itself in the multi-peril crop insurance market through its track record of delivering superior service, demonstrated commitment to the market and national scale, including distribution through 5,600 independent agents, the largest agency footprint in this sector. Clients also value the business's online portal that facilitates the payment of claims quickly.

"Multi-peril crop insurance is a vital part of the chain of commerce for agricultural communities, and it's a core business for Chubb as well," said

"The natural catastrophes of 2017 and 2018 heightened awareness among homeowners about their insurance policy and what it covers. That has created an opportunity for us to really show what Chubb brings to the table, for our customers and for agents and brokers."

– Paul Krump

Mr. Lupica. "2018 was another great year in terms of our performance, growing our policy count and further building the brand, which is the best in the industry."

In 2018, Rain and Hail entered into a multi-year agreement with Bushel™, a software platform that allows grain elevators, cooperatives and ethanol plants to connect with their growers digitally. The addition of Bushel to Rain and Hail's platform provides growers and agents a fast and efficient way to report critical production information that can help save them time during the harvest season.

North America Personal P&C Insurance

Chubb is the leading provider of personal lines insurance for successful individuals and families in the U.S. and Canada. **Chubb Personal Risk Services** shares many of the strengths of the company's North American commercial P&C insurance businesses, including a broad product offering, superior claims and risk consulting services, and access to Chubb's extensive branch network in the U.S. and Canada. Clients of Chubb Personal Risk Services also benefit from the company's global presence, which offers protection for their assets around the world.

Net premiums written for the North America Personal P&C Insurance segment were $4.7 billion for the year, up 3.1% from 2017. In a year of elevated industry losses from natural catastrophes, the 2018 combined ratio was 96.6%. The current accident year combined ratio excluding catastrophe losses was 81.9%. Segment income was $378 million.

Chubb has built and is widening its leadership position with this discerning market segment by continuing to raise the bar in terms of service. "Here's how we think about our relationships with customers, and with agents and brokers: we look for ways to do more and we look for ways to say 'yes,'" said Mr. Krump.

In a world that is rapidly digitizing, and where customers expect to be able to interact 24/7 through the channel they prefer, saying "yes" also means a commitment to invest in digital technology to enhance the customer and agent experience. For Chubb, the digital journey encompasses marketing, quoting, onboarding, providing risk consulting services and superior claims handling.

In 2018, Chubb Personal Risk Services enhanced its web portal and introduced a mobile app with features that include biometric login, voice commands, text and email alerts, and a simpler approach for paying bills. With the app, customers can easily pull up their auto identification information or, if they have a claim, choose to file the first notice of loss digitally. The tool also enables customers to sign up for services such as Chubb Property Manager℠, which provides policyholders with assistance for second homes that suffer damage from hurricane-force winds.

"The natural catastrophes of 2017 and 2018, including major hurricanes and wildfires in the U.S. and Canada, has heightened awareness among homeowners about their insurance policy and what it covers," said Mr. Krump. "That has created an opportunity for us to really show what Chubb brings to the table, for our customers and for agents and brokers."

At the top of the list of differentiators is the superior claim service offered by Chubb, which has been validated by independent sources such as J.D. Power. The client retention rate for Chubb Personal Risk Services was 96% in 2018.

But Chubb's definition of service begins long before a customer may have a claim. Chubb's risk consultants can be deployed to policyholder homes to assess risks from water, electrical systems or other exposures. Policyholders also have access to Chubb's network of service providers, including appraisers, with expertise in assets ranging from art and jewelry to yachts and collector cars.

Through digital marketing efforts, the company engages with clients to raise awareness about risks such as flooding and internal water leaks. Water damage from burst pipes, frayed hoses and other plumbing failures are the number one loss a homeowner is likely to face and a growing industry issue. Through these awareness and education campaigns, Chubb encourages policyholders to install water leak detection devices or to turn off their main water valve when they leave their home for extended periods of time. In 2018, Chubb entered into a partnership with Hartford Steam Boiler Inspection and Insurance Company to begin installing web-connected sensors in the homes and businesses of Chubb policyholders. The devices monitor for water leaks and changes in temperature, humidity, vibration and water pressure that, if left undetected, can lead to severe property damage, including to valuables such as fine art and wine collections.

Chubb has also been using analytics to identify clients that have a higher propensity for a loss, and is working with them and their agents proactively to mitigate or prevent a loss from happening in the first place.

Chubb's commitment to prevent customer losses was also evident in the wildfire defense services deployed to protect homes before, during and after the California wildfires. Available in 18 states, our WDS partners monitor the homes of our policyholders and, based on the threat level, will take actions such as clearing of hazardous objects and material around the home to create a more defensible space, installing sprinklers, addressing hot spots and, as a last line of defense in home protection, applying fire retardant gel to the home. Tens of thousands of policyholders in wildfire-prone states are enrolled in this complimentary service.

Chubb also differentiates itself in the market through the breadth of its products, which are crafted to meet the needs of different customer segments. In 2018, the company launched a supplement to its Masterpiece® homeowners policy that offers individuals and families in North America enhanced protections for cyberattacks. The policy includes protections from extortion and ransomware, financial loss, cyberbullying, cyber disruption, and breach of privacy. Clients also benefit from discounted access to third-party resources, with tools ranging from how to secure the home Wi-Fi network and mobile devices to how to spot signs of online manipulation.

"When I look across our businesses in North America, and around the world, I saw in 2018 a higher level of comfort and confidence of our people," said Mr. Keogh. "As we focus on executing our strategies, there is a quiet confidence across the company. And that gives me a great deal of optimism as we look to the future."

Overseas General Insurance

Key Financial Results

Dollars in millions

Overseas General Insurance	
2018	
Gross premiums written	$10,885
Net premiums written	$8,902
Combined ratio	90.4%
P&C current accident year combined ratio excluding catastrophe losses	90.5%
Segment income	$1,401

Chubb's international general insurance operation is comprised of two main businesses: one with distribution through retail channels in five regions of the world and the other an excess and surplus (E&S) lines business with distribution through brokers in the London wholesale market and Lloyd's.

Toward the end of 2018, the international operating environment for Chubb improved in a number of important business lines and geographies, notably in Australia and the London wholesale market. In both market segments in 2018, Chubb demonstrated its underwriting discipline and ability to move quickly to seize opportunities as market conditions changed.

At the same time, Chubb's focus on executing its strategies produced strong growth and profitability for the Overseas General Insurance segment. Commercial P&C and personal lines businesses performed well and the company deepened and accelerated its globally integrated capabilities to deliver for customers and distribution partners, particularly in Asia and Latin America. Net premiums written were $8.9 billion, up 6.6%. The combined ratio for the year was 90.4%. The current accident year combined ratio excluding catastrophe losses was 90.5%, and segment income was $1.4 billion, up 15% from prior year.

"Our international operations performed well in 2018," said Juan C. Andrade, Executive Vice President, Chubb Group and President, Overseas General Insurance. "The pace of growth increased as we continued to leverage the power of today's Chubb through our expanded distribution, product capabilities and customer segmentation. Our diversified platform, in terms of geography, branch offices, product and distribution, continues to be a competitive advantage and key growth driver for us."

"This business, which operates in more than 50 countries and with over 450 local offices, is truly in an elite class among global insurers," said Mr. Keogh. "It's also home to some of Chubb's most compelling growth opportunities, including small and middle-market commercial P&C, personal lines and accident and health. Asia and Latin America are the regions where Chubb has forged some of our most significant long-term distribution agreements, which enable us to reach our partners' vast customer bases through digital channels."

In 2018, Chubb launched its partnership with DBS Bank in Singapore and formed new distribution partnerships with Grab, the leading on-demand transportation platform in Southeast Asia; Citibanamex, a subsidiary of Citigroup Inc. and one of Mexico's premier financial institutions; and, in early 2019, with Banco de Chile, the largest bank based in Chile. These new distribution partnerships give Chubb access to millions of potential new customers.

Growth in Chubb's international retail P&C operations was highlighted by the strong results in Australia, where Chubb moved quickly and pursued a strategy of accelerated growth as underwriting and market conditions became more favorable. The company's continued emphasis on building its middle-market and small commercial

Chubb's Overseas General Insurance Business Units

International		Commercial P&C, A&H and traditional and specialty personal lines sold by retail brokers, agents and other channels in five regions:
	Europe	Operations in the U.K. and 18 other countries comprised of P&C commercial lines and consumer lines, including A&H and specialty personal lines
	Asia Pacific	Operations in 13 countries and territories serving commercial customers and consumers with P&C, A&H and personal lines
	Latin America	Operations in nine countries serving commercial customers with P&C products and consumers through A&H and personal lines
	Far East	Operations in Japan serving commercial customers with P&C products and consumers through A&H and personal lines
	Eurasia & Africa	Operations in nine countries serving commercial customers with P&C products and consumers through A&H and personal lines
Chubb Global Markets		Commercial P&C excess and surplus lines and A&H sold by wholesale brokers in the London market and through Lloyd's

businesses globally also contributed to the improved results. In addition, the major accounts segment, which serves the large corporate market, produced good growth in the U.K., Ireland and Continental Europe as market conditions improved in 2018 after several years of declining rates.

In the middle-market P&C segment, a key focus was expanding Chubb's dedicated industry practices, which bring together teams of experienced underwriting, claims and risk engineering professionals that understand the particular exposures of that industry. Industry practices helping to drive growth during the year included technology, life sciences and real estate. Further developing the company's multiline capability, which combines property and casualty with specialty lines and multinational capabilities, remained a priority.

In the small commercial segment, the focus was on expanding product offerings to distribution partners via easy-to-use technology solutions, which can be integrated with affiliate and partner platforms for a streamlined customer experience. Chubb continues to implement better and faster analytics capabilities and increase the volume of business it processes digitally.

Personal lines generated strong growth in 2018, particularly in the emerging markets of Asia and Latin America. Highlights included the company's motor insurance business in Mexico, which is recognized for its top-tier sales and service capabilities. "The investments we have made in technology, product development, customer segmentation, and traditional bancassurance and digital distribution are paying off," said Mr. Andrade.

"Our international operations performed well in 2018. The pace of growth increased as we continued to leverage the power of today's Chubb through our expanded distribution, product capabilities and customer segmentation."

– Juan Andrade

The company's unique cell phone cover and other consumer protection and service propositions within Chubb's specialty personal lines (SPL) portfolio are an excellent fit with the needs of a growing middle class in emerging markets. The business achieved significant growth across Asia and Latin America in 2018.

Chubb's international accident and health business is focused on driving profitable growth through its core direct marketing business, growing group business through large and small brokers and agents, and growing the leisure and business travel insurance segment. All of this is enabled by investments in digital technology, distribution expansion, product enhancements, and servicing and processing efficiency.

"Chubb's international accident and health business is well diversified by geography, distribution methods, products and customer segments. This diversification provides a powerful platform for Chubb to deliver our specialty A&H products globally," said Joe Vasquez, Senior Vice President, Chubb Group, Global Accident & Health. "Our continued investment in our A&H platform allows us to go beyond traditional direct marketing where we are now seamlessly integrating our products and services into the customer journeys of our distribution partners."

Chubb's **Asia Pacific** region generated gross premiums written of $2.7 billion, up 11.3% in constant dollars from prior year, which represents 7% of the company total. "In Asia, as in Latin America, we focus on the emerging middle class and small and mid-size businesses," said Mr. Andrade. "Our broad product offering, technologically advanced front-end systems and multichannel distribution platform, which is enabled by our significant branch network, have been the backbone of our small commercial and middle-market growth."

Digital capabilities are at the heart of Chubb's distribution partnership with DBS Bank, the largest banking group in Southeast Asia. Within the first 12 months, Chubb rolled out over 60 general insurance products across five markets. The products, offered on an exclusive or preferred basis, are distributed through multiple DBS banking channels, including all of its digital platforms. One of those products, CyberSmart℠, was developed through Chubb's annual employee innovation competition, which encourages volunteer teams from around the world to build innovative new product ideas. The winning entry was developed by an all-women Singapore-based team. CyberSmart, which is available as a family plan for parents and as an individual plan for young adults, provides cover for cyber bullying, online privacy invasion and identity theft.

In its partnership with Grab, Chubb is now offering insurance solutions for the ride-hailing firm's driver-partners through the Grab app. Drivers can select different insurance products, including coverages for loss of income and personal accidents, to protect their livelihoods and their families. Chubb plans to further expand this partnership throughout Southeast Asia in future years.

Chubb is also pursuing growth strategies in the developed economies of Asia Pacific, including Australia and Korea, where the company conducts consumer direct marketing programs. The company has a significant presence in Korea for supplemental A&H and residential coverages and is building a strong digital capability to further enhance distribution opportunities in this critical market.

In 2018, Chubb launched a Major Accounts division in Asia Pacific, featuring a dedicated service encompassing underwriting, risk engineering and claims for the region's large, global and multinational clients and business partners. The division leverages the model the company successfully uses in other regions, including Global Client Executives, Claims Client Relationship Managers and risk engineers, to meet the complex insurance needs of large enterprises.

In **China**, the largest economy in Asia and the second-largest in the world, Chubb focused on building and deepening its presence. The company operates a fully licensed, 100% Chubb-owned subsidiary with branch offices in Shanghai, Beijing, Jiangsu and Guangdong. Chubb China offers one

Overseas General
Regional and Business Unit Leaders

(From left)

Juan Luis Ortega
Senior Vice President
Chubb Group;
Regional President
Latin America

David Furby
Senior Vice President
Chubb Group;
Regional President
European Group

Paul McNamee
Senior Vice President
Chubb Group;
Regional President
Asia Pacific

(From left)

Darryl Page
Vice President
Chubb Group;
Division President
Personal Insurance

Timothy O'Donnell
Vice President
Chubb Group;
Division President
Commercial Property
and Casualty

John Thompson
Division President
International Accident
& Health

"Our continued investment in our A&H platform allows us to go beyond traditional direct marketing, where we are now seamlessly integrating our products and services into the customer journeys of our distribution partners."

– Joe Vasquez

of the largest commercial P&C product portfolios in the Chinese insurance market. It also offers a series of protection products such as personal accident, homeowners, travel and personal devices insurance via the rapidly growing internet channel to Chinese families and individuals across the country.

Chubb has a strategic cooperation agreement with PICC Property and Casualty Company of China, which is the country's largest P&C insurance company. The agreement, which was reached in 2017, involves establishing dedicated underwriting and service centers for Chinese-affiliated enterprises in Chubb's offices throughout the world. In addition, Chubb will make its global insurance capabilities available to PICC and its customers.

Chubb's **Latin America** region generated gross premiums written of $2.7 billion, up 10.2% in constant dollars from 2017, representing 7% of the company total. Continuing execution of growth strategies, along with an improving operating environment, contributed to solid premium revenue in the company's personal lines and commercial P&C businesses.

Chubb's performance in Mexico, where the company has a network of 46 branches across the nation, stood out, led by growth in motor and P&C coverages for small business. Chubb deepened its presence in Mexico with the long-term exclusive agreement with Citibanamex, which will distribute Chubb's general insurance products through the bank's branches as well as a variety of digital and direct marketing channels. The agreement encompasses coverages for motor insurance, homeowners, and small-to-medium enterprises, A&H insurance products, and commercial P&C coverages for larger businesses.

Chubb's business across Latin America is well balanced. In Brazil, the company has the second-largest commercial P&C business, which is distinguished by its track record of superior technical ability and multiple affinity distribution partnerships. Chubb also has a strong presence in the Andean region – Colombia, Ecuador, Peru, Argentina and Chile – that accounts for 30% of the total region, and where the company operates in all segments of commercial P&C through brokers and affinity partners. In the Caribbean and Central America, Chubb operates through wholly owned subsidiaries in Puerto Rico and Panama and partnerships in other locations.

Early in 2019, Chubb signed a distribution agreement with Banco de Chile through which Chubb will distribute its life and general insurance products on an exclusive basis in Chile through Banco de Chile's multiple channels, including in-branch, automated teller machines, direct marketing and a number of digital channels including mobile.

Europe is Chubb's second-largest region behind North America, operating in 19 countries, with $3.6 billion of gross premiums written, representing 10% of the company total. In 2018, Chubb maintained strong profitability with continued underwriting discipline and achieved solid premium growth across the region, driven by commercial P&C, where highlights included further progress developing industry practices, as well as new business wins and increased account penetration in the Major Accounts segment. For the year, gross premiums written were up 1.7% in constant dollars.

On January 1, 2019, the company completed the move of its European Union headquarters to Paris as planned. Chubb's approach has ensured that its customers, brokers and other partners will have continuous, uninterrupted service regardless of the final outcome of Brexit negotiations. The company continues to maintain a significant presence in the U.K.

In property and casualty lines, further building out Chubb's capabilities to serve small and middle-market businesses remained a priority. Among the new industry practices launched in the U.K. and Ireland was real estate. Chubb also introduced a new service for multinational companies and large middle-market businesses that combines the company's capabilities in terrorism and political violence underwriting, risk engineering, global security, catastrophe modeling and digital.

Cyber insurance, where Chubb is a leader globally, remained a fast-growing product category in Europe, as well as in other regions. The global cyber practice benefitted from investment in accelerating cyber underwriting, claims and risk engineering resources across all regions. The business launched a global cyber incident reporting platform to provide customers with immediate access to local experts who can assist with event response. The platform is accessible via mobile app, web portal and a telephone hotline. Cyber customers also have access to a new website where they can register for pre- and post-event services based on their geographic location. The company also launched a new cyber loss mitigation service for password management and phishing training to insureds in Europe, an example of Chubb using claims insights to drive new areas of loss mitigation services in areas of highest claims frequency.

Chubb's **Far East** region, which encompasses Japan, had an excellent year, driven by the strong performance of its P&C and A&H businesses, enabling the company to continue to outpace the market in growth. In P&C, Chubb's success stems from its targeted middle-market and small commercial segments, via brokers and agents, with increased capabilities in multinational, risk engineering and cyber, as well as additional underwriting focus on industry practices, particularly life science and technology. These also enable Chubb to take advantage of market opportunities within the large commercial segment.

A&H is a significant growth engine in the region with Chubb further building out its multi-channel distribution with agents, brokers, direct marketing and online digital. Chubb remains focused on adding direct marketing partners through customer-segmented campaigns as well as new online travel partners by seamlessly integrating insurance products into their digital purchase path. Each channel is supported by continuous enhancements to product offerings within personal accident, supplemental medical and travel categories.

In **Eurasia and Africa**, although growth was limited by economic and political factors, Chubb had a good year, producing a strong combined ratio on the back of improved operational efficiency and disciplined underwriting management. In line with other markets, the region saw improved pricing and withdrawal of both local and international capacity, particularly for larger and more technical risks, affording the company the opportunity to build its position in several product lines.

Chubb Global Markets

Chubb Global Markets, the company's London market wholesale and international excess and surplus business, provides global access to specialist underwriters in aviation, energy, financial lines, marine, political risk and credit, property, and accident and health.

In recent years, the commercial P&C E&S market was the most competitive insurance market in the world. In 2018, however, the E&S rating environment in London began to improve in numerous lines. Chubb, with its focus on driving for rate adequacy, resumed growth after several years of shrinking the business. Other initiatives in 2018 included exploring new distribution channels outside of wholesale brokers and expanding digital distribution. This business continues to rank in the top quartile for profitability at Lloyd's.

"We recognized and moved quickly to take advantage of changing and dynamic market conditions," said Mr. Andrade. "The way we've managed Chubb Global Markets exemplifies both our underwriting discipline as well as our ability to be nimble when we see opportunity. Looking ahead, we expect to expand existing lines that are within our risk appetite, and consider additional lines where we find rate adequacy and improving terms and conditions."

"Looking across our business globally, Chubb has built a company with scale, a deep local presence, brand recognition and an unmatched reputation for service," said Mr. Keogh. "Our customers and distribution partners should know that we are not resting on our laurels. We continue to invest in our business, our people and our digital transformation."

"We are proud of what we've built here," he continued. "But there is so much more that we can imagine for this company in the future, so much opportunity to build well beyond what we are today, in terms of products, services, capabilities, as well as opportunities for our people."

Life Insurance

Key Financial Results

Dollars in millions

Life Insurance	
2018	
Net premiums written and deposits*	$3,808
Segment income	$308

"Chubb Life's patient strategy to develop and build the business by diversifying and expanding its captive agency force, opening new offices, focusing on protection-oriented products and pursuing digital initiatives produced excellent results in 2018."

– Russell Bundschuh

Chubb's Life Insurance segment comprises two businesses. **Chubb Life** is an international life insurer, primarily focused on Asia, that provides protection and savings-oriented life insurance products to individuals and groups. **Combined Insurance** provides personal accident and supplemental health insurance coverages to consumers in North America.

For the year, the Life Insurance segment generated net premiums written and deposits of $3.8 billion, up 6.5% from prior year.

Chubb Life

Chubb Life serves the needs of consumers through a variety of distribution channels including primarily captive agents, but also through banks, retailers, brokers, independent agents and direct marketing. In the six Asian markets where Chubb Life has full operations – Hong Kong, Indonesia, Korea, Taiwan, Thailand and Vietnam – the number of captive agents has grown to 37,000. In China, the company is also a joint venture partner in Huatai Life, a fast-growing life insurer that serves more than 1.3 million customers across 19 provinces with a broad portfolio of savings and protection products.

Across the region, Chubb Life focuses on two market segments. In emerging economies where growing middle class consumers are beginning to accumulate wealth, the company's protection-oriented products provide individuals and families a vehicle to transfer the financial risks associated with death, illness and accidents. In the developed markets of Asia where the company operates, Chubb's life insurance products are a tool for legacy planning and wealth management.

"Chubb Life's patient strategy to develop and build the business by diversifying and expanding its captive agency force, opening new offices, focusing on protection-oriented products and pursuing digital initiatives produced excellent results in 2018," said Russell Bundschuh, Senior Vice President, Chubb Group and President of Chubb Life. "With earnings topping $100 million for the year, Chubb Life continued to advance its potential to make meaningful contributions to the company's premium growth and profitability over time."

Chubb Life's growth was fastest in the emerging economies of Thailand and Vietnam, and in the developed market of Korea. In Thailand, the business opened 10 new offices in 2018, and grew the agency force by nearly 18%, to about 3,500 captive agents. Among the new protection-oriented products launched in 2018 were a 20-year term life policy and a whole life extra series, which provides a cash benefit that contributes to retirement funds while also offering family protection in the event of an unexpected incident.

In Vietnam, 19 new offices were opened and the number of agents grew 9% to more than 29,500. Chubb Life is focused on diversifying its product offer to enhance its competitiveness in the market and give customers more options. Examples of new products

*Includes deposits collected on universal life and investment contracts. Consistent with GAAP, premiums collected on universal life and investment contracts are considered deposits and excluded from revenue.

Global A&H, Life Insurance and Reinsurance Business Unit Leaders

(From left)

Kevin Goulding
President
Combined Insurance

Joe Vasquez
Senior Vice President
Chubb Group;
Global Accident & Health

Russell Bundschuh
Senior Vice President
Chubb Group;
President
Chubb Life

James E. Wixtead
Senior Vice President
Chubb Group;
President
Chubb Tempest Re Group

Cunqiang Li
Chief Operating Officer
Chubb Life

in Thailand include C-Care, which offers protection against cancer, and Education Endowment, which covers multiple risks, such as hospitalization for critical illnesses, total disability and death, for children up to age 27. The comprehensive product also provides an educational fund.

In Korea, Chubb Life is emphasizing digital channels for a number of new products, including coverages for certain cancers, as well as a preferred term life policy.

"We have a number of digital initiatives focused on enhancing service for our agents," said Mr. Bundschuh. "For example, in Hong Kong and Korea we are enabling individual agents to have a microsite on the Chubb platform that allows them to communicate directly with their clients, as well as cross-sell."

In China, Huatai Life had an excellent year in 2018, with its rate of growth again outpacing the overall market. The business entered two new provinces and increased its network of exclusive agents by 7% to approximately 43,000.

Across the region, Chubb Life is also developing strategies to expand sales through banks and brokers. For example, in Taiwan, Chubb Life has traditionally sold products through banks. Now, the focus has expanded to drive sales growth through the broker channel, which is well suited to market protection-oriented products.

"Looking to 2019, we will continue our focus on building the business through geographic expansion, growing our agency force, introducing products that give our customers greater choice, and further developing our distribution channels, including digital," said Mr. Bundschuh. "We believe we are well positioned to continue to build the breadth and depth of our life business across the region."

Combined Insurance

Combined Insurance generated solid results in 2018. An area of particular strength was Chubb Workplace Benefits, which produced another year of double-digit growth. The business, which serves large and middle-market companies by partnering with benefit brokers, agents and consultants, offers a line of supplemental insurance products, including accident, critical illness, hospital indemnity, life and disability income. Launched in 2016 under the Chubb Workplace Benefits brand, the business brought together Combined Insurance's workplace products with Chubb's extensive branch network and our substantial relationships with national and regional insurance brokerage firms. In 2018, Chubb Workplace Benefits generated over $150 million of premiums.

The continued growth and expansion of Chubb Workplace Benefits demonstrates both the breadth of Chubb's A&H offerings as well as the power of its branch network in the U.S. This business continues to be positioned for growth over the next few years.

Our Combined Insurance core sales force is focused on distributing our personal accident, life and supplemental health insurance coverages direct to consumers. The business ended 2018 with close to 2,300 agents and plans to grow to 3,000 agents in 2019. In hiring, Combined Insurance continues to expand the number of Spanish-speaking agents as well as veterans looking to re-enter the civilian workforce. The business has received numerous recognitions for its diverse and military-friendly hiring practices. For example, the company was named the #1 Military Friendly Employer in the over $1 billion revenue category by VIQTORY for 2019. Combined Insurance has also been named a "Best for Vets" employer by *Military Times* and a Top Diversity Employer by *Hispanic Network Magazine*. The company has appeared for four consecutive years on the HNM Best of the Best Lists, which identifies organizations that embrace a wide range of perspectives, attract the very best talent and understand the demographics of the marketplace and its needs.

"We continue to see opportunity in building our capabilities for the underserved Latino market in the U.S.," said Mr. Vasquez. "Our core hospital, indemnity and life insurance product offerings, as well as coverages for critical illness, help to fill a big gap in the marketplace."

Global Reinsurance

Key Financial Results

Dollars in millions

Global Reinsurance	
2018	
Gross premiums written	$722
Net premiums written	$671
Combined ratio	101.8%
P&C current accident year combined ratio excluding catastrophe losses	81.6%
Segment income	$277

"Tempest Re has successfully navigated different cycles during its 25-year history and we stand ready to deploy more capital and capacity should the market opportunity develop favorably. If not, then we will continue to service our clients with our current risk appetite."

– James Wixtead

Chubb's reinsurance business, which operates under the Chubb Tempest Re brand, offers a broad range of products to a diverse group of primary property and casualty insurers worldwide. Doing business globally with offices in Bermuda, Stamford, London, Montreal, Shanghai and Zurich, the business has deep underwriting, actuarial and claims expertise.

The elevated level of natural catastrophes in 2018, following a record year for CATs in 2017, brought additional pressure to property catastrophe reinsurers, including both traditional carriers and the insurance-linked securities (ILS) market. In non-property lines, incremental improvement in pricing and terms and conditions created some opportunities for reinsurers.

In 2018, Chubb's Global Reinsurance segment posted net premiums written of $671 million, down 2% from prior year. The combined ratio was 101.8%, and the current accident year combined ratio excluding catastrophe losses was 81.6%. Segment income was $277 million, up 41% from 2017.

"Tempest Re has successfully navigated different cycles during its 25-year history and we stand ready to deploy more capital and capacity should the market opportunity develop favorably," said James Wixtead, Senior Vice President, Chubb Group and President of Chubb Tempest Re Group. "If not, then we will continue to service our clients with our current risk appetite, as our platform allows for Tempest to be patient and wisely deploy capital where we can gain the best margins."

With its financial strength, diverse risk appetite and seasoned underwriting team, the business is strongly positioned to tailor reinsurance programs to meet clients' specific needs. Because Chubb Tempest Re is part of a larger insurance group, it also has ample flexibility to adjust its risk appetite to market conditions.

"When we do not have the opportunity to achieve rate adequacy, we can return capital to our parent company, which can be deployed to other businesses where there is more opportunity," noted Mr. Wixtead. "This is a strength we have by being part of Chubb."

Corporate and Global Functional Leaders

(From left)

Sean Ringsted
Executive Vice President
Chubb Group;
Chief Risk Officer and
Chief Digital Officer

Philip Bancroft
Executive Vice President
Chubb Limited/
Chubb Group;
Chief Financial Officer

Timothy Boroughs
Executive Vice President
Chubb Group;
Chief Investment Officer

(From left)

Joseph Wayland
Executive Vice President
Chubb Limited/
Chubb Group;
General Counsel

Julie Dillman
Senior Vice President
Chubb Group;
Global Head of
Operations

Rainer Kirchgaessner
Executive Vice President
Chubb Group;
Global Corporate
Development Officer

(From left)

Paul Medini
Senior Vice President
Chubb Group;
Chief Accounting Officer

Paul O'Connell
Senior Vice President
Chubb Group;
Chief Actuary

Monique Shivanandan
Vice President
Chubb Group;
Chief Information Officer

(From left)

Jo Ann Rabitz
Global Human
Resources Officer
Chubb Group

Michael W. Smith
Senior Vice President
Chubb Group;
Global Claims Officer

Ivy Kusinga
Chief Culture Officer
Chubb Group

Our Mission

Protecting the Present and Building a Better Future

Good corporate citizenship lies at our core – how we practice our craft of insurance, how we work together to serve our customers, how we treat each other, and how we work to help make a better world for our communities and our planet. Citizenship is about responsibility – and we express that responsibility in a way that reflects our core values and our mission to protect the present and build a better future.

We accomplish our mission by providing the security from risk that allows people and businesses to grow and prosper. Our mission is realized by sustaining a culture that values and rewards excellence, integrity, inclusion and opportunity; by working to protect our planet and assisting less fortunate individuals and communities in achieving and sustaining productive and healthy lives; and by promoting the rule of law.

From our roots in 18th century Philadelphia, we have built Chubb to be a dynamic, forward-looking global enterprise with a commitment to responsible citizenship. We act on this promise of responsibility through a wide range of activities that include our contributions of time and money.

Philanthropy

Chubb recognizes its responsibility to assist less fortunate individuals and communities in achieving and sustaining productive and healthy lives in geographic areas where the company operates. The company's philanthropy is funded principally through the Chubb Charitable Foundation and the Chubb Rule of Law Fund.

The Chubb Charitable Foundation addresses actionable problems and contributes to helping alleviate poverty, improve the health of at-risk populations, provide access to quality education and protect the environment. In the last 10 years, the company has contributed more than $100 million to the Foundation.

For many years, for example, the Foundation has supported the International Rescue Committee, including its efforts to help refugees get settled and establish productive lives. The Foundation has helped build schools in China and Vietnam, fund micro-finance projects in Mexico and Colombia, and serve as a major partner for Teach for America and Teach for All programs in the United States and around the globe.

For more information about Global Citizenship at Chubb, please visit About Us on chubb.com.

Environment

Chubb recognizes the reality of climate change and the substantial impact of human activity on our planet. Our environmental activities reflect our desire to do our part as a steward of the Earth. Through our Foundation, we support important environmental projects, including the protection of biodiversity and saving land.

Since 2005, for example, the Chubb Land Legacy Fund has supported The Conservation Fund, one of America's top environmental preservation organizations, which has protected 8 million acres of vital land and water habitats across the nation. The Chubb Charitable Foundation has supported the work of The Nature Conservancy (TNC) in the repair and protection of the unique and critically important Mesoamerican Reef along Mexico's Yucatan Peninsula, which helps protect the local coastal infrastructure and economy against storm surge. In 2018 the Foundation made a major grant to TNC for a wetlands restoration and resilience project in Miami-Dade County designed to serve as a model to be replicated in other urban coastal areas.

Chubb has had a formal program to measure, record and reduce greenhouse gas (GHG) emissions in its own operations since 2006. From 2015 to 2018, Chubb has reduced its absolute global GHG emissions by 21%. In 2018, the company earned a score of B on the CDP's climate change program ranking.

Diversity and Inclusion

At Chubb, we recognize our responsibility to ensure opportunity within our own organization, where we foster a diverse and inclusive meritocracy. We can't succeed unless we give everyone the opportunity to thrive and advance in our company, and we hold our leaders accountable for improving the advancement of women and people of all races, nationalities and religions around the globe.

The company's extensive efforts in this area include mentorships, affinity groups, diversity awareness training, management development programs, and mandating diverse slates in recruiting and promotion. Examples of initiatives include the company's Business Roundtables and Regional Inclusion Councils, which promote dynamic networking across the business and engage hundreds of employees in constructive dialogue. Other initiatives include Chubb Start, a program that supports the continuous professional development of early career women, and Chubb Signatures, a global and regional lecture series for successful senior women, diverse men and inclusion champions to share their unique backgrounds, experiences and hard-earned lessons in business.

Chubb Rule of Law Fund

As a corporate citizen, Chubb recognizes the rule of law as the foundation of a liberal world order that the company embraces as essential to the proper functioning of markets and the protection of personal freedoms. Through the Chubb Rule of Law Fund, a unique corporate initiative, we support projects around the world that promote the preservation and advancement of the rule of law.

Since it was founded in 2008, the Fund has supported 45 projects in 50 countries focused on improving access to justice, strengthening courts, fighting corruption and creating the conditions of security and freedom in which our customers, employees and fellow citizens can thrive.

The Chubb Rule of Law Fund is funded by the Chubb Charitable Foundation and contributions from 15 of Chubb's partner law firms. In 2018, 10 new projects were funded. Among them were an initiative in Sri Lanka to support the legal community in its effort to encourage post-civil war reconciliation and the restoration of the rule of law; a program in Brazil to support the provision of defense counsel for indigent criminal defendants; and a project to support a pan-African network of judges and lawyers committed to the development of commercial law competence.

Officers and Executives

Chubb Group Corporate Officers

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Chairman and
Chief Executive Officer
Chubb Limited/Chubb Group

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Chief Operating Officer

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and Specialty Insurance

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President
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Executive Vice President
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President
Overseas General Insurance

Philip Bancroft*
Executive Vice President
Chubb Limited/Chubb Group;
Chief Financial Officer

Timothy Boroughs*
Executive Vice President
Chubb Group;
Chief Investment Officer

Rainer Kirchgaessner
Executive Vice President
Chubb Group;
Global Corporate
Development Officer

Sean Ringsted*
Executive Vice President
Chubb Group;
Chief Risk Officer and
Chief Digital Officer

Joseph Wayland*
Executive Vice President
Chubb Limited/Chubb Group;
General Counsel

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Chubb Group;
Regional President
Far East

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Senior Vice President
Chubb Group;
President
Chubb Life

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Chubb Group;
Global Head of Operations

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Regional President
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Division President
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Division President
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Chubb Group;
Chief Communications Officer

Paul McNamee
Senior Vice President
Chubb Group;
Regional President
Asia Pacific

Paul Medini
Senior Vice President
Chubb Group;
Chief Accounting Officer

Frances D. O'Brien
Senior Vice President
Chubb Group;
Division President
North America Personal
Risk Services

Paul O'Connell
Senior Vice President
Chubb Group;
Chief Actuary

Juan Luis Ortega
Senior Vice President
Chubb Group;
Regional President
Latin America

Michael W. Smith
Senior Vice President
Chubb Group;
Global Claims Officer

Joe Vasquez
Senior Vice President
Chubb Group;
Global Accident & Health

James E. Wixtead
Senior Vice President
Chubb Group;
President
Chubb Tempest Re Group

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Vice President
Chubb Group;
Global Underwriting

Joseph S. Clabby
Vice President
Chubb Group;
Chairman
Chubb Bermuda;
Executive Vice President
North America Field Operations

*Executive Officers for SEC reporting purposes

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Chairman, Chubb Agriculture;
Chairman, Rain and Hail

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Deputy Chief Investment Officer

Judy Gonsalves
Vice President
Chubb Group;
Division President
Chubb Bermuda

Michael Kessler
Vice President
Chubb Group;
Chief Reinsurance Officer

Timothy O'Donnell
Vice President
Chubb Group;
Division President
Commercial Property and Casualty
Overseas General Insurance

Darryl Page
Vice President
Chubb Group;
Division President
Personal Insurance
Overseas General Insurance

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Vice President
Chubb Group;
Chief Information Officer

James Williamson
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Chubb Group;
Division President
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Commercial Insurance

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President
Rail and Hail

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Continental Europe

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Chief Auditor
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Bermuda Operations

Kevin Goulding
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Chief Operating Officer
Latin America

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Division President
North America Surety;
Chief Underwriting Officer
Global Surety

Ivy Kusinga
Chief Culture Officer
Chubb Group

Eric Larson
Chief Compliance Officer
Chubb Group

Cunqiang Li
Chief Operating Officer
Chubb Life

David Lupica
Chief Operating &
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Westchester

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Chubb Tempest Re Bermuda

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Division President
North America Financial Lines

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Chubb Tempest Re USA

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Chubb Group

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U.K. & Ireland

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Division President
Chubb Global Markets

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Division President
International Accident & Health
Overseas General Insurance

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Division President
North America Property

Giles Ward
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Chief Executive Officer
Chubb Limited

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Business Administration
Harvard University

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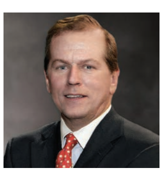
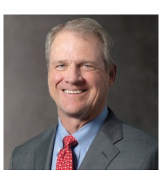
Deutsche Bank



Michael P. Connors
Chairman and
Chief Executive Officer
Information Services
Group, Inc.



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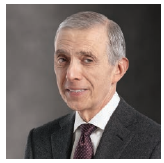
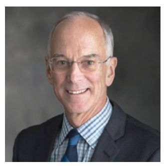
Retired Chairman and
Chief Executive Officer
CDW Corporation



Robert M. Hernandez
Lead Director
Chubb Limited

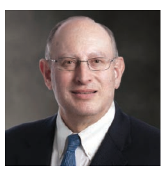
Retired Vice Chairman
and Chief Financial Officer
USX Corporation

Kimberly A. Ross
Former Chief
Financial Officer
Baker Hughes

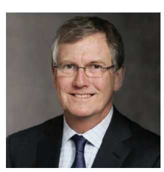


Robert W. Scully
Retired Co-President
Morgan Stanley

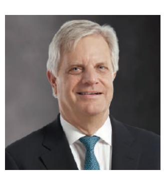
Eugene B. Shanks, Jr.
Retired President
Bankers Trust Company



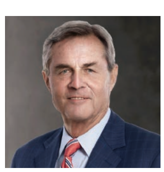
Theodore E. Shasta
Retired Partner
Wellington Management
Company



David H. Sidwell
Retired Chief
Financial Officer
Morgan Stanley



Olivier Steimer
Former Chairman
Banque Cantonale
Vaudoise



James M. Zimmerman
Retired Chairman and
Chief Executive Officer
Federated Department
Stores, Inc. (Macy's)

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Robert W. Scully, Chair
James I. Cash
Kimberly A. Ross
Theodore E. Shasta
David H. Sidwell

Compensation Committee
Michael P. Connors, Chair
Mary Cirillo
Robert M. Hernandez
James M. Zimmerman

Nominating & Governance Committee
Mary Cirillo, Chair
Michael P. Connors
Robert M. Hernandez
James M. Zimmerman

Risk & Finance Committee
Olivier Steimer, Chair
Michael G. Atieh
Sheila P. Burke
John A. Edwardson
Eugene B. Shanks, Jr.

Executive Committee
Evan G. Greenberg, Chair
Mary Cirillo
Michael P. Connors
Robert M. Hernandez
Robert W. Scully
Olivier Steimer

Shareholder Information

Visit investors.chubb.com, write to the Investor Relations Department at Chubb Limited or e-mail investorrelations@chubb.com for copies of the company's reports to the Securities and Exchange Commission on Form 10-K, Form 10-Q or Form 8-K, all of which are available without charge.

Address Investor Relations Inquiries to:

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www-us.computershare.com/investor

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Independent Auditors

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PricewaterhouseCoopers LLP
Two Commerce Square, Suite 1800
Philadelphia, PA 19103 USA
Tel: 267 330 3000

New York Stock Exchange Symbol

CB

Chubb Common Shares CUSIP Number

H1467J 104

Price Range of Common Shares and Dividends

As of February 14, 2019, the company had 458,380,937 Common Shares outstanding with 7,440 registered holders of Common Shares. The accompanying table sets forth the cash dividends and the high/low closing sales prices of the company's Common Shares, as reported on the NYSE Composite Tape for the periods indicated. We have paid dividends each quarter since we became a public company in 1993. The method of payment of our dividend approved at our May 2018 and May 2017 annual general meetings was a distribution from capital contribution reserves (additional paid-in capital).

	2018				2017			
			Dividends				Dividends	
Quarter Ending	High	Low	USD	CHF	High	Low	USD	CHF
March 31	**$156.15**	**$134.57**	**$0.71**	**0.66**	$140.38	$128.48	$0.69	0.69
June 30	**$138.29**	**$124.57**	**$0.73**	**0.73**	$147.58	$135.48	$0.71	0.69
September 30	**$140.12**	**$126.81**	**$0.73**	**0.72**	$149.87	$134.88	$0.71	0.68
December 31	**$136.59**	**$120.19**	**$0.73**	**0.73**	$155.19	$144.70	$0.71	0.70

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Non-GAAP Financial Measures
This document contains non-GAAP financial measures. These measures should not be viewed as a substitute for measures determined in accordance with generally accepted accounting principles (GAAP). Amounts below are shown in millions of U.S. dollars, except for ratios, share and per share data.

We provide certain financial measures on a constant-dollar basis. We believe it is useful to evaluate the trends in these measures exclusive of the effect of fluctuations in exchange rates between the U.S. dollar and the currencies in which our international business is transacted, as these exchange rates could fluctuate significantly between periods and distort the analysis of trends. The impact is determined by assuming constant foreign exchange rates between periods by translating prior period results using the same local currency exchange rates as the comparable current period.

Core operating income is a non-GAAP financial measure that excludes the after-tax impact of adjusted realized gains (losses), net realized gains (losses) included in other income (expense) related to partially owned entities, Chubb integration expenses, and the amortization of the fair value adjustments related to purchased invested assets and long-term debt from the acquisition of The Chubb Corporation (Chubb Corp). We exclude adjusted realized gains and losses because the amount of these gains (losses) is heavily influenced by, and fluctuates in part according to, the availability of market opportunities. We exclude Chubb Corp integration expenses due to the size and complexity of this acquisition. These integration expenses are distortive to our results and are not indicative of our underlying profitability. We believe that excluding these integration expenses facilitates the comparison of our financial results to our historical operating results. Chubb Corp integration expenses are incurred by the overall company and are therefore included in Corporate. These costs are not related to the ongoing activities of the individual segments and are therefore excluded from our definition of segment income as well.

Core operating income with expected level of catastrophe losses (CATs) is a non-GAAP financial measure which excludes catastrophe losses above or below management's view of typical catastrophe losses for that period. The adjustment for normalized catastrophe activity reduces the unusually large impact of catastrophe activity which is not indicative of our underlying performance.

The following table presents the reconciliation of Net income to Core operating income:

(in millions of U.S. dollars, except share and per share data)	Full Year 2018	Full Year 2017
Net income, as reported	$3,962	$3,861
Amortization of fair value adjustment of acquired invested assets and long-term debt, pre-tax [1]	(215)	(283)
Tax benefit on amortization adjustment	40	85
Chubb integration expenses, pre-tax	(59)	(310)
Tax benefit on Chubb integration expenses	12	93
Adjusted realized gains (losses), pre-tax [2]	(649)	91
Net realized gains (losses) related to unconsolidated entities, pre-tax [3]	431	406
Tax (expense) benefit on adjusted net realized gains (losses)	(5)	(5)
Core operating income	$4,407	$3,784
Add: Actual CATs above expected levels, after-tax	583	
Core operating income with expected level of CATs	$4,990	
Denominator	466,802,348	471,196,901
Diluted earnings per share		
Net income	$8.49	$8.19
Amortization of fair value adjustment of acquired invested assets and long-term debt, net of tax [1]	(0.37)	(0.42)
Chubb integration expenses, net of tax	(0.10)	(0.46)
Adjusted net realized gains (losses), net of tax	(0.48)	1.04
Core operating income	$9.44	$8.03
% Change from prior year	17.6%	

[1] Related to the acquisition of The Chubb Corporation.
[2] Excludes realized losses on crop derivatives of $3 million and $7 million for 2018 and 2017, respectively.
[3] Realized gains (losses) on partially owned entities, which are investments where we hold more than an insignificant percentage of the investee's shares. The net income or loss is included in other income (expense).

Core operating return on equity (ROE) and Core operating return on tangible equity (ROTE) are non-GAAP financial measures. The ROE and ROTE numerator includes core operating income. The ROE and ROTE denominator includes the average shareholders' equity for the period adjusted to exclude unrealized gains (losses) on investments, net of tax. The ROTE denominator is also adjusted to exclude goodwill and other intangible assets, net of tax. These measures enhance the understanding of the return on shareholders' equity by highlighting the underlying profitability relative to shareholders' equity excluding the effect of unrealized gains and losses on our investments, and Core operating ROTE further highlights the underlying profitability relative to tangible shareholders' equity. **Core operating ROE with expected level of CATs and mark-to-market on private equities** excludes catastrophe losses above or below management's view of typical catastrophe losses for that period and includes the change in the fair value of private equity funds which are recorded as realized gains and losses and excluded from core operating income. We believe that this measure provides comparison with our peer companies that record the fair value changes of private equity funds within core operating income as a component of investment income. Also, the adjustment for normalized catastrophe activity reduces the unusually large impact of catastrophe activity which is not indicative of our underlying performance.

(in millions of U.S. dollars except ratios)	Full Year 2018	Full Year 2017
Net income	$3,962	$3,861
Core operating income	$4,407	$3,784
Core operating income with expected level of CATs	$4,990	
Core operating income with expected level of CATs and mark-to-market on private equities of $382 million	$5,372	
Equity – beginning of period, as reported	$51,172	$48,275
Less: unrealized gains (losses) on investments, net of deferred tax [1]	1,154	1,058
Equity – beginning of period, as adjusted	$50,018	$47,217
Less: goodwill and other intangible assets, net of tax	$20,621	$20,019
Equity – beginning of period, as adjusted, excluding goodwill and other intangible assets	$29,397	$27,198
Equity – end of period, as reported	$50,312	$51,172
Less: unrealized gains (losses) on investments, net of deferred tax	(545)	1,450
Equity – end of period, as adjusted	$50,857	$49,722
Less: goodwill and other intangible assets, net of tax	$20,054	$20,621
Equity – end of period, as adjusted, excluding goodwill and other intangible assets	$30,803	$29,101
Equity – end of period, as adjusted	$50,857	
Add: Actual CATs above expected levels, after-tax	583	
Equity – end of period, as adjusted, with expected level of CATs	$51,440	
Weighted average equity, as reported	$50,742	$49,724
Weighted average equity, as adjusted	$50,438	$48,470
Weighted average equity, as adjusted, excluding goodwill and other intangible assets	$30,100	$28,150
Weighted average equity, as adjusted with expected level of CATs	$50,729	
ROE	7.8%	7.8%
Core operating ROE	8.7%	7.8%
Core operating ROTE	14.6%	13.4%
Core operating ROE with expected level of CATs	9.8%	
Core operating ROE with expected level of CATs and mark-to-market on private equities	10.6%	

[1] In 2018, the company adopted new guidance that requires the reclassification of $417 million of unrealized appreciation to beginning retained earnings related to public equities and cost-method private equities. In addition, the company reclassified tax expense of $121 million related to the unrealized appreciation of investments as of December 31, 2017 to beginning retained earnings representing the stranded tax effects related to the 2017 U.S. Tax Reform which reduced the tax expense on unrealized appreciation of investments. This reduction in tax was recorded in net income in Q4 2017 as part of the U.S. Tax Reform benefit.

Combined ratio measures the underwriting profitability of our property and casualty (P&C) business. **P&C combined ratio, Current accident year (CAY) P&C combined ratio excluding catastrophe losses, CAY P&C combined ratio with expected level of CATs,** and **P&C combined ratio with expected level of CATs** are non-GAAP financial measures. Refer to the Non-GAAP Reconciliation section in the 2018 Form 10-K, on pages 73-75, for the definition of these non-GAAP financial measures and reconciliation to the combined ratio by segment.

	Total P&C Full Year 2018	Total P&C Full Year 2017	Total North America P&C Insurance [1] Full Year 2018
Combined ratio	90.6%	94.7%	88.4%
Add: impact of gains and losses on crop derivatives	0.0%	0.0%	0.0%
P&C combined ratio	90.6%	94.7%	88.4%
Less: Catastrophe losses	5.9%	10.2%	6.6%
Less: Prior period development	-3.3%	-3.1%	-3.7%
CAY P&C combined ratio excluding CATs	88.0%	87.6%	85.5%
Add: Expected level of CATs	3.4%		
CAY P&C combined ratio with expected level of CATs	91.4%		
Add: Prior period development	-3.3%		
P&C combined ratio with expected level of CATs	88.1%		

[1] Total North America P&C Insurance includes the company's North America Commercial P&C Insurance, North America Personal P&C Insurance, and North America Agricultural Insurance segments. Refer to the Non-GAAP Reconciliation section in the 2018 Form 10-K, on page 74 for the reconciliation to the combined ratio by segment.

The following table presents the reconciliation of catastrophe losses, pre-tax, to catastrophe losses above expected levels, pre-tax:

(in millions of U.S. dollars)	Full Year 2018
Catastrophe losses, pre-tax	$1,626
Less: Expected levels of CATs, pre-tax	937
Catastrophe losses above expected levels, pre-tax	$689

Non-GAAP Financial Measures (continued)

Tangible book value per common share is a non-GAAP financial measure and is shareholders' equity less goodwill and other intangible assets, net of tax, divided by the shares outstanding. We believe that goodwill and other intangible assets are not indicative of our underlying insurance results or trends and make book value comparisons to less acquisitive peer companies less meaningful.

(in millions of U.S. dollars, except share and per share data)	December 31 2018	December 31 2017	% Change
Shareholders' equity	$50,312	$51,172	
Less: goodwill and other intangible assets, net of tax	20,054	20,621	
Numerator for tangible book value per share	$30,258	$30,551	
Shares outstanding	459,203,378	463,833,179	
Book value per common share	$109.56	$110.32	-0.7%
Tangible book value per common share	$65.89	$65.87	0.0%

Book value per common share excluding mark-to-market is a non-GAAP measure and is shareholders' equity less unrealized investment gains and (losses), net of tax, divided by shares outstanding. **Tangible book value per common share excluding mark-to-market** is a non-GAAP measure and is shareholders' equity less goodwill and other intangible assets, net of tax, and unrealized investment gains and (losses), net of tax, divided by shares outstanding. We exclude unrealized investment gains (losses) because the amount of these gains (losses) is heavily influenced by changes in market conditions, including interest rate changes. We believe these measures are meaningful to understanding growth in book and tangible book value by highlighting the underlying profitability relative to shareholders' equity excluding the effect of unrealized gains and losses on our investments.

The following table provides a reconciliation of Book value and Tangible book value per share, excluding mark-to-market:

(in millions of U.S. dollars, except share and per share data)	December 31 2018	January 1 2018	% Change
Shareholders' equity	$50,312	$51,172	
Less: unrealized gains (losses) on investments, net of deferred tax	(545)	1,154	
Book value excluding mark-to-market	$50,857	$50,018	
Less: goodwill and other intangible assets, net of tax	20,054	20,621	
Tangible book value excluding mark-to-market	$30,803	$29,397	
Shares outstanding	459,203,378	463,833,179	
Book value per share excluding mark-to-market	$110.75	$107.84	2.7%
Tangible book value per share excluding mark-to-market	$67.08	$63.38	5.8%

P&C underwriting income is a non-GAAP financial measure which excludes the Life Insurance segment. P&C underwriting income is used to monitor results of operations without the impact of certain factors as detailed below. We believe that P&C underwriting income is a useful measure as it enhances the understanding of our results of operations by highlighting the underlying profitability of our P&C insurance business.

The following table presents a reconciliation of Net income to P&C underwriting income:

(in millions of U.S. dollars)	Full Year 2018	Full Year 2017
Net income	$3,962	$3,861
Less: Income tax (expense) benefit	(695)	139
Chubb integration expenses	(59)	(310)
Amortization expense of purchased intangibles	(339)	(260)
Other income (expense)	434	400
Interest expense	(641)	(607)
Net investment income	3,305	3,125
Net realized gains (losses)	(652)	84
Life Insurance underwriting loss [1]	(5)	(147)
Add: Crop derivative losses	(3)	(7)
P&C underwriting income	$2,611	$1,430

[1] Excludes gains (losses) on fair value changes in separate account assets of $(38) million in 2018 and $97 million in 2017 and Life Insurance net investment income of $341 million in 2018 and $313 million in 2017.

International life insurance revenue is a non-GAAP financial measure which includes international life insurance net premiums written and deposits collected. Deposits collected on universal life and investment contracts (life deposits) are not reflected as revenues in our consolidated statements of operations in accordance with GAAP. However, new life deposits are an important component of production and key to our efforts to grow our business.

(in millions of U.S. dollars)	Full Year 2018
International life insurance net premiums written	$887
International life deposits	1,538
Total international life insurance revenue [1]	$2,425

[1] Excludes Combined North America and Life reinsurance businesses.

Adjusted net investment income is net investment income excluding the amortization of the fair value adjustment on acquired invested assets. We believe this measure is meaningful as it highlights the underlying performance of our invested assets and portfolio management in support of our lines of business.

The following table presents a reconciliation of net investment income to adjusted net investment income:

(in millions of U.S. dollars)	Full Year 2018	Full Year 2017
Net investment income	$3,305	$3,125
Less: Amortization expense of fair value adjustment on acquired invested assets	(248)	(332)
Adjusted net investment income	$3,553	$3,457
% Change from prior year	2.8%	

UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

☑ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2018

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the Transition Period from to

Commission File No. 1-11778

CHUBB LIMITED

(Exact name of registrant as specified in its charter)

Switzerland	**98-0091805**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

Baerengasse 32

Zurich, Switzerland CH-8001

(Address of principal executive offices) (Zip Code)

+41 (0)43 456 76 00

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Name of each exchange on which registered**
Common Shares, par value CHF 24.15 per share	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

YES ☑ NO ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.

YES ☐ NO ☑

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15 (d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. YES ☑ NO ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). YES ☑ NO ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference into Part III of this Form 10-K or any amendment to this Form 10-K. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☑	Accelerated filer ☐
Non-accelerated filer ☐	Smaller reporting company ☐
	Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). YES ☐ NO ☑

The aggregate market value of voting stock held by non-affiliates as of June 29, 2018 (the last business day of the registrant's most recently completed second fiscal quarter), was approximately $59 billion. For the purposes of this computation, shares held by directors and officers of the registrant have been excluded. Such exclusion is not intended, nor shall it be deemed, to be an admission that such persons are affiliates of the registrant.

As of February 14, 2019 there were 458,380,937 Common Shares par value CHF 24.15 of the registrant outstanding.

Documents Incorporated by Reference

Certain portions of the registrant's definitive proxy statement relating to its 2019 Annual General Meeting of Shareholders are incorporated by reference into Part III of this report.

PART I

ITEM 1. Business

General

Chubb Limited is the Swiss-incorporated holding company of the Chubb Group of Companies. Chubb Limited, which is headquartered in Zurich, Switzerland, and its direct and indirect subsidiaries (collectively, the Chubb Group of Companies, Chubb, we, us, or our) are a global insurance and reinsurance organization, serving the needs of a diverse group of clients worldwide. At December 31, 2018, we had total assets of $168 billion and shareholders' equity of $50 billion. Chubb was incorporated in 1985 at which time it opened its first business office in Bermuda and continues to maintain operations in Bermuda. We have grown our business through increased premium volume, expansion of product offerings and geographic reach, and the acquisition of other companies, including The Chubb Corporation (Chubb Corp), to become a global property and casualty (P&C) leader.

With operations in 54 countries and territories, Chubb provides commercial and personal property and casualty insurance, personal accident and supplemental health insurance (A&H), reinsurance, and life insurance to a diverse group of clients. We offer commercial insurance products and service offerings such as risk management programs, loss control, and engineering and complex claims management. We provide specialized insurance products ranging from Directors & Officers (D&O) and professional liability to various specialty-casualty and umbrella and excess casualty lines to niche areas such as aviation and energy. We also offer personal lines insurance coverage including homeowners, automobile, valuables, umbrella liability, and recreational marine products. In addition, we supply personal accident, supplemental health, and life insurance to individuals in select countries.

We serve multinational corporations, mid-size and small businesses with property and casualty insurance and risk engineering services; affluent and high net worth individuals with substantial assets to protect; individuals purchasing life, personal accident, supplemental health, homeowners, automobile, and specialty personal insurance coverage; companies and affinity groups providing or offering accident and health insurance programs and life insurance to their employees or members; and insurers managing exposures with reinsurance coverage.

At December 31, 2018, we employed approximately 32,700 people. We believe that employee relations are satisfactory.

We make available free of charge through our website (investors.chubb.com, under Financials) our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports, if any, filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after they have been electronically filed with or furnished to the U.S. Securities and Exchange Commission (SEC). Also available through our website (under Investor Relations / Corporate Governance) are our Corporate Governance Guidelines, Code of Conduct, and Charters for the Committees of our Board of Directors (the Board). Printed documents are available by contacting our Investor Relations Department (Telephone: +1 (212) 827-4445, E-mail: investorrelations@chubb.com).

We also use our website as a means of disclosing material, non-public information and for complying with our disclosure obligations under SEC Regulation FD (Fair Disclosure). Accordingly, investors should monitor the Investor Relations portion of our website, in addition to following our press releases, SEC filings, and public conference calls and webcasts. The information contained on, or that may be accessed through, our website is not incorporated by reference into, and is not a part of, this report. The SEC maintains an Internet site (www.sec.gov) that contains reports, proxy and information statements, and other information regarding issuers that file with the SEC.

Customers

For most commercial and personal lines of business we offer, insureds typically use the services of an insurance broker or agent. An insurance broker acts as an agent for the insureds, offering advice on the types and amount of insurance to purchase and also assisting in the negotiation of price and terms and conditions. We obtain business from the local and major international insurance brokers and typically pay a commission to brokers for any business accepted and bound. Loss of all or a substantial portion of the business provided by one or more of these brokers could have a material adverse effect on our business. In our opinion, no material part of our business is dependent upon a single insured or group of insureds. We do not believe that the loss of any one insured would have a material adverse effect on our financial condition or results of operations, and no one insured or group of affiliated insureds account for as much as 10 percent of our total revenues.

Competition

Competition in the insurance and reinsurance marketplace is substantial. We compete on an international and regional basis with major U.S., Bermuda, European, and other international insurers and reinsurers and with underwriting syndicates, some of which have greater financial, technological, marketing, distribution and management resources than we do. In addition, capital market participants have created alternative products that are intended to compete with reinsurance products. We also compete with new companies and existing companies that move into the insurance and reinsurance markets. Competitors include other stock companies, mutual companies, alternative risk sharing groups (such as group captives and catastrophe pools), and other underwriting organizations. Competitors sell through various distribution channels and business models, across a broad array of product lines, and with a high level of variation regarding geographic, marketing, and customer segmentation. We compete for business not only on the basis of price but also on the basis of availability of coverage desired by customers and quality of service.

The insurance industry is changing rapidly. Our ability to compete is dependent on a number of factors, particularly our ability to maintain the appropriate financial strength ratings as assigned by independent rating agencies and effectively utilize new technology in our business. Our broad market capabilities in personal, commercial, specialty, and A&H lines made available by our underwriting expertise, business infrastructure, and global presence, help define our competitive advantage. Our strong balance sheet is attractive to businesses, and our strong capital position and global platform affords us opportunities for growth not available to smaller, less diversified insurance companies. Refer to “Segment Information” for competitive environment by segment.

Trademarks and Trade Names

Various trademarks and trade names we use protect names of certain products and services we offer and are important to the extent they provide goodwill and name recognition in the insurance industry. We use commercially reasonable efforts to protect these proprietary rights, including various trade secret and trademark laws. We intend to retain material trademark rights in perpetuity, so long as it satisfies the use and registration requirements of applicable countries. One or more of the trademarks and trade names could be material to our ability to sell our products and services. We have taken appropriate steps to protect our ownership of key names, and we believe it is unlikely that anyone would be able to prevent us from using names in places or circumstances material to our operations.

Segment Information

Chubb operates through six business segments: North America Commercial P&C Insurance, North America Personal P&C Insurance, North America Agricultural Insurance, Overseas General Insurance, Global Reinsurance, and Life Insurance. The following table presents net premiums earned (NPE) by segment:

Years Ended December 31 (in millions of U.S. dollars, except for percentages)	**2018 Net Premiums Earned**	**% of Total**	2017 Net Premiums Earned	% of Total	2016 Net Premiums Earned	% of Total
North America Commercial P&C Insurance	**$ 12,402**	**42%**	$ 12,191	42%	$ 12,217	43%
North America Personal P&C Insurance	**4,593**	**15%**	4,399	15%	4,319	15%
North America Agricultural Insurance	**1,569**	**5%**	1,508	6%	1,316	5%
Overseas General Insurance	**8,612**	**29%**	8,131	28%	8,132	28%
Global Reinsurance	**670**	**2%**	704	2%	710	2%
Life Insurance	**2,218**	**7%**	2,101	7%	2,055	7%
Total	**$ 30,064**	**100%**	$ 29,034	100%	$ 28,749	100%

The results of operations of Chubb Corp are included from the acquisition date forward (i.e., after January 14, 2016). Additional financial information about our segments, including net premiums earned by geographic region, is included in Note 14 to the Consolidated Financial Statements.

North America Commercial P&C Insurance (42 percent of 2018 Consolidated NPE)

Overview

The North America Commercial P&C Insurance segment comprises operations that provide P&C insurance and services to large, middle market, and small commercial businesses in the U.S., Canada, and Bermuda. This segment includes:

- Major Accounts, a retail division focused on large institutional organizations and corporate companies
- Commercial Insurance, which includes the retail division focused on middle market customers and small businesses
- Westchester and Chubb Bermuda, our wholesale and specialty divisions

Products and Distribution

Major Accounts provides a broad array of traditional and specialty P&C, A&H, and risk management products and services to large U.S. and Canadian-based institutional organizations and corporate companies. Major Accounts distributes its insurance products primarily through a limited number of retail brokers. In addition to using brokers, certain products are also distributed through general agents, independent agents, managing general agents (MGA), managing general underwriters, alliances, affinity groups, and direct marketing operations. Products and services offered include property, professional liability, cyber risk, excess casualty, commercial marine, surety, environmental, construction, medical risk, inland marine, A&H coverages, as well as claims and risk management products and services.

The Major Accounts operations, which represented approximately 40 percent of North America Commercial P&C Insurance's net premiums earned in 2018, are organized into the following distinct business units, each offering specialized products and services targeted at specific markets:

- Chubb Global Casualty offers a range of customized risk management primary casualty products designed to help large insureds, including national accounts, address the significant costs of financing and managing risk for workers' compensation, general liability and automobile liability coverages. Chubb Global Casualty also provides products which insure specific global operating risks of U.S.-based multinational companies and include deductible programs, captive programs, and paid or incurred loss retrospective plans. Within Chubb Global Casualty, Chubb Alternative Risk Solutions Group underwrites contractual indemnification policies which provides prospective coverage for loss events within the insured's policy retention levels, and underwrites assumed loss portfolio transfer (LPT) contracts in which insured loss events have occurred prior to the inception of the contract.
- Property provides products and services including primary, quota share and excess all-risk insurance, risk management programs and services, commercial, inland marine, and aerospace products.
- Casualty Risk provides coverages including umbrella and excess liability, environmental risk, casualty programs for commercial construction related projects for companies and institutions, and medical risk specialty liability products for the healthcare industry.
- Surety offers a wide variety of surety products and specializes in underwriting both commercial and contract bonds and has the capacity for bond issuance on an international basis.
- Accident & Health (A&H) products include employee benefit plans, occupational accident, student accident, and worldwide travel accident and global medical programs. With respect to products that include supplemental medical and hospital indemnity coverages, we typically pay fixed amounts for claims and are therefore insulated from rising healthcare costs. A&H also provides specialty personal lines products, including credit card enhancement programs (identity theft, rental car collision damage waiver, trip travel, and purchase protection benefits) distributed through affinity groups.
- Financial Lines provides management liability and professional liability (D&O and E&O), transactional risk and cyber risk products to public companies as well as to private and not for profit organizations.
- ESIS Inc. (ESIS) is an in-house third-party claims administrator that performs claims management and risk control services for domestic and international organizations as well as for the North America Commercial P&C Insurance segment. ESIS services include comprehensive medical managed care; integrated disability services; pre-loss control and risk management; health, safety and environmental consulting; salvage and subrogation; and healthcare recovery services. The net results for ESIS are included in North America Commercial P&C Insurance's administrative expenses.

The Commercial Insurance operations, which include Small Commercial, represented approximately 40 percent of North America Commercial P&C Insurance's net premiums earned in 2018. Commercial Insurance provides a broad range of P&C, professional lines, and A&H products targeted to U.S and Canadian-based middle market customers in a variety of industries with annual revenues generally greater than $30 million, while the Small Commercial operations provide a broad range of property and casualty, workers' compensation, small commercial management and professional liability for small businesses based in the U.S., targeted to customers with annual revenues up to $30 million.

- Commercial Insurance products and services offered include traditional property and casualty lines of business, including Package, which combines property and general liability, workers' compensation, automobile, umbrella; financial lines of business, including professional liability, management liability and cyber risk coverage; and other lines including environmental, A&H, and international coverages. Commercial Insurance distributes its insurance products through a North American network of independent retail agents, regional brokers, and multinational and digital brokers. Generally, our customers purchase insurance through a single retail agent or broker, do not employ a risk management department, and do not retain significant risk through self-insured retentions. The majority of our customers purchase a Package product or a Portfolio product, which is a collection of insurance offerings designed to cover various needs.
- Small Commercial Insurance products and services offered include property and casualty lines of business, including a business owner policy which contains property and general liability; financial lines, including professional liability, management liability, cyber risk; and other lines including workers' compensation, automobile liability, and international coverages. Products are generally offered through a North American network of independent agents and brokers, as well as eTraditional, which are digital platforms where we electronically quote, bind, and issue for agents and brokers. An example of this is our North America Small Commercial Marketplace.

Wholesale and Specialty, which represented approximately 20 percent of North America Commercial P&C Insurance's net premiums earned in 2018, comprises Westchester and Chubb Bermuda.

- Westchester serves the market for business risks that tend to be hard to place or not easily covered by traditional policies due to unique or complex exposures. Products offered include wholesale excess and surplus lines property, casualty, environmental, professional liability, inland marine, and product recall coverages in the U.S., Canada, and Bermuda.
- Chubb Bermuda provides commercial insurance products on an excess basis including excess liability, D&O, professional liability, property, and political risk, the latter being written by Sovereign Risk Insurance Ltd., a wholly-owned managing agent. Chubb Bermuda focuses on Fortune 1000 companies and targets risks that are generally low in frequency and high in severity. Chubb Bermuda offers its products primarily through the Bermuda offices of major, internationally recognized insurance brokers.

Competitive Environment
Major Accounts competes against a number of large, national carriers as well as regional competitors and other entities offering risk alternatives such as self-insured retentions and captive programs. The markets in which we compete are subject to significant cycles of fluctuating capacity and wide disparities in price adequacy. We pursue a specialist strategy and focus on market opportunities where we can compete effectively based on service levels and product design, while still achieving an adequate level of profitability. We also achieve a competitive advantage through Major Accounts' innovative product offerings and our ability to provide multiple products to a single client due to our nationwide local presence. In addition, all our domestic commercial units are able to deliver global products and coverage to customers in concert with our Overseas General Insurance segment.

The Commercial Insurance and Small Commercial Insurance operations compete against numerous insurance companies ranging from large national carriers to small and mid-size insurers who provide specialty coverages and standard P&C products. Recent competitive developments include the growth of new digital-based distribution models.

Westchester competes against a number of large, national carriers as well as regional competitors and other entities offering risk alternatives such as self-insured retentions and captive programs. Chubb Bermuda competes against international commercial carriers writing business on an excess of loss basis.

North America Personal P&C Insurance (15 percent of 2018 Consolidated NPE)

Overview

The North America Personal P&C Insurance segment includes the business written by Chubb Personal Risk Services division, which includes high net worth personal lines business, with operations in the U.S. and Canada. This segment provides affluent and high net worth individuals and families with homeowners, automobile and collector cars, valuable articles (including fine arts), personal and excess liability, travel insurance, and recreational marine insurance and services. Our homeowners business, including valuable articles, represented 68 percent of North America Personal P&C Insurance's net premiums earned in 2018.

Products and Distribution

Chubb Personal Risk Services offers comprehensive personal insurance products and services to meet the evolving needs of high net worth families and individuals. Our seamless customer experience and superior coverage protect not only our clients' most valuable possessions, but also their standard of living. Our target customers consist of high net worth consumers with insurance needs that typically extend beyond what mass market carriers can offer. These coverages are offered solely through independent regional agents and brokers.

Competitive Environment

Chubb Personal Risk Services competes against insurance companies of varying sizes that sell personal lines products through various distribution channels, including retail agents as well as online distribution channels. We achieve a competitive advantage through our ability to address the specific needs of high net worth families and individuals, to provide superior service to our customers, and to develop and deploy digital production and processes.

North America Agricultural Insurance (5 percent of 2018 Consolidated NPE)

Overview

The North America Agricultural Insurance segment comprises our U.S. and Canadian-based businesses that provide a variety of coverages including crop insurance, primarily Multiple Peril Crop Insurance (MPCI) and crop-hail insurance through Rain and Hail Insurance Service, Inc. (Rain and Hail) as well as farm and ranch and specialty P&C commercial insurance products and services through our Chubb Agribusiness unit.

Products and Distribution

Rain and Hail provides comprehensive MPCI and crop-hail insurance coverages.

- MPCI is federally subsidized crop protection from numerous causes of loss, including drought, excessive moisture, freeze, disease and more. The MPCI program is offered in conjunction with the U.S. Department of Agriculture. MPCI products include revenue protection (defined as providing both commodity price and yield coverages), yield protection, margin protection, prevented planting coverage and replant coverage. For additional information on our MPCI program, refer to "Crop Insurance" under Item 7.
- Crop-Hail coverage provides crop protection from damage caused by hail and/or fire, with options in some markets for other perils such as wind or theft. Coverage is provided on an acre-by-acre basis and is available in the U.S. and in some parts of Canada. Crop-Hail can be used in conjunction with MPCI or other comprehensive coverages to offset the deductible and provide protection up to the actual cash value of the crop.

Chubb Agribusiness comprises Commercial Agribusiness and Farm and Ranch Agribusiness.

- Commercial Agribusiness offers specialty P&C coverages for commercial companies that manufacture, process and distribute agricultural products. Commercial products and services include property, general liability for premises/operations and product liability, commercial automobile, workers' compensation, employment practices liability coverage, built-in coverage for premises pollution, cyber and information security, and product withdrawal.
- Farm and Ranch Agribusiness offers an extensive line of coverages for farming operations from Hobby/Gentleman farms to complex corporate farms and equine services including personal use, boarding, and training. Coverages include farm and ranch structures, machinery and other equipment, automobile and other vehicle coverages, and livestock.

Competitive Environment
Rain and Hail primarily operates in a federally regulated program where all approved providers offer the same product forms and rates through independent and/or captive agents. We seek a competitive advantage through our ability to provide superior service to our customers, including the development of digital solutions. Chubb Agribusiness competes against both national and regional competitors offering specialty P&C insurance coverages to companies that manufacture, process, and distribute agricultural products.

Overseas General Insurance (29 percent of 2018 Consolidated NPE)

Overview
The Overseas General Insurance segment comprises Chubb International and Chubb Global Markets (CGM). CGM, our London-based international specialty and excess and surplus lines business, includes Lloyd's of London (Lloyd's) Syndicate 2488, a wholly-owned Chubb syndicate supported by funds at Lloyd's provided by Chubb Corporate Members. Syndicate 2488 has an underwriting capacity of £405 million for the Lloyd's 2019 account year. The syndicate is managed by Chubb's Lloyd's managing agency, Chubb Underwriting Agencies Limited.

Products and Distribution
Chubb International maintains a presence in every major insurance market in the world and is organized geographically along product lines as follows: Europe, Asia Pacific, Eurasia and Africa, Far East, and Latin America. Products offered include P&C, A&H, specialty coverages, and personal lines insurance products and services. Chubb International's P&C business is generally written, on both a direct and assumed basis, through major international, regional, and local brokers and agents. Certain European branded products are also offered via an eTraditional digital-commerce platform, Chubb Online, that allows brokers to quote, bind, and issue specialty policies online, and Asia Pacific utilizes similar eTraditional platforms to quote, bind, and issue policies. Property insurance products include traditional commercial fire coverage as well as energy industry-related, marine, construction, and other technical coverages. Principal casualty products are commercial primary and excess casualty, environmental, and general liability. A&H and other consumer lines products are distributed through brokers, agents, direct marketing programs, including thousands of telemarketers, and sponsor relationships. The A&H operations primarily offer personal accident and supplemental medical coverages including accidental death, business/holiday travel, specified disease, disability, medical and hospital indemnity, and income protection. We are not in the primary healthcare business. With respect to our supplemental medical and hospital indemnity products, we typically pay fixed amounts for claims and are therefore largely insulated from the direct impact of rising healthcare costs. Chubb International specialty coverages include D&O, professional indemnity, energy, aviation, political risk, and specialty personal lines products. Chubb International's personal lines operations provide specialty products and services designed to meet the needs of specific target markets and include property damage, automobile, homeowners, and personal liability.

CGM offers products through its parallel distribution network via two legal entities, Chubb European Group SE (CEG) and Chubb Underwriting Agencies Limited, managing agent of Syndicate 2488. CGM uses the syndicate to underwrite P&C business on a global basis through Lloyd's worldwide licenses. CGM uses CEG to underwrite similar classes of business through its network of U.K. and European licenses, and in the U.S. where it is eligible to write excess and surplus lines business. Factors influencing the decision to place business with the syndicate or CEG include licensing eligibilities, capitalization requirements, and client/broker preference. All business underwritten by CGM is accessed through registered brokers. The main lines of business include aviation, property, energy, professional lines, marine, financial lines, political risk, and A&H.

Competitive Environment
Chubb International's primary competitors include U.S.-based companies with global operations, as well as non-U.S. global carriers and indigenous companies in regional and local markets. For the A&H lines of business, locally based competitors also include financial institutions and bank owned insurance subsidiaries. Our international operations have the distinct advantage of being part of one of the few international insurance groups with a global network of licensed companies able to write policies on a locally admitted basis. The principal competitive factors that affect the international operations are underwriting expertise and pricing, relative operating efficiency, product differentiation, producer relations, and the quality of policyholder services. A competitive strength of our international operations is our global network and breadth of insurance programs, which assist individuals and business organizations to meet their risk management objectives, while also having a significant presence in all of the countries in which we operate, giving us the advantage of accessing local technical expertise and regulatory environments, understanding local markets and culture, accomplishing a spread of risk, and offering a global network to service multinational accounts.

CGM is one of the preeminent international specialty insurers in London and is an established lead underwriter on a significant portion of the risks it underwrites for all lines of business. This leadership position allows CGM to set the policy terms and conditions of many of the policies written. All lines of business face competition, depending on the business class, from Lloyd's syndicates, the London market, and other major international insurers and reinsurers. Competition for international risks is also seen from domestic insurers in the country of origin of the insured. CGM differentiates itself from competitors through long standing experience in its product lines, its multiple insurance entities (Syndicate 2488 and CEG), and the quality of its underwriting and claims service.

Global Reinsurance (2 percent of 2018 Consolidated NPE)

Overview
The Global Reinsurance segment represents Chubb's reinsurance operations comprising Chubb Tempest Re Bermuda, Chubb Tempest Re USA, Chubb Tempest Re International, and Chubb Tempest Re Canada. Global Reinsurance markets reinsurance products worldwide under the Chubb Tempest Re brand name and provides solutions for small to mid-sized clients and multinational ceding companies. Global Re offers a broad array of traditional and non-traditional (e.g., loss portfolio transfer) property and casualty products.

Products and Distribution
Global Reinsurance services clients globally through its major units. Major international brokers submit business to one or more of these units' underwriting teams who have built strong relationships with both key brokers and clients by providing a responsive, client-focused approach to risk assessment and pricing.

Chubb Tempest Re Bermuda principally provides property catastrophe reinsurance globally to insurers of commercial and personal property. Property catastrophe reinsurance is on an occurrence or aggregate basis and protects a ceding company against an accumulation of losses covered by its issued insurance policies, arising from a common event or occurrence. Chubb Tempest Re Bermuda underwrites reinsurance principally on an excess of loss basis, meaning that its exposure only arises after the ceding company's accumulated losses have exceeded the attachment point of the reinsurance policy. Chubb Tempest Re Bermuda also writes other types of reinsurance on a limited basis for selected clients. Examples include proportional property where the reinsurer shares a proportional part of the premiums and losses of the ceding company, together with casualty (catastrophe workers' compensation) and specialty lines (assumed retrocessional catastrophe business and terrorism). Chubb Tempest Re Bermuda's business is produced through reinsurance intermediaries.

Chubb Tempest Re USA writes all lines of traditional and specialty P&C reinsurance, and surety and fidelity reinsurance for the North American market, principally on a treaty basis, with a focus on writing property per risk and casualty reinsurance. Chubb Tempest Re USA underwrites reinsurance on both a proportional and excess of loss basis. This unit's diversified portfolio is produced through reinsurance intermediaries.

Chubb Tempest Re International provides traditional and specialty P&C reinsurance to insurance companies worldwide, with emphasis on non-U.S. and Canadian risks. Chubb Tempest Re International writes all lines of traditional and specialty reinsurance including property risk and property catastrophe, casualty, marine, aviation, and specialty through our London- and Zurich-based offices. The London-based office of Chubb Tempest Re International focuses on the development of business sourced through London market brokers. The Zurich-based office focuses on providing reinsurance to continental European insurers via continental European brokers while also serving Asian and Latin American markets. The London- and Zurich-based offices write a diverse book of international business using Syndicate 2488, CEG, and CISL. Chubb Tempest Re International underwrites reinsurance on both a proportional and excess of loss basis.

Chubb Tempest Re Canada offers a full array of traditional and specialty P&C, and reinsurance to the Canadian market, including casualty, property risk and property catastrophe, surety, and crop hail. Chubb Tempest Re Canada provides coverage through its Canadian company platform and also offers clients access to Syndicate 2488. Chubb Tempest Re Canada underwrites reinsurance on both a proportional and excess of loss basis.

Competitive Environment
The Global Reinsurance segment competes worldwide with major U.S. and non-U.S. reinsurers as well as reinsurance departments of numerous multi-line insurance organizations. In addition, capital markets participants have developed alternative capital sources intended to compete with traditional reinsurance. Additionally, government sponsored or backed catastrophe funds can affect demand for reinsurance. Global Reinsurance is considered a lead reinsurer and is typically involved in the negotiation and quotation of the terms and conditions of the majority of the contracts in which it participates. Global

Reinsurance competes effectively in P&C markets worldwide because of its strong capital position, analytical capabilities and quality customer service, the leading role it plays in setting the terms, pricing, and conditions in negotiating contracts, and its customized approach to risk selection. The key competitors in our markets vary by geographic region and product line. An advantage of our international platform is that we are able to change our mix of business in response to changes in competitive conditions in the territories in which we operate. Our geographic reach is also sought by multinational ceding companies since all of our offices, with the exception of Bermuda, provide local reinsurance license capabilities which benefit our clients in dealing with country regulators.

Life Insurance (7 percent of 2018 Consolidated NPE)

Overview
The Life segment comprises Chubb's international life operations (Chubb Life), Chubb Tempest Life Re (Chubb Life Re), and the North American supplemental A&H and life business of Combined Insurance.

Products and Distribution
Chubb Life provides individual life and group benefit insurance primarily in developing markets, including Hong Kong, Indonesia, South Korea, Taiwan, Thailand, Vietnam, and Egypt; also throughout Latin America; selectively in Europe; and in China through a non-consolidated joint venture insurance company. Chubb Life offers a broad portfolio of protection and savings products including whole life, endowment plans, individual term life, group term life, medical and health, personal accident, credit life, universal life, Group Employee benefits, unit linked contracts, and credit protection insurance for automobile, motorcycle and home loans. The policies written by Chubb Life generally provide funds to beneficiaries of insureds after death and/or protection and/or savings benefits while the contract owner is living. Chubb Life sells to consumers through a variety of distribution channels including captive and independent agencies, bancassurance, worksite marketing, retailers, brokers, telemarketing, mobilassurance, and direct to consumer marketing. We continue to expand Chubb Life with a focus on opportunities in developing markets that we believe will result in strong and sustainable operating profits as well as a favorable return on capital commitments over time. Our dedicated captive agency distribution channel, whereby agents sell Chubb Life products exclusively, enables us to maintain direct contact with the individual consumer, promote quality sales practices, and exercise greater control over the future of the business. We have developed a substantial sales force of agents principally located in our Asia-Pacific countries. Chubb also maintains approximately 36 percent direct and indirect ownership interest in Huatai Life Insurance Co., Ltd. (Huatai Life), which commenced operations in 2005 and has since grown to become one of the larger life insurance foreign joint ventures in China. Huatai Life offers a broad portfolio of insurance products through a variety of distribution channels including approximately 450 licensed sales locations in 19 Chinese provinces.

Chubb Life Re's core business is a Bermuda-based operation which provides reinsurance to primary life insurers, focusing on guarantees included in certain variable annuity products and also on more traditional mortality reinsurance protection. Chubb Life Re's U.S.-based traditional life reinsurance operation was discontinued for new business in January 2010. Since 2007, Chubb Life Re has not quoted on new opportunities in the variable annuity reinsurance marketplace and our focus has been on managing the current portfolio of risk, both in the aggregate and on a contract basis. This business is managed with a long-term perspective and short-term earnings volatility is expected.

Combined Insurance distributes specialty supplemental A&H and life insurance products targeted to middle income consumers and businesses in the U.S. and Canada. Combined Insurance's substantial North American sales force distributes a wide range of supplemental accident and sickness insurance products, including personal accident, short-term disability, critical illness, Medicare supplement products, and hospital confinement/recovery. Most of these products are primarily fixed-indemnity benefit obligations and are not directly subject to escalating medical cost inflation.

Competitive Environment
Chubb Life's competition differs by location but generally includes multinational insurers, and in some locations, local insurers, joint ventures, or state-owned insurers. Chubb's financial strength and reputation as an entrepreneurial organization with a global presence gives Chubb Life a strong base from which to compete. While Chubb Life Re is not currently quoting on new opportunities in the variable annuity reinsurance marketplace, we continue to monitor developments in this market. Combined Insurance competes for A&H business in the U.S. against numerous A&H and life insurance companies across various industry segments.

Corporate

Corporate results primarily include results of all run-off asbestos and environmental (A&E) exposures, the results of our run-off Brandywine business, the results of Westchester specialty operations for 1996 and prior years, certain other run-off exposures, and income and expenses not attributable to reportable segments and the results of our non-insurance companies. The run-off operations do not actively sell insurance products, but are responsible for the management of existing policies and settlement of related claims.

Our exposure to A&E claims principally arises out of liabilities acquired when we purchased Westchester Specialty in 1998, CIGNA's P&C business in 1999, and Chubb Corp A&E claims in 2016. The A&E liabilities principally relate to claims arising from bodily-injury claims related to asbestos products and remediation costs associated with hazardous waste sites.

Underwriting

Chubb is an underwriting company and we strive to emphasize quality of underwriting rather than volume of business or market share. Our underwriting strategy is to manage risk by employing consistent, disciplined pricing and risk selection. This, coupled with writing a number of less cyclical product lines, has helped us develop flexibility and stability of our business, and has allowed us to maintain a profitable book of business throughout market cycles. Clearly defined underwriting authorities, standards, and guidelines coupled with a strong underwriting audit function are in place in each of our local operations and global profit centers. Global product boards ensure consistency of approach and the establishment of best practices throughout the world. Our priority is to help ensure adherence to criteria for risk selection by maintaining high levels of experience and expertise in our underwriting staff. In addition, we employ a business review structure that helps ensure control of risk quality and appropriate use of policy limits and terms and conditions. Underwriting discipline is at the heart of our operating philosophy.

Actuaries in each region work closely with the underwriting teams to provide additional expertise in the underwriting process. We use internal and external data together with sophisticated analytical, catastrophe loss and risk modeling techniques to ensure an appropriate understanding of risk, including diversification and correlation effects, across different product lines and territories. We recognize that climate changes and weather patterns are integral to our underwriting process and we continually adjust our process to address these changes. This is intended to help to ensure that losses are contained within our risk tolerance and appetite for individual product lines, businesses, and Chubb as a whole. Our use of such tools and data also reflects an understanding of their inherent limitations and uncertainties.

We also purchase protection from third parties, including, but not limited to, reinsurance as a tool to diversify risk and limit the net loss potential of catastrophes and large or unusually hazardous risks. For additional information refer to "Risk Factors" under Item 1A, "Reinsurance Protection", below, "Catastrophe Management" and "Natural Catastrophe Property Reinsurance Program", under Item 7, and Note 4 to the Consolidated Financial Statements, under Item 8.

Reinsurance Protection

As part of our risk management strategy, we purchase reinsurance protection to mitigate our exposure to losses, including certain catastrophes, to a level consistent with our risk appetite. Although reinsurance agreements contractually obligate our reinsurers to reimburse us for an agreed-upon portion of our gross paid losses, reinsurance does not discharge our primary liability to our insureds and, thus, we ultimately remain liable for the gross direct losses. In certain countries, reinsurer selection is limited by local laws or regulations. In most countries there is more freedom of choice, and the counterparty is selected based upon its financial strength, claims settlement record, management, line of business expertise, and its price for assuming the risk transferred. In support of this process, we maintain a Chubb authorized reinsurer list that stratifies these authorized reinsurers by classes of business and acceptable limits. This list is maintained by our Reinsurance Security Committee (RSC), a committee comprising senior management personnel and a dedicated reinsurer security team. Changes to the list are authorized by the RSC and recommended to the Chair of the Risk and Underwriting Committee. The reinsurers on the authorized list and potential new markets are regularly reviewed and the list may be modified following these reviews. In addition to the authorized list, there is a formal exception process that allows authorized reinsurance buyers to use reinsurers already on the authorized list for higher limits or different lines of business, for example, or other reinsurers not on the authorized list if their use is supported by compelling business reasons for a particular reinsurance program.

A separate policy and process exists for captive reinsurance companies. Generally, these reinsurance companies are established by our clients or our clients have an interest in them. It is generally our policy to obtain collateral equal to the expected losses that may be ceded to the captive. Where appropriate, exceptions to the collateral requirement are granted but only after senior management review. Specific collateral guidelines and an exception process are in place for the North America Commercial P&C

Insurance, North America Personal P&C Insurance, and Overseas General Insurance segments, all of which have credit management units evaluating the captive's credit quality and that of their parent company. The credit management units, working with actuaries, determine reasonable exposure estimates (collateral calculations), ensure receipt of collateral in an acceptable form, and coordinate collateral adjustments as and when needed. Financial reviews and expected loss evaluations are performed annually for active captive accounts and as needed for run-off exposures. In addition to collateral, parental guarantees are often used to enhance the credit quality of the captive.

In general, we seek to place our reinsurance with highly rated companies with which we have a strong trading relationship. For additional information refer to "Catastrophe Management" and "Natural Catastrophe Property Reinsurance Program" under Item 7, and Note 4 to the Consolidated Financial Statements, under Item 8.

Unpaid Losses and Loss Expenses

We establish reserves for unpaid losses and loss expenses, which are estimates of future payments on reported and unreported claims for losses and related expenses, with respect to insured events that have occurred. These reserves are recorded in Unpaid losses and loss expenses in the Consolidated balance sheets. The process of establishing loss and loss expense reserves for P&C claims can be complex and is subject to considerable uncertainty as it requires the use of informed estimates and judgments based on circumstances known at the date of accrual. These estimates and judgments are based on numerous factors, and may be revised as additional experience and other data become available and are reviewed, as new or improved methodologies are developed, or as laws change. Internal actuaries regularly analyze the levels of loss and loss expense reserves, taking into consideration factors that may impact the ultimate settlement value of the unpaid losses and loss expenses. These analyses could result in future changes in the estimates of loss and loss expense reserves or reinsurance recoverables and any such changes would be reflected in our results of operations in the period in which the estimates are changed. Losses and loss expenses are charged to income as incurred. The reserve for unpaid losses and loss expenses represents the estimated ultimate losses and loss expenses less paid losses and loss expenses, and comprises case reserves and incurred but not reported (IBNR) reserves. With the exception of certain structured settlements, for which the timing and amount of future claim payments are reliably determinable, and certain reserves for unsettled claims that are discounted in statutory filings, our loss reserves are not discounted for the time value of money. In connection with such structured settlements and certain reserves for unsettled claims, we carried net discounted reserves of $73 million at December 31, 2018.

For each product line, management, after consultation with internal actuaries, develops a "best estimate" of the ultimate settlement value of the unpaid losses and loss expenses that it believes provides a reasonable estimate of the required reserve. We evaluate our estimates of reserves quarterly in light of developing information. While we are unable at this time to determine whether additional reserves may be necessary in the future, we believe that our reserves for unpaid losses and loss expenses are adequate at December 31, 2018. Future additions to reserves, if needed, could have a material adverse effect on our financial condition, results of operations, and cash flows. For additional information refer to "Critical Accounting Estimates – Unpaid losses and loss expenses", under Item 7, and Note 6 to the Consolidated Financial Statements, under Item 8.

Investments

Our objective is to maximize investment income and total return while ensuring an appropriate level of liquidity, investment quality, and diversification. As such, Chubb's investment portfolio is invested primarily in investment-grade fixed-income securities as measured by the major rating agencies. We do not allow leverage in our investment portfolio.

The critical aspects of the investment process are controlled by Chubb Asset Management, an indirect wholly-owned subsidiary of Chubb. These aspects include asset allocation, portfolio and guideline design, risk management, and oversight of external asset managers. In this regard, Chubb Asset Management:

- conducts formal asset allocation modeling for each of the Chubb subsidiaries, providing formal recommendations for the portfolio's structure;
- establishes recommended investment guidelines that are appropriate to the prescribed asset allocation targets;
- provides the analysis, evaluation, and selection of our external investment advisors;
- establishes and develops investment-related analytics to enhance portfolio engineering and risk control;
- monitors and aggregates the correlated risk of the overall investment portfolio; and
- provides governance over the investment process for each of our operating companies to ensure consistency of approach and adherence to investment guidelines.

Under our guidance and direction, external asset managers conduct security and sector selection and transaction execution. Use of multiple managers benefits Chubb in several ways – it provides us with operational and cost efficiencies, diversity of styles and approaches, innovations in investment research and credit and risk management, all of which enhance the risk adjusted returns of our portfolios.

Chubb Asset Management determines the investment portfolio's allowable, targeted asset allocation and ranges for each of the segments. These asset allocation targets are derived from sophisticated asset and liability modeling that measures correlated histories of returns and volatility of returns. Allowable investment classes are further refined through analysis of our operating environment including expected volatility of cash flows, potential impact on our capital position, and regulatory and rating agency considerations.

The Board has established a Risk & Finance Committee which helps execute the Board's supervisory responsibilities pertaining to enterprise risk management including investment risk. Under the overall supervision of the Risk & Finance Committee, Chubb's governance over investment management is rigorous and ongoing. Among its responsibilities, the Risk & Finance Committee of the Board:

- reviews and approves asset allocation targets and investment policy to ensure that it is consistent with our overall goals, strategies, and objectives;
- reviews and approves investment guidelines to ensure that appropriate levels of portfolio liquidity, credit quality, diversification, and volatility are maintained; and
- systematically reviews the portfolio's exposures including any potential violations of investment guidelines.

We have long-standing global credit limits for our entire portfolio across the organization and for individual obligors. Exposures are aggregated, monitored, and actively managed by our Global Credit Committee, comprising senior executives, including our Chief Financial Officer, our Chief Risk Officer, our Chief Investment Officer, and our Treasurer.

Within the guidelines and asset allocation parameters established by the Risk & Finance Committee, individual investment committees of the segments determine tactical asset allocation. Additionally, these committees review all investment-related activity that affects their operating company, including the selection of outside investment advisors, proposed asset allocation changes, and the systematic review of investment guidelines.

For additional information regarding the investment portfolio, including breakdowns of the sector and maturity distributions, refer to Note 2 to the Consolidated Financial Statements under Item 8.

Regulation

Our insurance and reinsurance subsidiaries conduct business globally, including in all 50 states of the United States and the District of Columbia. Our business is subject to varying degrees of regulation and supervision in each of the jurisdictions in which our insurance and reinsurance subsidiaries are domiciled and on a group basis. The laws and regulations of the jurisdictions in which our insurance and reinsurance subsidiaries are domiciled require among other things that these subsidiaries maintain minimum levels of statutory capital, surplus, and liquidity, meet solvency standards, and submit to periodic examinations of their financial condition. The complex regulatory environments in which Chubb operates are subject to change and are regularly monitored.

Group Supervision

In 2012, the Pennsylvania Insurance Department (Department), in consultation with other insurance regulatory bodies that oversee Chubb's insurance activities, convened the first Chubb Supervisory College (College). Regulators from approximately ten jurisdictions attended the College in Philadelphia, Pennsylvania, during which the supervisors reviewed information on Chubb. The Department, in cooperation with the other supervisory college regulators, published a notice of its determination that it is the appropriate group-wide supervisor for Chubb.

Since 2012, the College has convened bi-annually in-person, with the most recent in-person College held in Philadelphia in September 2018. In July 2017, the College convened its first interim College teleconference and the next such interim College teleconference is tentatively scheduled for July 2019. During these meetings, the College reviewed extensive information about Chubb's businesses, without material adverse comment.

The following is an overview of regulations for our operations in Switzerland, the U.S., Bermuda, and other international locations.

Swiss Operations
The Swiss Financial Market Supervisory Authority (FINMA) has the discretion to supervise Chubb on a group-wide basis. However, FINMA acknowledges the Department's assumption of group supervision over us.

In 2008, we formed Chubb Insurance (Switzerland) Limited which offers property and casualty insurance to Swiss companies, A&H insurance for individuals of Swiss Corporations as well as reinsurance predominantly in Continental Europe. We have also formed a reinsurance subsidiary named Chubb Reinsurance (Switzerland) Limited, which we operate as primarily a provider of reinsurance to Chubb entities. Both companies are licensed and governed by FINMA.

U.S. Operations
Our U.S. insurance subsidiaries are subject to extensive regulation and supervision by the states in which they do business. The laws of the various states establish departments of insurance with broad authority to regulate, among other things: the standards of solvency that must be met and maintained, the licensing of insurers and their producers, approval of policy forms and rates, the nature of and limitations on investments, restrictions on the size of the risks which may be insured under a single policy, deposits of securities for the benefit of policyholders, requirements for the acceptability of reinsurers, periodic examinations of the affairs of insurance companies, the form and content of reports of financial condition required to be filed, and the adequacy of reserves for unearned premiums, losses, and other exposures.

Our U.S. insurance subsidiaries are required to file detailed annual and quarterly reports with state insurance regulators. In addition, our U.S. insurance subsidiaries' operations and financial records are subject to examination at regular intervals by state regulators.

All states have enacted legislation that regulates insurance holding companies. This legislation provides that each insurance company in the insurance holding company system (system) is required to register with the insurance department of its state of domicile and furnish information concerning the operations of companies within the system that may materially affect the operations, management, or financial condition of the insurers within the system. We are required to file an annual enterprise risk report with the Department, identifying the material risks within our system that could pose enterprise risk to the insurance subsidiaries in the system. All transactions within a system must be fair and equitable. Notice to the insurance departments is required prior to the consummation of transactions affecting the ownership or control of an insurer and of certain material transactions between an insurer and an entity in its system. In addition, certain transactions may not be consummated without the department's prior approval.

We are also required to file an annual report with the Department, reflecting our internal assessment of material risks associated with our current business plan and the sufficiency of our capital resources to support those risks.

Statutory surplus is an important measure used by the regulators and rating agencies to assess our U.S. insurance subsidiaries' ability to support business operations and provide dividend capacity. Our U.S. insurance subsidiaries are subject to various state statutory and regulatory restrictions that limit the amount of dividends that may be paid without prior approval from regulatory authorities. These restrictions differ by state, but are generally based on calculations incorporating statutory surplus, statutory net income, and/or investment income.

The National Association of Insurance Commissioners (NAIC) has a risk-based capital requirement for P&C insurance companies. This risk-based capital formula is used by many state regulatory authorities to identify insurance companies that may be undercapitalized and which merit further regulatory attention. These requirements are designed to monitor capital adequacy using a formula that prescribes a series of risk measurements to determine a minimum capital amount for an insurance company, based on the profile of the individual company. The ratio of a company's actual policyholder surplus to its minimum capital requirement will determine whether any state regulatory action is required. There are progressive risk-based capital failure levels that trigger more stringent regulatory action. If an insurer's policyholders' surplus falls below the Mandatory Control Level (70 percent of the Authorized Control Level, as defined by the NAIC), the relevant insurance commissioner is required to place the insurer under regulatory control.

However, an insurance regulator may allow a P&C company operating below the Mandatory Control Level that is writing no business and is running off its existing business to continue its run-off. Brandywine is running off its liabilities consistent with the terms of an order issued by the Insurance Commissioner of Pennsylvania. This includes periodic reporting obligations to the Department.

Government intervention has also occurred in the insurance and reinsurance markets in relation to terrorism coverage in the U.S. (and through industry initiatives in other countries). The U.S. Terrorism Risk Insurance Act (TRIA), which was enacted in 2002 to ensure the availability of insurance coverage for certain types of terrorist acts in the U.S., was extended in 2015 for six years, through December 31, 2020, and applies to certain of our operations.

From time to time, Chubb and its subsidiaries and affiliates receive inquiries from state agencies and attorneys general, with which we generally comply, seeking information concerning business practices, such as underwriting and non-traditional or loss mitigation insurance products. Moreover, many recent factors, such as consequences of and reactions to industry and economic conditions and focus on domestic issues, have contributed to the potential for change in the legal and regulatory framework applicable to Chubb's U.S. operations and businesses. We cannot assure that changes in laws or investigative or enforcement activities in the various states in the U.S. will not have a material adverse impact on our financial condition, results of operations, or business practices.

We are subject to numerous U.S. federal and state laws governing the protection of personal and confidential information of our clients or employees. These laws and regulations are increasing in complexity, and the requirements are extensive and detailed. Several states, including New York and Connecticut, require us to certify our compliance with their data protection laws.

We are subject to the New York Department of Financial Services' Cybersecurity Regulation (the NYDFS Cybersecurity Regulation) which mandates detailed cybersecurity standards for all institutions, including insurance entities, authorized by the NYDFS to operate in New York. Among the requirements are the maintenance of a cybersecurity program with governance controls, risk-based minimum data security standards for technology systems, cyber breach preparedness and response requirements, including reporting obligations, vendor oversight, training, and program record keeping and certification obligations. Because our North America systems are integrated our companies domiciled in other states may also be impacted by this requirement.

Additionally, on October 24, 2017, the NAIC adopted an Insurance Data Security Model Law, which require licensed insurance entities to comply with detailed information security requirements. The NAIC model law is similar in many respects to the NYDFS Cybersecurity Regulation.

Bermuda Operations
The Insurance Act 1978 of Bermuda and related regulations, as amended (the Insurance Act), regulates the insurance business of our Bermuda domiciled (re)insurance subsidiaries (Bermuda domiciled subsidiaries) and provides that no person may carry on any insurance business in or from within Bermuda unless registered as an insurer by the Bermuda Monetary Authority (BMA). The Insurance Act imposes solvency and liquidity standards and auditing and reporting requirements on Bermuda insurance companies and grants the BMA powers to supervise, investigate, and intervene in the affairs of insurance companies.

Bermuda domiciled subsidiaries must prepare and file with the BMA, audited annual statutory financial statements and audited annual financial statements prepared in accordance with accounting principles generally accepted in the U.S. (GAAP), International Financial Reporting Standards (IFRS), or any such other generally accepted accounting principles as the BMA may recognize. These audited financial statements are made public by the BMA. The Insurance Act prescribes rules for the preparation and content of the statutory financial statements that require Bermuda domiciled subsidiaries to give detailed information and analyses regarding premiums, claims, reinsurance, and investments. In addition, the Bermuda domiciled subsidiaries are required to prepare and publish a Financial Condition Report (FCR). The FCR provides details of measures governing the business operations, corporate governance framework, solvency and financial performance. The FCR must be filed with the BMA and requires Bermuda insurance companies to make the FCR publicly available.

Effective January 1, 2016, Bermuda implemented a new solvency and risk management regime which has been deemed equivalent to the European Union's (EU) Solvency II regime. Bermuda statutory reporting rules have been amended to introduce an economic balance sheet (EBS) framework. The Bermuda domiciled subsidiaries submitted their first annual filings under the EBS framework in April 2017.

Bermuda's regulatory regime provides a risk-based capital model, termed the Bermuda Solvency Capital Requirement (BSCR), as a tool to assist the BMA both in measuring risk and in determining appropriate levels of capitalization. The BSCR employs a standard mathematical model that correlates the risk underwritten by Bermuda insurers to their capital. The BSCR framework applies a standard measurement format to the risk associated with an insurer's assets, liabilities, and premiums, including a formula to take into account catastrophe risk exposure.

The BMA established risk-based regulatory capital adequacy and solvency margin requirements for Bermuda insurers that mandate that a Bermuda domiciled subsidiary’s Enhanced Capital Requirement (ECR) be calculated by either (a) BSCR, or (b) an internal capital model which the BMA has approved for use for this purpose. The Bermuda domiciled subsidiaries use the BSCR in calculating their solvency requirements. The EBS framework is embedded as part of the BSCR and forms the basis of our ECR.

In order to minimize the risk of a shortfall in capital arising from an unexpected adverse deviation and in moving towards the implementation of a risk based capital approach, the BMA has established a threshold capital level, (termed the Target Capital Level (TCL)), set at 120 percent of ECR, that serves as an early warning tool for the BMA. Failure to maintain statutory capital at least equal to the TCL would likely result in increased BMA regulatory oversight.

Under the Insurance Act, Chubb's Bermuda domiciled subsidiaries are prohibited from declaring or paying any dividends of more than 25 percent of total statutory capital and surplus, as shown in its previous financial year unconsolidated statutory balance sheet, unless at least seven days before payment of the dividends, it files with the BMA an affidavit that it will continue to meet its required solvency margins. Furthermore, Bermuda domiciled subsidiaries may only declare and pay a dividend from retained earnings and a dividend or distribution from contributed surplus if it has no reasonable grounds for believing that it is, or would after the payment be, unable to pay its liabilities as they become due, or if the realizable value of its assets would be less than the aggregate of its liabilities and its issued share capital and share premium accounts.

In addition, Chubb's Bermuda domiciled subsidiaries must obtain the BMA's prior approval before reducing total statutory capital, as shown in its previous financial year statutory balance sheet, by 15 percent or more.

Other International Operations
The extent of insurance regulation varies significantly among the countries in which non-U.S. Chubb operations conduct business. While each country imposes licensing, solvency, auditing, and financial reporting requirements, the type and extent of the requirements differ substantially. For example:

- in some countries, insurers are required to prepare and file monthly and/or quarterly financial reports, and in others, only annual reports;
- some regulators require intermediaries to be involved in the sale of insurance products, whereas other regulators permit direct sales contact between the insurer and the customer;
- the extent of restrictions imposed upon an insurer's use of local and offshore reinsurance vary;
- policy form filing and rate regulation vary by country;
- the frequency of contact and periodic on-site examinations by insurance authorities differ by country; and
- regulatory requirements relating to insurer dividend policies vary by country.

Significant variations can also be found in the size, structure, and resources of the local regulatory departments that oversee insurance activities. Certain regulators prefer close relationships with all subject insurers and others operate a risk-based approach.

Chubb operates in some countries through subsidiaries and in some countries through branches of subsidiaries. Local capital requirements applicable to a subsidiary generally include its branches. Certain Chubb companies are jointly owned with local companies to comply with legal requirements for local ownership. Other legal requirements include discretionary licensing procedures, compulsory cessions of reinsurance, local retention of funds and records, data privacy and protection program requirements, and foreign exchange controls. Chubb's international companies are also subject to multinational application of certain U.S. laws.

There are various regulatory bodies and initiatives that impact Chubb in multiple international jurisdictions and the potential for significant impact on Chubb could be heightened as a result of recent industry and economic developments.

On June 23, 2016, the United Kingdom (UK) voted in a national referendum to withdraw from the EU. In anticipation of the UK leaving the EU, effective January 1, 2019, we have redomiciled our European headquarters to France. Paris is the principal office for our Continental European operations. We have a significant investment there in both financial and human resources, as well as a large portfolio of commercial and consumer insurance business throughout France. Following the anticipated withdrawal of the UK from the EU, Chubb will continue to have a substantial presence in London in addition to its offices and operations across the UK and EU.

The EU's General Data Protection Regulation (GDPR) came into effect on May 25, 2018, and requires businesses operating in the EU or foreign business offering goods and services to or monitoring the behavior of customers in the EU, to comply with onerous accountability obligations and significantly enhanced conditions to processing personal data. For example, the GDPR has more rigorous rules for obtaining consent on the use of personal data and more stringent guidelines to demonstrate compliance. The GDPR also has specific requirements regarding the transfer of data out of the EU, including only transfers to countries deemed to have adequate data protection laws.

The EU's executive body, the European Commission, implemented new capital adequacy and risk management regulations for the European insurance industry, known as Solvency II, which aims to establish a revised set of EU-wide capital requirements and risk management standards that replaced the Solvency I requirements. The Solvency II requirements were effective January 1, 2016 for our European operations. Our capital management strategies, results of operations, and financial condition were not materially affected by the Solvency II requirements.

Enterprise Risk Management

As an insurer, Chubb is in the business of profitably managing risk for its customers. Since risk management must permeate an organization conducting a global insurance business, we have an established Enterprise Risk Management (ERM) framework that is integrated into management of our businesses and is led by Chubb's senior management. As a result, ERM is a part of the day-to-day management of Chubb and its operations.

Our global ERM framework is broadly multi-disciplinary and its objectives include:

- **External Risks**: identify, analyze, quantify, and where possible, mitigate significant external risks that could materially hamper the financial condition of Chubb and/or the achievement of corporate business objectives over the next 36 months;
- **Exposure Accumulations**: identify and quantify the accumulation of exposure to individual counterparties, products or industry sectors, particularly those that materially extend across or correlate between business units or divisions and/or the balance sheet;
- **Risk Modeling**: develop and use various data-sets, analytical tools, metrics and processes (including economic capital models and advanced analytics, including catastrophe models to quantify natural catastrophe risk for product pricing, risk management, capital allocation and to simulate and estimate hurricane losses) that help business and corporate leaders make informed underwriting, portfolio management and risk management decisions within a consistent risk/reward framework;
- **Governance**:
    - establish and coordinate risk guidelines that reflect the corporate appetite for risk;
    - monitor exposure accumulations relative to established guidelines; and
    - ensure effective internal risk management communication up to management and the Board, (including our Risk & Finance Committee and our Nominating & Governance Committee), down to the various business units and legal entities, and across the firm; and
- **Disclosure**: develop protocols and processes for risk-related disclosure internally as well as externally to rating agencies, regulators, shareholders and analysts.

Chubb Group's Risk and Underwriting Committee (RUC) reports to and assists the Chief Executive Officer in the oversight and review of the ERM framework which covers the processes and guidelines used to manage insurance risk, financial risk, strategic risk, and operational risk. The RUC is chaired by Chubb Group's Chief Risk Officer. The RUC meets at least monthly, and is comprised of Chubb Group's most senior executives, in addition to the Chair, including the Chief Executive Officer, Chief Operating Officer, Chief Financial Officer, Chief Investment Officer, Chief Claims Officer, General Counsel, President – North America Commercial and Personal Insurance, President – North America Major Accounts and Specialty Insurance, President – Overseas General Insurance, and Chief Underwriting Officer.

The RUC is assisted in its activities by Chubb's Enterprise Risk Unit (ERU) and Product Boards. The ERU is responsible for the collation and analysis of risk insight in two key areas. First, external information that provides insight to the RUC on existing or emerging risks that might significantly impact Chubb's key objectives and second, internal risk aggregations arising from Chubb's business writings and other activities such as investments and operations. The ERU is independent of the operating units and reports to our Chief Risk Officer. The Product Boards exist to provide oversight for products that we offer globally. A Product Board currently exists for each of Chubb's major product areas. Each Product Board is responsible for ensuring consistency in underwriting and pricing standards, identification of emerging issues, and guidelines for relevant accumulations.

Chubb's Chief Risk Officer also reports to the Board's Risk & Finance Committee, which helps execute the Board's supervisory responsibilities pertaining to ERM. The role of the Risk & Finance Committee includes evaluation of the integrity and effectiveness of our ERM procedures, systems, and information; governance on major policy decisions pertaining to risk aggregation and minimization; and assessment of our major decisions and preparedness levels pertaining to perceived material risks. The Audit Committee meets annually and on an as needed basis with the Risk & Finance Committee in order to exercise its duties under New York Stock Exchange Rules.

Others within the ERM structure contribute toward accomplishing Chubb's ERM objectives, including regional management, Corporate Underwriting, Internal Audit, Compliance, external consultants, and managers of our internal control processes and procedures.

Tax Matters

Refer to "Risk Factors", under Item 1A and Note 1 o) and Note 7 to the Consolidated Financial Statements, under Item 8.

EXECUTIVE OFFICERS OF THE REGISTRANT

Name	Age	Position
Evan G. Greenberg	64	Chairman, President, Chief Executive Officer, and Director
John W. Keogh	54	Executive Vice Chairman and Chief Operating Officer
Philip V. Bancroft	59	Executive Vice President and Chief Financial Officer
John J. Lupica	53	Vice Chairman; President, North America Major Accounts & Specialty Insurance
Joseph F. Wayland	61	Executive Vice President and General Counsel
Sean Ringsted	56	Executive Vice President, Chief Digital Officer, and Chief Risk Officer
Timothy A. Boroughs	69	Executive Vice President and Chief Investment Officer
Paul J. Krump	59	Executive Vice President; President, North America Commercial and Personal Insurance
Juan C. Andrade	53	Executive Vice President; President, Overseas General Insurance

Evan G. Greenberg has been a director of Chubb Limited since August 2002. Mr. Greenberg was elected Chairman of the Board of Directors in May 2007. Mr. Greenberg was a director of The Coca-Cola Company from February 2011 until his resignation in October 2016. Mr. Greenberg was appointed to the position of President and Chief Executive Officer of Chubb Limited in May 2004, and in June 2003, was appointed President and Chief Operating Officer of Chubb Limited. Mr. Greenberg was appointed to the position of Chief Executive Officer of Chubb Overseas General in April 2002. He joined Chubb as Vice Chairman, Chubb Limited, and Chief Executive Officer of Chubb Tempest Re in November 2001. Prior to joining Chubb, Mr. Greenberg was most recently President and Chief Operating Officer of American International Group (AIG), a position he held from 1997 until 2000.

John W. Keogh was appointed Executive Vice Chairman of Chubb Limited in November 2015. Mr. Keogh has served as Chief Operating Officer of Chubb Limited since July 2011 and Vice Chairman of Chubb Limited and Chubb Group Holdings since August 2010. Mr. Keogh joined Chubb as Chief Executive Officer of Overseas General Insurance in April 2006 and became Chairman of Overseas General Insurance in August 2010. Prior to joining Chubb, Mr. Keogh served as Senior Vice President, Domestic General Insurance of AIG, and President and Chief Executive Officer of National Union Fire Insurance Company, AIG's member company that specializes in D&O and fiduciary liability coverages. Mr. Keogh joined AIG in 1986. He served in a number of other senior positions there including as Executive Vice President of AIG's Domestic Brokerage Group and as President and Chief Operating Officer of AIG's Lexington Insurance Company unit.

Philip V. Bancroft was appointed Chief Financial Officer of Chubb Limited in January 2002. For nearly 20 years, Mr. Bancroft worked for PricewaterhouseCoopers LLP. Prior to joining Chubb, he served as partner-in-charge of the New York Regional Insurance Practice. Mr. Bancroft had been a partner with PricewaterhouseCoopers LLP for ten years.

John J. Lupica was appointed President, North America Major Accounts & Specialty Insurance in January 2016, Vice Chairman of Chubb Limited and Chubb Group Holdings in November 2013 and Chairman, Insurance - North America, in July 2011. Mr. Lupica had been Chief Operating Officer, Insurance - North America, since 2010 and President of ACE USA since 2006. He also previously served as Division President of U.S. Professional Risk business and U.S. Regional Operations. Mr. Lupica joined Chubb as Executive Vice President of Professional Risk in 2000. Prior to joining Chubb, he served as Senior Vice President for Munich-American Risk Partners, Inc. He also held various management positions at AIG.

Joseph F. Wayland was appointed Executive Vice President of Chubb Limited in January 2016, General Counsel and Secretary of Chubb Limited in July 2013. Mr. Wayland joined Chubb from the law firm of Simpson Thacher & Bartlett LLP, where he was a partner since 1994. From 2010 to 2012, he served in the United States Department of Justice, first as Deputy Assistant Attorney General of the Antitrust Division, and was later appointed as the Acting Assistant Attorney General in charge of that division.

Sean Ringsted was appointed Executive Vice President and Chief Digital Officer in February 2017 and Chief Risk Officer in November 2008. Mr. Ringsted previously served as Chief Actuary of Chubb Limited from November 2008 to January 2017. Mr. Ringsted's previous roles at Chubb also include Chief Actuary for Chubb Group from 2004 to 2008, Executive Vice President and Chief Risk Officer for Chubb Tempest Re from 2002 to 2004, and Senior Vice President and Chief Actuary for Chubb Tempest Re from 1998 to 2002. Prior to joining Chubb, Mr. Ringsted was a consultant at Tillinghast-Towers Perrin.

Timothy A. Boroughs was appointed Executive Vice President and Chief Investment Officer of Chubb Group in June 2000. Prior to joining Chubb, Mr. Boroughs was Director of Fixed Income at Tudor Investment Corporation from 1997 to 2000, and Managing Partner and Director of Global Leveraged Investment Activity at Fischer Francis Trees & Watts from 1976 to 1997.

Paul J. Krump was appointed Executive Vice President, Chubb Group and President North America Commercial and Personal Insurance in January 2016. Prior to Chubb Limited's January 2016 acquisition of The Chubb Corporation, Mr. Krump was Chief Operating Officer of The Chubb Corporation, responsible for the company's Commercial, Specialty, Personal and Accident & Health insurance lines; Claims; Global Field Operations; Information Technology; Human Resources; Communications; and External Affairs. Mr. Krump joined The Chubb Corporation in 1982 as a commercial underwriting trainee in the Minneapolis office. He held numerous headquarters and field positions in the United States and Europe, including President of Personal Lines and Claims and President of Commercial and Specialty Lines.

Juan C. Andrade was appointed Executive Vice President, Chubb Group and President, Overseas General Insurance in January 2016. Mr. Andrade joined Chubb in December 2010 to lead the global personal lines and small commercial property & casualty insurance businesses. In January 2013, he became the Chief Operating Officer for Overseas General Insurance. Prior to joining Chubb, Mr. Andrade was President and Chief Operating Officer of property & casualty operations for The Hartford Financial Services Group. He joined The Hartford in 2006 as head of the property & casualty claims organization.

ITEM 1A. Risk Factors

Factors that could have a material impact on our results of operations or financial condition are outlined below. Additional risks not presently known to us or that we currently deem insignificant may also impair our business or results of operations as they become known or as facts and circumstances change. Any of the risks described below could result in a material adverse effect on our results of operations or financial condition.

Insurance

Our results of operations or financial condition could be adversely affected by the occurrence of natural and man-made disasters.

We have substantial exposure to losses resulting from natural disasters, man-made catastrophes such as terrorism or cyber-attack, and other catastrophic events, including pandemics. This could impact a variety of our businesses, including our commercial and personal lines, and life and accident and health (A&H) products. Catastrophes can be caused by various events, including hurricanes, typhoons, earthquakes, hailstorms, droughts, explosions, severe winter weather, fires, war, acts of terrorism, nuclear accidents, political instability, and other natural or man-made disasters, including a global or other wide-impact pandemic or a significant cyber-attack. The last several years saw a particularly significant set of catastrophes, principally in the form of Hurricanes Harvey, Irma, Maria, Florence, and Michael; the global cyber-attacks known as WannaCry and Petya; and significant California wildfires. The incidence and severity of catastrophes are inherently unpredictable and our losses from catastrophes could be substantial. In addition, climate change and resulting changes in global temperatures, weather patterns, and sea levels may both increase the frequency and severity of natural catastrophes and the resulting losses in the future and impact our risk modeling assumptions. We cannot predict the impact that changing climate conditions, if any, may have on our results of operations or our financial condition. Additionally, we cannot predict how legal, regulatory and/or social responses to concerns around global climate change may impact our business. The occurrence of claims from catastrophic events could result in substantial volatility in our results of operations or financial condition for any fiscal quarter or year. The historical incidence for events such as earthquakes, pandemics and cyber-attacks is infrequent and may not be representative of contemporary exposures and risks. As an example, increases in the values and concentrations of insured property may increase the severity of these occurrences in the future. Although we attempt to manage our exposure to such events through the use of underwriting controls, risk models, and the purchase of third-party reinsurance, catastrophic events are inherently unpredictable and the actual nature of such events when they occur could be more frequent or severe than contemplated in our pricing and risk management expectations. As a result, the occurrence of one or more catastrophic events could have an adverse effect on our results of operations and financial condition.

If actual claims exceed our loss reserves, our financial results could be adversely affected.

Our results of operations and financial condition depend upon our ability to accurately assess the potential losses associated with the risks that we insure and reinsure. We establish reserves for unpaid losses and loss expenses, which are estimates of future payments of reported and unreported claims for losses and related expenses, with respect to insured events that have occurred at or prior to the balance sheet date. The process of establishing reserves can be highly complex and is subject to considerable variability as it requires the use of informed estimates and judgments.

Actuarial staff in each of our segments regularly evaluates the levels of loss reserves. Any such evaluation could result in future changes in estimates of losses or reinsurance recoverables and would be reflected in our results of operations in the period in which the estimates are changed. Losses and loss expenses are charged to income as incurred. During the loss settlement period, which can be many years in duration for some of our lines of business, additional facts regarding individual claims and trends often will become known which may result in a change in overall reserves. In addition, application of statistical and actuarial methods may require the adjustment of overall reserves upward or downward from time to time.

Included in our loss reserves are liabilities for latent claims such as asbestos and environmental (A&E), which are principally related to claims arising from remediation costs associated with hazardous waste sites and bodily-injury claims related to exposure to asbestos products and environmental hazards. At December 31, 2018, gross A&E liabilities represented approximately 3.4 percent of our loss reserves. The estimation of these liabilities is subject to many complex variables including: the current legal environment; specific settlements that may be used as precedents to settle future claims; assumptions regarding trends with respect to claim severity and the frequency of higher severity claims; assumptions regarding the ability to allocate liability among defendants (including bankruptcy trusts) and other insurers; the ability of a claimant to bring a claim in a state in which it has no residency or exposure; the ability of a policyholder to claim the right to non-products coverage; whether high-level excess policies have the potential to be accessed given the policyholder's claim trends and liability situation; payments to unimpaired claimants; and the potential liability of peripheral defendants. Accordingly, the ultimate settlement of losses, arising from either latent or non-latent causes, may be significantly greater or less than the loss and loss expense reserves held at the balance sheet date. In particular the amount and timing of the settlement of our P&C liabilities are uncertain and our actual payments could be higher than contemplated in our loss reserves owing to the impact of insurance, judicial decisions, and/or social inflation. If our loss reserves are determined to be inadequate, we may be required to increase loss reserves at the time of the determination and our net income and capital may be reduced.

The effects of emerging claim and coverage issues on our business are uncertain.
As industry practices and legislative, regulatory, judicial, social, financial, technological and other environmental conditions change, unexpected and unintended issues related to claims and coverage may emerge. These issues may adversely affect our business by either extending coverage beyond our underwriting intent or by increasing the frequency and severity of claims. In some instances, these changes may not become apparent until after we have issued insurance or reinsurance contracts that are affected by the changes. As a result, the full extent of liability under our insurance or reinsurance contracts may not be known for many years after issuance.

The failure of any of the loss limitation methods we use could have an adverse effect on our results of operations and financial condition.
We seek to manage our loss exposure by maintaining a disciplined underwriting process throughout our insurance operations. We also look to limit our loss exposure by writing a number of our insurance and reinsurance contracts on an excess of loss basis. Excess of loss insurance and reinsurance indemnifies the insured against losses in excess of a specified amount. In addition, we limit program size for each client and purchase third-party reinsurance for our own account. In the case of our assumed proportional reinsurance treaties, we seek per occurrence limitations or loss and loss expense ratio caps to limit the impact of losses ceded by the client. In proportional reinsurance, the reinsurer shares a proportional part of the premiums and losses of the reinsured. We also seek to limit our loss exposure by geographic diversification. Geographic zone limitations involve significant underwriting judgments, including the determination of the area of the zones and the inclusion of a particular policy within a particular zone's limits.

However, there are inherent limitations in all of these tactics and no assurance can be given against the possibility of an event or series of events that could result in loss levels that could have an adverse effect on our financial condition or results of operations. It is also possible that losses could manifest themselves in ways that we do not anticipate and that our risk mitigation strategies are not designed to address. Additionally, various provisions of our policies, such as limitations or exclusions from coverage or choice of forum negotiated to limit our risks, may not be enforceable in the manner we intend. As a result, one or more natural catastrophes and/or terrorism or other events could result in claims that substantially exceed our expectations, which could have an adverse effect on our results of operations and financial condition.

We may be unable to purchase reinsurance, and/or if we successfully purchase reinsurance, we are subject to the possibility of non-payment.
We purchase protection from third parties including, but not limited to, reinsurance to protect against catastrophes and other sources of volatility, to increase the amount of protection we can provide our clients, and as part of our overall risk management strategy. Our reinsurance business also purchases retrocessional protection which allows a reinsurer to cede to another company all or part of the reinsurance originally assumed by the reinsurer. A reinsurer's or retrocessionaire's insolvency or inability or unwillingness to make timely payments under the terms of its reinsurance agreement with us could have an adverse effect on us because we remain liable to the insured. From time to time, market conditions have limited, and in some cases have prevented, insurers and reinsurers from obtaining the types and amounts of reinsurance or retrocessional reinsurance that they consider adequate for their business needs.

There is no guarantee our desired amounts of reinsurance or retrocessional reinsurance will be available in the marketplace in the future. In addition to capacity risk, the remaining capacity may not be on terms we deem appropriate or acceptable or with companies with whom we want to do business. Finally, we face some degree of counterparty risk whenever we purchase reinsurance or retrocessional reinsurance. Consequently, the insolvency of these counterparties, or the inability, or unwillingness of any of our present or future reinsurers to make timely payments to us under the terms of our reinsurance or retrocessional agreements could have an adverse effect on us. At December 31, 2018, we had $16.2 billion of reinsurance recoverables, net of reserves for uncollectible recoverables.

Certain active Chubb companies are primarily liable for A&E and other exposures they have reinsured to our inactive run-off company Century Indemnity Company (Century). At December 31, 2018, the aggregate reinsurance balances ceded by our active subsidiaries to Century were approximately $1.5 billion. Should Century's loss reserves experience adverse development in the future and should Century be placed into rehabilitation or liquidation, the reinsurance recoverables due from Century to its affiliates would be payable only after the payment in full of third party expenses and liabilities, including administrative expenses and direct policy liabilities. Thus, the intercompany reinsurance recoverables would be at risk to the extent of the shortage of assets remaining to pay these recoverables. While we believe the intercompany reinsurance recoverables from Century are not impaired at this time, we cannot assure that adverse development with respect to Century's loss reserves, if manifested, will not result in Century's insolvency, which could result in our recognizing a loss to the extent of any uncollectible reinsurance from Century. This could have an adverse effect on our results of operations and financial condition.

Our net income may be volatile because certain products sold by our Life Insurance business expose us to reserve and fair value liability changes that are directly affected by market and other factors and assumptions.
Our pricing, establishment of reserves for future policy benefits and valuation of life insurance and annuity products, including reinsurance programs, are based upon various assumptions, including but not limited to equity market changes, interest rates, mortality rates, morbidity rates, and policyholder behavior. The process of establishing reserves for future policy benefits relies on our ability to accurately estimate insured events that have not yet occurred but that are expected to occur in future periods. Significant deviations in actual experience from assumptions used for pricing and for reserves for future policy benefits could have an adverse effect on the profitability of our products and our business.

Under reinsurance programs covering variable annuity guarantees, we assumed the risk of guaranteed minimum death benefits (GMDB) and guaranteed living benefits (GLB), principally guaranteed minimum income benefits (GMIB), associated with variable annuity contracts. We ceased writing this business in 2007. Our net income is directly impacted by changes in the reserves calculated in connection with the reinsurance of GMDB and GLB liabilities. In addition, our net income is directly impacted by the change in the fair value of the GLB liability. Reported liabilities for both GMDB and GLB reinsurance are determined using internal valuation models which require considerable judgment and are subject to significant uncertainty. Refer to the “Critical Accounting Estimates – Guaranteed living benefits (GLB) derivatives” under Item 7 and “Quantitative and Qualitative Disclosures about Market Risk – Reinsurance of GMDB and GLB guarantees” under Item 7A for additional information on the assumptions used in this program. We view our variable annuity reinsurance business as having a similar risk profile to that of catastrophe reinsurance, with the probability of long-term economic loss relatively small at the time of pricing. Adverse changes in market factors and policyholder behavior will have an impact on both Life Insurance underwriting income and consolidated net income.

Payment of obligations under surety bonds could have an adverse effect on our results of operations.
The surety business tends to be characterized by infrequent but potentially high severity losses. The majority of our surety obligations are intended to be performance-based guarantees. When losses occur, they may be mitigated, at times, by recovery rights to the customer’s assets, contract payments, and collateral and bankruptcy recoveries. We have substantial commercial and construction surety exposure for current and prior customers. In that regard, we have exposures related to surety bonds issued on behalf of companies that have experienced or may experience deterioration in creditworthiness. If the financial condition of these companies were adversely affected by the economy or otherwise, we may experience an increase in filed claims and may incur high severity losses, which could have an adverse effect on our results of operations.

Our exposure to counterparties in various industries, our reliance on brokers, and certain of our policies may subject us to credit risk.
We have exposure to counterparties through reinsurance and in various industries, including banks, hedge funds and other investment vehicles, and derivative transactions that expose us to credit risk in the event our counterparty fails to perform its obligations. We also have exposure to financial institutions in the form of secured and unsecured debt instruments and equity securities.

In accordance with industry practice, we generally pay amounts owed on claims to brokers who, in turn, remit these amounts to the insured or ceding insurer. Although the law is unsettled and depends upon the facts and circumstances of the particular case, in some jurisdictions, if a broker fails to make such a payment, we might remain liable to the insured or ceding insurer for the deficiency. Conversely, in certain jurisdictions, if a broker does not remit premiums paid for these policies over to us, these premiums might be considered to have been paid and the insured or ceding insurer will no longer be liable to us for those amounts, whether or not we have actually received the premiums from the broker. Consequently, we assume a degree of credit risk associated with a broker with whom we transact business. However, due to the unsettled and fact-specific nature of the law, we are unable to quantify our exposure to this risk. To date, we have not experienced any material losses related to this credit risk.

Under the terms of certain high-deductible policies which we offer, such as workers’ compensation and general liability, our customers are responsible to reimburse us for an agreed-upon dollar amount per claim. In nearly all cases we are required under such policies to pay covered claims first, and then seek reimbursement for amounts within the applicable deductible from our customers. This obligation subjects us to credit risk from these customers. While we generally seek to mitigate this risk through collateral agreements and maintain a provision for uncollectible accounts associated with this credit exposure, an increased inability of customers to reimburse us in this context could have an adverse effect on our financial condition and results of operations. In addition, a lack of credit available to our customers could impact our ability to collateralize this risk to our satisfaction, which in turn, could reduce the amount of high-deductible policies we could offer.

Since we depend on a few distribution and bancassurance partners for a large portion of our revenues, loss of business provided by any one of them could adversely affect us.
We market our insurance and reinsurance worldwide primarily through independent insurance agents, insurance and reinsurance brokers, and bancassurance relationships. Accordingly, our business is dependent on the willingness of these agents and brokers to recommend our products to their customers, who may also promote and distribute the products of our competitors. Deterioration in relationships with our agent and broker distribution network or their increased promotion and distribution of our competitors' products could adversely affect our ability to sell our products. Loss of all or a substantial portion of the business provided by one or more of these agents and brokers could have an adverse effect on our business.

Financial

Our investment performance may affect our financial results and our ability to conduct business.
Our investment assets are invested by professional investment management firms under the direction of our management team in accordance with investment guidelines approved by the Risk & Finance Committee of the Board of Directors. Although our investment guidelines stress diversification of risks and conservation of principal and liquidity, our investments are subject to market risks and risks inherent in individual securities. Interest rates are highly sensitive to many factors, including inflation, monetary and fiscal policies, and domestic and international political conditions. Given the risk that London Interbank Offered Rate (LIBOR) may no longer be available, we are monitoring industry efforts via our external investment managers to transition away from LIBOR by the end of 2021. The volatility of our losses may force us to liquidate securities, which may cause us to incur capital losses. Realized and unrealized losses in our investment portfolio would reduce our book value, and if significant, can affect our ability to conduct business.

Volatility in interest rates could impact the performance of our investment portfolio which could have an adverse effect on our investment income and operating results. Although we take measures to manage the risks of investing in a changing interest rate environment, we may not be able to effectively mitigate interest rate sensitivity. Our mitigation efforts include maintaining a high quality portfolio of primarily fixed income investments with a relatively short duration to reduce the effect of interest rate changes on book value. A significant increase in interest rates would generally have an adverse effect on our book value. Our life insurance investments typically focus on longer duration bonds to better match the obligations of this business. For the life insurance business, policyholder behavior may be influenced by changing interest rate conditions and require a re-balancing of duration to effectively manage our asset/liability position.

As stated, our fixed income portfolio is primarily invested in high quality, investment-grade securities. However, a smaller portion of the portfolio, approximately 15 percent at December 31, 2018, is invested in below investment-grade securities. These securities, which pay a higher rate of interest, also have a higher degree of credit or default risk and may also be less liquid in times of economic weakness or market disruptions. While we have put in place procedures to monitor the credit risk and liquidity of our invested assets, it is possible that, in periods of economic weakness (such as recession), we may experience credit or default losses in our portfolio, which could adversely affect our results of operations and financial condition.

As a part of our ongoing analysis of our investment portfolio, we are required to assess whether the debt and equity securities we hold for which we have recorded an unrealized loss have been “other-than-temporarily impaired” under GAAP, which implies an inability to recover the full economic benefits of these securities. Refer to Note 2 to the Consolidated Financial Statements for additional information. This analysis requires a high degree of judgment and requires us to make certain assessments about the potential for recovery of the assets we hold. Declines in relevant stock and other financial markets, and other factors impacting the value of our investments, could result in impairments and could adversely affect our net income and other financial results.

We may require additional capital or financing sources in the future, which may not be available or may be available only on unfavorable terms.
Our future capital and financing requirements depend on many factors, including our ability to write new business successfully and to establish premium rates and reserves at levels sufficient to cover losses, as well as our investment performance and

capital expenditure obligations, including with respect to acquisitions. We may need to raise additional funds through financings or access funds through existing or new credit facilities or through short-term repurchase agreements. We also from time to time seek to refinance debt or credit as amounts become due or commitments expire. Any equity or debt financing or refinancing, if available at all, may be on terms that are not favorable to us. In the case of equity financings, dilution to our shareholders could result, and in any case, such securities may have rights, preferences, and privileges that are senior to those of our Common Shares. Our access to funds under existing credit facilities is dependent on the ability of the banks that are parties to the facilities to meet their funding commitments. Under Swiss law we would be prohibited from selling shares in an equity financing at a purchase price below our then-current par value. If we cannot obtain adequate capital or sources of credit on favorable terms, or at all, we could be forced to use assets otherwise available for our business operations, and our business, results of operations, and financial condition could be adversely affected.

We may be required to post additional collateral because of changes in our reinsurance liabilities to regulated insurance companies, or because of regulatory changes that affect our companies.
If our reinsurance liabilities increase, including in our property & casualty and variable annuity reinsurance businesses, we may be required to post additional collateral for insurance company clients. In addition, regulatory changes sometimes affect our obligations to post collateral. The need to post this additional collateral, if significant enough, may require us to sell investments at a loss in order to provide securities of suitable credit quality or otherwise secure adequate capital at an unattractive cost. This could adversely impact our net income and liquidity and capital resources.

U.S. and global economic and financial industry events and their consequences could harm our business, our liquidity and financial condition, and our stock price.
The consequences of adverse global or regional market and economic conditions may affect (among other aspects of our business) the demand for and claims made under our products, the ability of customers, counterparties, and others to establish or maintain their relationships with us, our ability to access and efficiently use internal and external capital resources, the availability of reinsurance protection, the risks we assume under reinsurance programs covering variable annuity guarantees, and our investment performance. The increasing impact of climate change could affect our cost of claims, loss ratios, and financial results. Volatility in the U.S. and other securities markets may adversely affect our stock price.

A decline in our financial strength ratings could affect our standing among distribution partners and customers and cause our premiums and earnings to decrease. A decline in our debt ratings could increase our borrowing costs and impact our ability to access capital markets.
Ratings are an important factor in establishing the competitive position of insurance and reinsurance companies. The objective of these rating systems is to provide an opinion of an insurer's financial strength and ability to meet ongoing obligations to its policyholders. A ratings downgrade could result in a substantial loss of business as insureds, ceding companies, and brokers move to other insurers and reinsurers with higher ratings. If one or more of our debt ratings were downgraded, we could also incur higher borrowing costs, and our ability to access the capital markets could be impacted. Additionally, we could be required to post collateral or be faced with the cancellation of policies and resulting premium in certain circumstances. We cannot give any assurance regarding whether or to what extent any of the rating agencies might downgrade our ratings in the future.

Our ability to pay dividends and/or to make payments on indebtedness may be constrained by our holding company structure.
Chubb Limited is a holding company that owns shares of its operating insurance and reinsurance subsidiaries and does not itself have any significant operations or liquid assets. Dividends and other permitted distributions from our insurance subsidiaries are a primary source of funds to meet ongoing cash requirements, including any future debt service payments and other expenses, and to pay dividends to our shareholders. Some of our insurance subsidiaries are subject to significant regulatory restrictions limiting their ability to declare and pay dividends. The inability of our insurance subsidiaries to pay dividends (or other intercompany amounts due, such as intercompany debt obligations) in an amount sufficient to enable us to meet our cash requirements at the holding company level could have an adverse effect on our operations and our ability to pay dividends to our shareholders and/or meet our debt service obligations.

Our operating results and shareholders' equity may be adversely affected by currency fluctuations.
Our reporting currency is the U.S. dollar. In general, we match assets and liabilities in local currencies. Where possible, capital levels in local currencies are limited to satisfy minimum regulatory requirements and to support local insurance operations. The principal currencies creating foreign exchange risk are the British pound sterling, the euro, the Mexican peso, the Brazilian real, the Korean won, the Canadian dollar, the Japanese yen, the Thai baht, the Australian dollar, and the Hong Kong dollar. At December 31, 2018, approximately 20.7 percent of our net assets were denominated in foreign currencies. We may experience

losses resulting from fluctuations in the values of non-U.S. currencies, which could adversely impact our results of operations and financial condition.

Operational

The regulatory and political regimes under which we operate, and their volatility, could have an adverse effect on our business.
Our insurance and reinsurance subsidiaries conduct business globally. Our businesses in each jurisdiction are subject to varying degrees of regulation and supervision. The laws and regulations of the jurisdictions in which our insurance and reinsurance subsidiaries are domiciled require, among other things, maintenance of minimum levels of statutory capital, surplus, and liquidity; various solvency standards; and periodic examinations of subsidiaries' financial condition. In some jurisdictions, laws and regulations also restrict payments of dividends and reductions of capital. Applicable statutes, regulations, and policies may also restrict the ability of these subsidiaries to write insurance and reinsurance policies, to make certain investments, and to distribute funds. The purpose of insurance laws and regulations generally is to protect policyholders and ceding insurance companies, not our shareholders. For example, some jurisdictions have enacted various consumer protection laws that make it more burdensome for insurance companies to sell policies and interact with customers in personal lines businesses. Failure to comply with such regulations can lead to significant penalties and reputational injury. Fines and penalties in the U.S. in particular have been trending upwards.

The foreign and U.S. federal and state laws and regulations that are applicable to our operations are complex and may increase the costs of regulatory compliance or subject our business to the possibility of regulatory actions or proceedings. Laws and regulations not specifically related to the insurance industry include trade sanctions that relate to certain countries, anti-money laundering laws, and anti-corruption laws such as the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act 2010, the anti-bribery provisions of the Swiss Penal Code and similar local laws prohibiting corrupt payments to governmental officials. The insurance industry is also affected by political, judicial, and legal developments that may create new and expanded regulations and theories of liability. The current economic and financial climates present additional uncertainties and risks relating to increased regulation and the potential for increased involvement of the U.S. and other governments in the financial services industry.

Regulators in countries where we have operations are working with the International Association of Insurance Supervisors (IAIS) to consider changes to insurance company supervision, including with respect to group supervision and solvency requirements. The IAIS has developed a Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame) which is focused on the effective group-wide supervision of international active insurance groups (IAIGs), such as Chubb. As part of ComFrame, the IAIS has announced plans to develop an international capital standard for insurance groups. The details of ComFrame including this global capital standard and its applicability to Chubb are uncertain at this time. In addition, Chubb businesses across the EU are subject to Solvency II, a capital and risk management regime and our Bermuda businesses are subject to an equivalent of the EU's Solvency II regime. Also applicable to Chubb businesses are the requirements of the Swiss Financial Market Supervisory Authority (FINMA) whose regulations include Swiss Solvency Tests. There are also Risk Based Capital (RBC) requirements in the U.S. which are also subject to revision in response to global developments. While it is not certain how or if these actions will impact Chubb, we do not currently expect that our capital management strategies, results of operations and financial condition will be materially affected by these regulatory changes.

In the event or absence of changes in applicable laws and regulations in particular jurisdictions, we may from time to time face challenges, or changes in approach to oversight of our business from insurance or other regulators, including challenges resulting from requiring the use of information technology that cannot be quickly adjusted to address new regulatory requirements.

We may not be able to comply fully with, or obtain appropriate exemptions from, applicable statutes and regulations and any changes thereto, which could have an adverse effect on our business. Failure to comply with or obtain appropriate authorizations and/or exemptions under any applicable laws and regulations could result in restrictions on our ability to do business or undertake activities that are regulated in one or more of the jurisdictions in which we conduct business and could subject us to fines and other sanctions.

Evolving privacy and data security regulations could adversely affect our business.
We are subject to numerous U.S. federal and state laws and non-U.S. regulations governing the protection of personal and confidential information of our clients and employees, including in relation to medical records, credit card data and financial information. These laws and regulations are increasing in complexity and number, change frequently and sometimes conflict.

We are subject to the New York Department of Financial Services' Cybersecurity Regulation (the NYDFS Cybersecurity Regulation) which mandates detailed cybersecurity standards for all institutions, including insurance entities, authorized by the NYDFS to operate in New York. Among the requirements are the maintenance of a cybersecurity program with governance controls, risk-based minimum data security standards for technology systems, cyber breach preparedness and response requirements, including reporting obligations, vendor oversight, training, and program record keeping and certification obligations. The NYDFS Cybersecurity Regulation has increased our compliance costs and could increase the risk of noncompliance and subject us to regulatory enforcement actions and penalties, as well as reputation risk.

Additionally, on October 24, 2017, the National Association of Insurance Commissioners (NAIC) adopted an Insurance Data Security Model Law, which requires licensed insurance entities to comply with detailed information security requirements. The NAIC model law is similar in many respects to the NYDFS Cybersecurity Regulation and has been adopted by a few states and is under consideration by others. It is not yet known whether or not, and to what extent, states legislatures or insurance regulators where we operate will enact the Insurance Data Security Model Law in whole or in part, or in a modified form. Such enactments, especially if inconsistent between states or with existing laws and regulations could raise compliance costs or increase the risk of noncompliance, with the attendant risk of being subject to regulatory enforcement actions and penalties, as well as reputational harm. Any such events could potentially have an adverse impact on our business, financial condition or results of operations.

We operate in a number of countries outside of the U.S. whose laws may in some cases be more stringent than the requirements in the U.S. For example, European Union (EU) member countries have specific requirements relating to cross-border transfers of personal information to certain jurisdictions, including to the U.S. In addition, some countries provide stronger individual rights and have stricter consumer notice and/or consent requirements for the collection, use or sharing of personal information and more stringent requirements relating to organizations' privacy programs. Moreover, international privacy and data security regulations may become more complex and have greater consequences.

The EU General Data Protection Regulation (the "GDPR"), which became effective on May 25, 2018, is a comprehensive regulation applying across all EU member states. All of our business units (regardless of whether they are located in the EU) may be subject to the GDPR when personal data is processed in relation to the offer of goods and services to individuals within the EU. Our compliance with GDPR requires preparation, expenditures, and ongoing compliance efforts. Further, enforcement priorities and interpretation of certain of the GDPR's provisions are still unclear. Under the GDPR there are penalties for noncompliance which could result in a material fine for certain activities of up to 4 percent of a firm's global annual revenue per violation. Our failure to comply with GDPR and other countries' privacy or data security-related laws, rules or regulations could result in significant penalties imposed by regulators, which could have an adverse effect on our business, financial condition and results of operations.

Significant other comprehensive privacy laws have been enacted by other countries, most notably the California Consumer Privacy Act (CCPA) and Brazil's Lei Geral de Protecao de Dados, which may affect our use of data and could affect our operations and subject us to fines and actions for noncompliance. In the U.S., there are ongoing discussions regarding a National Privacy Law. New laws similar to the GDPR are expected to be enacted in coming years in additional countries in which we operate.

Political uncertainty in the United Kingdom and the European Union may lead to volatility and/or have an adverse effect on our business, our liquidity and financial condition, and our stock price.
On June 23, 2016, the United Kingdom (U.K.) voted in a national referendum to withdraw from the European Union (EU). On March 29, 2017, the U.K. government gave notice to the EU, under Article 50(2) of the Treaty on EU, of the U.K.'s intention to withdraw from the EU.

The expected exit of the U.K. from the EU, or prolonged periods of uncertainty relating to such a possibility could result in significant macroeconomic deterioration including, but not limited to, decreases in global stock exchange indices, increased foreign exchange volatility (in particular a further weakening of the pound sterling and euro against other leading currencies), decreased GDP in the U.K., and a downgrade of the U.K.'s sovereign credit rating. In addition, these events if sufficiently extreme could push the U.K., Eurozone, and/or United States into an economic recession any of which, were they to occur, would further destabilize the global financial markets and could have a material adverse effect on our business, financial condition, and results of operations. We have significant operations in the U.K. and other EU member states. In anticipation of the U.K. leaving the EU as expected in 2019, effective January 1, 2019, we have redomiciled our European headquarters to France. Paris is the principal office for our Continental European operations. We have a significant investment there in both financial and human resources, as well as a large portfolio of commercial and consumer insurance business throughout France.

Following the withdrawal of the U.K. from the EU, Chubb will continue to have a substantial presence in London in addition to its offices and operations across the U.K. and EU.

The rules governing the EU Single Market (which is made up of the 27 other EU member states and to some extent, Iceland, Liechtenstein, and Norway (together, the European Economic Area or EEA)) require local risks to be underwritten by a local authorized insurer, an EEA authorized insurer or a non-local insurer with the benefit of an EU “passport”. As such, U.K. insurers (as well as EEA insurers operating as passported branches in the U.K., such as our French companies Chubb European Group SE and ACE Europe Life SE), are currently able to underwrite risks from the U.K. into EEA member states via a “passport”. If the withdrawal agreement in its current form is entered into, the U.K. will withdraw from the EU Single Market, in which case our passporting rights would be lost. In addition, there can be no assurance that there will be any agreement between the U.K. and the EU by the date on which the U.K. withdraws from the EU, by the end of any transitional period, or at all. In particular, the terms of the U.K.'s exit from the EU and the framework for future discussions on the terms of the U.K.'s relationship with the EU is subject to approval by the U.K. Parliament, which may not be given. As such, there is a possibility that the withdrawal agreement will not be approved by the U.K. Parliament, and that the U.K. will withdraw from the EU without any withdrawal agreement. In addition, any free trade agreement that is subsequently concluded between the U.K. and the EU may not maintain the passporting rights of U.K. insurers nor deem relevant U.K. regulations to be equivalent to those of the EU. In the event that, following the U.K.’s withdrawal from the EU, U.K. insurers are unable to access the EU Single Market via a passporting arrangement, a regulatory equivalence regime or other similar arrangement, such insurers may not be able to underwrite risks into EEA member states except through local branches incorporated in the EEA. Such branches might require local authorization, regulatory and prudential supervision, and capital to be deposited. As an EEA authorized insurer, Chubb will be able to continue to underwrite local risks across the EU Single Market. On July 24, 2018, the U.K. government legislated the Temporary Permissions Regime which allows U.K. branches of EEA authorized insurers to continue underwriting U.K. insurance business if the U.K. leaves the EU on March 29, 2019 without a withdrawal agreement, while the insurer seeks local authorization from the U.K. regulator, which might require local capital to be deposited. We have commenced implementation of plans to ensure that following the date of the U.K.'s exit from the EU, our French companies, Chubb European Group SE and ACE Europe Life SE, will be able to underwrite risks across the EEA via a "passport", and the U.K. branches of these companies will have the benefit of the U.K.'s Temporary Permissions Regime, allowing them to continue to carry on insurance business in the U.K. for the period of up to three years following the date of the U.K.'s exit from the EU or until the relevant entity obtains branch authorization from the Prudential Regulatory Authority. However, any change to the terms of the U.K.’s access to the EU Single Market following the withdrawal of the U.K. from the EU could still have a material adverse effect on our business, financial condition, and results of operations.

Chubb underwrites P&C business on a global basis through Lloyd's of London (Lloyd's). Effective January 1, 2019, Lloyd's launched the Lloyd's Insurance Company which enables Lloyd's to continue to write insurance and reinsurance in EEA member states through an alternative entity in its group located in Brussels, following the U.K.'s withdrawal from the EU. Lloyd's has announced its intention to transfer all existing EEA business from the U.K. entity to the Lloyd's Insurance Company through a regulatory process called a Part VII transfer.

Our worldwide operations, particularly in developing nations, expose us to global geopolitical developments that could have an adverse effect on our business, liquidity, results of operations, and financial condition.
With operations in 54 countries and territories, we provide insurance and reinsurance products and services to a diverse group of clients worldwide, including operations in various developing nations. Both current and future foreign operations could be adversely affected by unfavorable geopolitical developments including law changes; tax changes; changes in trade policies; changes to visa or immigration policies; regulatory restrictions; government leadership changes; political events and upheaval; sociopolitical instability; social, political or economic instability resulting from climate change; and nationalization of our operations without compensation. Adverse activity in any one country could negatively impact operations, increase our loss exposure under certain of our insurance products, and could, otherwise, have an adverse effect on our business, liquidity, results of operations, and financial condition depending on the magnitude of the events and our net financial exposure at that time in that country.

A failure in our operational systems or infrastructure or those of third parties, including due to security breaches or cyber-attacks, could disrupt business, damage our reputation, and cause losses.
Our operations rely on the secure processing, storage, and transmission of confidential and other information and assets, including in our computer systems and networks and those of third-party service providers. Our business depends on effective information security and systems and the integrity and timeliness of the data our information systems use to run our business. Our ability to adequately price products and services, to establish reserves, to provide effective, efficient and secure service to our customers, to value our investments and to timely and accurately report our financial results also depends significantly on

the integrity and availability of the data we maintain, including that within our information systems, as well as data in and assets held through third-party service providers and systems. In an effort to ensure the integrity of such data, we implement new security measures and systems, including the use of confidential intellectual property, and improve or upgrade our existing security measures and systems on a continuing basis. The instances of major cyber incidents have continued to expand in recent years, as exemplified by the 2017 "Petya" and “WannaCry” ransomware attacks. Although we have implemented administrative and technical controls and have taken protective actions to reduce the risk of cyber incidents and to protect our information technology and assets, and although we additionally endeavor to modify such procedures as circumstances warrant and negotiate agreements with third-party providers to protect our assets, such measures may be insufficient to prevent unauthorized access, computer viruses, malware or other malicious code or cyber-attack, business compromise attacks, catastrophic events, system failures and disruptions (including in relation to new security measures and systems), employee errors or malfeasance, third party (including outsourced service providers) errors or malfeasance, loss of assets and other events that could have security consequences (each, a Security Event). In some cases, such events may not be immediately detected. As the breadth and complexity of our security infrastructure continues to grow, the potential risk of a Security Event increases. Like other global companies, we have from time to time experienced Security Events, none of which had, individually or in the aggregate, an adverse impact on our business, results of operations, or financial condition. If additional Security Events occur, these events may jeopardize Chubb's or its clients' or counterparties' confidential and other information processed and stored within Chubb, and transmitted through its computer systems and networks, or otherwise cause interruptions, delays, or malfunctions in Chubb's, its clients', its counterparties', or third parties' operations, or result in data loss or loss of assets which could result in significant losses, reputational damage or an adverse effect on our operations and critical business functions. Chubb may be required to expend significant additional resources to modify our protective measures or to investigate and remediate vulnerabilities or other exposures and to pursue recovery of lost data or assets and we may be subject to litigation and financial losses that are either not insured against or not fully covered by insurance maintained.

The regulatory environment surrounding information security and privacy is increasingly demanding. We are subject to numerous U.S. federal and state laws and regulations in jurisdictions outside the U.S. governing the protection of personal and confidential information of our clients or employees, including in relation to medical records, credit card data and financial information. These laws and regulations are increasing in complexity and number, change frequently and sometimes conflict. Evolving cyber and data privacy laws and regulations and resulting changes to our business practices may affect our businesses and revenue sources. If any person, including any of our employees or those with whom we share such information, negligently disregards or intentionally breaches our established controls with respect to our client data, or otherwise mismanages or misappropriates that data, we could be subject to significant monetary damages, regulatory enforcement actions, fines and/or criminal prosecution in one or more jurisdictions.

Despite the contingency plans and facilities we have in place and our efforts to observe the regulatory requirements surrounding information security, our ability to conduct business may be adversely affected by a disruption of the infrastructure that supports our business in the communities in which we are located, or of outsourced services or functions. This may include a disruption involving electrical, communications, transportation, or other services used by Chubb. If a disruption occurs in one location and Chubb employees in that location are unable to occupy our offices and conduct business or communicate with or travel to other locations, our ability to service and interact with clients may suffer and we may not be able to successfully implement contingency plans that depend on communication or travel.

We use analytical models to assist our decision making in key areas such as underwriting, claims, reserving, and catastrophe risks but actual results could differ materially from the model outputs and related analyses.

We use various modeling techniques (e.g., scenarios, predictive, stochastic and/or forecasting) and data analytics to analyze and estimate exposures, loss trends and other risks associated with our assets and liabilities. We use the modeled outputs and related analyses to assist us in decision-making (e.g., underwriting, pricing, claims, reserving, reinsurance, and catastrophe risk) and to maintain competitive advantage. The modeled outputs and related analyses are subject to various assumptions, uncertainties, model errors and the inherent limitations of any statistical analysis, including the use of historical internal and industry data. In addition, the modeled outputs and related analyses may from time to time contain inaccuracies, perhaps in material respects, including as a result of inaccurate inputs or applications thereof. Climate change may make modeled outcomes less certain or produce new, non-modeled risks. Consequently, actual results may differ materially from our modeled results. If, based upon these models or other factors, we misprice our products or underestimate the frequency and/or severity of loss events, or overestimate the risks we are exposed to, new business growth and retention of our existing business may be adversely affected which could have an adverse effect on our results of operations and financial condition.

We could be adversely affected by the loss of one or more key executives or by an inability to attract and retain qualified personnel.
Our success depends on our ability to retain the services of our existing key executives and to attract and retain additional qualified personnel in the future. The loss of the services of any of our key executives or the inability to hire and retain other highly qualified personnel in the future could adversely affect our ability to conduct or grow our business. This risk may be particularly acute for us relative to some of our competitors because some of our senior executives work in countries where they are not citizens and work permit and immigration issues could adversely affect the ability to retain or hire key persons. We do not maintain key person life insurance policies with respect to our employees.

Employee error and misconduct may be difficult to detect and prevent and could adversely affect our business, results of operations, and financial condition.
Losses may result from, among other things, fraud, errors, failure to document transactions properly, failure to obtain proper internal authorization, failure to comply with underwriting or other internal guidelines, or failure to comply with regulatory requirements. It is not always possible to deter or prevent employee misconduct and the precautions that we take to prevent and detect this activity may not be effective in all cases. Resultant losses could adversely affect our business, results of operations, and financial condition.

Strategic

The continually changing landscape, including competition, technology and products, existing and new market entrants could reduce our margins and adversely impact our business and results of operations.
Insurance and reinsurance markets are highly competitive. We compete on an international and regional basis with major U.S., Bermuda, European, and other international insurers and reinsurers and with underwriting syndicates, some of which have greater financial, technological, marketing, distribution and management resources than we do. In addition, capital market participants have created alternative products that are intended to compete with reinsurance products. We also compete with new companies and existing companies that move into the insurance and reinsurance markets. If competition, or technological or other changes to the insurance markets in which we operate, limits our ability to retain existing business or write new business at adequate rates or on appropriate terms, our business and results of operations could be materially and adversely affected. Increased competition could also result in fewer submissions, lower premium rates, and less favorable policy terms and conditions, which could reduce our profit margins and adversely impact our net income and shareholders' equity.

Recent technological advancements in the insurance industry and information technology industry present new and fast-evolving competitive risks as participants seek to increase transaction speeds, lower costs and create new opportunities. Advancements in technology are occurring in underwriting, claims, distribution and operations at a pace that may quicken, including as companies increase use of data analytics and technology as part of their business strategy. We will be at a competitive disadvantage if, over time, our competitors are more effective than us in their utilization of technology and evolving data analytics. If we do not anticipate or keep pace with these technological and other changes impacting the insurance industry, it could also limit our ability to compete in desired markets.

Insurance and reinsurance markets are historically cyclical, and we expect to experience periods with excess underwriting capacity and unfavorable premium rates.
The insurance and reinsurance markets have historically been cyclical, characterized by periods of intense price competition due to excessive underwriting capacity as well as periods when shortages of capacity permitted favorable premium levels. An increase in premium levels is often offset by an increasing supply of insurance and reinsurance capacity, either by capital provided by new entrants or by the commitment of additional capital by existing insurers or reinsurers, which may cause prices to decrease. Any of these factors could lead to a significant reduction in premium rates, less favorable policy terms, and fewer submissions for our underwriting services. In addition to these considerations, changes in the frequency and severity of losses suffered by insureds and insurers may affect the cycles of the insurance and reinsurance markets significantly, as could periods of economic weakness (such as recession).

The integration of acquired companies may not be as successful as we anticipate.
Acquisitions involve numerous operational, strategic, financial, accounting, legal, tax, and other risks; potential liabilities associated with the acquired businesses; and uncertainties related to design, operation and integration of acquired businesses' internal controls over financial reporting. Difficulties in integrating an acquired company, along with its personnel, may result in the acquired company performing differently than we expected, in operational challenges or in our failure to realize anticipated expense-related efficiencies. Our existing businesses could also be negatively impacted by acquisitions. In addition, goodwill and intangible assets recorded in connection with insurance company acquisitions may be impaired if premium growth, underwriting profitability, agency retention and policy persistency, among other factors, differ from expectations.

There is also the potential that proposed acquisitions that have been publicly announced will not be consummated, even if a definitive agreement has been signed by the parties. If an agreement is terminated before closing, the result would be that our proposed acquisition would not occur, which could, among other things, expose us to damages or liability and adversely impact our stock price and future operations.

We may be subject to U.S. tax and Bermuda tax which may have an adverse effect on our results of operations and shareholder investment.
Chubb Limited and our non-U.S. subsidiaries operate in a manner so that none of these companies should be subject to U.S. tax (other than U.S. excise tax on insurance and reinsurance premium income attributable to insuring or reinsuring U.S. risks and U.S. withholding tax on some types of U.S. source investment income), because none of these companies should be treated as engaged in a trade or business within the U.S. However, because there is considerable uncertainty as to the activities that constitute being engaged in a trade or business within the U.S., we cannot be certain that the Internal Revenue Service (IRS) will not contend successfully that Chubb Limited or its non-U.S. subsidiaries are engaged in a trade or business in the U.S. If Chubb Limited or any of its non-U.S. subsidiaries were considered to be engaged in a trade or business in the U.S., such entity could be subject to U.S. corporate income and branch profits taxes on the portion of its earnings effectively connected to such U.S. business, in which case our results of operations and our shareholders' investments could be adversely affected.

The Bermuda Minister of Finance, under the Exempted Undertakings Tax Protection Act 1966 of Bermuda, as amended, has given Chubb Limited and its Bermuda insurance subsidiaries a written assurance that if any legislation is enacted in Bermuda that would impose tax computed on profits or income, or computed on any capital asset, gain, or appreciation, or any tax in the nature of estate duty or inheritance tax, then the imposition of any such tax would not be applicable to those companies or any of their respective operations, shares, debentures, or other obligations until March 31, 2035, except insofar as such tax would apply to persons ordinarily resident in Bermuda or is payable by us in respect of real property owned or leased by us in Bermuda. We cannot be certain that we will not be subject to any Bermuda tax after March 31, 2035.

We could be adversely affected by certain features of the 2017 U.S. tax reform legislation.
New tax legislation known as the Tax Cuts and Jobs Act (2017 Tax Act) became law in the U.S. on December 22, 2017. In addition to reducing the U.S. corporate income tax rate from 35 percent to 21 percent, it fundamentally changed many elements of the pre-2017 Tax Act U.S. tax law and introduced several new concepts to tax multinational corporations such as us. Among the most notable new rules are the Base Erosion and Anti-Abuse Tax (commonly called BEAT), which may apply as a result of payments by U.S. taxpayers to non-U.S. affiliates, and the Global Intangible Low Taxed Income (GILTI) addition to Subpart F income, which for insurance groups potentially expands U.S. taxation on the earnings of foreign subsidiaries. The 2017 Tax Act also includes a one-time reduced-rate transition tax in 2017 on previously untaxed post-1986 earnings of foreign subsidiaries of U.S. corporations. The 2017 Tax Act, which is generally effective for 2018, is a complex law with many significant new provisions. During 2018, the IRS/Treasury issued notices and proposed regulations to assist taxpayers in understanding and implementing the new provisions. There may be changes between this guidance and final regulations to be issued in 2019. Thus, there are many uncertainties relating to its ultimate application and effects on our company.

The Organization for Economic Cooperation and Development (OECD) and the European Union (EU) are considering measures that might encourage countries to increase our taxes.
A number of multilateral organizations, including the EU and the OECD have, in recent years, expressed concern about some countries not participating in adequate tax information exchange arrangements and have threatened those that do not agree to cooperate with punitive sanctions by member countries. It is as yet unclear what all of these sanctions might be, which countries might adopt them, and when or if they might be imposed. We cannot assure, however, that the Tax Information Exchange Agreements (TIEAs) that have been or will be entered into by Switzerland and Bermuda will be sufficient to preclude all of the sanctions described above, which, if ultimately adopted, could adversely affect us or our shareholders.

The OECD has published an action plan to address base erosion and profit shifting (BEPS) impacting its member countries and other jurisdictions. It is possible that jurisdictions in which we do business could react to the BEPS initiative or their own concerns by enacting tax legislation that could adversely affect us or our shareholders.

Shareholders

There are provisions in our charter documents that may reduce the voting rights and diminish the value of our Common Shares.
Our Articles of Association generally provide that shareholders have one vote for each Common Share held by them and are entitled to vote at all meetings of shareholders. However, the voting rights exercisable by a shareholder may be limited so that

certain persons or groups are not deemed to hold 10 percent or more of the voting power conferred by our Common Shares. Moreover, these provisions could have the effect of reducing the voting power of some shareholders who would not otherwise be subject to the limitation by virtue of their direct share ownership. Our Board of Directors may refuse to register holders of shares as shareholders with voting rights based on certain grounds, including if the holder would, directly or indirectly, formally, constructively or beneficially own (as described in Articles 8 and 14 of our Articles of Association) or otherwise control voting rights with respect to 10 percent or more of the registered share capital recorded in the commercial register. In addition, the Board of Directors shall reject entry of holders of registered shares as shareholders with voting rights in the share register or shall decide on their deregistration when the acquirer or shareholder upon request does not expressly state that she/he has acquired or holds the shares in her/his own name and for her/his account.

Applicable laws may make it difficult to effect a change of control of our company.
Before a person can acquire control of a U.S. insurance company, prior written approval must be obtained from the insurance commissioner of the state where the domestic insurer is domiciled. Prior to granting approval of an application to acquire control of a domestic insurer, the state insurance commissioner will consider such factors as the financial strength of the applicant, the integrity and management of the applicant's Board of Directors and executive officers, the acquirer's plans for the future operations of the domestic insurer, and any anti-competitive results that may arise from the consummation of the acquisition of control. Generally, state statutes provide that control over a domestic insurer is presumed to exist if any person, directly or indirectly, owns, controls, holds with the power to vote, or holds proxies representing 10 percent or more of the voting securities of the domestic insurer. Because a person acquiring 10 percent or more of our Common Shares would indirectly control the same percentage of the stock of our U.S. insurance subsidiaries, the insurance change of control laws of various U.S. jurisdictions would likely apply to such a transaction. Laws of other jurisdictions in which one or more of our existing subsidiaries are, or a future subsidiary may be, organized or domiciled may contain similar restrictions on the acquisition of control of Chubb.

While our Articles of Association limit the voting power of any shareholder to less than 10 percent, we cannot assure that the applicable regulatory body would agree that a shareholder who owned 10 percent or more of our Common Shares did not, because of the limitation on the voting power of such shares, control the applicable insurance subsidiary.

These laws may discourage potential acquisition proposals and may delay, deter, or prevent a change of control of Chubb, including transactions that some or all of our shareholders might consider to be desirable.

Shareholder voting requirements under Swiss law may limit our flexibility with respect to certain aspects of capital management.
Swiss law allows our shareholders to authorize share capital which can be issued by the Board of Directors without shareholder approval but this authorization must be renewed by the shareholders every two years. Swiss law also does not provide as much flexibility in the various terms that can attach to different classes of stock as permitted in other jurisdictions. Swiss law also reserves for approval by shareholders many corporate actions over which the Board of Directors had authority prior to our re-domestication to Switzerland. For example, dividends must be approved by shareholders. While we do not believe that Swiss law requirements relating to our capital management will have an adverse effect on Chubb, we cannot assure that situations will not arise where such flexibility would have provided substantial benefits to our shareholders.

Chubb Limited is a Swiss company; it may be difficult to enforce judgments against it or its directors and executive officers.
Chubb Limited is incorporated pursuant to the laws of Switzerland. In addition, certain of our directors and officers reside outside the U.S. and all or a substantial portion of our assets and the assets of such persons are located in jurisdictions outside the U.S. As such, it may be difficult or impossible to effect service of process within the U.S. upon those persons or to recover against us or them on judgments of U.S. courts, including judgments predicated upon civil liability provisions of the U.S. federal securities laws.

Chubb has been advised by its Swiss counsel that there is doubt as to whether the courts in Switzerland would enforce:
- judgments of U.S. courts based upon the civil liability provisions of the U.S. federal securities laws obtained in actions against it or its directors and officers, who reside outside the U.S.; or
- original actions brought in Switzerland against these persons or Chubb predicated solely upon U.S. federal securities laws.

Chubb has also been advised by its Swiss counsel that there is no treaty in effect between the U.S. and Switzerland providing for this enforcement and there are grounds upon which Swiss courts may not enforce judgments of U.S. courts. Some remedies available under the laws of U.S. jurisdictions, including some remedies available under the U.S. federal securities laws, would not be allowed in Swiss courts as contrary to that nation's public policy.

Shareholders may be subject to Swiss withholding taxes on the payment of dividends.
Our dividends are generally subject to a Swiss withholding tax at a rate of 35 percent; however, payment of a dividend in the form of a par value reduction or qualifying capital contribution reserves reduction is not subject to Swiss withholding tax. We have previously obtained shareholder approval for dividends to be paid in such form. We currently intend to recommend to shareholders that they annually approve the payment of dividends in such form but we cannot assure that our shareholders will continue to approve a reduction in such form each year or that we will be able to meet the other legal requirements for a reduction in par value, or that Swiss withholding tax rules will not be changed in the future. We estimate we would be able to pay dividends in such form, and thus exempt from Swiss withholding tax until 2028–2033. This range may vary depending upon changes in annual dividends, special dividends, certain share repurchases, fluctuations in U.S. dollar/Swiss franc exchange rates, changes in par value or qualifying capital contribution reserves or changes or new interpretations to Swiss corporate or tax law or regulations.

Under certain circumstances, U.S. shareholders may be subject to adverse U.S. federal income tax consequences.
Under certain circumstances, a U.S. person who owns or is deemed to own 10 percent or more of the voting power or value of a foreign corporation that is a “controlled foreign corporation” (CFC) (a foreign corporation in which 10 percent U.S. shareholders own or are deemed to own more than 50 percent of the voting power or value of the stock of a foreign corporation or more than 25 percent of certain foreign insurance corporations) for any period during a taxable year must include in gross income for U.S. federal income tax purposes such "10 percent U.S. Shareholder's" pro rata share of the CFC's "subpart F income". We believe that because of the dispersion of our share ownership it is unlikely that any U.S. person who acquires shares of Chubb Limited directly or indirectly through one or more foreign entities should be required to include any subpart F income in income under the CFC rules of U.S. tax law.

Separately, any U.S. persons who hold shares may be subject to U.S. federal income taxation at ordinary income tax rates on their proportionate share of our Related Person Insurance Income (RPII). If the RPII of any of our non-U.S. insurance subsidiaries (each a "Non-U.S. Insurance Subsidiary") were to equal or exceed 20 percent of that company's gross insurance income in any taxable year and direct or indirect insureds (and persons related to those insureds) own directly or indirectly through foreign entities 20 percent or more of the voting power or value of Chubb Limited, then a U.S. person who owns any shares of Chubb Limited (directly or indirectly through foreign entities) on the last day of the taxable year would be required to include in his or her income for U.S. federal income tax purposes such person's pro rata share of such company's RPII for the entire taxable year. In addition, any RPII that is includible in the income of a U.S. tax-exempt organization may be treated as unrelated business taxable income. We believe that the gross RPII of each Non-U.S. Insurance Subsidiary did not in prior years of operation and is not expected in the foreseeable future to equal or exceed 20 percent of each such company's gross insurance income. Likewise, we do not expect the direct or indirect insureds of each Non-U.S. Insurance Subsidiary (and persons related to such insureds) to directly or indirectly own 20 percent or more of either the voting power or value of our shares. However, we cannot be certain that this will be the case because some of the factors which determine the extent of RPII may be beyond our control. If these thresholds are met or exceeded, any U.S. person’s investment in Chubb Limited could be adversely affected.

A U.S. tax-exempt organization may recognize unrelated business taxable income if a portion of our insurance income is allocated to the organization. This generally would be the case if either we are a CFC and the tax-exempt shareholder is a 10 percent U.S. shareholder or there is RPII, certain exceptions do not apply, and the tax-exempt organization, directly or indirectly through foreign entities, owns any shares of Chubb Limited. Although we do not believe that any U.S. tax-exempt organization should be allocated such insurance income, we cannot be certain that this will be the case. Potential U.S. tax-exempt investors are advised to consult their tax advisors.

U.S. persons who hold shares will be subject to adverse tax consequences if we are considered to be a Passive Foreign Investment Company (PFIC) for U.S. federal income tax purposes.
If Chubb Limited is considered a PFIC for U.S. federal income tax purposes, a U.S. person who holds Chubb Limited shares will be subject to adverse U.S. federal income tax consequences in which case their investment could be adversely affected. In addition, if Chubb Limited were considered a PFIC, upon the death of any U.S. individual owning shares, such individual's heirs or estate would not be entitled to a "step-up" in the basis of the shares which might otherwise be available under U.S. federal income tax laws. We believe that we are not, have not been, and currently do not expect to become, a PFIC for U.S. federal income tax purposes. We cannot assure, however, that we will not be deemed a PFIC by the IRS. Recently enacted U.S. federal tax law and proposed regulations previously issued by the IRS contain objective and subjective standards regarding the application of the PFIC provisions to an insurance company. Final regulations or pronouncements interpreting or clarifying these rules may be forthcoming. We cannot predict what impact, if any, such guidance would have on an investor that is subject to U.S. federal income taxation.

Changes in tax law could adversely affect an investment in us and our securities.
The 2017 Tax Act contained significant changes to the taxation of multinational corporations. As the U.S. Treasury department continues to develop implementing regulations and guidance, the full impact of the Act is uncertain. The 2017 Tax Act, future tax law changes, administrative guidance, or U.S. court decisions regarding tax law could have an adverse impact on us or our investors.

Similarly, jurisdictions outside the U.S. in which we do business could enact tax legislation in the future that could have an adverse impact on us or our investors. For example, Switzerland is currently revising its corporate tax laws and pursuing the implementation of corporate tax reform measures. The first effort was rejected by a public vote; however a revised corporate tax reform measure is scheduled for a public vote on May 19, 2019. The potential impact on us of Swiss tax reform will depend on the specific provisions adopted.

ITEM 1B. Unresolved Staff Comments
There are currently no unresolved SEC staff comments regarding our periodic or current reports.

ITEM 2. Properties
We maintain office facilities around the world including in North America, Europe (including our principal executive offices in Switzerland), Bermuda, Latin America, Asia Pacific, and the Far East. Most of our office facilities are leased, although we own major facilities in Hamilton, Bermuda, and in the U.S., including in Philadelphia, Pennsylvania; Wilmington, Delaware; Whitehouse Station, New Jersey; and Simsbury, Connecticut. Management considers its office facilities suitable and adequate for the current level of operations.

ITEM 3. Legal Proceedings
The information required with respect to Item 3 is included in Note 9 h) to the Consolidated Financial Statements, which is hereby incorporated herein by reference.

ITEM 4. Mine Safety Disclosures
Item not applicable.

ITEM 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Repurchases of Equity Securities

Our Common Shares have been listed on the New York Stock Exchange since March 25, 1993, with a current par value of CHF 24.15 per share. The trading symbol for our Common Shares is "CB."

We have paid dividends each quarter since we became a public company in 1993. Our annual dividends are paid by way of a distribution from capital contribution reserves (Additional paid-in capital) through the transfer of dividends from Additional paid-in capital to Retained earnings (free reserves) as approved by our shareholders in 2018 and 2017.

Chubb Limited is a holding company whose principal sources of income are investment income and dividends from its operating subsidiaries. The ability of the operating subsidiaries to pay dividends to us and our ability to pay dividends to our shareholders are each subject to legal and regulatory restrictions. The recommendation and payment of future dividends will be based on the determination of the Board of Directors (Board) and will be dependent upon shareholder approval, profits and financial requirements of Chubb and other factors, including legal restrictions on the payment of dividends and other such factors as the Board deems relevant. Refer to Part I, Item 1A and Part II, Item 7 for additional information.

The number of record holders of Common Shares as of February 14, 2019 was 7,440. This is not the actual number of beneficial owners of Chubb's Common Shares since most of our shareholders hold their shares through a stockbroker, bank or other nominee rather than directly in their own names.

Refer to Part III, Item 12 for information relating to compensation plans under which equity securities are authorized for issuance.

Issuer's Repurchases of Equity Securities for the Three Months Ended December 31, 2018

Period	Total Number of Shares Purchased[(1)]	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans[(2)]	Approximate Dollar Value of Shares that May Yet be Purchased Under Publicly Announced Plans[(3)]
October 1 through October 31	853,823	$ 125.70	850,000	$ 190 million
November 1 through November 30	681,561	$ 129.75	675,000	$ 102 million
December 1 through December 31	1,106,982	$ 127.71	968,873	$ 1.48 billion [(4)]
Total	2,642,366	$ 127.59	2,493,873	

(1) This represents open market share repurchases and the surrender to Chubb of Common Shares to satisfy tax withholding obligations in connection with the vesting of restricted stock issued to employees and the exercising of options by employees.

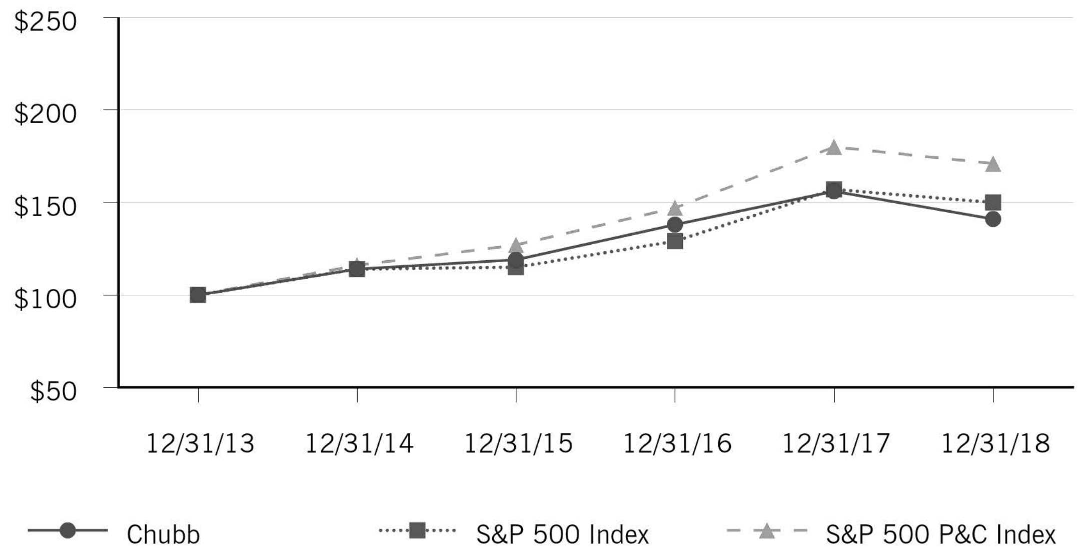
(2) The aggregate value of shares purchased in the three months ended December 31, 2018 as part of the publicly announced plans was $318 million.

(3) Refer to Note 10 to the Consolidated Financial Statements for more information on the Chubb Limited securities repurchase authorizations. In December 2017, our Board authorized the repurchase of up to $1.0 billion of Chubb's Common Shares from January 1, 2018 through December 31, 2018. In December 2018, our Board authorized the repurchase of up to $1.5 billion of Chubb's Common Shares from December 1, 2018 through December 31, 2019. This authorization replaced the previous authorization made by the Board that was fully utilized. For the period January 1, 2019 through February 27, 2019, we repurchased 1,328,754 Common Shares for a total of $174 million in a series of open market transactions. As of February 27, 2019, $1.30 billion in share repurchase authorization remained through December 31, 2019.

(4) The $1.0 billion December 2017 Board authorization remained effective through December 31, 2018, and was fully utilized before the $1.5 billion December 1, 2018 to December 31, 2019 authorization began being utilized.

Performance Graph

Set forth below is a line graph comparing the dollar change in the cumulative total shareholder return on Chubb's Common Shares from December 31, 2013, through December 31, 2018, as compared to the cumulative total return of the Standard & Poor's 500 Stock Index and the cumulative total return of the Standard & Poor's Property-Casualty Insurance Index. The cumulative total shareholder return is a concept used to compare the performance of a company's stock over time and is the ratio of the stock price change plus the cumulative amount of dividends over the specified time period (assuming dividend reinvestment), to the stock price at the beginning of the time period. The chart depicts the value on December 31, 2014, 2015, 2016, 2017, and 2018, of a $100 investment made on December 31, 2013, with all dividends reinvested.



	12/31/2013	12/31/2014	12/31/2015	12/31/2016	12/31/2017	12/31/2018
Chubb Limited	$100	$114	$119	$138	$156	$141
S&P 500 Index	$100	$114	$115	$129	$157	$150
S&P 500 P&C Index	$100	$116	$127	$147	$180	$171

ITEM 6. Selected Financial Data

On January 14, 2016, we completed the acquisition of the Chubb Corporation (Chubb Corp). The results of operations of Chubb Corp are included in our results from the acquisition date forward (i.e., after January 14, 2016 and only in the 2016, 2017, and 2018 columns) within the table below.

(in millions, except per share data and ratios)	2018	2017	2016	2015	2014
Operations data:					
Net premiums earned – excluding Life Insurance segment	**$ 27,846**	$ 26,933	$ 26,694	$ 15,266	$ 15,464
Net premiums earned – Life Insurance segment	**2,218**	2,101	2,055	1,947	1,962
Total net premiums earned	**30,064**	29,034	28,749	17,213	17,426
Net investment income	**3,305**	3,125	2,865	2,194	2,252
Losses and loss expenses	**18,067**	18,454	16,052	9,484	9,649
Policy benefits	**590**	676	588	543	517
Policy acquisition costs and administrative expenses	**8,798**	8,614	8,985	5,211	5,320
Net income	**3,962**	3,861	4,135	2,834	2,853
Weighted-average shares outstanding – diluted	**467**	471	466	329	339
Diluted earnings per share	**$ 8.49**	$ 8.19	$ 8.87	$ 8.62	$ 8.42
Balance sheet data (at end of period):					
Total investments	**$ 100,968**	$ 102,444	$ 99,094	$ 66,251	$ 62,904
Total assets	**167,771**	167,022	159,786	102,306	98,223
Net unpaid losses and loss expenses	**48,271**	49,165	47,832	26,562	27,008
Net future policy benefits	**5,304**	5,137	4,854	4,620	4,537
Long-term debt	**12,087**	11,556	12,610	9,389	3,334
Trust preferred securities	**308**	308	308	307	307
Total liabilities	**117,459**	115,850	111,511	73,171	68,636
Shareholders' equity	**50,312**	51,172	48,275	29,135	29,587
Book value per share	**$ 109.56**	$ 110.32	$ 103.60	$ 89.77	$ 90.02
Selected data:					
Loss and loss expense ratio (1)	**62.1%**	65.8%	57.7%	58.1%	58.7%
Underwriting and administrative expense ratio (2)	**28.5%**	28.9%	30.6%	29.2%	29.4%
Combined ratio (3)	**90.6%**	94.7%	88.3%	87.3%	88.1%
Cash dividends per share (4)	**$ 2.90**	$ 2.82	$ 2.74	$ 2.66	$ 2.70

(1) The Loss and loss expense ratio is calculated by dividing losses and loss expenses, excluding the Life Insurance segment, by Net premiums earned – excluding Life Insurance segment. Losses and loss expenses for the Life Insurance segment were $766 million, $739 million, $663 million, $601 million, and $589 million for the years ended December 31, 2018, 2017, 2016, 2015, and 2014, respectively.

(2) The Underwriting and administrative expense ratio is calculated by dividing the policy acquisition costs and administrative expenses, excluding the Life Insurance segment, by Net premiums earned – excluding Life Insurance segment. Policy acquisition costs and administrative expenses for the Life Insurance segment were $867 million, $833 million, $816 million, $767 million, and $763 million for the years ended December 31, 2018, 2017, 2016, 2015, and 2014, respectively.

(3) The combined ratio is the sum of Loss and loss expense ratio and the Underwriting and administrative expense ratio.

(4) Cash dividends per share in 2014 include a $0.12 per share increase related to the fourth quarter 2013, approved by our shareholders on January 10, 2014.

ITEM 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following is a discussion of our results of operations, financial condition, and liquidity and capital resources as of and for the year ended December 31, 2018. This discussion should be read in conjunction with the consolidated financial statements and related Notes, under Item 8 of this Form 10-K.

All comparisons in this discussion are to the corresponding prior year unless otherwise indicated. All dollar amounts are rounded. However, percent changes and ratios are calculated using whole dollars. Accordingly, calculations using rounded dollars may differ.

Forward-Looking Statements

The Private Securities Litigation Reform Act of 1995 provides a "safe harbor" for forward-looking statements. Any written or oral statements made by us or on our behalf may include forward-looking statements that reflect our current views with respect to future events and financial performance. These forward-looking statements are subject to certain risks, uncertainties, and other factors that could, should potential events occur, cause actual results to differ materially from such statements. These risks, uncertainties, and other factors, which are described in more detail under Part I, Item 1A, under Risk Factors, starting on page 19 and elsewhere herein and in other documents we file with the U.S. Securities and Exchange Commission (SEC), include but are not limited to:

- losses arising out of natural or man-made catastrophes such as hurricanes, typhoons, earthquakes, floods, climate change (including effects on weather patterns; greenhouse gases; sea, land and air temperatures; sea levels; and rain and snow), nuclear accidents, or terrorism which could be affected by:
    - the number of insureds and ceding companies affected;
    - the amount and timing of losses actually incurred and reported by insureds;
    - the impact of these losses on our reinsurers and the amount and timing of reinsurance recoverable actually received;
    - the cost of building materials and labor to reconstruct properties or to perform environmental remediation following a catastrophic event; and
    - complex coverage and regulatory issues such as whether losses occurred from storm surge or flooding and related lawsuits;
- actions that rating agencies may take from time to time, such as financial strength or credit ratings downgrades or placing these ratings on credit watch negative or the equivalent;
- the ability to collect reinsurance recoverable, credit developments of reinsurers, and any delays with respect thereto and changes in the cost, quality, or availability of reinsurance;
- actual loss experience from insured or reinsured events and the timing of claim payments;
- the uncertainties of the loss-reserving and claims-settlement processes, including the difficulties associated with assessing environmental damage and asbestos-related latent injuries, the impact of aggregate-policy-coverage limits, the impact of bankruptcy protection sought by various asbestos producers and other related businesses, and the timing of loss payments;
- changes to our assessment as to whether it is more likely than not that we will be required to sell, or have the intent to sell, available for sale fixed maturity investments before their anticipated recovery;
- infection rates and severity of pandemics and their effects on our business operations and claims activity;
- developments in global financial markets, including changes in interest rates, stock markets, and other financial markets, increased government involvement or intervention in the financial services industry, the cost and availability of financing, and foreign currency exchange rate fluctuations (which we refer to in this report as foreign exchange and foreign currency exchange), which could affect our statement of operations, investment portfolio, financial condition, and financing plans;
- general economic and business conditions resulting from volatility in the stock and credit markets and the depth and duration of potential recession;
- global political conditions, the occurrence of any terrorist attacks, including any nuclear, radiological, biological, or chemical events, or the outbreak and effects of war, and possible business disruption or economic contraction that may result from such events;
- the potential impact of the United Kingdom's vote to withdraw from the European Union, including political, regulatory, social, and economic uncertainty and market and exchange rate volatility;
- judicial decisions and rulings, new theories of liability, legal tactics, and settlement terms;

- the effects of public company bankruptcies and/or accounting restatements, as well as disclosures by and investigations of public companies relating to possible accounting irregularities, and other corporate governance issues, including the effects of such events on:
    - the capital markets;
    - the markets for directors and officers (D&O) and errors and omissions (E&O) insurance; and
    - claims and litigation arising out of such disclosures or practices by other companies;
- uncertainties relating to governmental, legislative and regulatory policies, developments, actions, investigations, and treaties, which, among other things, could subject us to insurance regulation or taxation in additional jurisdictions or affect our current operations;
- the effects of data privacy or cyber laws or regulation on our current or future business;
- the actual amount of new and renewal business, market acceptance of our products, and risks associated with the introduction of new products and services and entering new markets, including regulatory constraints on exit strategies;
- the competitive environment in which we operate, including trends in pricing or in policy terms and conditions, which may differ from our projections and changes in market conditions that could render our business strategies ineffective or obsolete;
- acquisitions made by us performing differently than expected, our failure to realize anticipated expense-related efficiencies or growth from acquisitions, the impact of acquisitions on our pre-existing organization, or announced acquisitions not closing;
- risks associated with being a Swiss corporation, including reduced flexibility with respect to certain aspects of capital management and the potential for additional regulatory burdens;
- the potential impact from government-mandated insurance coverage for acts of terrorism;
- the availability of borrowings and letters of credit under our credit facilities;
- the adequacy of collateral supporting funded high deductible programs;
- changes in the distribution or placement of risks due to increased consolidation of insurance and reinsurance brokers;
- material differences between actual and expected assessments for guaranty funds and mandatory pooling arrangements;
- the effects of investigations into market practices in the property and casualty (P&C) industry;
- changing rates of inflation and other economic conditions, for example, recession;
- the amount of dividends received from subsidiaries;
- loss of the services of any of our executive officers without suitable replacements being recruited in a reasonable time frame;
- the ability of our technology resources, including information systems and security, to perform as anticipated such as with respect to preventing material information technology failures or third-party infiltrations or hacking resulting in consequences adverse to Chubb or its customers or partners;
- the ability of our company to increase use of data analytics and technology as part of our business strategy and adapt to new technologies; and
- management's response to these factors and actual events (including, but not limited to, those described above).

The words "believe," "anticipate," "estimate," "project," "should," "plan," "expect," "intend," "hope," "feel," "foresee," "will likely result," or "will continue," and variations thereof and similar expressions, identify forward-looking statements. You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of their dates. We undertake no obligation to publicly update or review any forward-looking statements, whether as a result of new information, future events or otherwise.

Overview

We operate through six business segments: North America Commercial P&C Insurance, North America Personal P&C Insurance, North America Agricultural Insurance, Overseas General Insurance, Global Reinsurance, and Life Insurance. For more information on our segments refer to "Segment Information" under Item 1.

We have grown our business through increased premium volume, expansion of product offerings and geographic reach, and acquisitions of other companies. On January 14, 2016, we acquired The Chubb Corporation (Chubb Corp) which impacted all segments excluding North America Agricultural Insurance. The consolidated financial statements include results of acquired businesses from the acquisition dates.

Our product and geographic diversification differentiates us from the vast majority of our competitors and has been a source of stability during periods of industry volatility. Our long-term business strategy focuses on sustained growth in book value achieved through a combination of underwriting and investment income. By doing so, we provide value to our clients and shareholders through use of our substantial capital base in the insurance and reinsurance markets.

We are organized along a profit center structure by line of business and territory that does not necessarily correspond to corporate legal entities. Profit centers can access various legal entities subject to licensing and other regulatory rules. Profit centers are expected to generate underwriting income and appropriate risk-adjusted returns. Our corporate structure has facilitated the development of management talent by giving each profit center's senior management team the necessary autonomy within underwriting authorities to make operating decisions and create products and coverages needed by its target customer base. We are focused on delivering underwriting profit by only writing policies which we believe adequately compensate us for the risk we accept.

Our insurance and reinsurance operations generate gross revenues from two principal sources: premiums and investment income. Cash flow is generated from premiums collected and investment income received less paid losses and loss expenses, policy acquisition costs, and administrative expenses. Invested assets are substantially held in liquid, investment grade fixed income securities of relatively short duration. Claims payments in any short-term period are highly unpredictable due to the random nature of loss events and the timing of claims awards or settlements. The value of investments held to pay future claims is subject to market forces such as the level of interest rates, stock market volatility, and credit events such as corporate defaults. The actual cost of claims is also volatile based on loss trends, inflation rates, court awards, and catastrophes. We believe that our cash balance, our highly liquid investments, credit facilities, and reinsurance protection provide sufficient liquidity to meet unforeseen claim demands that might occur in the year ahead. Refer to "Liquidity" and "Capital Resources" for additional information.

Financial Highlights for the Year Ended December 31, 2018

- Net income was $3,962 million compared with $3,861 million in 2017, which included a tax benefit of $25 million and $450 million, respectively, related to the 2017 U.S. Tax Cuts and Jobs Act.
- Total company and P&C net premiums written were $30.6 billion and $28.3 billion, respectively, up 4.6 percent and 4.4 percent, respectively.
- P&C combined ratio was 90.6 percent compared with 94.7 percent in 2017. P&C current accident year combined ratio excluding catastrophe losses was 88.0 percent compared with 87.6 percent in 2017, reflecting high loss activity in our North America property lines and elevated homeowners loss activity.
- Total pre-tax and after-tax catastrophe losses, including reinstatement premiums, were $1,626 million (5.9 percentage points of the combined ratio) and $1,354 million, respectively, compared with $2,746 million (10.2 percentage points of the combined ratio) and $2,171 million, respectively, in 2017.
- Total pre-tax and after-tax favorable prior period development were $896 million (3.3 percentage points of the combined ratio) and $706 million, respectively, compared with $829 million (3.1 percentage points of the combined ratio) and $634 million, respectively, in 2017.
- Operating cash flow was $5,480 million compared with $4,503 million in 2017. Refer to the Liquidity section for additional information on our cash flows.
- Net investment income was $3,305 million compared with $3,125 million in 2017.
- Share repurchases totaled $1,021 million, or approximately 7.7 million shares for the year.

Outlook

We completed 2018 with net income per share of $8.49, up 3.7 percent from 2017, and strong net premiums written of $30.6 billion, up 4.6 percent. We are optimistic about the year ahead. We have good momentum as we execute on business initiatives across the globe and take advantage of an improving pricing and underwriting environment.

There are a number of factors that impact the variability in investment income, including interest rates and private equity distributions. Nevertheless, we expect our quarterly net investment income in 2019 to be in the range of $825 million to $835 million, including the expected amortization of the fair value adjustment on acquired invested assets, at current exchange rates, of approximately $55 million per quarter. Excluding the amortization of the fair value adjustment on acquired invested assets, we expect quarterly adjusted net investment income in 2019 to be in the range of $880 million to $890 million. The estimate of amortization expense of the fair value adjustment on acquired invested assets could vary materially based on current market conditions, bond calls, overall duration of the acquired investment portfolio, and foreign exchange.

Critical Accounting Estimates

Our consolidated financial statements include amounts that, either by their nature or due to requirements of generally accepted accounting principles in the U.S. (GAAP), are determined using best estimates and assumptions. While we believe that the amounts included in our consolidated financial statements reflect our best judgment, actual amounts could ultimately materially differ from those currently presented. We believe the items that require the most subjective and complex estimates are:

- unpaid loss and loss expense reserves, including long-tail asbestos and environmental (A&E) reserves;
- future policy benefits reserves;
- the valuation of value of business acquired (VOBA) and amortization of deferred policy acquisition costs and VOBA;
- the assessment of risk transfer for certain structured insurance and reinsurance contracts;
- reinsurance recoverable, including a provision for uncollectible reinsurance;
- the valuation of our investment portfolio and assessment of other-than-temporary impairments (OTTI);
- the valuation of deferred income taxes;
- the valuation of derivative instruments related to guaranteed living benefits (GLB); and
- the assessment of goodwill for impairment.

We believe our accounting policies for these items are of critical importance to our consolidated financial statements. The following discussion provides more information regarding the estimates and assumptions required to arrive at these amounts and should be read in conjunction with the sections entitled: Prior Period Development, Asbestos and Environmental (A&E), Reinsurance Recoverable on Ceded Reinsurance, Investments, Net Realized and Unrealized Gains (Losses), and Other Income and Expense Items.

Unpaid losses and loss expenses

As an insurance and reinsurance company, we are required by applicable laws and regulations and GAAP to establish loss and loss expense reserves for the estimated unpaid portion of the ultimate liability for losses and loss expenses under the terms of our policies and agreements with our insured and reinsured customers. At December 31, 2018, our gross unpaid loss and loss expense reserves were $63.0 billion and our net unpaid loss and loss expense reserves were $48.3 billion. With the exception of certain structured settlements, for which the timing and amount of future claim payments are reliably determinable, and certain reserves for unsettled claims that are discounted in statutory filings, our loss reserves are not discounted for the time value of money. In connection with such structured settlements and certain reserves for unsettled claims, we carried net discounted reserves of $73 million and $77 million at December 31, 2018 and 2017, respectively.

The following table presents a roll-forward of our unpaid losses and loss expenses:

(in millions of U.S. dollars)	**December 31, 2018** Gross Losses	Reinsurance Recoverable [1]	Net Losses	December 31, 2017 Gross Losses	Reinsurance Recoverable [1]	Net Losses
Balance, beginning of year	**$ 63,179**	**$ 14,014**	**$ 49,165**	$ 60,540	$ 12,708	$ 47,832
Losses and loss expenses incurred	**23,645**	**5,578**	**18,067**	23,933	5,479	18,454
Losses and loss expenses paid	**(23,079)**	**(4,739)**	**(18,340)**	(21,812)	(4,364)	(17,448)
Other (including foreign exchange translation)	**(785)**	**(164)**	**(621)**	518	191	327
Balance, end of year	**$ 62,960**	**$ 14,689**	**$ 48,271**	$ 63,179	$ 14,014	$ 49,165

(1) Net of provision for uncollectible reinsurance.

The estimate of the liabilities includes provisions for claims that have been reported but are unpaid at the balance sheet date (case reserves) and for obligations on claims that have been incurred but not reported (IBNR) at the balance sheet date. IBNR may also include provisions to account for the possibility that reported claims may settle for amounts that differ from the established case reserves. Loss reserves also include an estimate of expenses associated with processing and settling unpaid claims (loss expenses). Our loss reserves comprise approximately 80 percent casualty-related business, which typically encompasses long-tail risks, and other risks where a high degree of judgment is required.

The process of establishing loss reserves for property and casualty claims can be complex and is subject to considerable uncertainty as it requires the use of informed estimates and judgments based on circumstances underlying the insured loss known at the date of accrual. For example, the reserves established for high excess casualty claims, asbestos and environmental claims, claims from major catastrophic events, or for our various product lines each require different assumptions and judgments to be made. Necessary judgments are based on numerous factors and may be revised as additional experience and other data become available and are reviewed, as new or improved methods are developed, or as laws change. Hence, ultimate loss payments may differ from the estimate of the ultimate liabilities made at the balance sheet date. Changes to our previous estimates of prior period loss reserves impact the reported calendar year underwriting results, adversely if our estimates increase and favorably if our estimates decrease. The potential for variation in loss reserve estimates is impacted by numerous factors. Reserve estimates for casualty lines are particularly uncertain given the lengthy reporting patterns and corresponding need for IBNR.

Case reserves for those claims reported by insureds or ceding companies to us prior to the balance sheet date and where we have sufficient information are determined by our claims personnel as appropriate based on the circumstances of the claim(s), standard claim handling practices, and professional judgment. Furthermore, for our Brandywine run-off operations and our assumed reinsurance operation, Global Reinsurance, we may adjust the case reserves as notified by the ceding company if the judgment of our respective claims department differs from that of the cedant.

With respect to IBNR reserves and those claims that have been incurred but not reported prior to the balance sheet date, there is, by definition, limited actual information to form the case reserve estimate and reliance is placed upon historical loss experience and actuarial methods to estimate the ultimate loss obligations and the corresponding amount of IBNR. IBNR reserve estimates are generally calculated by first projecting the ultimate amount of losses for a product line and subtracting paid losses and case reserves for reported claims. The judgments involved in projecting the ultimate losses may pertain to the use and interpretation of various standard actuarial reserving methods that place reliance on the extrapolation of actual historical data, loss development patterns, industry data, and other benchmarks as appropriate. The estimate of the required IBNR reserve also requires judgment by actuaries and management to reflect the impact of more contemporary and subjective factors, both qualitative and quantitative. Among some of these factors that might be considered are changes in business mix or volume, changes in ceded reinsurance structures, changes in claims handling practices, reported and projected loss trends, inflation, the legal environment, and the terms and conditions of the contracts sold to our insured parties.

Determining management's best estimate

Our recorded reserves represent management's best estimate of the provision for unpaid claims as of the balance sheet date, and establishing them involves a process that includes collaboration with various relevant parties in the company. For information on our reserving process, refer to Note 6 to the Consolidated Financial Statements.

Sensitivity to underlying assumptions
While we believe that our reserve for unpaid losses and loss expenses at December 31, 2018, is adequate, new information or emerging trends that differ from our assumptions may lead to future development of losses and loss expenses that is significantly greater or less than the recorded reserve, which could have a material effect on future operating results. As noted previously, our best estimate of required loss reserves for most portfolios is judgmentally selected for each origin year after considering the results from a number of reserving methods and is not a purely mechanical process. Therefore, it is difficult to convey, in a simple and quantitative manner, the impact that a change to a single assumption will have on our best estimate. In the examples below, we attempt to give an indication of the potential impact by isolating a single change for a specific reserving method that would be pertinent in establishing the best estimate for the product line described. We consider each of the following sensitivity analyses to represent a reasonably likely deviation in the underlying assumption.

North America Commercial P&C Insurance
Given the long reporting and paid development patterns for workers' compensation business, the development factors used to project actual current losses to ultimate losses for our current exposure require considerable judgment that could be material to consolidated loss and loss expense reserves. Specifically, adjusting ground up ultimate losses by a one percent change in the tail factor (i.e., 1.04 changed to either 1.05 or 1.03) would cause a change of approximately $790 million, either positive or negative, for the projected net loss and loss expense reserves. This represents an impact of about 8.6 percent relative to recorded net loss and loss expense reserves of approximately $9.2 billion.

The reserve portfolio for our Chubb Bermuda operations contains exposure to predominantly high excess liability coverage on an occurrence-first-reported basis (typically with attachment points in excess of $325 million and gross limits of up to $150 million) and D&O and other professional liability coverage on a claims-made basis (typically with attachment points in excess of $125 million and gross limits of up to $75 million). Due to the layer of exposure covered, the expected frequency for this book is very low. As a result of the low frequency/high severity nature of the book, a small difference in the actual vs. expected claim frequency, either positive or negative, could result in a material change to the projected ultimate loss if such change in claim frequency was related to a policy where close to maximum limits were deployed.

North America Personal P&C Insurance
Due to the relatively short-tailed nature of many of the coverages involved (e.g., homeowners property damage), most of the incurred losses in Personal Lines are resolved within a few years of occurrence. As shown in our loss triangle disclosure, the vast majority (over 95 percent) of Personal Lines net ultimate losses and allocated loss adjustment expenses are typically paid within five years of the accident date and over 80 percent within two years. Even though there are significant reserves associated with some liability exposures such as personal excess/umbrella liability, our incurred loss triangle also shows a roughly consistent pattern of only relatively minor movements in incurred estimates over time by accident year especially after twenty four months of maturity. While the liability exposures are subject to additional uncertainties from more protracted resolution times, the main drivers of volatility in the Personal Lines business are relatively short-term in nature and relate to things like natural catastrophes, non-catastrophe weather events, man-made risks, and individual large loss volatility from other fortuitous claim events.

North America Agricultural Insurance
Approximately 74 percent of the reserves for this segment are from the crop related lines, which all have short payout patterns, with the majority of the liabilities expected to be resolved in the ensuing twelve months. Claim reserves for our Multiple Peril Crop Insurance (MPCI) product are set on a case-by-case basis and our aggregate exposure is subject to state level risk sharing formulae as well as third-party reinsurance. The majority of the development risk arises out of the accuracy of case reserve estimates and the time needed for final crop conditions to be assessed. We do not view our Agriculture reserves as substantially influenced by the general assumptions and risks underlying more typical P&C reserve estimates.

Overseas General Insurance
Certain long-tail lines, such as casualty and professional lines, are particularly susceptible to changes in loss trend and claim inflation. Heightened perceptions of tort and settlement awards around the world can increase the demand for these products as well as contributing to the uncertainty in the reserving estimates. Our reserving methods rely on loss development patterns estimated from historical data and while we attempt to adjust such factors for known changes in the current tort environment, it is possible that such factors may not entirely reflect all recent trends in tort environments. For example, when applying the reported loss development method, the lengthening of our selected loss development patterns by six months would increase reserve estimates on long-tail casualty and professional lines for accident years 2016 and prior by approximately $490 million. This represents an impact of 14.2 percent relative to recorded net loss and loss expense reserves of approximately $3.5 billion.

Global Reinsurance
Typically, there is inherent uncertainty around the length of paid and reported development patterns, especially for certain casualty lines such as excess workers' compensation or general liability, which may take decades to fully develop. This uncertainty is accentuated by the need to supplement client development patterns with industry development patterns due to the sometimes low statistical credibility of the data. The underlying source and selection of the final development patterns can thus have a significant impact on the selected ultimate net losses and loss expenses. For example, a 20 percent shortening or lengthening of the development patterns used for U.S. long-tail lines would cause the loss reserve estimate derived by the reported Bornhuetter-Ferguson method for these lines to change by approximately $380 million. This represents an impact of 51 percent relative to recorded net loss and loss expense reserves of approximately $750 million.

Assumed reinsurance
At December 31, 2018, net unpaid losses and loss expenses for the Global Reinsurance segment aggregated to $1.6 billion, consisting of $807 million of case reserves and $807 million of IBNR. In comparison, at December 31, 2017, net unpaid losses and loss expenses for the Global Reinsurance segment aggregated to $1.7 billion, consisting of $843 million of case reserves and $870 million of IBNR.

For our catastrophe business, we principally estimate unpaid losses and loss expenses on an event basis by considering various sources of information, including specific loss estimates reported by our cedants, ceding company and overall industry loss estimates reported by our brokers, and our internal data regarding reinsured exposures related to the geographical location of the event. Our internal data analysis enables us to establish catastrophe reserves for known events with more certainty at an earlier date than would be the case if we solely relied on reports from third parties to determine carried reserves.

For our casualty reinsurance business, we generally rely on ceding companies to report claims and then use that data as a key input to estimate unpaid losses and loss expenses. Due to the reliance on claims information reported by ceding companies, as well as other factors, the estimation of unpaid losses and loss expenses for assumed reinsurance includes certain risks and uncertainties that are unique relative to our direct insurance business. These include, but are not necessarily limited to, the following:

- The reported claims information could be inaccurate;
- Typically, a lag exists between the reporting of a loss event to a ceding company and its reporting to us as a reinsurance claim. The use of a broker to transmit financial information from a ceding company to us increases the reporting lag. Because most of our reinsurance business is produced by brokers, ceding companies generally first submit claim and other financial information to brokers, who then report the proportionate share of such information to each reinsurer of a particular treaty. The reporting lag generally results in a longer period of time between the date a claim is incurred and the date a claim is reported compared with direct insurance operations. Therefore, the risk of delayed recognition of loss reserve development is higher for assumed reinsurance than for direct insurance lines; and
- The historical claims data for a particular reinsurance contract can be limited relative to our insurance business in that there may be less historical information available. Further, for certain coverages or products, such as excess of loss contracts, there may be relatively few expected claims in a particular year so the actual number of claims may be susceptible to significant variability. In such cases, the actuary often relies on industry data from several recognized sources.

We mitigate the above risks in several ways. In addition to routine analytical reviews of ceding company reports to ensure reported claims information appears reasonable, we perform regular underwriting and claims audits of certain ceding companies to ensure reported claims information is accurate, complete, and timely. As appropriate, audit findings are used to adjust claims in the reserving process. We also use our knowledge of the historical development of losses from individual ceding companies to adjust the level of adequacy we believe exists in the reported ceded losses.

On occasion, there will be differences between our carried loss reserves and unearned premium reserves and the amount of loss reserves and unearned premium reserves reported by the ceding companies. This is due to the fact that we receive consistent and timely information from ceding companies only with respect to case reserves. For IBNR, we use historical experience and other statistical information, depending on the type of business, to estimate the ultimate loss. We estimate our unearned premium reserve by applying estimated earning patterns to net premiums written for each treaty based upon that treaty's coverage basis (i.e., risks attaching or losses occurring). At December 31, 2018, the case reserves reported to us by our ceding companies were $795 million, compared with the $807 million we recorded. Our policy is to post additional case reserves in addition to the amounts reported by our cedants when our evaluation of the ultimate value of a reported claim is different than the evaluation of that claim by our cedant.

Within Corporate, we also have exposure to certain liability reinsurance lines that have been in run-off since 1994. Unpaid losses and loss expenses relating to this run-off reinsurance business resides within the Brandywine Division of Corporate. Most of the remaining unpaid loss and loss expense reserves for the run-off reinsurance business relate to A&E claims. Refer to the "Asbestos and Environmental (A&E)" section for additional information.

Asbestos and environmental reserves
Included in our liabilities for losses and loss expenses are amounts for A&E (A&E liabilities). The A&E liabilities principally relate to claims arising from bodily-injury claims related to asbestos products and remediation costs associated with hazardous waste sites. The estimation of our A&E liabilities is particularly sensitive to future changes in the legal, social, and economic environment. We have not assumed any such future changes in setting the value of our A&E liabilities, which include provisions for both reported and IBNR claims.

There are many complex variables that we consider when estimating the reserves for our inventory of asbestos accounts and these variables may directly impact the predicted outcome. We believe the most significant variables relating to our A&E liabilities include the current legal environment; specific settlements that may be used as precedents to settle future claims; assumptions regarding trends with respect to claim severity and the frequency of higher severity claims; assumptions regarding the ability to allocate liability among defendants (including bankruptcy trusts) and other insurers; the ability of a claimant to bring a claim in a state in which they have no residency or exposure; the ability of a policyholder to claim the right to unaggregated coverage; whether high-level excess policies have the potential to be accessed given the policyholder's claim trends and liability situation; payments to unimpaired claimants; and, the potential liability of peripheral defendants. Based on the policies, the facts, the law, and a careful analysis of the impact that these factors will likely have on any given account, we estimate the potential liability for indemnity, policyholder defense costs, and coverage litigation expense.

The results in asbestos cases announced by other carriers or defendants may well have little or no relevance to us because coverage exposures are highly dependent upon the specific facts of individual coverage and resolution status of disputes among carriers, policyholders, and claimants.

For additional information refer to the "Asbestos and Environmental (A&E)" section and to Note 6 to the Consolidated Financial Statements.

Future policy benefits reserves
We issue contracts in our Overseas General Insurance and Life Insurance segments that are classified as long-duration. These contracts generally include accident and supplemental health products, term and whole life products, endowment products, and annuities. In accordance with GAAP, we establish reserves for contracts determined to be long-duration based on approved actuarial methods that include assumptions related to expenses, mortality, morbidity, persistency, and investment yields with a factor for adverse deviation. These assumptions are "locked in" at the inception of the contract, meaning we use our original assumptions throughout the life of the policy and do not subsequently modify them unless we deem the reserves to be inadequate. The future policy benefits reserves balance is regularly evaluated for a premium deficiency. If experience is less favorable than assumptions, additional liabilities may be required, resulting in a charge to policyholder benefits and claims.

Valuation of value of business acquired (VOBA), and amortization of deferred policy acquisition costs and VOBA
As part of the acquisition of businesses that sell long-duration contracts, such as life products, we established an intangible asset related to VOBA, which represented the fair value of the future profits of the in-force contracts. The valuation of VOBA at the time of acquisition is derived from similar assumptions to those used to establish the associated future policy benefits

reserves. The most significant input in this calculation is the discount rate used to arrive at the present value of the net cash flows. We amortize deferred policy acquisition costs associated with long-duration contracts and VOBA (collectively policy acquisition costs) over the estimated life of the contracts, generally in proportion to premium revenue recognized based upon the same assumptions used in estimating the liability for future policy benefits. For non-traditional long-duration contracts, we amortize policy acquisition costs over the expected life of the contracts in proportion to estimates of expected gross profits. The estimated life is established at the inception of the contracts or upon acquisition and is based on current persistency assumptions. Policy acquisition costs, which consist of commissions, premium taxes, and certain underwriting costs related directly to the successful acquisition of a new or renewal insurance contract, are reviewed to determine if they are recoverable from future income, including investment income. Unrecoverable costs are expensed in the period identified.

Risk transfer

In the ordinary course of business, we both purchase (or cede) and sell (or assume) reinsurance protection. We discontinued the purchase of all finite risk reinsurance contracts, as a matter of policy, in 2002. For both ceded and assumed reinsurance, risk transfer requirements must be met in order to use reinsurance accounting, principally resulting in the recognition of cash flows under the contract as premiums and losses. If risk transfer requirements are not met, a contract is to be accounted for as a deposit, typically resulting in the recognition of cash flows under the contract through a deposit asset or liability and not as revenue or expense. To meet risk transfer requirements, a reinsurance contract must include both insurance risk, consisting of underwriting and timing risk, and a reasonable possibility of a significant loss for the assuming entity. We also apply similar risk transfer requirements to determine whether certain commercial insurance contracts should be accounted for as insurance or a deposit. Contracts that include fixed premium (i.e., premium not subject to adjustment based on loss experience under the contract) for fixed coverage generally transfer risk and do not require judgment.

Reinsurance and insurance contracts that include both significant risk sharing provisions, such as adjustments to premiums or loss coverage based on loss experience, and relatively low policy limits, as evidenced by a high proportion of maximum premium assessments to loss limits, can require considerable judgment to determine whether or not risk transfer requirements are met. For such contracts, often referred to as finite or structured products, we require that risk transfer be specifically assessed for each contract by developing expected cash flow analyses at contract inception. To support risk transfer, the cash flow analyses must demonstrate that a significant loss is reasonably possible, such as a scenario in which the ratio of the net present value of losses divided by the net present value of premiums equals or exceeds 110 percent. For purposes of cash flow analyses, we generally use a risk-free rate of return consistent with the expected average duration of loss payments. In addition, to support insurance risk, we must prove the reinsurer's risk of loss varies with that of the reinsured and/or support various scenarios under which the assuming entity can recognize a significant loss.

To ensure risk transfer requirements are routinely assessed, qualitative and quantitative risk transfer analyses and memoranda supporting risk transfer are developed by underwriters for all structured products. We have established protocols for structured products that include criteria triggering an accounting review of the contract prior to quoting. If any criterion is triggered, a contract must be reviewed by a committee established by each of our segments with reporting oversight, including peer review, from our global Structured Transaction Review Committee.

With respect to ceded reinsurance, we entered into a few multi-year excess of loss retrospectively-rated contracts, principally in 2002. These contracts primarily provided severity protection for specific product divisions. Because traditional one-year reinsurance coverage had become relatively costly, these contracts were generally entered into in order to secure a more cost-effective reinsurance program. All of these contracts transferred risk and were accounted for as reinsurance. In addition, we maintain a few aggregate excess of loss reinsurance contracts that were principally entered into prior to 2003, such as the National Indemnity Company (NICO) contracts referred to in the section entitled, “Asbestos and Environmental (A&E)”. We have not purchased any other retroactive ceded reinsurance contracts since 1999.

With respect to assumed reinsurance and insurance contracts, products giving rise to judgments regarding risk transfer were primarily sold by our financial solutions business. Although we have significantly curtailed writing financial solutions business, several contracts remain in-force and principally include multi-year retrospectively-rated contracts and loss portfolio transfers. Because transfer of insurance risk is generally a primary client motivation for purchasing these products, relatively few insurance and reinsurance contracts have historically been written for which we concluded that risk transfer criteria had not been met. For certain insurance contracts that have been reported as deposits, the insured desired to self-insure a risk but was required, legally or otherwise, to purchase insurance so that claimants would be protected by a licensed insurance company in the event of non-payment from the insured.

Reinsurance recoverable
Reinsurance recoverable includes balances due to us from reinsurance companies for paid and unpaid losses and loss expenses and is presented net of a provision for uncollectible reinsurance. The provision for uncollectible reinsurance is determined based upon a review of the financial condition of the reinsurers and other factors. Ceded reinsurance contracts do not relieve our primary obligation to our policyholders. Consequently, an exposure exists with respect to reinsurance recoverable to the extent that any reinsurer is unable or unwilling to meet its obligations or disputes the liabilities assumed under the reinsurance contracts. We determine the reinsurance recoverable on unpaid losses and loss expenses using actuarial estimates as well as a determination of our ability to cede unpaid losses and loss expenses under existing reinsurance contracts.

The recognition of a reinsurance recoverable asset requires two key judgments. The first judgment involves our estimation based on the amount of gross reserves and the percentage of that amount which may be ceded to reinsurers. Ceded IBNR, which is a major component of the reinsurance recoverable on unpaid losses and loss expenses, is generally developed as part of our loss reserving process and, consequently, its estimation is subject to similar risks and uncertainties as the estimation of gross IBNR (refer to "Critical Accounting Estimates – Unpaid losses and loss expenses"). The second judgment involves our estimate of the amount of the reinsurance recoverable balance that we may ultimately be unable to recover from reinsurers due to insolvency, contractual dispute, or for other reasons. Estimated uncollectible amounts are reflected in a provision that reduces the reinsurance recoverable asset and, in turn, shareholders' equity. Changes in the provision for uncollectible reinsurance are reflected in net income.

Although the obligation of individual reinsurers to pay their reinsurance obligations is based on specific contract provisions, the collectability of such amounts requires estimation by management. The majority of the recoverable balance will not be due for collection until sometime in the future, and the duration of our recoverables may be longer than the duration of our direct exposures. Over this period of time, economic conditions and operational performance of a particular reinsurer may impact their ability to meet these obligations and while they may continue to acknowledge their contractual obligation to do so, they may not have the financial resources or willingness to fully meet their obligation to us.

To estimate the provision for uncollectible reinsurance, the reinsurance recoverable must first be determined for each reinsurer. This determination is based on a process rather than an estimate, although an element of judgment must be applied. As part of the process, ceded IBNR is allocated to reinsurance contracts because ceded IBNR is not generally calculated on a contract by contract basis. The allocations are generally based on premiums ceded under reinsurance contracts, adjusted for actual loss experience and historical relationships between gross and ceded losses. If actual premium and loss experience vary materially from historical experience, the allocation of reinsurance recoverable by reinsurer will be reviewed and may change. While such change is unlikely to result in a large percentage change in the provision for uncollectible reinsurance, it could, nevertheless, have a material effect on our net income in the period recorded.

Generally, we use a default analysis to estimate uncollectible reinsurance. The primary components of the default analysis are reinsurance recoverable balances by reinsurer, net of collateral, and default factors used to estimate the probability that the reinsurer may be unable to meet its future obligations in full. The definition of collateral for this purpose requires some judgment and is generally limited to assets held in a Chubb-only beneficiary trust, letters of credit, and liabilities held by us with the same legal entity for which we believe there is a right of offset. We do not currently include multi-beneficiary trusts. However, we have several reinsurers that have established multi-beneficiary trusts for which certain of our companies are beneficiaries. The determination of the default factor is principally based on the financial strength rating of the reinsurer and a corresponding default factor applicable to the financial strength rating. Default factors require considerable judgment and are determined using the current financial strength rating, or rating equivalent, of each reinsurer as well as other key considerations and assumptions. Significant considerations and assumptions include, but are not necessarily limited to, the following:

- For reinsurers that maintain a financial strength rating from a major rating agency, and for which recoverable balances are considered representative of the larger population (i.e., default probabilities are consistent with similarly rated reinsurers and payment durations conform to averages), the judgment exercised by management to determine the provision for uncollectible reinsurance of each reinsurer is typically limited because the financial rating is based on a published source and the default factor we apply is based on a historical default factor of a major rating agency applicable to the particular rating class. Default factors applied for financial ratings of AAA, AA, A, BBB, BB, B, and CCC, are 0.8 percent, 1.2 percent, 1.7 percent, 4.9 percent, 19.6 percent, 34.0 percent, and 62.2 percent, respectively. Because our model is predicated on the historical default factors of a major rating agency, we do not generally consider alternative factors. However, when a recoverable is expected to be paid in a brief period of time by a highly-rated reinsurer, such as certain property catastrophe claims, a default factor may not be applied;

- For balances recoverable from reinsurers that are both unrated by a major rating agency and for which management is unable to determine a credible rating equivalent based on a parent or affiliated company, we may determine a rating equivalent based on our analysis of the reinsurer that considers an assessment of the creditworthiness of the particular entity, industry benchmarks, or other factors as considered appropriate. We then apply the applicable default factor for that rating class. For balances recoverable from unrated reinsurers for which our ceded reserve is below a certain threshold, we generally apply a default factor of 34.0 percent;
- For balances recoverable from reinsurers that are either insolvent or under regulatory supervision, we establish a default factor and resulting provision for uncollectible reinsurance based on specific facts and circumstances surrounding each company. Upon initial notification of an insolvency, we generally recognize expense for a substantial portion of all balances outstanding, net of collateral, through a combination of write-offs of recoverable balances and increases to the provision for uncollectible reinsurance. When regulatory action is taken on a reinsurer, we generally recognize a default factor by estimating an expected recovery on all balances outstanding, net of collateral. When sufficient credible information becomes available, we adjust the provision for uncollectible reinsurance by establishing a default factor pursuant to information received; and
- For captives and other recoverables, management determines the provision for uncollectible reinsurance based on the specific facts and circumstances.

The following table summarizes reinsurance recoverables and the provision for uncollectible reinsurance for each type of recoverable balance at December 31, 2018:

(in millions of U.S. dollars)	Gross Reinsurance Recoverables on Losses and Loss Expenses	Recoverables (net of Usable Collateral)	Provision for Uncollectible Reinsurance [1]
Type			
Reinsurers with credit ratings	$ 12,185	$ 10,597	$ 164
Reinsurers not rated	314	178	64
Reinsurers under supervision and insolvent reinsurers	87	84	37
Captives	2,590	383	16
Other - structured settlements and pools	1,140	1,132	42
Total	$ 16,316	$ 12,374	$ 323

[1] The provision for uncollectible reinsurance is based on a default analysis applied to gross reinsurance recoverables, net of approximately $3.9 billion of collateral at December 31, 2018.

At December 31, 2018, the use of different assumptions within our approach could have a material effect on the provision for uncollectible reinsurance. To the extent the creditworthiness of our reinsurers were to deteriorate due to an adverse event affecting the reinsurance industry, such as a large number of major catastrophes, actual uncollectible amounts could be significantly greater than our provision for uncollectible reinsurance. Such an event could have a material adverse effect on our financial condition, results of operations, and our liquidity. Given the various considerations used to estimate our uncollectible provision, we cannot precisely quantify the effect a specific industry event may have on the provision for uncollectible reinsurance. However, based on the composition (particularly the average credit quality) of the reinsurance recoverable balance at December 31, 2018, we estimate that a ratings downgrade of one notch for all rated reinsurers (e.g., from A to A- or A- to BBB+) could increase our provision for uncollectible reinsurance by approximately $68 million or approximately 0.4 percent of the gross reinsurance recoverable balance, assuming no other changes relevant to the calculation. While a ratings downgrade would result in an increase in our provision for uncollectible reinsurance and a charge to earnings in that period, a downgrade in and of itself does not imply that we will be unable to collect all of the ceded reinsurance recoverable from the reinsurers in question. Refer to Note 4 to the Consolidated Financial Statements for additional information.

Fair value measurements
Accounting guidance defines fair value as the price to sell an asset or transfer a liability (an exit price) in an orderly transaction between market participants and establishes a three-level valuation hierarchy based on the reliability of the inputs. The fair value hierarchy gives the highest priority to quoted prices in active markets (Level 1 inputs) and the lowest priority to unobservable data (Level 3 inputs). Level 2 includes inputs, other than quoted prices within Level 1, that are observable for assets or liabilities either directly or indirectly. Refer to Note 3 and Note 12 to the Consolidated Financial Statements for information on our fair value measurements.

Other-than-temporary impairments (OTTI)
Each quarter, we review securities in an unrealized loss position (impaired securities), including fixed maturities and securities lending collateral to identify impaired securities to be specifically evaluated for a potential OTTI. Because our investment portfolio is the largest component of consolidated assets, OTTI could be material to our financial condition and results of operations. Refer to Note 2 c) to the Consolidated Financial Statements for a description of the OTTI process.

Deferred income taxes
At December 31, 2018, our net deferred tax liability was $304 million. Our deferred tax assets and liabilities primarily result from temporary differences between the amounts recorded in our consolidated financial statements and the tax basis of our assets and liabilities. We determine deferred tax assets and liabilities separately for each tax-paying component (an individual entity or group of entities that is consolidated for tax purposes) in each tax jurisdiction. The realization of deferred tax assets depends upon the existence of sufficient taxable income within the carryback or carryforward periods under the tax law in the applicable tax jurisdiction. There may be changes in tax laws in a number of countries where we transact business that impact our deferred tax assets and liabilities.

At each balance sheet date, management assesses the need to establish a valuation allowance that reduces deferred tax assets when it is more likely than not that all, or some portion, of the deferred tax assets will not be realized. The determination of the need for a valuation allowance is based on all available information including projections of future taxable income, principally derived from business plans and where appropriate available tax planning strategies. Projections of future taxable income incorporate assumptions of future business and operations that are apt to differ from actual experience. If our assumptions and estimates that resulted in our forecast of future taxable income prove to be incorrect, an additional valuation allowance could become necessary, which could have a material adverse effect on our financial condition, results of operations, and liquidity. At December 31, 2018, the valuation allowance of $79 million reflects management's assessment that it is more likely than not that a portion of the deferred tax assets will not be realized due to the inability of certain foreign subsidiaries to generate sufficient taxable income.

Assumed reinsurance programs involving minimum benefit guarantees under variable annuity contracts
Chubb reinsures various death and living benefit guarantees associated with variable annuities issued primarily in the United States. We ceased writing this business in 2007. Guarantees which are payable on death are referred to as guaranteed minimum death benefits (GMDB). Guarantees on living benefits (GLB) consist mainly of guaranteed minimum income benefits (GMIB). For further description of this product and related accounting treatment, refer to Note 1 j) to the Consolidated Financial Statements.

Guaranteed living benefits (GLB) derivatives
Our GLB reinsurance is classified as a derivative for accounting purposes and therefore carried at fair value. We believe that the most meaningful presentation of these GLB derivatives is as follows:

- Estimates of the average modeled value of future cash outflows is recorded as incurred losses (i.e., benefit reserves). Cash inflows or revenue are reported as net premiums earned and changes in the benefit reserves are reflected as Policy benefits expense in the Consolidated statements of operations, which is included in underwriting income.
- The incremental difference between the fair value of GLB reinsurance contracts and benefit reserves is reflected in Accounts payable, accrued expenses, and other liabilities in the Consolidated balance sheets and related changes in fair value are reflected in Net realized gains (losses) in the Consolidated statements of operations.

Determination of GLB fair value
The fair value of GLB reinsurance is estimated using an internal valuation model, which includes current market information and estimates of policyholder behavior from the perspective of a theoretical market participant that would assume these liabilities. All of our treaties contain claim limits, which are factored into the valuation model. The fair value depends on a number of factors, including interest rates, equity markets, credit risk, current account value, market volatility, expected annuitization rates and other policyholder behavior, and changes in policyholder mortality. The model and related assumptions are regularly re-evaluated by management and enhanced, as appropriate, based upon additional experience obtained related to policyholder behavior and availability of more timely market information. Due to the inherent uncertainties of the assumptions used in the valuation models to determine the fair value of these derivative products, actual experience may differ materially from the estimates reflected in our Consolidated Financial Statements.

We intend to hold these derivative contracts to maturity (i.e., the expiration of the underlying liabilities through lapse, annuitization, death, or expiration of the reinsurance contract). To partially offset the risk of changes in the fair value of GLB reinsurance contracts, we invest in derivative hedge instruments. At maturity, the cumulative realized gains and losses (excluding cumulative hedge gains or losses) from fair value changes of GLB reinsurance contracts will net to zero because, over time, the insurance liability will be increased or decreased to equal our obligation.

Determination of GLB and Guaranteed minimum death benefits (GMDB) benefit reserves
Management established benefit reserves based on a long-term benefit ratio (or loss ratio) calculated using assumptions reflecting management's best estimate of the future short-term and long-term performance of the variable annuity line of business. Despite the long-term nature of the risk, the benefit ratio calculation is impacted by short-term market movements that may be judged by management to be transient. Management regularly examines both qualitative and quantitative analysis, including a review of the differential between the benefit ratio used at the most recent valuation date and the benefit ratio calculated on subsequent dates. Management regularly evaluates its estimates and uses judgment to determine the extent to which assumptions underlying the benefit ratio calculation should be adjusted. For the year ended December 31, 2018, management determined that no change to the benefit ratio was warranted.

For further information on the estimates and assumptions used in determining the fair value of GLB reinsurance, refer to Note 3 to the Consolidated Financial Statements. For a sensitivity discussion of the effect of changes in interest rates, equity indices, and other assumptions on the fair value of GLBs, and the estimated resulting impact on our net income, refer to Item 7A.

Risk Management
We employ a strategy to manage the financial market and policyholder behavior risks embedded in the reinsurance of variable annuity (VA) guarantees. Risk management begins with underwriting a prospective client and guarantee design, with particular focus on protecting our position from policyholder options that, because of anti-selective behavior, could adversely impact our obligation.

A second layer of risk management is the structure of the reinsurance contracts. All VA guarantee reinsurance contracts include some form of annual or aggregate claim limit(s) primarily designed to reduce our exposure to severe equity market and/or interest rate declines (which would cause an increase in expected claims).

A third layer of risk management is the hedging strategy which looks to mitigate both long-term economic loss over time as well as dampen income statement volatility. We owned financial market instruments as part of the hedging strategy with a fair value asset (liability) of $23 million and $(21) million at December 31, 2018 and 2017, respectively. The instruments are substantially collateralized on a daily basis.

We also limit the aggregate amount of variable annuity reinsurance guarantee risk we are willing to assume. The last substantive transactions were quoted in late 2007. The aggregate number of policyholders is currently decreasing through policyholder withdrawals, annuitizations, and deaths at a rate of 5 percent to 15 percent per annum.

Note that GLB claims cannot occur for any reinsured policy until it has reached the end of its "waiting period". As shown in the table below, 90 percent of the policies we reinsure reached the end of their "waiting periods" in 2018 and prior.

Year of first payment eligibility	Percent of living benefit account values
2018 and prior	90%
2019	3%
2020	1%
2021	2%
2022	—%
2023 and after	4%
Total	100%

The following table presents the historical cash flows under these policies for the periods indicated. The amounts represent accrued past premium received and claims paid, split by benefit type.

(in millions of U.S. dollars)			**2018**			2017			2016
	GMDB	**GLB**	**Total**	GMDB	GLB	Total	GMDB	GLB	Total
Premium received	**$ 47**	**$ 96**	**$ 143**	$ 49	$ 110	$ 159	$ 55	$ 118	$ 173
Less paid claims	**32**	**49**	**81**	31	54	85	42	39	81
Net cash received	**$ 15**	**$ 47**	**$ 62**	$ 18	$ 56	$ 74	$ 13	$ 79	$ 92

Collateral

Chubb holds collateral on behalf of most of its clients in the form of qualified assets in trust or letters of credit, typically in an amount sufficient for the client to obtain statutory reserve credit for the reinsurance. The timing of the calculation and amount of the collateral varies by client according to the particulars of the reinsurance treaty and the statutory reserve guidelines of the client's domicile.

Goodwill impairment assessment

Goodwill, which represents the excess of acquisition cost over the estimated fair value of net assets acquired, was $15.3 billion and $15.5 billion at December 31, 2018 and 2017, respectively. Goodwill is assigned to applicable reporting units of acquired entities at the time of acquisition. Our reporting units are the same as our reportable segments. For goodwill balances by reporting units, refer to Note 5 to the Consolidated Financial Statements.

Goodwill is not amortized but is subject to a periodic evaluation for impairment at least annually, or earlier if there are any indications of possible impairment. Impairment is tested at the reporting unit level. The impairment evaluation first uses a qualitative assessment to determine whether it is more likely than not (i.e., more than a 50 percent probability) that the fair value of a reporting unit is greater than its carrying amount. If a reporting unit fails this qualitative assessment, a single quantitative analysis is used to measure and record the amount of the impairment.

In assessing the fair value of a reporting unit, we make assumptions and estimates about the profitability attributable to our reporting units, including:

- short-term and long-term growth rates; and
- estimated cost of equity and changes in long-term risk-free interest rates.

If our assumptions and estimates made in assessing the fair value of acquired entities change, we could be required to write-down the carrying value of goodwill which could be material to our results of operations in the period the charge is taken. Based on our impairment testing for 2018, we determined no impairment was required and none of our reporting units was at risk for impairment.

Consolidated Operating Results – Years Ended December 31, 2018, 2017, and 2016

(in millions of U.S. dollars, except for percentages)	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net premiums written [(1)]	**$ 30,579**	$ 29,244	$ 28,145	4.6 %	3.9 %
Net premiums earned [(1)]	**30,064**	29,034	28,749	3.5 %	1.0 %
Net investment income	**3,305**	3,125	2,865	5.8 %	9.1 %
Net realized gains (losses)	**(652)**	84	(145)	NM	NM
Total revenues	**32,717**	32,243	31,469	1.5 %	2.5 %
Losses and loss expenses	**18,067**	18,454	16,052	(2.1)%	15.0 %
Policy benefits	**590**	676	588	(12.7)%	15.0 %
Policy acquisition costs	**5,912**	5,781	5,904	2.3 %	(2.1)%
Administrative expenses	**2,886**	2,833	3,081	1.9 %	(8.0)%
Interest expense	**641**	607	605	5.6 %	0.3 %
Other (income) expense	**(434)**	(400)	(222)	8.5 %	80.2 %
Amortization of purchased intangibles	**339**	260	19	30.4 %	NM
Chubb integration expenses	**59**	310	492	(81.0)%	(37.0)%
Total expenses	**28,060**	28,521	26,519	(1.6)%	7.5 %
Income before income tax	**4,657**	3,722	4,950	25.1 %	(24.8)%
Income tax expense (benefit)	**695**	(139)	815	NM	NM
Net income	**$ 3,962**	$ 3,861	$ 4,135	2.6 %	(6.6)%

NM – not meaningful

(1) On a constant-dollar basis for the years ended December 31, 2018 and 2017, net premiums written increased $1.2 billion, or 4.1 percent, and $1.1 billion, or 3.9 percent, respectively, and net premiums earned increased $912 million, or 3.1 percent, and $232 million, or 0.8 percent, respectively. Amounts are calculated by translating prior period results using the same local currency rates as the comparable current period.

Net Premiums Written

2018 vs. 2017

Net premiums written reflect the premiums we retain after purchasing reinsurance protection. Consolidated net premiums written increased $1.3 billion in 2018, or $1.2 billion (4.1 percent) on a constant-dollar basis, reflecting growth across most segments.

- Net premiums written in our North America Commercial P&C Insurance segment increased $466 million, or 3.9 percent in 2018 reflecting positive rate increases, new business written, and strong renewals across a number of lines. Retail casualty and risk management, A&H, retail property, and continued growth in our small commercial business represented $339 million of the $466 million increase. In addition, the year-over-year increase in large structured transactions was $195 million. This growth was partially offset by merger-related underwriting actions of $123 million and premium reductions from planned portfolio management in our retail and wholesale brokerage financial lines ($62 million).
- Net premiums written in our North America Personal P&C Insurance segment increased $141 million, or 3.1 percent for 2018, primarily due to strong retention and new business growth in homeowners and complementary products such as automobiles and valuables. In addition, the non-renewal of a quota share treaty in the second quarter of 2017 covering the acquired Fireman's Fund homeowners and automobile businesses added $47 million of additional net premiums written in 2018. These increases were partially offset by the addition of California to the homeowners quota share reinsurance treaty, effective October 1, 2018 ($47 million), which included a non-recurring unearned premium reserves (UPR) transfer of $32 million.
- Net premiums written in our North America Agricultural Insurance segment increased $61 million, or 4.0 percent in 2018, primarily due to growth in our MPCI business and growth in our Chubb Agribusiness. The growth in MPCI premium was driven by policy count growth and the year-over-year impact of the premium sharing formulas under the U.S. government. Under the MPCI profit and loss calculation, we cede additional premiums to the government during profitable years. In the prior year, the program was more profitable which resulted in higher cessions compared to 2018. The increase was partially offset by lower volatility factors, which are a component of the policy pricing that measures the likelihood the commodity price will fluctuate over the crop year and reduces the premium we charge.

- Net premiums written in our Overseas General Insurance segment increased $552 million in 2018, or $448 million (5.3 percent) on a constant-dollar basis, reflecting growth across most regions and lines of business. P&C lines growth ($235 million) was across all regions, principally in small commercial property and general casualty lines reflecting new business, and in middle market driven by new business and rate increases. Personal lines growth ($134 million) was principally in our automobile line in Mexico driven by new business, as well as in our specialty lines in Asia. A&H lines growth ($79 million) was principally in Asia driven by new business.
- Net premiums written in our Global Reinsurance segment decreased $14 million in 2018, or $22 million (3.3 percent) on a constant-dollar basis, primarily due to higher reinstatement premiums collected in the prior year principally relating to the 2017 natural catastrophes ($15 million year-over-year decrease) and lower renewals, which is reflective of competitive market conditions primarily in catastrophe and catastrophe exposed lines of business, partially offset by new business written in the casualty line of business.
- Net premiums written in our Life Insurance segment increased $129 million in 2018, or $123 million (5.7 percent) on a constant-dollar basis, primarily due to growth in our North American Combined Insurance supplemental A&H program business ($73 million), and Asian and Latin American international life operations ($58 million), partially offset by our life reinsurance business ($8 million), which continues to decline as no new life reinsurance business is being written.

2017 vs. 2016

We discuss financial measures on a "comparative basis" for 2016 throughout the Management's Discussion and Analysis section, which exclude the impact of the unearned premium reserves intangible amortization and the elimination of the historical policy acquisition costs as a result of purchase accounting related to the Chubb Corp acquisition. The combined company (combined legacy ACE and legacy Chubb) results for the year ended December 31, 2016 are inclusive of the first 14 days of January 2016 (the Chubb Corp acquisition was completed on January 14, 2016). We believe these measures provide visibility into our results, allow for comparability to our historical results and are consistent with how management evaluates results. A reconciliation of "comparative basis" results as defined above is provided under the Non-GAAP Reconciliation section starting on page 73.

Consolidated net premiums written increased $1.1 billion in 2017, reflecting growth across most segments. The increase is also due to the timing of the Chubb Corp acquisition in the prior year, which excluded approximately $855 million of production generated prior to the Chubb Corp acquisition close on January 14, 2016 (14-day stub period). On a comparative basis, which includes the 14-day stub period, net premiums written increased $244 million. This increase in premiums was partially offset by merger-related actions of $582 million. Merger-related actions include the cancellation of certain portfolios or lines of business that do not meet our underwriting standards and the purchase of additional reinsurance due to the acquisition of Chubb Corp.

- Net premiums written in our North America Commercial P&C Insurance segment increased $279 million in 2017. On a comparative basis, which includes the 14-day stub period ($519 million), net premiums written decreased $240 million driven by merger-related actions ($278 million). Excluding these items, net premiums written increased $38 million (0.3 percent) as growth, primarily in our risk management and casualty business was offset by declines in property and select components of our financial lines businesses due to competitive market conditions.
- Net premiums written in our North America Personal P&C Insurance segment increased $380 million in 2017. On a comparative basis, which includes the 14-day stub period ($100 million), net premiums written increased $280 million reflecting both growth across most lines as well as the non-renewal of a quota share treaty in 2017 covering the acquired Fireman's Fund homeowners and automobile businesses ($189 million). In addition, the prior year included a non-recurring unearned premium reserves (UPR) transfer ($128 million) related to the July 1, 2016 purchase of reinsurance for our homeowners and large limit valuable articles business written in the northeast United States which decreased net premiums written in the prior year. This reinsurance impacted 2017 growth ($126 million) as we had a full year of coverage in 2017 but only a partial year of coverage in 2016.
- Net premiums written in our North America Agricultural Insurance segment increased $188 million in 2017, primarily due to an increase in MPCI production and growth in our Agriculture P&C products. The increase in MPCI premium was driven in part by higher policy count and the year-over-year impact of our update to the MPCI margin estimate which resulted in a smaller cession to the U.S. government in 2016. Under the government's crop insurance profit and loss calculation formulas, we retained more premiums in 2017 as losses were higher compared to 2016.
- Net premiums written in our Overseas General Insurance segment increased $226 million in 2017, or $229 million (2.8 percent) on a constant-dollar basis. Excluding the favorable impact of the 14-day stub period ($215 million), unfavorable impact of merger-related accounting policy adjustments in 2016 to align the timing of premium recognition ($126 million)

and merger-related actions ($131 million), net premiums written increased $271 million on a constant-dollar basis, driven by growth in personal lines business, primarily from new automobile business written in Latin America, as well as growth across most property and casualty (P&C) lines, primarily in Asia and Latin America.

- Net premiums written in our Global Reinsurance segment increased $9 million in 2017, or $14 million (2.2 percent) on a constant-dollar basis, primarily due to a $30 million increase in catastrophe reinstatement premiums and the favorable impact of the 14-day stub period ($20 million). These increases were negatively impacted by merger-related actions of $10 million, declining rates and increasing competition.
- Net premiums written in our Life Insurance segment increased $17 million in 2017, or $8 million (0.3 percent) on a constant-dollar basis, due to growth in our Asian international life operations and Combined Insurance supplemental A&H program business. This growth was partially offset by planned declines in our Latin American operations, reflecting merger-related actions of $37 million, and in our life reinsurance business, which continues to decline as no new business is currently being written.

Net Premiums Written By Line of Business

(in millions of U.S. dollars, except for percentages)	2018	2017	2016	C$ [(1)] 2017	% Change C$ [(1)] 2018 vs. 2017
Commercial casualty	**$ 5,156**	$ 4,721	$ 4,462	$ 4,749	8.6 %
Workers' compensation	**2,150**	2,067	2,006	2,067	4.0 %
Professional liability	**3,527**	3,547	3,574	3,571	(1.2)%
Surety	**635**	627	584	619	2.7 %
Commercial multiple peril [(2)]	**911**	879	815	879	3.8 %
Property and other short-tail lines	**4,007**	3,819	3,835	3,850	4.1 %
Total Commercial P&C [(3)]	**16,386**	15,660	15,276	15,735	4.1 %
Agriculture	**1,577**	1,516	1,328	1,516	4.0 %
Personal automobile - North America	**831**	775	698	777	7.0 %
Personal automobile - International	**864**	788	674	786	9.9 %
Personal homeowners	**3,391**	3,302	3,053	3,304	2.6 %
Personal other	**1,508**	1,441	1,399	1,455	3.7 %
Total Personal lines	**6,594**	6,306	5,824	6,322	4.3 %
Total Property and Casualty lines	**24,557**	23,482	22,428	23,573	4.2 %
Global A&H lines [(4)]	**4,277**	4,056	3,970	4,078	4.9 %
Reinsurance lines	**671**	685	676	693	(3.3)%
Life	**1,074**	1,021	1,071	1,025	4.9 %
Total consolidated	**$ 30,579**	$ 29,244	$ 28,145	$ 29,369	4.1 %

(1) On a constant-dollar basis. Amounts are calculated by translating prior period results using the same local currency rates as the comparable current period.

(2) Commercial multiple peril represents retail package business (property and general liability).

(3) 2017 and 2016 included a reclassification between Commercial casualty, Professional liability, and Property and other short-tail lines to better align reporting with the current year presentation. There is no impact to total Commercial P&C.

(4) For purposes of this schedule only, A&H results from our Combined North America and International businesses, normally included in the Life Insurance and Overseas General Insurance segments, respectively, as well as the A&H results of our North America Commercial P&C segment, are included in the Global A&H line item above.

The increase in net premiums written in 2018 reflects growth across most lines of business from positive rate increases, new business and strong renewals, partially offset by planned merger-related underwriting actions related to the Chubb Corp acquisition of $138 million. The year-over-year increase in large structured transactions written contributed $195 million to the increase in commercial casualty business in 2018. The increase in commercial casualty was partially offset by planned merger-related underwriting actions. On a constant dollar basis, professional liability was adversely impacted by planned portfolio management. The growth in workers' compensation was partially offset by planned merger-related underwriting actions. Growth in Surety lines was due to new business in North America and Latin America. Property and other short-tail lines grew internationally due to new business and strong renewals. Our personal lines net premiums written increased due to new business in our automobile line in Mexico, new business growth in homeowners and complementary products, and the non-renewal of a quota share treaty in 2017, partially offset by the addition of California to the homeowners quota share treaty effective October 1, 2018. For additional information on net premiums written, refer to the segment results discussions.

Net Premiums Earned
2018 vs. 2017
Net premiums earned for short-duration contracts, typically P&C contracts, generally reflect the portion of net premiums written that were recorded as revenues for the period as the exposure periods expire. Net premiums earned for long-duration contracts, typically traditional life contracts, generally are recognized as earned when due from policyholders. Net premiums earned increased $1.0 billion, or $912 million on a constant-dollar basis in 2018, primarily due to the same factors driving the increase in net premiums written as described above. Net premiums earned were favorably impacted by the year-over-year increase in large structured transactions ($163 million), a number of which were earned immediately when written. These retroactive transactions will not impact premiums earned in 2019 as they were fully earned in 2018.

2017 vs. 2016
Net premiums earned increased $285 million, or $232 million on a constant-dollar basis in 2017, primarily due to the same factors driving the increase in net premiums written as described above.

Approximately $391 million of premiums earned in the 14-day stub period were excluded from 2016. On a comparative constant-dollar basis, which includes the 14-day stub period, net premiums earned decreased $159 million as growth was more than offset by merger-related actions.

P&C Combined Ratio
In evaluating our segments excluding Life Insurance, we use the P&C combined ratio, the loss and loss expense ratio, the policy acquisition cost ratio, and the administrative expense ratio. We calculate these ratios by dividing the respective expense amounts by net premiums earned. We do not calculate these ratios for the Life Insurance segment as we do not use these measures to monitor or manage that segment. The P&C combined ratio is determined by adding the loss and loss expense ratio, the policy acquisition cost ratio, and the administrative expense ratio. A P&C combined ratio under 100 percent indicates underwriting income, and a combined ratio exceeding 100 percent indicates underwriting loss.

	2018	2017	2016
Loss and loss expense ratio	**62.1%**	65.8%	57.7%
Policy acquisition cost ratio	**19.2%**	19.5%	20.2%
Administrative expense ratio	**9.3%**	9.4%	10.4%
P&C Combined ratio	**90.6%**	94.7%	88.3%

2018 vs. 2017
The loss and loss expense ratio decreased 3.7 percentage points in 2018 principally due to the following:
- Lower catastrophe losses (4.3 percentage points);
- Integration-related claims handling expense savings ($64 million or 0.2 percentage points);
- Partially offset by increased frequency and severity of homeowners losses in our North America Personal P&C Insurance segment, primarily non-catastrophe water related events and large fire losses which are trending above our expectations (0.5 percentage points), and higher non-catastrophe large losses in our North America Commercial P&C Insurance segment (0.1 percentage points).

Policy acquisition costs consist of commissions, premium taxes, and certain underwriting costs directly related to the successful acquisition of a new or renewal insurance contract. Our policy acquisition cost ratio decreased 0.3 percentage points in 2018 principally due to increased cessions under certain reinsurance agreements that resulted in higher ceded acquisition costs benefits than in the prior year.

Our administrative expense ratio remained relatively flat in 2018 where merit and inflation costs were offset by cost savings initiatives.

2017 vs. 2016

The loss and loss expense ratio increased 8.1 percentage points in 2017 due to the following:

- Higher catastrophe losses and lower favorable PPD (together 7.3 percentage points);
- Higher non-catastrophe large losses in property lines and mix of business in our Major Accounts division in our North America Commercial P&C Insurance segment, driven by growth in casualty lines which have a higher loss ratio and declines in property lines which have a lower loss ratio (0.4 percentage points);
- Higher non-catastrophe large losses in our North America Personal P&C Insurance segment (0.2 percentage point);
- An updated allocation that more appropriately classified certain claims-related expenses as loss adjustment expenses (previously reported as administrative expenses). This updated allocation increased loss adjustment expenses (0.4 percentage points), with an offsetting decrease to administrative expenses;
- Partially offset by integration-related claims handling expense savings realized of $128 million (0.5 percentage points).

Policy acquisition costs consist of commissions, premium taxes, and certain underwriting costs directly related to the successful acquisition of a new or renewal insurance contract. Our policy acquisition cost ratio decreased 0.7 percentage points in 2017, compared to the prior year period, which included a net unfavorable impact of purchase accounting adjustments related to the Chubb Corp acquisition (0.7 percentage points). The decrease was also due to integration-related expense savings realized (0.2 percentage points),which was offset by a change in the mix of business, principally in our Overseas General Insurance segment, and the non-renewal of the Fireman's Fund quota share treaty.

Our administrative expense ratio decreased 1.0 percentage point in 2017, primarily due to integration-related expense savings realized as a result of the Chubb Corp acquisition of $262 million (1.0 percentage point), lower employee benefit-related expenses (0.7 percentage points), and the updated loss expenses and administrative expenses allocation as noted above (0.4 percentage points), partially offset by the impact of merit-based salary increases, inflation, and increased spending to support growth.

Catastrophe Losses and Prior Period Development

(in millions of U.S dollars)		**2018**		2017		2016
Catastrophe losses excluding reinstatement premiums, pre-tax	**$**	**1,622**	$	2,753	$	1,067
Favorable prior period development net of related adjustments, pre-tax	**$**	**896**	$	829	$	1,135

We generally define catastrophe loss events consistent with the definition of the Property Claims Service (PCS) for events in the U.S. and Canada. PCS defines a catastrophe as an event that causes damage of $25 million or more in insured property losses and affects a significant number of insureds. For events outside of the U.S. and Canada, we generally use a similar definition.

The following table presents catastrophe losses and reinstatement premiums (RIPs) collected (expensed) in 2018:

(in millions of U.S. dollars)	North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Total excluding RIPs	RIPs collected (expensed)	Total including RIPs
	Catastrophe Loss Charge by Event							
Net losses								
Hurricane Michael	**$ 187**	**$ 16**	**$ 6**	**$ 6**	**$ 85**	**$ 300**	**$ 15**	**$ 285**
U.S. flooding, hail, tornadoes, and wind events [(1)]	**162**	**157**	**7**	**—**	**6**	**332**	**—**	**332**
Northeast winter storms	**43**	**117**	**—**	**—**	**5**	**165**	**—**	**165**
California wildfires	**51**	**61**	**1**	**1**	**58**	**172**	**(23)**	**195**
Hurricane Florence	**109**	**29**	**7**	**15**	**14**	**174**	**1**	**173**
California mudslides	**4**	**120**	**—**	**1**	**—**	**125**	**—**	**125**
Colorado rain and hail storm	**7**	**65**	**—**	**1**	**—**	**73**	**—**	**73**
International weather-related events	**—**	**—**	**—**	**182**	**31**	**213**	**2**	**211**
Other	**16**	**46**	**—**	**—**	**6**	**68**	**1**	**67**
Total	**$ 579**	**$ 611**	**$ 21**	**$ 206**	**$ 205**	**$ 1,622**		
RIPs collected (expensed)	**—**	**(26)**	**—**	**—**	**22**		**(4)**	
Total before income tax	**$ 579**	**$ 637**	**$ 21**	**$ 206**	**$ 183**			**$ 1,626**
Income tax benefit								**272**
Total after income tax								**$ 1,354**

(1) This grouping comprised of 34 separate events, principally impacting the southern and northeastern regions of the U.S.

The following table presents catastrophe losses and reinstatement premiums (RIPs) collected (expensed) in 2017:

(in millions of U.S. dollars)	North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Total excluding RIPs	RIPs collected (expensed)	Total including RIPs
	Catastrophe Loss Charge by Event							
Net losses								
N. California wildfires	$ 61	$ 151	$ —	$ 2	$ 42	$ 256	$ (21)	$ 277
S. California wildfires	23	134	—	—	—	157	—	157
Hurricane Harvey	391	175	1	40	48	655	5	650
Hurricane Irma	464	206	2	79	159	910	30	880
Hurricane Maria	50	—	—	89	55	194	(7)	201
Mexico Earthquakes	—	—	—	25	—	25	—	25
Other	231	205	15	96	9	556	—	556
Total	$ 1,220	$ 871	$ 18	$ 331	$ 313	$ 2,753		
RIPs collected (expensed)	(4)	(22)	—	(4)	37		7	
Total before income tax	$ 1,224	$ 893	$ 18	$ 335	$ 276			$ 2,746
Income tax benefit								575
Total after income tax								$ 2,171

The above tables represent catastrophe loss estimates for events that occurred in the related calendar year only. Changes in catastrophe loss estimates in the current calendar year that relate to loss events that occurred in previous calendar years are considered prior period development and are excluded from the table above.

Prior period development (PPD) arises from changes to loss estimates recognized in the current year that relate to loss events that occurred in previous calendar years and excludes the effect of losses from the development of earned premium from previous accident years.

Net favorable prior period development for the year ended 2018 was $896 million, which included favorable reinsurance settlements of $205 million related to legacy run-off exposures, $197 million favorable development related to the 2017 catastrophe events, and favorable development of $110 million in our crop insurance business. There were $216 million of adverse development related to legacy run-off exposures, principally asbestos and environmental liabilities. The remaining favorable development of $600 million comprised 82 percent long-tail lines, principally for the 2014 and prior accident years, and 18 percent short-tail lines.

Net favorable prior period development for the year ended 2017 was $829 million, which included favorable development of $119 million in our crop insurance business. There was $239 million of adverse development related to legacy run-off exposures, principally asbestos and environmental liabilities, and $41 million driven by a change in the discount rate in the U.K. (Ogden rate). The remaining favorable development of $990 million comprised 71 percent long-tail lines, principally for the 2013 and prior accident years, and 29 percent short-tail lines.

Refer to the Prior Period Development section in Note 6 to the Consolidated Financial Statements for additional information.

Current Accident Year (CAY) Loss Ratio Excluding Catastrophe Losses
For these measures, the numerator includes losses and loss expenses adjusted to exclude CATs and PPD. In addition, the denominator is adjusted to exclude net premiums earned adjustments on PPD and reinstatement premiums on CATs and PPD. Reinstatement premiums are additional premiums paid on certain reinsurance agreements in order to reinstate coverage that had been exhausted by catastrophe loss occurrences. The reinstatement premium amount is typically a pro rata portion of the original ceded premium paid based on how much of the reinsurance limit had been exhausted.

	2018	2017	2016
Loss and loss expense ratio	**62.1 %**	65.8 %	57.7 %
Catastrophe losses and related adjustments	**(5.8)%**	(10.2)%	(4.0)%
Prior period development net of related adjustments	**3.3 %**	3.2 %	4.3 %
CAY loss ratio excluding catastrophe losses	**59.6 %**	58.8 %	58.0 %

2018 vs. 2017
The CAY loss ratio excluding catastrophe losses increased 0.8 percentage points in 2018 principally due to the following:

- Increased frequency and severity of homeowners losses in our North America Personal P&C Insurance segment, primarily non-catastrophe water related events and large fire losses (0.6 percentage points);
- Higher non-catastrophe large losses in our North America Commercial P&C Insurance segment (0.2 percentage points);
- Partially offset by integration-related claims handling expense savings realized ($64 million or 0.2 percentage points).

2017 vs. 2016
The CAY loss ratio excluding catastrophe losses increased 0.8 percentage points in 2017, primarily due to the following:

- Higher non-catastrophe large losses in property lines and mix of business in our Major Accounts division in our North America Commercial P&C Insurance segment, driven by growth in casualty lines which have a higher loss ratio and declines in property lines which have a lower loss ratio (0.4 percentage points);
- Higher non-catastrophe large losses in our North America Personal P&C Insurance segment (0.2 percentage points);
- An updated allocation that more appropriately classified certain claims-related expenses as loss adjustment expenses (previously reported as administrative expenses). This updated allocation increased loss adjustment expenses (0.4 percentage points), with an offsetting decrease to administrative expenses;
- Partially offset by integration-related claims handling expense savings realized of $128 million (0.5 percentage points).

CAY P&C Combined Ratio excluding Catastrophe Losses

	2018	2017	2016
CAY Loss and loss expense ratio ex CATs	**59.6%**	58.8%	58.1%
CAY Policy acquisition cost ratio ex CATs	**19.2%**	19.4%	20.2%
CAY Administrative expense ratio ex CATs	**9.2%**	9.4%	10.7%
CAY P&C combined ratio ex CATs	**88.0%**	87.6%	89.0%

P&C Combined Ratio with an Expected Level of CATs and CAY P&C Combined Ratio with an Expected Level of CATs
These measures include the level of CATs that we view as typical for that period. Refer to the Non-GAAP Reconciliation section for the definition and determination of "expected level of CATs." We believe that these measures are meaningful and provide a better indication of our underwriting performance as the portion of CATs intended to be covered by the premiums over time is retained in the calculation. These measures more appropriately align the numerator with an expected level of CATs to the denominator which includes the net premiums earned on policies with exposures to that business.

The CAY P&C combined ratio with an expected level of CATs measure is further adjusted to exclude the impact of prior period development. We believe it is useful to exclude PPD as these unexpected loss developments on historical reserves are not indicative of our underlying performance.

	2018	2017	2016
P&C Combined Ratio	**90.6 %**	94.7 %	88.7 %
CATs above an expected level	**(2.5)%**	(6.8)%	(0.1)%
P&C combined ratio with an expected level of CATs	**88.1 %**	87.9 %	88.6 %
Prior period development net of related adjustments	**3.3 %**	3.1 %	4.3 %
CAY P&C Combined ratio with an expected level of CATs	**91.4 %**	91.0 %	92.9 %

Policy benefits
Policy benefits represent losses on contracts classified as long-duration and generally include accident and supplemental health products, term and whole life products, endowment products, and annuities. Refer to the Life segment operating results section for further discussion.

Policy benefits were $590 million, $676 million and $588 million in 2018, 2017 and 2016, respectively, which included separate account liabilities (gains) losses of $(38) million, $97 million and $11 million, respectively. The offsetting movements of these liabilities are recorded in Other (income) expense on the Consolidated statements of operations. Excluding the separate account gains and losses, Policy benefits were $628 million in 2018, compared with $579 million and $577 million in 2017 and 2016, respectively.

Refer to the respective sections that follow for a discussion of Net investment income, Interest expense, Other (income) expense, Net realized gains and losses, Amortization of purchased intangibles, and Income tax expense.

Segment Operating Results – Years Ended December 31, 2018, 2017, and 2016

We operate through six business segments: North America Commercial P&C Insurance, North America Personal P&C Insurance, North America Agricultural Insurance, Overseas General Insurance, Global Reinsurance, and Life Insurance. In addition, the results of our run-off Brandywine business, including all run-off asbestos and environmental (A&E) exposures, and the results of Westchester specialty operations for 1996 and prior years are presented within Corporate.

North America Commercial P&C Insurance

The North America Commercial P&C Insurance segment comprises operations that provide property and casualty (P&C) insurance and services to large, middle market, and small commercial businesses in the U.S., Canada, and Bermuda. This segment includes our North America Major Accounts and Specialty Insurance division (principally large corporate accounts and wholesale business), and the North America Commercial Insurance division (principally middle market and small commercial accounts).

(in millions of U.S. dollars, except for percentages)	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net premiums written	**$ 12,485**	$ 12,019	$ 11,740	3.9 %	2.4 %
Net premiums earned	**12,402**	12,191	12,217	1.7 %	(0.2)%
Losses and loss expenses	**8,000**	8,287	7,439	(3.5)%	11.4 %
Policy acquisition costs	**1,829**	1,873	2,023	(2.3)%	(7.4)%
Administrative expenses	**966**	981	1,125	(1.5)%	(12.8)%
Underwriting income	**1,607**	1,050	1,630	53.0 %	(35.6)%
Net investment income	**2,033**	1,961	1,860	3.7 %	5.4 %
Other (income) expense	**(25)**	1	(2)	NM	NM
Segment income	**$ 3,665**	$ 3,010	$ 3,492	21.8 %	(13.8)%
Loss and loss expense ratio	**64.5%**	68.0%	60.9%	(3.5) pts	7.1 pts
Policy acquisition cost ratio	**14.7%**	15.4%	16.6%	(0.7) pts	(1.2) pts
Administrative expense ratio	**7.8%**	8.0%	9.2%	(0.2) pts	(1.2) pts
Combined ratio	**87.0%**	91.4%	86.7%	(4.4) pts	4.7 pts

NM – not meaningful

Premiums
2018 vs. 2017
Net premiums written increased $466 million, or 3.9 percent in 2018 reflecting positive rate increases, new business written, and strong renewals across a number of lines. Retail casualty and risk management, A&H, retail property, and continued growth in our small commercial business represented $339 million of the $466 million increase. In addition, the year-over-year increase in large structured transactions was $195 million. This growth was partially offset by merger-related underwriting actions of $123 million and premium reductions from planned portfolio management in our retail and wholesale brokerage financial lines ($62 million).

Net premiums earned increased $211 million, or 1.7 percent in 2018 principally reflecting the net premiums written increases described above and the year-over-year increase in large structured transactions ($163 million), a number of which were earned immediately when written as they were retroactive covers.

2017 vs. 2016
Net premiums written increased $279 million in 2017 due to the timing of the Chubb Corp acquisition in 2016. Approximately $519 million of production was generated prior to the acquisition close on January 14, 2016 (14-day stub period). On a comparative basis, which includes the 14-day stub period, net premiums written, excluding merger-related actions of $278 million, increased $38 million, or 0.3 percent, as growth, primarily in our risk management and casualty business was offset by declines in property and select components of our financial lines businesses due to competitive market conditions.

Net premiums earned decreased $26 million in 2017. On a comparative basis, which includes the 14-day stub period ($208 million), net premiums earned decreased $234 million driven primarily by merger-related actions.

Combined Ratio
2018 vs. 2017
The loss and loss expense ratio decreased 3.5 percentage points in 2018, primarily due to lower catastrophe losses and integration-related claims handling expense savings realized, partially offset by lower favorable prior period development, higher non-catastrophe losses (0.4 percentage points), and a less favorable adjustment to our claims handling reserve in the current year relative to 2017.

The policy acquisition cost ratio decreased 0.7 percentage points in 2018, due to increased cessions under certain reinsurance agreements that resulted in higher ceded acquisition costs benefits than in the prior year.

The administrative expense ratio decreased 0.2 percentage points in 2018, primarily due to integration-related expense savings realized, higher net profit from our third party claims administration business, ESIS, and the net favorable impact of one-time expense accrual releases.

2017 vs. 2016

The loss and loss expense ratio increased 7.1 percentage points in 2017, primarily due to higher catastrophe losses, partially offset by lower favorable prior period development. Additionally, the increase was related to mix of business in our Major Accounts division, driven by growth in casualty lines which have a higher loss ratio and declines in property lines which have a lower loss ratio, as well as an updated allocation that more appropriately classified certain claims-related expenses as loss adjustment expenses (previously reported as administrative expenses). This updated allocation increased loss adjustment expenses (0.6 percentage points for 2017) with an offsetting decrease to administrative expenses. This increase was partially offset by integration-related expense savings realized of $68 million (0.5 percentage points).

The policy acquisition cost ratio decreased 1.2 percentage points in 2017, compared to 2016 which included the net unfavorable impact of initial year purchase accounting adjustments related to the Chubb Corp acquisition (1.1 percentage points). Excluding this item, the policy acquisition cost ratio decreased 0.1 percentage points primarily due to integration-related expense savings realized of $21 million.

The administrative expense ratio decreased 1.2 percentage points in 2017 primarily reflecting integration-related expense savings realized of $78 million (0.7 percentage points), lower employee benefit-related expenses of $107 million (0.9 percentage points), and the updated loss expenses and administrative expenses allocation as noted above (0.6 percentage points for 2017), partially offset by the impact of merit-based salary increases, inflation, and increased spending to support growth.

Catastrophe Losses and Prior Period Development

(in millions of U.S. dollars)	**2018**	2017	2016
Catastrophe losses excluding reinstatement premiums, pre-tax	**$ 579**	$ 1,220	$ 448
Favorable prior period development net of related adjustments, pre-tax	**$ 610**	$ 746	$ 778

Catastrophe losses were primarily from the following events (refer to the table on page 56):

- 2018: Hurricanes Florence and Michael, and severe weather-related events in the U.S., including California wildfires
- 2017: Hurricanes Harvey, Irma and Maria and severe weather-related events in the U.S., including California wildfires
- 2016: severe weather-related events in the U.S., including Hurricane Matthew, and a wildfire in Canada

CAY Loss Ratio Excluding Catastrophe Losses

	2018	2017	2016
Loss and loss expense ratio	**64.5 %**	68.0 %	60.9 %
Catastrophe losses and related adjustments	**(4.7)%**	(10.0)%	(3.7)%
Prior period development net of related adjustments	**5.1 %**	6.3 %	6.5 %
CAY loss ratio excluding catastrophe losses	**64.9 %**	64.3 %	63.7 %

2018 vs. 2017

The CAY loss ratio excluding catastrophe losses increased 0.6 percentage points for 2018, due to higher year-over-year large loss activity and a less favorable adjustment to our claims handling reserve in the current year relative to 2017, partially offset by integration-related claims handling expense savings realized.

2017 vs. 2016

The CAY loss ratio excluding catastrophe losses increased 0.6 percentage points for 2017, primarily due to mix of business in our Major Accounts division, driven by growth in casualty lines which have a higher loss ratio and declines in property lines which have a lower loss ratio, as well as an updated allocation that more appropriately classified certain claims-related expenses as loss adjustment expenses (previously reported as administrative expenses). This updated allocation increased loss adjustment expenses (0.6 percentage points for 2017) with an offsetting decrease to administrative expenses. This increase was partially offset by integration-related expense savings realized of $68 million (0.5 percentage points).

North America Personal P&C Insurance

The North America Personal P&C Insurance segment comprises operations that provide high net worth personal lines products, including homeowners and complementary products such as valuable articles, excess liability, automobile, and recreational marine insurance and services in the U.S. and Canada.

(in millions of U.S. dollars, except for percentages)	**2018**	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net premiums written	**$ 4,674**	$ 4,533	$ 4,153	3.1 %	9.1 %
Net premiums earned	**4,593**	4,399	4,319	4.4 %	1.9 %
Losses and loss expenses	**3,229**	3,265	2,558	(1.1)%	27.6 %
Policy acquisition costs	**939**	899	966	4.4 %	(6.9)%
Administrative expenses	**269**	264	363	1.9 %	(27.3)%
Underwriting income (loss)	**156**	(29)	432	NM	NM
Net investment income	**236**	226	207	4.4 %	9.2 %
Other (income) expense	**1**	4	6	(75.0)%	(33.3)%
Amortization of purchased intangibles	**13**	16	19	(18.8)%	(15.8)%
Segment income	**$ 378**	$ 177	$ 614	113.6 %	(71.2)%
Loss and loss expense ratio	**70.3%**	74.2%	59.2%	(3.9) pts	15.0 pts
Policy acquisition cost ratio	**20.4%**	20.4%	22.4%	— pts	(2.0) pts
Administrative expense ratio	**5.9%**	6.1%	8.4%	(0.2) pts	(2.3) pts
Combined ratio	**96.6%**	100.7%	90.0%	(4.1) pts	10.7 pts

NM – not meaningful

Premiums

2018 vs. 2017

Net premiums written increased $141 million, or 3.1 percent for 2018, primarily due to strong retention and new business growth in homeowners and complementary products such as automobiles and valuables. In addition, the non-renewal of a quota share treaty in the second quarter of 2017 covering the acquired Fireman's Fund homeowners and automobile businesses added $47 million of additional net premiums written in 2018. These increases were partially offset by the addition of California to the homeowners quota share reinsurance treaty, effective October 1, 2018 ($47 million), which included a non-recurring unearned premium reserves (UPR) transfer of $32 million.

Net premiums earned increased $194 million, or 4.4 percent for 2018, primarily due to the factors described above.

2017 vs. 2016

Net premiums written increased $380 million in 2017. On a comparative basis, which includes the 14-day stub period ($100 million), net premiums written increased $280 million reflecting both growth across most lines as well as the non-renewal of a quota share treaty in 2017 covering the acquired Fireman's Fund homeowners and automobile businesses ($189 million). In addition, the prior year included a non-recurring unearned premium reserves (UPR) transfer ($128 million) related to the July 1, 2016 purchase of reinsurance for our homeowners and large limit valuable articles business written in the northeast United States which decreased net premiums written in the prior year. This reinsurance impacted 2017 growth ($126 million) as we had a full year of coverage in 2017 but only a partial year of coverage in 2016.

Net premiums earned increased $80 million, primarily due to the factors described above.

Combined Ratio

2018 vs. 2017

The loss and loss expense ratio decreased 3.9 percentage points in 2018, primarily due to lower catastrophe losses (6.5 percentage points), lower unfavorable prior period development (0.6 percentage points), and integration-related claims handling expense savings realized. These decreases were offset by increased frequency and severity of homeowners losses primarily non-catastrophe water related events and large fire losses which are trending above our expectations (3.3 percentage points).

The policy acquisition cost ratio remained flat in 2018. The administrative expense ratio decreased 0.2 percentage points in 2018, primarily due to integration-related expense savings realized that exceeded normal merit and inflation.

2017 vs. 2016

The loss and loss expense ratio increased 15.0 percentage points in 2017, primarily due to higher catastrophe (12.6 percentage points) and non-catastrophe large losses (1.2 percentage points), as well as an updated allocation that more appropriately classified certain claims-related expenses as loss adjustment expenses (previously reported as administrative expenses). This updated allocation increased loss adjustment expenses (0.5 percentage points), with an offsetting decrease to administrative expenses. This increase was partially offset by integration-related claims handling expense savings realized of $22 million (0.5 percentage points).

The policy acquisition cost ratio decreased 2.0 percentage points in 2017 compared to the prior year which included the net unfavorable impact from purchase accounting adjustments (1.9 percentage points) related to the Chubb Corp acquisition. Excluding this adjustment, the policy acquisition cost ratio remained flat as the increase related to the non-renewal of the Fireman's Fund quota share treaty which had a higher ceded acquisition cost ratio was offset by integration-related expense savings realized of $7 million (0.2 percentage points).

The administrative expense ratio decreased 2.3 percentage points in 2017, due to integration-related expense savings realized of $29 million (0.7 percentage points), lower employee benefit-related expenses of $42 million (0.9 percentage points), and the updated loss expenses and administrative expenses allocation as noted above (0.5 percentage points).

Catastrophe Losses and Prior Period Development

(in millions of U.S. dollars)	**2018**	2017	2016
Catastrophe losses excluding reinstatement premiums, pre-tax	**$ 611**	$ 871	$ 326
Unfavorable prior period development net of related adjustments, pre-tax	**$ (41)**	$ (69)	$ (27)

Catastrophe losses were primarily from the following events (refer to the table on page 56):
- 2018: Colorado rain and hailstorms, Hurricanes Florence and Michael, California mudslides, and other severe weather-related events in the U.S. including California wildfires
- 2017: Hurricanes Harvey and Irma and severe weather-related events in the U.S., including California wildfires
- 2016: severe weather-related events in the U.S., including Hurricane Matthew

CAY Loss Ratio Excluding Catastrophe Losses

	2018	2017	2016
Loss and loss expense ratio	**70.3 %**	74.2 %	59.2 %
Catastrophe losses and related adjustments	**(13.6)%**	(20.1)%	(7.5)%
Prior period development net of related adjustments	**(0.9)%**	(1.5)%	(0.7)%
CAY loss ratio excluding catastrophe losses	**55.8 %**	52.6 %	51.0 %

2018 vs. 2017

The CAY loss ratio excluding catastrophe losses increased 3.2 percentage points in 2018, due to increased frequency and severity of homeowners losses primarily non-catastrophe water related events and large fire losses.

2017 vs. 2016

The CAY loss ratio excluding catastrophe losses increased 1.6 percentage points in 2017 primarily due to higher non-catastrophe large losses (1.2 percentage points), as well as an updated allocation that more appropriately classified certain claims-related expenses as loss adjustment expenses (previously reported as administrative expenses). This updated allocation increased loss adjustment expenses (0.5 percentage points), with an offsetting decrease to administrative expenses. This increase was partially offset by integration-related claims handling expense savings realized of $22 million (0.5 percentage points).

North America Agricultural Insurance

The North America Agricultural Insurance segment comprises our North American based businesses that provide a variety of coverages in the U.S. and Canada including crop insurance, primarily Multiple Peril Crop Insurance (MPCI) and crop-hail through Rain and Hail Insurance Service, Inc. (Rain and Hail) as well as farm and ranch and specialty P&C commercial insurance products and services through our Chubb Agribusiness unit.

(in millions of U.S. dollars, except for percentages)	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net premiums written	**$ 1,577**	$ 1,516	$ 1,328	4.0 %	14.2 %
Net premiums earned	**1,569**	1,508	1,316	4.1 %	14.6 %
Losses and loss expenses [1]	**1,114**	1,043	898	6.8 %	16.1 %
Policy acquisition costs	**79**	81	83	(2.5)%	(2.4)%
Administrative expenses	**(9)**	(8)	(6)	12.5 %	33.3 %
Underwriting income	**385**	392	341	(1.8)%	15.0 %
Net investment income	**28**	25	20	12.0 %	25.0 %
Other (income) expense	**2**	2	1	—	100.0 %
Amortization of purchased intangibles	**28**	29	29	(3.4)%	—
Segment income	**$ 383**	$ 386	$ 331	(0.8)%	16.6 %
Loss and loss expense ratio	**71.0 %**	69.2 %	68.3 %	1.8 pts	0.9 pts
Policy acquisition cost ratio	**5.0 %**	5.4 %	6.3 %	(0.4) pts	(0.9) pts
Administrative expense ratio	**(0.5)%**	(0.6)%	(0.5)%	0.1 pts	(0.1) pts
Combined ratio	**75.5 %**	74.0 %	74.1 %	1.5 pts	(0.1) pts

(1) Gains (losses) on crop derivatives were $(3) million, $(7) million, and $(5) million in 2018, 2017, and 2016, respectively. These gains (losses) are included in Net realized gains (losses) in our Consolidated statements of operations but are reclassified to Losses and loss expenses for purposes of presenting North America Agricultural Insurance underwriting income.

Premiums

2018 vs. 2017

Net premiums written increased $61 million, or 4.0 percent in 2018, primarily due to growth in our MPCI business and growth in our Chubb Agribusiness. The growth in MPCI premium was driven by policy count growth and the year-over-year impact of the premium sharing formulas under the U.S. government. Under the MPCI profit and loss calculation, we cede additional premiums to the government during profitable years. In the prior year, the program was more profitable which resulted in higher cessions compared to 2018. The increase was partially offset by lower volatility factors, which are a component of the policy pricing that measures the likelihood the commodity price will fluctuate over the crop year and reduces the premium we charge.

Net premiums earned increased $61 million, or 4.1 percent in 2018, due to the factors described above.

2017 vs. 2016

Net premiums written increased $188 million in 2017, primarily due to an increase in MPCI production and growth in our Agriculture P&C products. The increase in MPCI premium was driven in part by higher policy count and the year over year impact of our update to the MPCI margin estimate which resulted in a smaller cession to the U.S. government. Under the government's crop insurance profit and loss calculation formulas, we retained more premiums in 2017 as losses were higher compared to 2016.

Net premiums earned increased $192 million in 2017, due to the factors described above.

Combined Ratio

2018 vs. 2017

The loss and loss expense ratio increased 1.8 percentage points in 2018 due to higher catastrophe losses and lower favorable prior period development.

The policy acquisition cost ratio decreased 0.4 percentage points in 2018 due to lower MPCI reinsurance cessions in the current year.

The administrative expense ratio remained relatively flat in 2018.

2017 vs. 2016

The loss and loss expense ratio increased 0.9 percentage points in 2017 reflecting the revision to the 2017 crop year margin estimate as discussed above. In addition, the increase was partially offset by higher favorable prior period development.

The policy acquisition cost ratio decreased 0.9 percentage point in 2017, primarily due to lower direct commissions in the current year and an increase in MPCI net premiums earned.

The administrative expense ratio remained relatively flat in 2017.

Catastrophe Losses and Prior Period Development

(in millions of U.S. dollars)	**2018**	2017	2016
Catastrophe losses excluding reinstatement premiums, pre-tax	**$ 21**	$ 18	$ 19
Favorable prior period development net of related adjustments, pre-tax	**$ 110**	$ 119	$ 72

Catastrophe losses in 2018, 2017, and 2016 were primarily weather-related events in our farm, ranch and specialty P&C business. Refer to the table on page 56.

Net favorable prior period development was $110 million, $119 million, and $72 million in 2018, 2017, and 2016, respectively. For 2018, the prior period development amount included $140 million of favorable incurred losses and $10 million of lower acquisition costs due to lower than expected MPCI losses for the 2017 crop year, partially offset by a $40 million decrease in net premiums earned related to the MPCI profit and loss calculation formula. For 2017, the prior period development amount included $174 million of favorable incurred losses and $11 million of lower acquisition costs due to lower than expected MPCI losses for the 2016 crop year, partially offset by a $66 million decrease in net premiums earned related to the MPCI profit and loss calculation formula.

CAY Loss Ratio Excluding Catastrophe Losses

	2018	2017	2016
Loss and loss expense ratio	**71.0 %**	69.2 %	68.3 %
Catastrophe losses and related adjustments	**(1.3)%**	(1.2)%	(1.5)%
Prior period development net of related adjustments	**7.0 %**	8.2 %	5.6 %
CAY loss ratio excluding catastrophe losses	**76.7 %**	76.2 %	72.4 %

2018 vs. 2017

The CAY loss ratio excluding catastrophe losses increased 0.5 percentage points in 2018, primarily due to a less favorable crop margin in the current year versus 2017, partially offset by lower underlying losses in our Chubb Agribusiness unit.

2017 vs. 2016

The CAY loss ratio excluding catastrophe losses increased 3.8 percentage points in 2017 reflecting the revision to the 2017 crop year margin estimate as discussed above.

Overseas General Insurance

Overseas General Insurance segment comprises Chubb International and Chubb Global Markets (CGM). Chubb International comprises our international commercial P&C traditional and specialty lines serving large corporations, middle market and small customers; A&H and traditional and specialty personal lines business serving local territories outside the U.S., Bermuda, and Canada. CGM, our London-based international commercial P&C excess and surplus lines business, includes Lloyd's of London (Lloyd's) Syndicate 2488. Chubb provides funds at Lloyd's to support underwriting by Syndicate 2488 which is managed by Chubb Underwriting Agencies Limited.

(in millions of U.S. dollars, except for percentages)	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net premiums written [1]	$ 8,902	$ 8,350	$ 8,124	6.6 %	2.8 %
Net premiums earned	8,612	8,131	8,132	5.9 %	—
Losses and loss expenses	4,429	4,281	4,005	3.5 %	6.9 %
Policy acquisition costs	2,346	2,221	2,136	5.6 %	4.0 %
Administrative expenses	1,014	982	1,057	3.3 %	(7.1)%
Underwriting income [2]	823	647	934	27.2 %	(30.7)%
Net investment income	619	610	600	1.5 %	1.7 %
Other (income) expense	—	(4)	(11)	NM	(63.6)%
Amortization of purchased intangibles	41	45	48	(8.9)%	(6.3)%
Segment income	$ 1,401	$ 1,216	$ 1,497	15.2 %	(18.8)%
Loss and loss expense ratio	51.4%	52.6%	49.3%	(1.2) pts	3.3 pts
Policy acquisition cost ratio	27.2%	27.3%	26.3%	(0.1) pts	1.0 pt
Administrative expense ratio	11.8%	12.1%	12.9%	(0.3) pts	(0.8) pts
Combined ratio	90.4%	92.0%	88.5%	(1.6) pts	3.5 pts

NM – not meaningful

(1) On a constant-dollar basis, for the years ended December 31, 2018 and 2017, net premiums written increased $448 million, or 5.3 percent, and increased $229 million, or 2.8 percent, respectively. Amounts are calculated by translating prior period results using the same local currency rates as the comparable current period.

(2) On a constant-dollar basis, for the years ended December 31, 2018 and 2017, underwriting income increased $159 million, or 24.1 percent, and decreased $310 million or 32.3 percent, respectively. Amounts are calculated by translating prior period results using the same local currency rates as the comparable current period.

Premiums

2018 vs. 2017

Net premiums written increased $552 million in 2018, or $448 million (5.3 percent) on a constant-dollar basis, reflecting growth across most regions and lines of business. P&C lines growth ($235 million) was across all regions, principally in small commercial property and general casualty lines reflecting new business, and in middle market driven by new business and rate increases. Personal lines growth ($134 million) was principally in our automobile line in Mexico driven by new business, as well as in our specialty lines in Asia. A&H lines growth ($79 million) was principally in Asia driven by new business.

Net premiums earned increased $481 million in 2018, or $384 million (4.7 percent) on a constant-dollar basis, due to the factors described above.

2017 vs. 2016

Net premiums written increased $226 million in 2017, or $229 million (2.8 percent) on constant-dollar basis. Excluding the favorable impact of the 14-day stub period ($215 million), adverse impact of merger-related accounting policy adjustments in 2016 to align the timing of premium recognition ($126 million) and merger-related actions ($131 million), net premiums written increased $271 million on a constant-dollar basis, driven by growth in personal lines business, primarily from new automobile business written in Latin America, as well as growth across most P&C lines, primarily in Asia and Latin America.

Net premiums earned remained flat in 2017, and decreased $31 million on a constant-dollar basis, primarily due to a higher mix of multi-year policies written in the current year in comparison to the growth in net premiums written, as well as from the merger-related actions described above. These decreases were partially offset by the favorable impact of the 14-day stub period, as noted above.

Net Premiums Written by Region

(in millions of U.S. dollars, except for percentages)	2018	2017	2016	C$ [1] 2017	% Change 2018 vs. 2017	% Change C$ [1] 2018 vs. 2017	% Change 2017 vs. 2016
Region							
Europe	**$ 3,508**	$ 3,281	$ 3,227	$ 3,440	6.9 %	2.0 %	1.7 %
Latin America	**2,181**	2,108	1,992	2,012	3.5 %	8.4 %	5.8 %
Asia	**2,884**	2,596	2,537	2,635	11.1 %	9.4 %	2.3 %
Other [2]	**329**	365	368	367	(9.9)%	(10.4)%	(0.8)%
Net premiums written	**$ 8,902**	$ 8,350	$ 8,124	$ 8,454	6.6 %	5.3 %	2.8 %

	2018 % of Total	2017 % of Total	2016 % of Total
Region			
Europe	**39%**	40%	40%
Latin America	**25%**	25%	25%
Asia	**32%**	31%	31%
Other [2]	**4%**	4%	4%
Net premiums written	**100%**	100%	100%

(1) On a constant-dollar basis. Amounts are calculated by translating prior period results using the same local currency rates as the comparable current period.

(2) Comprises Combined International, Eurasia and Africa region, and other international.

Combined Ratio

2018 vs. 2017

The loss and loss expense ratio decreased 1.2 percentage points in 2018, reflecting lower catastrophe losses (1.6 percentage points) and a change in the mix of business towards consumer and property and casualty lines in countries that have a lower loss ratio and a higher acquisition cost ratio (0.3 percentage points), partially offset by lower favorable prior period development in the current year (0.6 percentage points).

The policy acquisition cost ratio was relatively flat in 2018.

The administrative expense ratio decreased 0.3 percentage points in 2018, primarily driven by integration-expense savings realized (0.3 percentage points).

2017 vs. 2016

The loss and loss expense ratio increased 3.3 percentage points in 2017, reflecting higher catastrophe losses and higher non-catastrophe large losses in the current year (0.2 percentage points), partially offset by a change in the mix of business (0.5 percentage points) towards products and regions that have a lower loss ratio and a higher acquisition cost ratio, integration-related claims handling expense savings realized of $38 million (0.5 percentage points) and lower favorable prior period development in the current year (2.1 percentage points).

The policy acquisition cost ratio increased 1.0 percentage point in 2017, compared to the prior year periods, which included the net favorable impact of initial year purchase accounting adjustments related to the Chubb Corp acquisition (0.3 percentage points). Excluding this item, the policy acquisition cost ratio increased 0.7 percentage points for the twelve months ended December 31, 2017, primarily due to a change in the mix of business (0.4 percentage points) towards products and regions within personal lines which have a higher acquisition cost ratio and a lower loss ratio. In addition, the adverse impact of aligning accounting policy after the Chubb Corp acquisition in the prior year increased the policy acquisition ratio by 0.2 percentage points. These increases were partially offset by integration-related expense savings realized of $22 million (0.3 percentage points).

The administrative expense ratio decreased 0.8 percentage points in 2017, primarily due to integration-related expense savings realized of $116 million (1.4 percentage points). This decrease was partially offset by the impact of merit-based salary increases, inflation, and increased spending to support growth initiatives.

Catastrophe Losses and Prior Period Development

(in millions of U.S. dollars)		**2018**		2017		2016
Catastrophe losses excluding reinstatement premiums, pre-tax	**$**	**206**	$	331	$	183
Favorable prior period development net of related adjustments, pre-tax	**$**	**212**	$	252	$	423

Catastrophe losses were primarily from the following events (refer to the table on page 56):

- 2018: Typhoons Jebi, Mangkhut and Trami; Hurricane Florence and storms in Australia
- 2017: Hurricanes Harvey, Irma and Maria; Earthquakes in Mexico, Cyclone Debbie in Australia, and flooding in Latin America
- 2016: severe weather-related events in Europe, earthquakes in Ecuador and New Zealand, and flooding in the U.K.

CAY Loss Ratio Excluding Catastrophe Losses

	2018	2017	2016
Loss and loss expense ratio	**51.4 %**	52.6 %	49.3 %
Catastrophe losses and related adjustments	**(2.4)%**	(4.0)%	(2.3)%
Prior period development net of related adjustments	**2.5 %**	3.1 %	5.2 %
CAY loss ratio excluding catastrophe losses	**51.5 %**	51.7 %	52.2 %

2018 vs. 2017

The CAY loss ratio excluding catastrophe losses decreased 0.2 percentage points in 2018 primarily due to a change in the mix of business towards consumer and property and casualty lines in countries that have a lower loss ratio and a higher acquisition cost ratio (0.3 percentage points).

2017 vs. 2016

The CAY loss ratio excluding catastrophe losses decreased 0.5 percentage points in 2017 due to a mix of business (0.5 percentage points) towards products and regions that have a lower loss ratio and a higher acquisition cost ratio and integration-related claims handling expense savings realized of $38 million (0.5 percentage points), partially offset by higher non-catastrophe large losses in the current year (0.2 percentage points).

Effective January 1, 2019, we have redomiciled our European headquarters to France, with Paris being the principal office for our Continental European operations. We have a significant investment in France in both financial and human resources, as well as a large portfolio of commercial and consumer insurance business throughout the country. Following the anticipated withdrawal of the UK from the EU, we will continue to have a substantial presence in London in addition to its offices and operations across the UK and EU. Our primary aim is to ensure a seamless transition and to offer certainty and continuity of service for all our customers and business partners, regardless of location or the final outcome of the Brexit negotiations. Total costs incurred in 2018 related to our relocation of European insurance companies, and other Brexit related costs, were $11 million, and the expected costs for 2019 are projected to be immaterial.

Global Reinsurance

The Global Reinsurance segment represents our reinsurance operations comprising Chubb Tempest Re Bermuda, Chubb Tempest Re USA, Chubb Tempest Re International, and Chubb Tempest Re Canada. Global Reinsurance markets its reinsurance products worldwide primarily through reinsurance brokers under the Chubb Tempest Re brand name and provides a broad range of traditional reinsurance coverage to a diverse array of primary P&C companies.

(in millions of U.S. dollars, except for percentages)	2018	2017	2016	% Change 2018 vs. 2017	% Change 2017 vs. 2016
Net premiums written	**$ 671**	$ 685	$ 676	(2.1)%	1.4 %
Net premiums earned	**670**	704	710	(4.9)%	(0.7)%
Losses and loss expenses	**479**	561	325	(14.7)%	72.6 %
Policy acquisition costs	**162**	177	187	(8.4)%	(5.3)%
Administrative expenses	**41**	44	52	(8.4)%	(15.4)%
Underwriting income (loss)	**(12)**	(78)	146	84.8 %	NM
Net investment income	**257**	273	263	(6.1)%	3.8 %
Other (income) expense	**(32)**	(1)	(4)	NM	(75.0)%
Segment income	**$ 277**	$ 196	$ 413	41.3 %	(52.5)%
Loss and loss expense ratio	**71.6%**	79.8%	45.7%	(8.2) pts	34.1 pts
Policy acquisition cost ratio	**24.2%**	25.1%	26.3%	(0.9) pts	(1.2) pts
Administrative expense ratio	**6.0%**	6.3%	7.5%	(0.3) pts	(1.2) pts
Combined ratio	**101.8%**	111.2%	79.5%	(9.4) pts	31.7 pts

NM – not meaningful

Premiums

2018 vs. 2017

Net premiums written decreased $14 million in 2018, or $22 million (3.3 percent) on a constant-dollar basis, primarily due to higher reinstatement premiums collected in the prior year principally relating to the 2017 natural catastrophes ($15 million year-over-year decrease) and lower renewals, which is reflective of competitive market conditions primarily in catastrophe and catastrophe exposed lines of business, partially offset by new business written in the casualty line of business.

Net premiums earned decreased $34 million in 2018, or $42 million (6.0 percent) on a constant-dollar basis, reflecting the decrease in net premiums written. The decrease was also due to $14 million of short-term treaties (less than one year in duration) earned in the prior year that were written in 2016 and 2017.

2017 vs. 2016

Net premiums written increased $9 million in 2017, or $14 million (2.2 percent) on a constant-dollar basis, primarily due to a $30 million increase in catastrophe reinstatement premiums and the timing of the Chubb Corp acquisition which excluded approximately $20 million of production generated prior to the Chubb Corp acquisition close on January 14, 2016 (14-day stub period). These increases were negatively impacted by merger-related actions of $10 million, declining rates and increasing competition.

Net premiums earned were about flat in 2017, which is approximately in line with the modest increase in net premiums written.

Combined Ratio

2018 vs. 2017

The loss and loss expense ratio decreased 8.2 percentage points in 2018 principally due to lower catastrophe losses partially offset by lower favorable prior period development and a shift in the mix of business from property catastrophe business towards casualty business, which generally has a higher loss ratio.

The policy acquisition cost ratio decreased 0.9 percentage points in 2018 primarily due to lower acquisition expenses from proportional business sold.

The administrative expense ratio decreased 0.3 percentage points in 2018 primarily due to continued expense management.

2017 vs. 2016

The loss and loss expense ratio increased 34.1 percentage points in 2017 primarily due to higher catastrophe losses and an increase in the loss ratio on our U.S. property business, partially offset by lower favorable prior period development.

The policy acquisition cost ratio decreased 1.2 percentage points in 2017 primarily due to higher net premiums earned from fully earned catastrophe reinstatement premiums, partially offset by lower profit commissions receivable on our outbound retrocessional treaties.

The administrative expense ratio decreased 1.2 percentage points in 2017 primarily reflecting expense reductions implemented to align our cost structure with our premium base and integration-related expense savings realized.

Catastrophe Losses and Prior Period Development

(in millions of U.S dollars)	**2018**	2017	2016
Catastrophe losses, pre-tax [1]	**$ 205**	$ 313	$ 91
Favorable prior period development net of related adjustments, pre-tax [2]	**$ 50**	$ 59	$ 78
[1] Excludes catastrophe reinstatement premiums collected - pre-tax	**$ 22**	$ 37	$ 7
[2] Net favorable (unfavorable) reinstatement premiums receivable, net of acquisition expenses, on prior period development - pre-tax	**$ (7)**	$ 4	$ (7)

Catastrophe losses were primarily from the following events (refer to table on page 56):

- 2018: Hurricanes Florence and Michael; Typhoons Jebi and Trami; Windstorm Friederike, California Wildfires, and severe weather-related events in the U.S., Canada and Japan
- 2017: Hurricanes Harvey, Irma and Maria; Northern California Wildfires, and severe weather-related events in the U.S.
- 2016: Fort McMurray wildfire, Hurricane Matthew, and severe weather-related events in Europe, the U.S. and Canada

CAY Loss Ratio Excluding Catastrophe Losses

	2018	2017	2016
Loss and loss expense ratio	**71.6 %**	79.8 %	45.7 %
Catastrophe losses and related adjustments	**(29.2)%**	(42.4)%	(12.5)%
Prior period development net of related adjustments	**8.1 %**	8.6 %	11.8 %
CAY loss ratio excluding catastrophe losses	**50.5 %**	46.0 %	45.0 %

2018 vs. 2017

The CAY loss ratio excluding catastrophe losses increased 4.5 percentage points primarily due to a shift in the mix of business from property catastrophe business towards casualty business which generally has a higher loss ratio and higher losses in our U.S. property lines.

2017 vs. 2016

The CAY loss ratio excluding catastrophe losses increased 1.0 percentage point due to an increase in the loss ratio on our U.S. property business.

Life Insurance

The Life Insurance segment comprises Chubb's international life operations, Chubb Tempest Life Re (Chubb Life Re), and the North American supplemental A&H and life business of Combined Insurance. We assess the performance of our life business based on Life Insurance underwriting income, which includes Net investment income and (Gains) losses from fair value changes in separate account assets that do not qualify for separate account reporting under GAAP.

				% Change	
(in millions of U.S. dollars, except for percentages)	**2018**	2017	2016	2018 vs. 2017	2017 vs. 2016
Net premiums written	**$ 2,270**	$ 2,141	$ 2,124	6.1 %	0.8 %
Net premiums earned	**2,218**	2,101	2,055	5.6 %	2.2 %
Losses and loss expenses	**766**	739	663	3.7 %	11.5 %
Policy benefits (1)	**590**	676	588	(12.7)%	15.0 %
(Gains) losses from fair value changes in separate account assets (1)	**38**	(97)	(11)	NM	NM
Policy acquisition costs	**557**	530	509	5.1 %	4.1 %
Administrative expenses	**310**	303	307	2.3 %	(1.3)%
Net investment income	**341**	313	283	8.9 %	10.6 %
Life Insurance underwriting income	**298**	263	282	13.3 %	(6.7)%
Other (income) expense (1)	**(12)**	13	16	NM	(18.8)%
Amortization of purchased intangibles	**2**	2	3	—	(33.3)%
Segment income	**$ 308**	$ 248	$ 263	24.2 %	(5.7)%

NM – not meaningful

(1) (Gains) losses from fair value changes in separate account assets that do not qualify for separate account reporting under GAAP have been reclassified from Other income (expense) for purposes of presenting Life Insurance underwriting income. The offsetting movement in the separate account liabilities is included in Policy benefits.

Premiums

2018 vs. 2017

Net premiums written increased $129 million in 2018, or $123 million (5.7 percent) on a constant-dollar basis, primarily due to growth in our North American Combined Insurance supplemental A&H program business ($73 million), and Asian and Latin American international life operations ($58 million), partially offset by our life reinsurance business, which continues to decline as no new life reinsurance business is being written ($8 million).

2017 vs. 2016

Net premiums written increased $17 million in 2017, or $8 million (0.3 percent) on a constant-dollar basis, due to growth in our Asian international life operations and Combined Insurance supplemental A&H program business. This growth was partially offset by planned declines in our Latin American operations, reflecting merger-related actions of $37 million, and in our life reinsurance business, which continues to decline as no new business is being written.

Deposits

The following table presents deposits collected on universal life and investment contracts:

				% Change		
(in millions of U.S. dollars, except for percentages)	**2018**	2017	2016	2018 vs. 2017	C$ (1) 2018 vs. 2017	2017 vs. 2016
Deposits collected on universal life and investment contracts	**$ 1,538**	$ 1,436	$ 1,006	7.1%	6.0%	42.7%

(1) On a constant-dollar basis. Amounts are calculated by translating prior period results using the same local currency rates as the comparable current period.

Deposits collected on universal life and investment contracts (life deposits) are not reflected as revenues in our Consolidated statements of operations in accordance with GAAP. New life deposits are an important component of production, and although they do not significantly affect current period income from operations they are key to our efforts to grow our business. Life deposits collected increased in 2018 due to growth in Korea, Taiwan, and Vietnam. Foreign exchange favorably impacted growth by $14 million in 2018.

Life deposits collected increased in 2017 due to growth in Taiwan, partially offset by a decline in Korea. Foreign exchange favorably impacted growth by $25 million in 2017.

Life Insurance underwriting income

Life Insurance underwriting income increased $35 million in 2018 compared to 2017 primarily due to an increase in net investment income as well as growth as described above.

Life Insurance underwriting income decreased $19 million in 2017 compared to 2016 primarily due to the adverse impact of updating our long-term benefit ratio in our variable annuity business in 2016 ($48 million). This decrease was partially offset by higher net investment income as well as improved margins in our international life operations and growth in our Combined North America operations.

Corporate

Corporate results primarily include the results of our non-insurance companies, income and expenses not attributable to reportable segments and loss and loss expenses of asbestos and environmental (A&E) liabilities.

Our exposure to A&E claims principally arises out of liabilities acquired when we purchased Westchester Specialty in 1998, CIGNA's P&C business in 1999, and legacy Chubb Corp A&E claims in 2016. Corporate staff expenses and net investment income of Chubb Limited, including the amortization of the fair value adjustment on acquired invested assets and debt, interest expense, amortization of purchased intangibles related to the Chubb Corp acquisition, Chubb integration expenses and other merger related expenses and the one-time pension curtailment benefit related to the harmonization of our U.S. pension plans are reported within Corporate.

				% Change	
(in millions of U.S. dollars, except for percentages)	**2018**	2017	2016	2018 vs. 2017	2017 vs. 2016
Losses and loss expenses	**$ 53**	$ 285	$ 169	(81.4)%	68.6 %
Administrative expenses	**295**	267	183	10.5 %	45.9 %
Underwriting loss	**348**	552	352	(37.0)%	56.8 %
Net investment income (loss)	**(209)**	(283)	(368)	(26.1)%	(23.1)%
Interest expense	**641**	607	605	5.6 %	0.3 %
Adjusted net realized gains (losses)	**(649)**	91	(140)	NM	NM
Other (income) expense	**(406)**	(318)	(217)	27.7 %	46.5 %
Amortization expense (benefit) of purchased intangibles	**255**	168	(80)	51.8 %	NM
Chubb integration expenses	**59**	310	492	(81.0)%	(37.0)%
Income tax expense (benefit)	**695**	(139)	815	NM	NM
Net loss	**$ (2,450)**	$ (1,372)	$ (2,475)	78.6 %	(44.6)%

NM – not meaningful

Losses and loss expenses decreased $232 million in 2018 primarily due to lower adverse development related to Brandywine asbestos and environmental exposures of $134 million compared to $170 million in the prior year as well as favorable reinsurance settlements in the current year of $205 million. Refer to Note 6 of the Consolidated Financial Statements for further information.

Losses and loss expenses increased $116 million in 2017 primarily due to higher adverse development related to Brandywine asbestos and environmental exposures. Additionally, during the fourth quarter of 2016, we amended several of our U.S. retirement programs as part of a harmonization effort that moved us towards a more unified retirement savings approach. This resulted in a one-time pension curtailment benefit of $113 million, $23 million of which was related to claims staff and was therefore recorded in losses and loss expenses in the above table. Refer to Note 12 to the Consolidated Financial Statements for further discussion of the pension curtailment.

Administrative expenses were higher by $28 million in 2018 compared to 2017, primarily due to increased spending to support overall company growth and higher global advertising expenses.

Administrative expenses were higher by $84 million in 2017 compared to 2016 which included the one-time pension curtailment benefit in 2016 discussed above, of which $90 million reduced administrative expenses in 2016. This increase was partially offset by integration-related expense savings ($34 million) and lower post-retirement benefit expenses ($7 million).

Chubb integration expenses are one-time in nature and are not related to the on-going business activities of the segments. The Chief Executive Officer does not manage segment results or allocate resources to segments when considering these costs and they are therefore excluded from our definition of segment income. Chubb integration expenses for 2018 were $59 million, compared to $310 million and $492 million for 2017 and 2016, respectively. These expenses principally consisted of personnel-related expenses and rebranding ($18 million and $14 million, respectively) in 2018, and personnel-related expenses ($168 million and $181 million) and Consulting fees ($64 million and $125 million) in 2017 and 2016, respectively.

Refer to the respective sections that follow for a discussion of Net investment income, Interest expense, Other (income) expense, Net realized gains and losses, Amortization of purchased intangibles, and Income tax expense.

Effective income tax rate

Our effective income tax rate reflects a mix of income or losses in jurisdictions with a wide range of tax rates, permanent differences between US GAAP and local tax laws, and the timing of recording discrete items. A change in the geographic mix of earnings could impact our effective tax rate.

In 2018, 2017, and 2016, our effective income tax rate was 14.9 percent, (3.7) percent, and 16.5 percent, respectively. The effective income tax rate in 2018 was favorably impacted by the reduced U.S. Federal income tax rate resulting from the passage of the Tax Cuts and Jobs Act (2017 Tax Act) and an increase to the provisional benefit recorded related to the impact of the 2017 Tax Act. The effective income tax rate in 2017 included the favorable income tax benefit of $450 million, which represented our best estimate of the impact of the 2017 Tax Act. In addition, the income tax benefit in 2017 reflected the significant catastrophe losses in the year. Refer to Note 7 to the Consolidated Financial Statements for additional information on the 2017 Tax Act.

The 2017 Tax Act included provisions for Global Intangible Low-Taxed Income (GILTI) under which taxes may be imposed on income of foreign subsidiaries and for a Base Erosion and Anti-Abuse Tax (BEAT) under which taxes may be imposed on certain payments to affiliated foreign companies. There remain substantial uncertainties in the interpretation of BEAT and GILTI and the formal guidance issued to date is still in proposed form. Finalization of the proposed guidance, and changes to the interpretations and assumptions of these provisions may impact amounts recorded with respect to the international provisions of the 2017 Tax Act, which may be material in the period the adjustment is recorded.

Our effective income tax rate reflects the lower corporate tax rates that prevailed outside the United States on income attributed to certain foreign operations, including 7.83 percent in Switzerland, 0.0 percent in Bermuda, and 19.0 percent in the U.K. During 2018, approximately 51 percent of our total pre-tax income was tax effected based on these lower rates compared with 62 percent and 54 percent in 2017 and 2016, respectively.

Non-GAAP Reconciliation

In presenting our results, we included and discussed certain non-GAAP measures. These non-GAAP measures, which may be defined differently by other companies, are important for an understanding of our overall results of operations and financial condition. However, they should not be viewed as a substitute for measures determined in accordance with generally accepted accounting principles (GAAP).

We provide financial measures, including net premiums written, net premiums earned, and underwriting income on a constant-dollar basis. We believe it is useful to evaluate the trends in these measures exclusive of the effect of fluctuations in exchange rates between the U.S. dollar and the currencies in which our international business is transacted, as these exchange rates could fluctuate significantly between periods and distort the analysis of trends. The impact is determined by assuming constant foreign exchange rates between periods by translating prior period results using the same local currency exchange rates as the comparable current period.

P&C performance metrics are non-GAAP financial measures and comprise consolidated operating results (including Corporate) and exclude the operating results of the Life Insurance segment. We believe that these measures are useful and meaningful to investors as they are used by management to assess the company's P&C operations which are the most economically similar. We exclude the Life Insurance segment because the results of this business do not always correlate with the results of our P&C operations.

The P&C combined ratio is a non-GAAP financial measure and includes the impact of realized gains and losses on crop derivatives. These derivatives were purchased to provide economic benefit, in a manner similar to reinsurance protection, in the event that a significant decline in commodity pricing will impact underwriting results. We view gains and losses on these derivatives as part of the results of our underwriting operations. The P&C combined ratio also excludes the one-time pension curtailment benefit recognized in 2016.

CAY P&C combined ratio excluding catastrophe losses (CATs) is a non-GAAP financial measure which excludes CATs and prior period development (PPD). We exclude CATs as they are not predictable as to timing and amount and PPD as these unexpected loss developments on historical reserves are not indicative of our current underwriting performance. The combined ratio numerator is adjusted to exclude net premiums earned adjustments on PPD, prior period expense adjustments and reinstatement premiums on PPD, and the denominator is adjusted to exclude net premiums earned adjustments on PPD and reinstatement premiums on CATs and PPD. In periods where there are adjustments on loss sensitive policies, these adjustments are excluded from PPD and net premiums earned when calculating the ratios. We believe this measure provides a better evaluation of our underwriting performance and enhances the understanding of the trends in our P&C business that may be obscured by these items. This measure is commonly reported among our peer companies and allows for a better comparison.

Reinstatement premiums are additional premiums paid on certain reinsurance agreements in order to reinstate coverage that had been exhausted by loss occurrences. The reinstatement premium amount is typically a pro rata portion of the original ceded premium paid based on how much of the reinsurance limit had been exhausted.

Net premiums earned adjustments within PPD are adjustments to the initial premium earned on retrospectively rated policies based on actual claim experience that develops after the policy period ends. The premium adjustments correlate to the prior period loss development on these same policies and are fully earned in the period the adjustments are recorded.

Prior period expense adjustments typically relate to either profit commission reserves or policyholder dividend reserves based on actual claim experience that develops after the policy period ends. The expense adjustments correlate to the prior period loss development on these same policies.

P&C combined ratio with expected level of CATs and CAY P&C combined ratio with expected level of CATs are non-GAAP financial measures which excludes CATs above or below managements' view of typical CATs for that period. An expected level of CATs is determined based on various factors, including historical experience, seasonal patterns, and consideration of both modeled CATs (e.g., windstorm and earthquake) as well as non-modeled CATs (e.g., wildfires, floods and freeze). For the years ended December 31, 2018 and 2017, based on these and other factors, the expected level of CATs was $937 million and $908 million, respectively, resulting in CATs above expected level of $689 million and $1,838 million, respectively. We believe that these measures are meaningful and provide a better indication of our underwriting performance as the portion of CATs intended to be covered by the premiums over time is retained in the calculation. These measures more appropriately align the numerator with an expected level of CATs to the denominator which includes the net premiums earned on policies with exposures to that business. The CAY P&C combined ratio with an expected level of CATs excludes PPD as these unexpected loss developments on historical reserves are not indicative of our current underwriting performance.

The following tables present the calculation of combined ratio, as reported for each segment to P&C combined ratio, adjusted for catastrophe losses (CATs) and PPD:

For the Year Ended December 31, 2018 (in millions of U.S. dollars except for ratios)		North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Corporate	Total P&C
Numerator								
Losses and loss expenses								
Losses and loss expenses		$ 8,000	$ 3,229	$ 1,111	$4,429	$ 479	$ 53	$17,301
Realized (gains) losses on crop derivatives		—	—	3	—	—	—	3
Adjusted losses and loss expenses	A	$ 8,000	$ 3,229	$ 1,114	$4,429	$ 479	$ 53	$17,304
Catastrophe losses		(579)	(611)	(21)	(206)	(205)	—	(1,622)
PPD and related adjustments								
PPD, net of related adjustments - favorable (unfavorable)		610	(41)	110	212	50	(45)	896
Net premiums earned adjustments on PPD - unfavorable (favorable)		29	—	40	—	8	—	77
Expense adjustments - unfavorable (favorable)		7	—	(10)	—	(1)	—	(4)
PPD reinstatement premiums - unfavorable (favorable)		7	1	—	4	—	—	12
PPD - gross of related adjustments - favorable (unfavorable)		653	(40)	140	216	57	(45)	981
CAY loss and loss expense ex CATs	B	$ 8,074	$ 2,578	$ 1,233	$4,439	$ 331	$ 8	$16,663
Policy acquisition costs and administrative expenses								
Policy acquisition costs and administrative expenses	C	$ 2,795	$ 1,208	$ 70	$3,360	$ 203	$ 295	$ 7,931
Expense adjustments - favorable (unfavorable)		(7)	—	10	—	1	—	4
Policy acquisition costs and administrative expenses, adjusted	D	$ 2,788	$ 1,208	$ 80	$3,360	$ 204	$ 295	$ 7,935
Denominator								
Net premiums earned	E	$12,402	$ 4,593	$ 1,569	$8,612	$ 670		$27,846
Reinstatement premiums (collected) expensed on catastrophe losses		—	26	—	—	(22)		4
Net premiums earned adjustments on PPD - unfavorable (favorable)		29	—	40	—	8		77
PPD reinstatement premiums - unfavorable (favorable)		7	1	—	4	—		12
Net premiums earned excluding adjustments	F	$12,438	$ 4,620	$ 1,609	$8,616	$ 656		$27,939
P&C Combined ratio								
Losses and loss expense ratio	A/E	64.5%	70.3%	71.0%	51.4%	71.6%		62.1%
Policy acquisition cost and administrative expense ratio	C/E	22.5%	26.3%	4.5%	39.0%	30.2%		28.5%
P&C Combined ratio		87.0%	96.6%	75.5%	90.4%	101.8%		90.6%
CAY P&C Combined ratio ex CATs								
Loss and loss expense ratio, adjusted	B/F	64.9%	55.8%	76.7%	51.5%	50.5%		59.6%
Policy acquisition cost and administrative expense ratio, adjusted	D/F	22.4%	26.1%	4.9%	39.0%	31.1%		28.4%
CAY P&C Combined ratio ex CATs		87.3%	81.9%	81.6%	90.5%	81.6%		88.0%
Combined ratio								
Combined ratio								90.6%
Add: impact of gains and losses on crop derivatives								—
P&C Combined ratio								90.6%

Note: The ratios above are calculated using whole U.S. dollars. Accordingly, calculations using rounded amounts may differ. Letters A, B, C, D, E and F included in the table are references for calculating the ratios above.

For the Year Ended December 31, 2017 (in millions of U.S. dollars except for ratios)		North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Corporate	Total P&C
Numerator								
Losses and loss expenses								
Losses and loss expenses		$ 8,287	$3,265	$ 1,036	$ 4,281	$ 561	$ 285	$17,715
Realized (gains) losses on crop derivatives		—	—	7	—	—	—	7
Adjusted losses and loss expenses	**A**	$ 8,287	$3,265	$ 1,043	$ 4,281	$ 561	$ 285	$17,722
Catastrophe losses		(1,220)	(871)	(18)	(331)	(313)	—	(2,753)
PPD and related adjustments								
PPD, net of related adjustments - favorable (unfavorable)		746	(69)	119	252	59	(278)	829
Net premiums earned adjustments on PPD - unfavorable (favorable)		42	—	66	—	(4)	—	104
Expense adjustments - unfavorable (favorable)		6	—	(11)	—	—	—	(5)
PPD reinstatement premiums - unfavorable (favorable)		9	—	—	—	—	—	9
PPD - gross of related adjustments - favorable (unfavorable)		803	(69)	174	252	55	(278)	937
CAY loss and loss expense ex CATs	**B**	$ 7,870	$2,325	$ 1,199	$ 4,202	$ 303	$ 7	$15,906
Policy acquisition costs and administrative expenses								
Policy acquisition costs and administrative expenses	**C**	$ 2,854	$1,163	$ 73	$ 3,203	$ 221	$ 267	$ 7,781
Expense adjustments - favorable (unfavorable)		(6)	—	11	—	—	—	5
Policy acquisition costs and administrative expenses, adjusted	**D**	$ 2,848	$1,163	$ 84	$ 3,203	$ 221	$ 267	$ 7,786
Denominator								
Net premiums earned	**E**	$12,191	$4,399	$ 1,508	$ 8,131	$ 704		$26,933
Reinstatement premiums (collected) expensed on catastrophe losses		4	22	—	4	(37)		(7)
Net premiums earned adjustments on PPD - unfavorable (favorable)		42	—	66	—	(4)		104
PPD reinstatement premiums - unfavorable (favorable)		9	—	—	—	—		9
Net premiums earned excluding adjustments	**F**	$12,246	$4,421	$ 1,574	$ 8,135	$ 663		$27,039
P&C Combined ratio								
Losses and loss expense ratio	**A/E**	68.0%	74.2%	69.2%	52.6%	79.8%		65.8%
Policy acquisition cost and administrative expense ratio	**C/E**	23.4%	26.5%	4.8%	39.4%	31.4%		28.9%
P&C Combined ratio		91.4%	100.7%	74.0%	92.0%	111.2%		94.7%
CAY P&C Combined ratio ex CATs								
Loss and loss expense ratio, adjusted	**B/F**	64.3%	52.6%	76.2%	51.7%	46.0%		58.8%
Policy acquisition cost and administrative expense ratio, adjusted	**D/F**	23.2%	26.3%	5.3%	39.3%	33.2%		28.8%
CAY P&C Combined ratio ex CATs		87.5%	78.9%	81.5%	91.0%	79.2%		87.6%
Combined ratio								
Combined ratio								94.7%
Add: impact of gains and losses on crop derivatives								—
P&C Combined ratio								94.7%

Note: The ratios above are calculated using whole U.S. dollars. Accordingly, calculations using rounded amounts may differ. Letters A, B, C, D, E and F included in the table are references for calculating the ratios above.

Adjusted interest expense and adjusted net investment income are non-GAAP financial measures which exclude amortization of the fair value adjustment on assumed long-term debt and acquired invested assets, respectively, related to the Chubb Corp acquisition due to the size and complexity of this acquisition. Refer to the Interest Expense section for a reconciliation of interest expense to adjusted interest expense.

The following table presents a reconciliation of the 2019 quarterly expected net investment income range to the 2019 quarterly expected adjusted net investment income range:

(in millions of U.S. dollars)	2019 Per Quarter
Expected net investment income range, pre-tax	$825 to $835
Expected amortization expense of the fair value adjustment on acquired invested assets, pre-tax	$55
Expected adjusted net investment income range, pre-tax	$880 to $890

"2016 Comparative basis" is the combined legacy ACE and legacy Chubb Corp results, excluding the impact of the unearned premium reserves intangible amortization and the elimination of the historical policy acquisition costs as a result of purchase accounting related to the Chubb Corp acquisition in order to present the underlying profitability of our insurance business for the entire relevant periods. The combined company results for the year ended December 31, 2016 are inclusive of the first 14 days of January 2016 (the Chubb Corp acquisition was completed on January 14, 2016). We believe this measure provides visibility into our results, allows for comparability to our historical results and is consistent with how management evaluates results. The following tables present a reconciliation of 2016 actual results to "2016 Comparative basis":

(in millions of U.S. dollars)	North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Life Insurance	Consolidated
Net premiums written							
2016 Net premiums written	$ 11,740	$ 4,153	$ 1,328	$ 8,124	$ 676	$ 2,124	$ 28,145
14 day stub period	519	100	—	215	20	1	855
2016 Comparative basis	$ 12,259	$ 4,253	$ 1,328	$ 8,339	$ 696	$ 2,125	$ 29,000
Net premiums earned							
2016 Net premiums earned	$ 12,217	$ 4,319	$ 1,316	$ 8,132	$ 710	$ 2,055	$ 28,749
14 day stub period	208	110	—	71	—	2	391
2016 Comparative basis	$ 12,425	$ 4,429	$ 1,316	$ 8,203	$ 710	$ 2,057	$ 29,140

(in millions of U.S. dollars)	North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Corporate	Total P&C
Loss and loss expenses							
2016 Loss and loss expenses	$ 7,439	$ 2,558	$ 893	$ 4,005	$ 325	$ 169	$ 15,389
14 day stub period	127	53	—	42	—	—	222
(Gain) loss on crop derivatives	—	—	5	—	—	—	5
Pension curtailment benefit	—	—	—	—	—	23	23
2016 Comparative basis	$ 7,566	$ 2,611	$ 898	$ 4,047	$ 325	$ 192	$ 15,639
Policy acquisition costs							
2016 Policy acquisition costs	$ 2,023	$ 966	$ 83	$ 2,136	$ 187	$ —	$ 5,395
Amortization of acquired UPR intangible asset	(859)	(492)	—	(208)	—	—	(1,559)
Elimination of deferred acquisition cost benefit	729	406	—	238	—	—	1,373
14 day stub period	33	14	—	13	—	—	60
2016 Comparative basis	$ 1,926	$ 894	$ 83	$ 2,179	$ 187	$ —	$ 5,269
Administrative expenses							
2016 Administrative expenses	$ 1,125	$ 363	$ (6)	$ 1,057	$ 52	$ 183	$ 2,774
Pension curtailment benefit	—	—	—	—	—	90	90
14 day stub period	35	13	—	12	—	3	63
2016 Comparative basis	$ 1,160	$ 376	$ (6)	$ 1,069	$ 52	$ 276	$ 2,927

Net Investment Income

(in millions of U.S. dollars, except for percentages)	2018	2017	2016
Average invested assets	**$ 101,453**	$ 99,675	$ 96,656
Net investment income [(1)]	**$ 3,305**	$ 3,125	$ 2,865
Yield on average invested assets	**3.3%**	3.1%	3.0%
Market yield on fixed maturities	**3.7%**	2.9%	2.8%

(1) Includes $248 million, $332 million and $393 million of amortization expense related to the fair value adjustment of acquired invested assets related to the Chubb Corp acquisition in 2018, 2017 and 2016, respectively.

Net investment income is influenced by a number of factors including the amounts and timing of inward and outward cash flows, the level of interest rates, and changes in overall asset allocation. Net investment income increased 5.8 percent in 2018 compared with 2017, primarily due to higher reinvestment rates offset by lower private equity distributions. Net investment income increased 9.1 percent in 2017 compared with 2016, primarily reflecting higher private equity distributions that included a $44 million final distribution from a co-investment with one of our private equity fund partners and a higher overall invested asset base. Refer to Note 2 g) to the Consolidated Financial Statements for additional information.

Net Realized and Unrealized Gains (Losses)

We take a long-term view with our investment strategy, and our investment managers manage our investment portfolio to maximize total return within certain specific guidelines designed to minimize risk. The majority of our investment portfolio is available for sale and reported at fair value. Our held to maturity investment portfolio is reported at amortized cost. The effect of market movements on our fixed maturities portfolio impacts Net income (through Net realized gains (losses)) when securities are sold or when we record an Other-than-temporary impairment (OTTI) charge. For a further discussion related to how we assess OTTI for our fixed maturities, including credit-related OTTI, and the related impact on Net income, refer to Note 2 c) to the Consolidated Financial Statements. Effective January 1, 2018, we adopted new accounting guidance that requires the effect of changes in fair value of equity securities and cost-method private equity securities to be recognized immediately in Net income (through realized gains (losses)). Additionally, Net income is impacted through the reporting of changes in the fair value of derivatives, including financial futures, options, swaps, and GLB reinsurance. Changes in unrealized appreciation and depreciation on available for sale securities resulting from the revaluation of securities held, changes in cumulative foreign currency translation adjustment, and unrealized postretirement benefit obligations liability adjustment, are reported as separate components of Accumulated other comprehensive income (loss) in Shareholders' equity in the Consolidated balance sheets.

	Year Ended December 31						
	2018			2017			2016
(in millions of U.S. dollars)	**Net Realized Gains (Losses)**	**Net Unrealized Gains (Losses)**	**Net Impact**	Net Realized Gains (Losses)	Net Unrealized Gains (Losses)	Net Impact	Net Realized Gains (Losses)
Fixed maturities	**$ (302)**	**$ (1,996)**	**$ (2,298)**	$ (31)	$ 537	$ 506	$ (163)
Fixed income and equity derivatives	**(75)**	**—**	**(75)**	(11)	—	(11)	(33)
Public equity	**70**	**—**	**70**	16	88	104	44
Private equity	**121**	**—**	**121**	(11)	8	(3)	(4)
Mark-to-market on public and private equity	**(255)**	**—**	**(255)**	—	—	—	—
Total investment portfolio	**(441)**	**(1,996)**	**(2,437)**	(37)	633	596	(156)
Variable annuity reinsurance derivative transactions, net of applicable hedges	**(252)**	**—**	**(252)**	103	—	103	(83)
Other derivatives	**(3)**	**—**	**(3)**	(5)	—	(5)	(10)
Foreign exchange	**131**	**(802)**	**(671)**	36	471	507	118
Other	**(87)**	**(321)**	**(408)**	(13)	(16)	(29)	(14)
Net gains (losses), pre-tax	**$ (652)**	**$ (3,119)**	**$ (3,771)**	$ 84	$ 1,088	$ 1,172	$ (145)

For the year ended December 31, 2018, other-than-temporary impairments in Net realized gains (losses) include $49 million for fixed maturities. For the year ended December 31, 2017, other-than-temporary impairments in Net realized gains (losses) include $23 million for fixed maturities, $10 million for public equity, and $12 million for private equity. For the year ended December 31, 2016, other-than-temporary impairments in Net realized gains (losses) include $81 million for fixed maturities, $8 million for public equity, and $14 million for private equity.

The unrealized loss in fixed maturities of $2.0 billion, pre-tax, is principally driven by rising interest rates. Other net realized gains (losses) for the year ended December 31, 2018, included a $36 million loss from the extinguishment of debt as discussed in Note 8 to the Consolidated Financial Statements, a $24 million loss related to lease impairments, and a $23 million loss related to the impairment of fixed assets.

The variable annuity reinsurance derivative transactions resulted in realized gains (losses), due to the (increase) decrease in the fair value of GLB liabilities of $(248) million, $364 million, and $50 million for the years ended December 31, 2018, 2017, and 2016, respectively. The realized losses in 2018 reflected an increase in the fair value of GLB liabilities due to lower global equity market levels, the impact of discounting future claims for one less year and changes made to our valuation model relating to policyholder behavior. The realized gains in 2017 and 2016 reflected a decrease in the fair value of GLB liabilities due to higher global equity market levels and changes in assumptions on policyholder behavior, partially offset by the unfavorable impact of discounting future claims for one less year. Additionally, the realized gain in 2017 was also due to changes in interest rates assumptions.

As part of our loss mitigation strategy for our GLB exposures, we maintain positions in derivative instruments that decrease in fair value when the S&P 500 index increases. During the years ended December 31, 2018, 2017, and 2016, we experienced realized losses of $(4) million, $(261) million, and $(136) million, respectively, related to these derivative instruments.

Amortization of purchased intangibles and Other amortization

Amortization expense related to purchased intangibles were $339 million, $260 million, and $19 million for the years ended December 31, 2018, 2017, and 2016, respectively. The increase in amortization expense of purchased intangibles in 2018 and 2017 compared to 2016, primarily reflects a lower amortization benefit from the fair value adjustment on acquired Unpaid losses and loss expenses related to the Chubb Corp acquisition. The amortization of purchased intangibles is expected to be an expense of $298 million, or approximately $75 million each quarter, in 2019. Refer to Note 5 to the Consolidated Financial Statements under Item 8.

Reduction of deferred tax liability associated with intangible assets related to Other intangible assets (excluding the fair value adjustment on Unpaid losses and loss expense)
At December 31, 2018, the deferred tax liability associated with the Other intangible assets (excluding the fair value adjustment on Unpaid losses and loss expenses) was $1,360 million.

The following table presents, as of December 31, 2018, the expected reduction to the deferred tax liability associated with Other intangible assets (which reduces as agency distribution relationships and renewal rights, and other intangible assets amortize), at current foreign currency exchange rates for the next five years:

For the Years Ending December 31 (in millions of U.S. dollars)	Reduction to deferred tax liability associated with intangible assets
2019	$ 80
2020	70
2021	63
2022	57
2023	53
Total	$ 323

Amortization of the fair value adjustment on acquired invested assets and assumed long-term debt

The following table presents at December 31, 2018, the expected amortization expense of the fair value adjustment on acquired invested assets, at current foreign currency exchange rates, and the expected amortization benefit from the amortization of the fair value adjustment on assumed long-term debt for the next five years as follows:

For the Years Ending December 31 (in millions of U.S. dollars)		Acquired invested assets [(1)]		Assumed long-term debt [(2)]
2019	$	(225)	$	21
2020		(200)		21
2021		(95)		21
2022		—		21
2023		—		21
Total	$	(520)	$	105

(1) Recorded as a reduction to Net investment income in the Consolidated statements of operations.

(2) Recorded as a reduction to Interest expense in the Consolidated statements of operations.

The estimate of amortization expense of the fair value adjustment on acquired invested assets could vary materially based on current market conditions, bond calls, overall duration of the acquired investment portfolio, and foreign exchange.

Interest Expense

The following table presents our pre-tax interest expense for the years ended December 31, 2018 and 2017. Also presented below is our estimated pre-tax interest expense for the year ended December 31, 2019 based on our existing debt obligations and fees based on our expected usage of certain facilities.

	Estimated Interest Expense										Actual Interest Expense			
(in millions of U.S. dollars)		First Quarter 2019		Second Quarter 2019		Third Quarter 2019		Fourth Quarter 2019		Full Year 2019		**Full Year 2018**		Full Year 2017
Fixed interest expense based on outstanding debt	$	124	$	123	$	116	$	117	$	480	**$**	**520**	$	560
Variable interest expense based on expected usage		22		25		26		27		100		**154**		96
Adjusted interest expense	$	146	$	148	$	142	$	144	$	580	**$**	**674**	$	656
Amortization of the fair value of debt assumed in the Chubb Corp acquisition		(5)		(5)		(5)		(6)		(21)		**(33)**		(49)
Total interest expense, including amortization of the fair value of debt	$	141	$	143	$	137	$	138	$	559	**$**	**641**	$	607

Estimated 2019 fixed interest expense assumes that the $500 million 5.9 percent senior note, due June 15, 2019, matured and was fully paid. Estimated variable interest expense is based on expected usage and current interest rates and may fluctuate.

Investments

Our investment portfolio is invested primarily in publicly traded, investment grade, fixed income securities with an average credit quality of A/Aa as rated by the independent investment rating services Standard and Poor's (S&P)/ Moody's Investors Service (Moody's). The portfolio is externally managed by independent, professional investment managers and is broadly diversified across geographies, sectors, and issuers. Other investments principally comprise direct investments, investment funds, and limited partnerships. We hold no collateralized debt obligations in our investment portfolio, and we provide no credit default protection. We have long-standing global credit limits for our entire portfolio across the organization. Exposures are aggregated, monitored, and actively managed by our Global Credit Committee, comprising senior executives, including our Chief Financial Officer, our Chief Risk Officer, our Chief Investment Officer, and our Treasurer. We also have well-established, strict contractual investment rules requiring managers to maintain highly diversified exposures to individual issuers and closely monitor investment manager compliance with portfolio guidelines.

The average duration of our fixed income securities, including the effect of options and swaps, was 3.7 years and 4.2 years at December 31, 2018 and 2017, respectively. We estimate that a 100 basis point (bps) increase in interest rates would reduce the valuation of our fixed income portfolio by approximately $3.5 billion at December 31, 2018.

The following table shows the fair value and cost/amortized cost of our invested assets:

	December 31, 2018		December 31, 2017	
(in millions of U.S. dollars)	**Fair Value**	**Cost/ Amortized Cost**	Fair Value	Cost/ Amortized Cost
Fixed maturities available for sale	**$ 78,470**	**$ 79,323**	$ 78,939	$ 77,835
Fixed maturities held to maturity	**13,259**	**13,435**	14,474	14,335
Short-term investments	**3,016**	**3,016**	3,561	3,561
	94,745	**95,774**	96,974	95,731
Equity securities [1]	**770**	**770**	937	737
Other investments [1]	**5,277**	**5,277**	4,672	4,417
Total investments	**$ 100,792**	**$ 101,821**	$ 102,583	$ 100,885

(1) Effective Q1 2018, we adopted new accounting guidance that requires any changes in fair value of equity securities and other investments that are accounted for under the cost-method to be recognized immediately in net income. Therefore, the amortized cost of these investments is equal to their fair value at December 31, 2018.

The fair value of our total investments decreased $1.8 billion during the year ended December 31, 2018, primarily due to unrealized depreciation driven by rising interest rates, the payment of dividends on our Common Shares, share repurchases, and unfavorable foreign currency movement. This decrease was partially offset by the investing of operating cash flows and the investing of net proceeds from the debt issuance, net of debt repayment.

The following tables present the market value of our fixed maturities and short-term investments at December 31, 2018 and 2017. The first table lists investments according to type and the second according to S&P credit rating:

	December 31, 2018		December 31, 2017	
(in millions of U.S. dollars, except for percentages)	**Market Value**	**% of Total**	Market Value	% of Total
Treasury	**$ 4,799**	**5%**	$ 4,049	4%
Agency	**528**	**1%**	564	1%
Corporate and asset-backed securities	**29,091**	**31%**	27,215	28%
Mortgage-backed securities	**18,026**	**19%**	18,032	19%
Municipal	**16,327**	**17%**	20,766	21%
Non-U.S.	**22,958**	**24%**	22,787	23%
Short-term investments	**3,016**	**3%**	3,561	4%
Total	**$ 94,745**	**100%**	$ 96,974	100%
AAA	**$ 14,571**	**15%**	$ 15,512	16%
AA	**36,715**	**39%**	37,407	39%
A	**17,253**	**18%**	18,369	19%
BBB	**12,035**	**13%**	12,377	13%
BB	**8,363**	**9%**	7,941	8%
B	**5,596**	**6%**	5,135	5%
Other	**212**	**—**	233	—
Total	**$ 94,745**	**100%**	$ 96,974	100%

Corporate and asset-backed securities

The following table presents our 10 largest global exposures to corporate bonds by market value at December 31, 2018:

(in millions of U.S. dollars)	Market Value
Wells Fargo & Co	$ 557
Bank of America Corp	465
JP Morgan Chase & Co	443
Comcast Corp	365
Goldman Sachs Group Inc	351
AT&T Inc	340
HSBC Holdings Plc	339
Anheuser-Busch InBev NV	337
Verizon Communications Inc	331
Morgan Stanley	292

Mortgage-backed securities

	S&P Credit Rating					Market Value	Amortized Cost
December 31, 2018 (in millions of U.S. dollars)	AAA	AA	A	BBB	BB and below	Total	Total
Agency residential mortgage-backed (RMBS)	$ —	$ 14,686	$ —	$ —	$ —	$ 14,686	$ 14,896
Non-agency RMBS	26	48	68	27	20	189	189
Commercial mortgage-backed	2,809	243	99	—	—	3,151	3,197
Total mortgage-backed securities	$ 2,835	$ 14,977	$ 167	$ 27	$ 20	$ 18,026	$ 18,282

Municipal

As part of our overall investment strategy, we may invest in states, municipalities, and other political subdivisions fixed maturity securities (Municipal). We apply the same investment selection process described previously to our Municipal investments. The portfolio is highly diversified primarily in state general obligation bonds and essential service revenue bonds including education and utilities (water, power, and sewers).

Non-U.S.

Our exposure to the Euro results primarily from Chubb European Group SE which is headquartered in France and offers a broad range of coverages throughout the European Union, Central, and Eastern Europe. Chubb primarily invests in Euro denominated investments to support its local currency insurance obligations and required capital levels. Chubb's local currency investment portfolios have strict contractual investment guidelines requiring managers to maintain a high quality and diversified portfolio to both sector and individual issuers. Investment portfolios are monitored daily to ensure investment manager compliance with portfolio guidelines.

Our non-U.S. investment grade fixed income portfolios are currency-matched with the insurance liabilities of our non-U.S. operations. The average credit quality of our non-U.S. fixed income securities is A and 50 percent of our holdings are rated AAA or guaranteed by governments or quasi-government agencies. Within the context of these investment portfolios, our government and corporate bond holdings are highly diversified across industries and geographies. Issuer limits are based on credit rating (AA—two percent, A—one percent, BBB—0.5 percent of the total portfolio) and are monitored daily via an internal compliance system. We manage our indirect exposure using the same credit rating based investment approach. Accordingly, we do not believe our indirect exposure is material.

The following table summarizes the market value and amortized cost of our non-U.S. fixed income portfolio by country/ sovereign for non-U.S. government securities at December 31, 2018:

(in millions of U.S. dollars)	Market Value	Amortized Cost
United Kingdom	$ 1,064	$ 1,053
Republic of Korea	1,055	950
Canada	831	837
Federative Republic of Brazil	707	700
Province of Ontario	644	648
Province of Quebec	502	504
United Mexican States	487	502
Kingdom of Thailand	460	439
Commonwealth of Australia	308	289
Federal Republic of Germany	304	295
Other Non-U.S. Government Securities (1)	4,319	4,306
Total	$ 10,681	$ 10,523

(1) There are no investments in Portugal, Ireland, Italy, Greece or Spain.

The following table summarizes the market value and amortized cost of our non-U.S. fixed income portfolio by country/ sovereign for non-U.S. corporate securities at December 31, 2018:

(in millions of U.S. dollars)	Market Value	Amortized Cost
United Kingdom	$ 1,924	$ 1,936
Canada	1,479	1,506
United States (1)	1,141	1,176
France	1,014	1,018
Australia	823	817
Netherlands	671	674
Germany	525	524
Japan	484	486
Switzerland	469	474
China	373	374
Other Non-U.S. Corporate Securities	3,374	3,411
Total	$ 12,277	$ 12,396

(1) The countries that are listed in the non-U.S. corporate fixed income portfolio above represent the ultimate parent company's country of risk. Non-U.S. corporate securities could be issued by foreign subsidiaries of U.S. corporations.

Below-investment grade corporate fixed income portfolio

Below-investment grade securities have different characteristics than investment grade corporate debt securities. Risk of loss from default by the borrower is greater with below-investment grade securities. Below-investment grade securities are generally unsecured and are often subordinated to other creditors of the issuer. Also, issuers of below-investment grade securities usually have higher levels of debt and are more sensitive to adverse economic conditions, such as recession or increasing interest rates, than investment grade issuers. At December 31, 2018, our corporate fixed income investment portfolio included below-investment grade and non-rated securities which, in total, comprised approximately 13 percent of our fixed income portfolio. Our below-investment grade and non-rated portfolio includes over 1,200 issuers, with the greatest single exposure being $128 million.

We manage high-yield bonds as a distinct and separate asset class from investment grade bonds. The allocation to high-yield bonds is explicitly set by internal management and is targeted to securities in the upper tier of credit quality (BB/B). Our minimum rating for initial purchase is BB/B. Ten external investment managers are responsible for high-yield security selection and portfolio construction. Our high-yield managers have a conservative approach to credit selection and very low historical default experience. Holdings are highly diversified across industries and generally subject to a 1.5 percent issuer limit as a percentage of high-yield allocation. We monitor position limits daily through an internal compliance system. Derivative and structured securities (e.g., credit default swaps and collateralized loan obligations) are not permitted in the high-yield portfolio.

Asbestos and Environmental (A&E)

Asbestos and environmental (A&E) reserving considerations

For asbestos, Chubb faces claims relating to policies issued to manufacturers, distributors, installers, and other parties in the chain of commerce for asbestos and products containing asbestos. Claimants will generally allege damages across an extended time period which may coincide with multiple policies covering a wide range of time periods for a single insured.

Environmental claims present exposure for remediation and defense costs associated with the contamination of property as a result of pollution.

The following table presents count information for asbestos claims by causative agent and environmental claims by account, for direct policies only:

	Asbestos (by causative agent)		Environmental (by account)	
	2018	2017 [(1)]	**2018**	2017 [(1)]
Open at beginning of year	**1,789**	1,822	**1,349**	1,419
Newly reported/reopened	**188**	166	**149**	133
Closed or otherwise disposed	**139**	199	**137**	203
Open at end of year	**1,838**	1,789	**1,361**	1,349

(1) 2017 was revised to conform to current year presentation.

Survival ratios are calculated by dividing the asbestos or environmental loss and allocated loss adjustment expense (ALAE) reserves by the average asbestos or environmental loss and ALAE payments for the three most recent calendar years (3-year survival ratio). The 3-year survival ratios for gross and net Asbestos loss and ALAE reserves were 4.4 years and 4.9 years, respectively. The 3-year survival ratios for gross and net Environmental loss and ALAE reserves were 5.4 years and 17.6 years, respectively. The net 3-year survival ratios were impacted by favorable reinsurance settlements in 2018. Excluding the settlements, the 3-year survival ratio for net Asbestos loss and ALAE reserves and net Environmental loss and ALAE reserves were 4.7 years and 5.7 years, respectively. Refer to the PPD section in Note 6 to the consolidated financial statements for additional information on the settlements. The survival ratios provide only a very rough depiction of reserves and are significantly impacted by a number of factors such as aggressive settlement practices, variations in gross to ceded relationships within the asbestos or environmental claims, and levels of coverage provided. We, therefore, urge caution in using these very simplistic ratios to gauge reserve adequacy.

Catastrophe Management

We actively monitor and manage our catastrophe risk accumulation around the world such as setting risk limits based on probable maximum loss (PML) and purchasing catastrophe reinsurance. The table below presents our modeled pre-tax estimates of natural catastrophe PML, net of reinsurance, at December 31, 2018, for Worldwide, U.S. hurricane and California earthquake events, based on our in-force portfolio at October 1, 2018 and reflecting the April 1, 2018 reinsurance program (see Natural Catastrophe Property Reinsurance Program section) as well as inuring reinsurance protection coverages. According to the model, for the 1-in-100 return period scenario, there is a one percent chance that our annual aggregate losses incurred in any year from U.S. hurricane events could be in excess of $2,730 million (or 5.4 percent of our total shareholders' equity at December 31, 2018).

	Modeled Net Probable Maximum Loss (PML)					
	Worldwide [(1)] Annual Aggregate		U.S. Hurricane [(2)] Annual Aggregate		California Earthquake [(3)] Single Occurrence	
(in millions of U.S. dollars, except for percentages)	**Chubb**	**% of Total Shareholders' Equity**	**Chubb**	**% of Total Shareholders' Equity**	**Chubb**	**% of Total Shareholders' Equity**
1-in-10	$ 1,884	3.7%	$ 1,078	2.1%	$ 128	0.3%
1-in-100	$ 3,880	7.7%	$ 2,730	5.4%	$ 1,361	2.7%
1-in-250	$ 6,195	12.3%	$ 4,830	9.6%	$ 1,493	3.0%

(1) Worldwide losses are comprised of losses arising only from hurricanes, typhoons, convective storms and earthquakes and do not include "non-modeled" perils such as wildfire and flood.

(2) U.S. Hurricane losses include losses from wind and storm-surge and exclude rainfall.

(3) California earthquakes include fire-following perils.

The above estimates of Chubb's loss profile are inherently uncertain for many reasons, including the following:

- While the use of third-party catastrophe modeling packages to simulate potential hurricane and earthquake losses is prevalent within the insurance industry, the models are reliant upon significant meteorology, seismology, and engineering assumptions to estimate catastrophe losses. In particular, modeled catastrophe events are not always a representation of actual events and ensuing additional loss potential;
- There is no universal standard in the preparation of insured data for use in the models, the running of the modeling software and interpretation of loss output. These loss estimates do not represent our potential maximum exposures and it is highly likely that our actual incurred losses would vary materially from the modeled estimates; and
- The potential effects of climate change add to modeling complexity.

Natural Catastrophe Property Reinsurance Program

Chubb's core property catastrophe reinsurance program provides protection against natural catastrophes impacting its primary property operations (i.e., excluding our Global Reinsurance and Life Insurance segments).

We regularly review our reinsurance protection and corresponding property catastrophe exposures. This may or may not lead to the purchase of additional reinsurance prior to a program's renewal date. In addition, prior to each renewal date, we consider how much, if any, coverage we intend to buy and we may make material changes to the current structure in light of various factors, including modeled PML assessment at various return periods, reinsurance pricing, our risk tolerance and exposures, and various other structuring considerations.

Chubb renewed its Global Property Catastrophe Reinsurance Program for our North American and International operations effective April 1, 2018 through March 31, 2019, with no significant change in coverage from the expiring program. The program consists of three layers in excess of losses retained by Chubb on a per occurrence basis. In addition, Chubb also renewed its terrorism coverage (excluding nuclear, biological, chemical and radiation coverage, with an inclusion of coverage for biological and chemical coverage for personal lines) for the United States from April 1, 2018 through March 31, 2019 with the same limits and retention and percentage placed except that the majority of terrorism coverage is on an aggregate basis above our retentions without a reinstatement.

Natural Catastrophe Property Reinsurance Program

Loss Location	Layer of Loss	Comments	Notes
United States (excluding Alaska and Hawaii)	$0 million – $1.0 billion	Losses retained by Chubb	(a)
United States (excluding Alaska and Hawaii)	$1.0 billion – $1.25 billion	All natural perils and terrorism	(b)
United States (excluding Alaska and Hawaii)	$1.25 billion – $2.0 billion	All natural perils and terrorism	(c)
United States (excluding Alaska and Hawaii)	$2.0 billion – $3.5 billion	All natural perils and terrorism	(d)
International (including Alaska and Hawaii)	$0 million – $175 million	Losses retained by Chubb	(a)
International (including Alaska and Hawaii)	$175 million – $925 million	All natural perils and terrorism	(c)
Alaska, Hawaii, and Canada	$925 million – $2.425 billion	All natural perils and terrorism	(d)

(a) Ultimate retention will depend upon the nature of the loss and the interplay between the underlying per risk programs and certain other catastrophe programs purchased by individual business units. These other catastrophe programs have the potential to reduce our effective retention below the stated levels. We added California to our Northeast homeowners quota share treaty effective October 1, 2018, which favorably impacted our net liabilities from events in California, such as the wildfires.

(b) These coverages are 20 percent placed with Reinsurers.

(c) These coverages are both part of the same Second layer within the Global Catastrophe Program and are 100 percent placed with Reinsurers. As such, it may be exhausted in one region and not available in the other.

(d) These coverages are both part of the same Third layer within the Global Catastrophe Program and are 100 percent placed with Reinsurers. As such, it may be exhausted in one region and not available in the other.

Chubb also has a property catastrophe bond in place that offers additional natural catastrophe protection for certain parts of the portfolio. The geographic scope of this coverage is from Virginia through Maine. The East Lane VI 2015 bond currently provides $250 million of coverage as part of a $430 million layer in excess of $2,014 million retention through March 13, 2020.

Political Risk and Credit Insurance

Political risk insurance is a specialized coverage that provides clients with protection against unexpected, catastrophic political or macroeconomic events, primarily in emerging markets. We participate in this market through our wholly-owned subsidiary Sovereign Risk Insurance Ltd. (Sovereign), and through a unit of our London-based CGM operation. Chubb is one of the world's leading underwriters of political risk and credit insurance, has a global portfolio spread across more than 150 countries and is also a member of the Berne Union. Our clients include financial institutions, national export credit agencies, leading multilateral agencies, private equity firms and multinational corporations. CGM writes political risk and credit insurance business out of underwriting offices in London, United Kingdom; Hamburg, Germany; Sao Paulo, Brazil; Singapore; Tokyo, Japan; and in the U.S. in the following locations: Chicago, Illinois; New York, New York; and Los Angeles, California.

Our political risk insurance provides protection to commercial lenders against defaults on cross border loans, insulates investors against equity losses, and protects exporters against defaults on contracts. Commercial lenders, our largest client segment, are covered for missed scheduled loan repayments due to acts of confiscation, expropriation or nationalization by the host government, currency inconvertibility or exchange transfer restrictions, or war or other acts of political violence. In addition, in the case of loans to government-owned entities or loans that have a government guarantee, political risk policies cover scheduled payments against risks of non-payment or non-honoring of government guarantees. Private equity investors and corporations receive similar coverage to that of lenders, except their equity is protected against financial losses, inability to repatriate dividends, and physical damage to their operations caused by covered events. Our export contracts protection provides coverage for both exporters and their financing banks against the risk of contract frustration due to government actions, including non-payment by governmental entities.

CGM's credit insurance businesses cover losses due to insolvency, protracted default, and political risk perils including export and license cancellation. Our credit insurance product provides coverage to larger companies that have sophisticated credit risk management systems, with exposure to multiple customers and that have the ability to self-insure losses up to a certain level through excess of loss coverage. It also provides coverage to trade finance banks, exporters, and trading companies, with exposure to trade-related financing instruments. CGM also has limited capacity for Specialist Credit insurance products which provide coverage for project finance and working capital loans for large corporations and banks.

We have implemented structural features in our policies in order to control potential losses within the political risk and credit insurance businesses. These include basic loss sharing features that include co-insurance and deductibles, and in the case of trade credit, the use of non-qualifying losses that drop smaller exposures deemed too difficult to assess. Ultimate loss severity is also limited by using waiting periods to enable the insurer and insured to agree on recovery strategies, and the subrogation of the rights of the lender/exporter to the insurer following a claim. We have the option to pay claims over the original loan payment schedule, rather than in a lump sum in order to provide insureds and the insurer additional time to remedy problems and work towards full recoveries. It is important to note that political risk and credit policies are named peril conditional contracts, not financial guarantees, and claims are only paid after conditions and warranties are fulfilled. Political risk and credit insurance do not cover currency devaluations, bond defaults, movements in overseas equity markets, transactions deemed illegal, situations where corruption or misrepresentation has occurred, or debt that is not legally enforceable. In addition to assessing and mitigating potential exposure on a policy-by-policy basis, we also have specific risk management measures in place to manage overall exposure and risk. These measures include placing country, credit, and individual transaction limits based on country risk and credit ratings, combined single loss limits on multi-country policies, the use of reinsurance protection as well as quarterly modeling and stress-testing of the portfolio. We have a dedicated Country and Credit Risk management team that are responsible for the portfolio.

Crop Insurance

We are, and have been since the 1980s, one of the leading writers of crop insurance in the U.S. and have conducted that business through a managing general agent subsidiary of Rain and Hail. We provide protection throughout the U.S. on a variety of crops and are therefore geographically diversified, which reduces the risk of exposure to a single event or a heavy accumulation of losses in any one region. Our crop insurance business comprises two components - Multiple Peril Crop Insurance (MPCI) and crop-hail insurance.

The MPCI program, offered in conjunction with the U.S. Department of Agriculture’s Risk Management Agency (RMA), is a federal subsidized insurance program that covers revenue shortfalls or production losses due to natural causes such as drought, excessive moisture, hail, wind, freeze, insects, and disease. These Revenue Products are defined as providing both commodity price and yield coverages. Policies are available for various crops in different areas of the U.S. and generally have deductibles generally ranging from 10 percent to 50 percent of the insured's risk. The USDA's Risk Management Agency (RMA) sets the policy terms and conditions, rates and forms, and is also responsible for setting compliance standards. As a participant in the MPCI program, we report all details of policies to the RMA and are party to a Standard Reinsurance Agreement (SRA). The SRA sets out the relationship between private insurance companies and the Federal Crop Insurance Corporation (FCIC) concerning the terms and conditions regarding the risks each will bear including the pro-rata and state stop-loss provisions, which allows companies to limit the exposure of any one state or group of states on their underwriting results. In addition to the pro-rata and excess of loss reinsurance protections inherent in the SRA, we also purchase third-party proportional and stop-loss reinsurance for our MPCI business to reduce our exposure. We may also enter into crop derivative contracts to further manage our risk exposure.

Each year the RMA issues a final SRA for the subsequent reinsurance year (i.e., the 2019 SRA covers the 2019 reinsurance year from July 1, 2018 through June 30, 2019). There were no significant changes in the terms and conditions to the 2019 SRA and therefore, the new SRA does not impact Chubb's outlook on the crop program relative to 2019.

We recognize net premiums written as soon as estimable on our MPCI business, which is generally when we receive acreage reports from the policyholders on the various crops throughout the U.S. This allows us to best determine the premium associated with the liability that is being planted. The MPCI program has specific timeframes as to when producers must report acreage to us and in certain cases, the reporting occurs after the close of the respective reinsurance year. Once the net premium written has been recorded, the premium is then earned over the growing season for the crops. A majority of the crops that are covered in the program are typically subject to the SRA in effect at the beginning of the year. Given the major crops covered in the program, we typically see a substantial written and earned premium impact in the second and third quarters.

The pricing of MPCI premium is determined using a number of factors including commodity prices and related volatility (i.e., both impact the amount of premium we can charge to the policyholder). For example, in most states, the pricing for the MPCI Revenue Product for corn (i.e., insurance coverage for lower than expected crop revenue in a given season) includes a factor based on the average commodity price in February. If corn commodity prices are higher in February, compared to the February price in the prior year, and all other factors are the same, the increase in price will increase the corn premium year-over-year. Pricing is also impacted by volatility factors, which measure the likelihood commodity prices will fluctuate over the crop year. For example, if volatility is set at a higher rate compared to the prior year, and all other factors are the same, the premium charged to the policyholder will be higher year-over-year for the same level of coverage.

Losses incurred on the MPCI business are determined using both commodity price and crop yield. With respect to commodity price, there are two important periods on a large portion of the business: The month of February when the initial premium base is set, and the month of October when the final harvest price is set. If the price declines from February to October, with yield remaining at normal levels, the policyholder may be eligible to recover on the policy. However, in most cases there are deductibles on these policies, therefore, the impact of a decline in price would have to exceed the deductible before a policyholder would be eligible to recover.

We evaluate our MPCI business at an aggregate level and the combination of all of our insured crops (both winter and summer) go into our underwriting gain or loss estimate in any given year. Typically, we do not have enough information on the harvest prices or crop yield outputs to quantify the preliminary estimated impact to our underwriting results until the fourth quarter.

Our crop-hail program is a private offering. Premium is earned on the crop-hail program over the coverage period of the policy. Given the very short nature of the growing season, most crop-hail business is typically written in the second and third quarters and the recognition of earned premium is also more heavily concentrated during this timeframe. We use industry data to develop our own rates and forms for the coverage offered. The policy primarily protects farmers against yield reduction caused by hail and/or fire, and related costs such as transit to storage. We offer various deductibles to allow the grower to partially self-insure for a reduced premium cost. We limit our crop-hail exposures through the use of township liability limits and third-party reinsurance on our net retained hail business.

Liquidity

Liquidity is a measure of a company's ability to generate cash flows sufficient to meet short-term and long-term cash requirements. As a holding company, Chubb Limited possesses assets that consist primarily of the stock of its subsidiaries and other investments. In addition to net investment income, Chubb Limited's cash flows depend primarily on dividends or other statutorily permissible payments. Historically, these dividends and other payments have come primarily from Chubb's Bermuda-based operating subsidiaries, which we refer to as our Bermuda subsidiaries. Our consolidated sources of funds consist primarily of net premiums written, fees, net investment income, and proceeds from sales and maturities of investments. Funds are used at our various companies primarily to pay claims, operating expenses, and dividends; to service debt; to purchase investments; and to fund acquisitions.

We anticipate that positive cash flows from operations (underwriting activities and investment income) should be sufficient to cover cash outflows under most loss scenarios for the near term. Should the need arise, we generally have access to capital markets and available credit facilities. Refer to “Credit Facilities” below for additional information. Our access to funds under the existing credit facility is dependent on the ability of the bank that is a party to the facility to meet its funding commitments. Should our existing credit provider experience financial difficulty, we may be required to replace credit sources, possibly in a difficult market. If we cannot obtain adequate capital or sources of credit on favorable terms, on a timely basis, or at all, our business, operating results, and financial condition could be adversely affected. To date, we have not experienced difficulty accessing our credit facility.

To further ensure the sufficiency of funds to settle unforeseen claims, we hold certain invested assets in cash and short-term investments. In addition, for certain insurance, reinsurance, or deposit contracts that tend to have relatively large and reasonably predictable cash outflows, we attempt to establish dedicated portfolios of assets that are duration-matched with the related liabilities. With respect to the duration of our overall investment portfolio, we manage asset durations to both maximize return given current market conditions and provide sufficient liquidity to cover future loss payments. At December 31, 2018, the average duration of our fixed maturities (3.7 years) is less than the average expected duration of our insurance liabilities (4.1 years).

Despite our safeguards, if paid losses accelerate beyond our ability to fund such paid losses from current operating cash flows, we might need to either liquidate a portion of our investment portfolio or arrange for financing. Potential events causing such a liquidity strain could include several significant catastrophes occurring in a relatively short period of time, large uncollectible reinsurance recoverables on paid losses (as a result of coverage disputes, reinsurers' credit problems, or decreases in the value of collateral supporting reinsurance recoverables) or increases in collateral postings under our variable annuity reinsurance business. Because each subsidiary focuses on a more limited number of specific product lines than is collectively available from the Chubb Group of Companies, the mix of business tends to be less diverse at the subsidiary level. As a result, the probability of a liquidity strain, as described above, may be greater for individual subsidiaries than when liquidity is assessed on a consolidated basis. If such a liquidity strain were to occur in a subsidiary, we could be required to liquidate a portion of our investments, potentially at distressed prices, as well as be required to contribute capital to the particular subsidiary and/or curtail dividends from the subsidiary to support holding company operations.

The payment of dividends or other statutorily permissible distributions from our operating companies are subject to the laws and regulations applicable to each jurisdiction, as well as the need to maintain capital levels adequate to support the insurance and reinsurance operations, including financial strength ratings issued by independent rating agencies. During 2018, we were able to meet all of our obligations, including the payments of dividends on our Common Shares, with our net cash flows.

We assess which subsidiaries to draw dividends from based on a number of factors. Considerations such as regulatory and legal restrictions as well as the subsidiary's financial condition are paramount to the dividend decision. Chubb Limited received dividends of $75 million and $450 million from its Bermuda subsidiaries in 2018 and 2017, respectively.

The payment of any dividends from CGM or its subsidiaries is subject to applicable U.K. insurance laws and regulations. In addition, the release of funds by Syndicate 2488 to subsidiaries of CGM is subject to regulations promulgated by the Society of Lloyd's. Chubb Limited received no dividends from CGM in 2018 and 2017.

The U.S. insurance subsidiaries of Chubb INA may pay dividends, without prior regulatory approval, subject to restrictions set out in state law of the subsidiary's domicile (or, if applicable, commercial domicile). Chubb INA's international subsidiaries are also subject to insurance laws and regulations particular to the countries in which the subsidiaries operate. These laws and regulations sometimes include restrictions that limit the amount of dividends payable without prior approval of regulatory insurance authorities. Chubb Limited received no dividends from Chubb INA in 2018 and 2017. Debt issued by Chubb INA is serviced by statutorily permissible distributions by Chubb INA's insurance subsidiaries to Chubb INA as well as other group resources. Chubb INA received dividends of $5.2 billion and $2.1 billion from its subsidiaries in 2018 and 2017, respectively. At December 31, 2018, the amount of dividends available to be paid to Chubb INA in 2019 from its subsidiaries without prior approval of insurance regulatory authorities totals $3.5 billion.

Cash Flows

Our insurance and reinsurance operations provide liquidity in that premiums are received in advance, sometimes substantially in advance, of the time claims are paid. Generally, cash flows are affected by claim payments that, due to the nature of our operations, may comprise large loss payments on a limited number of claims and which can fluctuate significantly from period to period. The irregular timing of these loss payments can create significant variations in cash flows from operations between periods. Refer to "Contractual Obligations and Commitments" for our estimate of future claim payments by period. Sources of liquidity include cash from operations, routine sales of investments, and financing arrangements. The following is a discussion of our cash flows for 2018, 2017, and 2016.

Operating cash flows reflect Net income for each period, adjusted for non-cash items and changes in working capital.

Operating cash flows were $5.5 billion in 2018, compared to $4.5 billion and $5.3 billion in 2017 and 2016, respectively. Operating cash flow was higher in 2018 compared to 2017, primarily due to higher premiums collected, net of higher catastrophe loss payments related to the 2017 catastrophe events, and lower taxes paid. The decrease in operating cash flows of $789 million in 2017 compared to 2016 was principally due to higher claims paid, related to the significant catastrophe losses during 2017.

Cash used for investing was $2.9 billion in 2018, compared to $2.4 billion and $5.3 billion in 2017 and 2016, respectively. The current year included higher net private equity contributions, net of distributions received, of $793 million. Cash used for investing in 2017 was lower compared to 2016 which included cash paid for the purchase of Chubb Corp of $14.3 billion, largely funded by sales in our investment portfolio, including net proceeds in short-term investments.

Cash used for financing was $2.0 billion in 2018, compared to $2.3 billion in 2017, and $742 million in 2016. Cash used for financing was lower by $328 million in 2018 compared to 2017. The current year included net proceeds from the issuance of long-term debt (net of repayments) of $170 million compared to the prior year which had repayments of $501 million. Cash used for financing in 2017, which included $801 million of share repurchases and $501 million of repayments of long-term debt, was higher compared to 2016, which did not have share repurchases or debt repayments.

Both internal and external forces influence our financial condition, results of operations, and cash flows. Claim settlements, premium levels, and investment returns may be impacted by changing rates of inflation and other economic conditions. In many cases, significant periods of time, ranging up to several years or more, may lapse between the occurrence of an insured loss, the reporting of the loss to us, and the settlement of the liability for that loss.

We use repurchase agreements as a low-cost funding alternative. At December 31, 2018, there were $1.4 billion in repurchase agreements outstanding with various maturities over the next seven months.

In addition to cash from operations, routine sales of investments, and financing arrangements, we have agreements with a third-party bank provider which implemented two international multi-currency notional cash pooling programs to enhance cash management efficiency during periods of short-term timing mismatches between expected inflows and outflows of cash by currency. The programs allow us to optimize investment income by avoiding portfolio disruption. In each program, participating Chubb entities establish deposit accounts in different currencies with the bank provider. Each day the credit or debit balances in every account are notionally translated into a single currency (U.S. dollars) and then notionally pooled. The bank extends overdraft credit to all participating Chubb entities as needed, provided that the overall notionally pooled balance of all accounts in each pool at the end of each day is at least zero. Actual cash balances are not physically converted and are not commingled between legal entities. Chubb entities may incur overdraft balances as a means to address short-term liquidity needs. Any overdraft balances incurred under this program by a Chubb entity would be guaranteed by Chubb Limited (up to $300 million in the aggregate). Our syndicated letter of credit facility allows for same day drawings to fund a net pool overdraft should participating Chubb entities withdraw contributed funds from the pool.

Capital Resources

Capital resources consist of funds deployed or available to be deployed to support our business operations.

(in millions of U.S. dollars, except for percentages)	**December 31 2018**	December 31 2017
Short-term debt	**$ 509**	$ 1,013
Long-term debt	**12,087**	11,556
Total financial debt	**12,596**	12,569
Trust preferred securities	**308**	308
Total shareholders' equity	**50,312**	51,172
Total capitalization	**$ 63,216**	$ 64,049
Ratio of financial debt to total capitalization	**19.9%**	19.6%
Ratio of financial debt plus trust preferred securities to total capitalization	**20.4%**	20.1%

Repurchase agreements are excluded from the table above and are disclosed separately from short-term debt in the Consolidated balance sheets. The repurchase agreements are collateralized borrowings where we maintain the right and ability to redeem the collateral on short notice, unlike short-term debt which comprises the current maturities of our long-term debt instruments.

In April 2018, we redeemed $1.0 billion of 6.375 percent unsecured junior subordinated capital securities with the final maturity date of March 2067. With the redemption of the capital securities, we no longer have exposures related to our debt obligations that are tied to the London Interbank Offered Rates (LIBOR). Related to certain of our investment portfolio, we are monitoring industry efforts via our external investment managers to establish alternatives and transition away from LIBOR by the end of 2021. Refer to Note 8 to the Consolidated Financial Statements for details about the debt issued and debt redeemed.

We believe our financial strength provides us with the flexibility and capacity to obtain available funds externally through debt or equity financing on both a short-term and long-term basis. Our ability to access the capital markets is dependent on, among other things, market conditions and our perceived financial strength. We have accessed both the debt and equity markets from time to time. We generally maintain the ability to issue certain classes of debt and equity securities via an unlimited Securities and Exchange Commission (SEC) shelf registration which is renewed every three years. This allows us capital market access for refinancing as well as for unforeseen or opportunistic capital needs. In October 2018, we filed an unlimited shelf registration which allows us to issue certain classes of debt and equity. This shelf registration expires in October 2021.

Securities Repurchases
From time to time, we repurchase shares as part of our capital management program. Our Board of Directors (Board) has authorized share repurchase programs as follows:

- $1.0 billion of Chubb Common Shares from November 17, 2016 through December 31, 2017
- $1.0 billion of Chubb Common Shares from January 1, 2018 through December 31, 2018
- $1.5 billion of Chubb Common Shares from December 1, 2018 through December 31, 2019

Share repurchases may be made in the open market, in privately negotiated transactions, block trades, accelerated repurchases and/or through option or other forward transactions. There were no share repurchases in 2016. In 2017 and 2018, we repurchased $830 million and $1.02 billion, respectively, of Common Shares in a series of open market transactions under the Board share repurchase authorizations. The $1.0 billion Board authorization approved in December 2017 remained effective through December 31, 2018, and was fully utilized before the $1.5 billion December 1, 2018 to December 31, 2019 authorization began being utilized. For the period January 1 through February 27, 2019, we repurchased 1,328,754 Common Shares for a total of $174 million in a series of open market transactions. At February 27, 2019, $1.30 billion in share repurchase authorization remained through December 31, 2019.

Common Shares
Our Common Shares had a par value of CHF 24.15 each at December 31, 2018.

As of December 31, 2018, there were 20,580,486 Common Shares in treasury with a weighted average cost of $127.19 per share.

Under Swiss law, dividends must be stated in Swiss francs though dividend payments are made by Chubb in U.S. dollars.

At our May 2017 annual general meeting, our shareholders approved an annual dividend for the following year of up to $2.84 per share, which was paid in four quarterly installments of $0.71 per share at dates determined by the Board after the annual general meeting by way of a distribution from capital contribution reserves, transferred to free reserves for payment.

At our May 2018 annual general meeting, our shareholders approved an annual dividend for the following year of up to $2.92 per share, expected to be paid in four quarterly installments of $0.73 per share after the annual general meeting by way of distribution from capital contribution reserves, transferred to free reserves for payment. The Board will determine the record and payment dates at which the annual dividend may be paid until the date of the 2019 annual general meeting, and is authorized to abstain from distributing a dividend at its discretion. The first three quarterly installments each of $0.73 per share, have been distributed by the Board as expected.

Dividend distributions on Common Shares amounted to CHF 2.84 ($2.90) per share for the year ended December 31, 2018. Refer to Note 10 to the Consolidated Financial Statements for additional information on our dividends.

Contractual Obligations and Commitments

The following table presents our future payments due by period under contractual obligations at December 31, 2018:

	Payments Due By Period				
(in millions of U.S. dollars)	Total	2019	2020 and 2021	2022 and 2023	Thereafter
Payment amounts determinable from the respective contracts					
Deposit liabilities [1]	$ 1,937	$ 20	$ 35	$ 61	$ 1,821
Purchase obligations [2]	510	177	269	64	—
Investments, including Limited Partnerships [3]	4,416	1,493	1,208	734	981
Operating leases	820	173	277	186	184
Repurchase agreements	1,418	1,418	—	—	—
Short-term debt	509	509	—	—	—
Long-term debt [4]	11,788	—	1,301	1,475	9,012
Trust preferred securities	309	—	—	—	309
Interest on debt obligations [4]	6,450	473	882	817	4,278
Total obligations in which payment amounts are determinable from the respective contracts	28,157	4,263	3,972	3,337	16,585
Payment amounts not determinable from the respective contracts					
Estimated gross loss payments under insurance and reinsurance contracts	62,982	17,798	17,524	8,728	18,932
Estimated payments for future policy benefits	20,592	963	1,875	1,632	16,122
Total contractual obligations and commitments	$ 111,731	$ 23,024	$ 23,371	$ 13,697	$ 51,639

(1) Refer to Note 1 k) to the Consolidated Financial Statements.

(2) Primarily comprises audit fees and agreements with vendors to purchase system software administration and maintenance services.

(3) Funding commitment primarily related to limited partnerships. The timing of the payments of these commitments is uncertain and may differ from the estimated timing in the table.

(4) Included in debt obligations are €900 million ($1.0 billion calculated using the Euro balance sheet rate as of December 31, 2018) of 1.55 percent Euro denominated senior notes due March 2028 and €900 million ($1.0 billion calculated using the Euro balance sheet rate as of December 31, 2018) of 2.50 percent Euro denominated senior notes due March 2038. Incepted on March 7, 2018, these senior notes are subject to foreign exchange fluctuations on interest expense and principal.

The above table excludes the following items:

- Pension obligations: Minimum funding requirements for our pension obligations are immaterial. Subsequent funding commitments are apt to vary due to many factors and are difficult to estimate at this time. Refer to Note 12 to the Consolidated Financial Statements for additional information.
- Liabilities for unrecognized tax benefits: The liability for unrecognized tax benefits, excluding interest, was $14 million at December 31, 2018. We record accruals for interest and penalties, if any, related to unrecognized tax benefits in Income Tax expense in the Consolidated statements of operations. At December 31, 2018, we had accrued $3 million in liabilities for income tax-related interest and penalties in our Consolidated balance sheets. We are unable to make a reasonably reliable estimate for the timing of cash settlement with respect to these liabilities. Refer to Note 7 to the Consolidated Financial Statements for additional information.

We have no other significant contractual obligations or commitments not reflected in the table above. We do not have any off-balance sheet arrangements that are reasonably likely to have a material effect on our financial condition, revenues or expenses, results of operations, liquidity, capital expenditures, or capital resources.

Estimated gross loss payments under insurance and reinsurance contracts

We are obligated to pay claims under insurance and reinsurance contracts for specified loss events covered under those contracts. Such loss payments represent our most significant future payment obligation as a P&C insurance and reinsurance company. In contrast to other contractual obligations, cash payments are not determinable from the terms specified within the contract. For example, we do not ultimately make a payment to our counterparty for many insurance and reinsurance contracts (i.e., when a loss event has not occurred) and if a payment is to be made, the amount and timing cannot be determined from the contract. In the table above, we estimate payments by period relating to our gross liability for unpaid losses and loss expenses included in the Consolidated balance sheet at December 31, 2018, and do not take into account reinsurance recoverable. These estimated loss payments are inherently uncertain and the amount and timing of actual loss payments are likely to differ from these estimates and the differences could be material. Given the numerous factors and assumptions involved in both estimates of loss and loss expense reserves and related estimates as to the timing of future loss and loss expense payments in the table above, differences between actual and estimated loss payments will not necessarily indicate a commensurate change in ultimate loss estimates. The liability for Unpaid losses and loss expenses presented in our balance sheet is discounted for certain structured settlements for which the timing and amount of future claim payments are reliably determinable and certain reserves for unsettled claims that are discounted in statutory filings. Accordingly, the estimated amounts in the table exceed the liability for Unpaid losses and loss expenses presented in our balance sheet. Refer to Note 1 h) to the Consolidated Financial Statements for additional information.

Estimated payments for future policy benefits

We establish reserves for future policy benefits for life, long-term health, and annuity contracts. The amounts in the table are gross of fees or premiums due from the underlying contracts. The liability for Future policy benefits for life, long-term health, and annuity contracts presented in our balance sheet is discounted and reflected net of fees or premiums due from the underlying contracts. Accordingly, the estimated amounts in the table exceed the liability for Future policy benefits presented in our balance sheet. Payment amounts related to these reserves must be estimated and are not determinable from the contract. Due to the uncertainty with respect to the timing and amount of these payments, actual results could materially differ from the estimates in the table.

Credit Facilities

As our Bermuda subsidiaries are non-admitted insurers and reinsurers in the U.S., the terms of certain U.S. insurance and reinsurance contracts require them to provide collateral, which can be in the form of letters of credit (LOCs). LOCs may also be used for general corporate purposes.

On October 25, 2017, we entered into a credit facility that provides for up to $1.0 billion of availability, all of which may be used for the issuance of LOC and for revolving loans. We have the ability to increase the capacity to $2.0 billion under certain conditions, but any such increase would not raise the sub-limit for revolving loans above $1.0 billion. Our existing credit facility has a remaining term expiring in October 2022. At December 31, 2018, our LOC usage was $398 million.

Our access to funds under an existing credit facility is dependent on the ability of the banks that are a party to the facility to meet their funding commitments. In the event that such credit support is insufficient, we could be required to provide alternative security to clients. This could take the form of additional insurance trusts supported by our investment portfolio or funds withheld using our cash resources. The value of LOCs required is driven by, among other things, statutory liabilities reported by variable annuity guarantee reinsurance clients, loss development of existing reserves, the payment pattern of such reserves, the expansion of business, and loss experience of such business.

The facility noted above requires that we maintain certain covenants, all of which have been met at December 31, 2018. These covenants include:

(i) a minimum consolidated net worth of not less than $34.985 billion; and
(ii) a ratio of consolidated debt to total capitalization of not greater than 0.35 to 1.

At December 31, 2018, (a) the minimum consolidated net worth requirement under the covenant described in (i) above was $34.985 billion and our actual consolidated net worth as calculated under that covenant was $52.8 billion and (b) our ratio of debt to total capitalization, as calculated under the covenant which excludes the fair value adjustment of debt acquired through the Chubb Corp acquisition, was 0.20 to 1, which is below the maximum debt to total capitalization ratio of 0.35 to 1 as described in (ii) above.

Our failure to comply with the covenants under any credit facility would, subject to grace periods in the case of certain covenants, result in an event of default. This could require us to repay any outstanding borrowings or to cash collateralize LOCs under such facility. Our failure to repay material financial obligations, as well as our failure with respect to certain other events expressly identified, would result in an event of default under the facility.

Should our existing credit provider experience financial difficulty, we may be required to replace credit sources, possibly in a difficult market. If we cannot obtain adequate capital or sources of credit on favorable terms, on a timely basis, or at all, our business, operating results, and financial condition could be adversely affected. To date, we have not experienced difficulty accessing our credit facility.

Ratings

Chubb Limited and its subsidiaries are assigned credit and financial strength (insurance) ratings from internationally recognized rating agencies, including S&P, A.M. Best, Moody's, and Fitch. The ratings issued on our companies by these agencies are announced publicly and are available directly from the agencies. Our Internet site (investors.chubb.com, under Shareholder Resources/Rating Agency Ratings) also contains some information about our ratings, but such information on our website is not incorporated by reference into this report.

Financial strength ratings reflect the rating agencies' opinions of a company's claims paying ability. Independent ratings are one of the important factors that establish our competitive position in the insurance markets. The rating agencies consider many factors in determining the financial strength rating of an insurance company, including the relative level of statutory surplus necessary to support the business operations of the company. These ratings are based upon factors relevant to policyholders, agents, and intermediaries and are not directed toward the protection of investors. Such ratings are not recommendations to buy, sell, or hold securities.

Credit ratings assess a company's ability to make timely payments of principal and interest on its debt. It is possible that, in the future, one or more of the rating agencies may reduce our existing ratings. If one or more of our ratings were downgraded, we could incur higher borrowing costs, and our ability to access the capital markets could be impacted. In addition, our insurance and reinsurance operations could be adversely impacted by a downgrade in our financial strength ratings, including a possible reduction in demand for our products in certain markets. Also, we have insurance and reinsurance contracts which contain rating triggers. In the event the S&P or A.M. Best financial strength ratings of Chubb fall, we may be faced with the cancellation of premium or be required to post collateral on our underlying obligation associated with this premium. We estimate that at December 31, 2018, a one-notch downgrade of our S&P or A.M. Best financial strength ratings would result in an immaterial loss of premium or requirement for collateral to be posted.

ITEM 7A. Quantitative and Qualitative Disclosures about Market Risk

Market Sensitive Instruments and Risk Management

Market risk represents the potential for loss due to adverse changes in the fair value of financial instruments. We are exposed to potential losses from various market risks including changes in interest rates, equity prices, and foreign currency exchange rates. Further, through writing the GLB and GMDB products, we are exposed to volatility in the equity and credit markets, as well as interest rates. Our investment portfolio consists primarily of fixed income securities, denominated in both U.S. dollars and foreign currencies, which are sensitive to changes in interest rates and foreign currency exchange rates. The majority of our fixed income portfolio is classified as available for sale. The effect of market movements on our available for sale investment portfolio impacts Net income (through Net realized gains (losses)) when securities are sold or when we record an OTTI charge in Net income. Changes in interest rates and foreign currency exchange rates will have an immediate effect on Shareholders' equity and Comprehensive income and in certain instances, Net income. From time to time, we also use derivative instruments such as futures, options, swaps, and foreign currency forward contracts to manage the duration of our investment portfolio and foreign currency exposures and also to obtain exposure to a particular financial market. At December 31, 2018 and 2017, our notional exposure to derivative instruments was $9.1 billion and $4.8 billion, respectively. These instruments are recognized as assets or liabilities in our consolidated financial statements and are sensitive to changes in interest rates, foreign currency exchange rates, and equity security prices. As part of our investing activities, we purchase to be announced mortgage backed securities (TBAs). Changes in the fair value of TBAs are included in Net realized gains (losses) and therefore, have an immediate effect on both our Net income and Shareholders' equity.

We seek to mitigate market risk using a number of techniques, including maintaining and managing the assets and liabilities of our international operations consistent with the foreign currencies of the underlying insurance and reinsurance businesses, thereby limiting exchange rate risk to net assets denominated in foreign currencies.

The following is a discussion of our primary market risk exposures at December 31, 2018. Our policies to address these risks in 2018 were not materially different from 2017. We do not currently anticipate significant changes in our primary market risk exposures or in how those exposures are managed in future reporting periods based upon what is known or expected to be in effect in future reporting periods.

Interest rate risk – fixed income portfolio and debt obligations

Our fixed income portfolio and debt obligations have exposure to interest rate risk. Changes in investment values attributable to interest rate changes are mitigated by corresponding and partially offsetting changes in the economic value of our insurance reserves and debt obligations. We monitor this exposure through periodic reviews of our asset and liability positions.

The following table presents the impact at December 31, 2018 and 2017, on the fair value of our fixed income portfolio of a hypothetical increase in interest rates of 100 bps applied instantly across the U.S. yield curve (an immediate time horizon was used as this presents the worst case scenario):

(in billions of U.S. dollars, except for percentages)	**2018**	2017
Fair value of fixed income portfolio	**$ 94.7**	$ 97.0
Pre-tax impact of 100 bps increase in interest rates:		
Decrease in dollars	**$ 3.5**	$ 4.1
As a percentage of total fixed income portfolio at fair value	**3.7%**	4.2%

Changes in interest rates will have an immediate effect on Comprehensive income and Shareholders' equity but will not ordinarily have an immediate effect on Net income. Variations in market interest rates could produce significant changes in the timing of prepayments due to available prepayment options. For these reasons, actual results could differ from those reflected in the tables.

Although our debt and trust preferred securities (collectively referred to as debt obligations) are reported at amortized cost and not adjusted for fair value changes, changes in interest rates could have a material impact on their fair value, albeit there would be no impact on our consolidated financial statements.

The following table presents the impact at December 31, 2018 and 2017, on the fair value of our debt obligations of a hypothetical decrease in interest rates of 100 bps applied instantly across the U.S. yield curve (an immediate time horizon was used as this presents the worst case scenario):

(in millions of U.S. dollars, except for percentages)	**2018**	2017
Fair value of debt obligations, including repurchase agreements	**$ 14,524**	$ 15,221
Pre-tax impact of 100 bps decrease in interest rates:		
Increase in dollars	**$ 1,201**	$ 1,144
As a percentage of total debt obligations at fair value	**8.3%**	7.5%

Foreign currency management

As a global company, Chubb entities transact business in multiple currencies. Our policy is to generally match assets, liabilities and required capital for each individual jurisdiction in local currency, which would include the use of derivatives. We do not hedge our net asset non-U.S. dollar capital positions; however, we do consider hedging for planned cross border transactions.

The following table summarizes the net assets in non-U.S. currencies at December 31, 2018 and 2017:

(in millions of U.S. dollars, except for percentages)	2018 Value of Net Assets	2018 Exchange rate per USD	2017 Value of Net Assets	2017 Exchange rate per USD	2018 vs. 2017 % change in exchange rate per USD
Canadian dollar (CAD)	$ 2,114	0.7333	$ 2,289	0.7955	(7.8)%
British pound sterling (GBP)	1,901	1.2754	2,696	1.3513	(5.6)%
Euro (EUR)	1,896	1.1467	1,846	1.2005	(4.5)%
Australian dollar (AUD)	1,149	0.7049	1,283	0.7809	(9.7)%
Brazilian real (BRL)	938	0.2577	1,524	0.3019	(14.6)%
Mexican peso (MXN)	729	0.0509	815	0.0509	—
Korean won (KRW) (x100)	726	0.0900	674	0.0937	(3.9)%
Thai baht (THB)	459	0.0309	513	0.0307	0.7 %
Hong Kong dollar (HKD)	362	0.1277	400	0.1280	(0.2)%
Japanese yen (JPY)	343	0.0091	465	0.0089	2.2 %
Euro denominated debt [1]	(2,016)	1.1467			
Other foreign currencies	1,791	various	1,644	various	NM
Value of net assets denominated in foreign currencies [2]	$ 10,392		$ 14,149		
As a percentage of total net assets	20.7%		27.7%		
Pre-tax decrease to Shareholders' equity of a hypothetical 10 percent strengthening of the U.S. dollar	$ 945		$ 1,285		

NM – not meaningful

(1) Refer to Note 8 to the Consolidated Financial Statements for additional information.

(2) At December 31, 2018, net assets denominated in foreign currencies comprised approximately 22 percent tangible assets and 78 percent intangible assets, primarily goodwill.

Effective July 1, 2018, Argentina was designated as a highly inflationary economy and therefore we changed the functional currency for our Argentine operations from the Argentine Peso to the U.S. dollar. Our net assets denominated in the Argentine Peso represent less than 0.1 percent of consolidated shareholders' equity. Therefore, this change in the functional currency of our Argentine operations did not have a material impact on our financial condition or results of operations.

Reinsurance of GMDB and GLB guarantees

Chubb views its variable annuity reinsurance business as having a similar risk profile to that of catastrophe reinsurance with the probability of long-term economic loss relatively small, at the time of pricing. Adverse changes in market factors and policyholder behavior will have an impact on both Life insurance underwriting income and net income. When evaluating these risks, we expect to be compensated for taking both the risk of a cumulative long-term economic net loss, as well as the short-term accounting variations caused by these market movements. Therefore, we evaluate this business in terms of its long-term economic risk and reward.

Net income is directly impacted by changes in benefit reserves calculated in connection with reinsurance of variable annuity guarantees. In addition, net income is directly impacted by changes in the fair value of the GLB liability (FVL), which is classified as a derivative for accounting purposes. The FVL established for a GLB reinsurance contract represents the difference between the fair value of the contract and the benefit reserves. Benefit reserves and FVL calculations are directly affected by market factors, including equity levels, interest rate levels, credit risk, and implied volatilities, as well as policyholder behaviors, such as annuitization and lapse rates, and policyholder mortality.

The tables below are estimates of the sensitivities to instantaneous changes in economic inputs (e.g., equity shock, interest rate shock, etc.) or actuarial assumptions at December 31, 2018 of the FVL and of the fair value of specific derivative instruments held (hedge value) to partially offset the risk in the variable annuity guarantee reinsurance portfolio. The following assumptions should be considered when using the below tables:

- No changes to the benefit ratio used to establish benefit reserves at December 31, 2018.
- Equity shocks impact all global equity markets equally
  - Our liabilities are sensitive to global equity markets in the following proportions: 75 percent—85 percent U.S. equity, and 15 percent—25 percent international equity.
  - Our current hedge portfolio is sensitive only to U.S. equity markets.
  - We would suggest using the S&P 500 index as a proxy for U.S. equity, and the MSCI EAFE index as a proxy for international equity.
- Interest rate shocks assume a parallel shift in the U.S. yield curve
  - Our liabilities are also sensitive to global interest rates at various points on the yield curve, mainly the U.S. Treasury curve in the following proportions: up to 10 percent short-term rates (maturing in less than 5 years), 25 percent—35 percent medium-term rates (maturing between 5 years and 10 years, inclusive), and 55 percent—65 percent long-term rates (maturing beyond 10 years).
  - A change in AA-rated credit spreads impacts the rate used to discount cash flows in the fair value model. AA-rated credit spreads are a proxy for both our own credit spreads and the credit spreads of the ceding insurers.
- The hedge sensitivity is from December 31, 2018 market levels.
- The sensitivities are not directly additive because changes in one factor will affect the sensitivity to changes in other factors. The sensitivities do not scale linearly and may be proportionally greater for larger movements in the market factors. The sensitivities may also vary due to foreign exchange rate fluctuations. The calculation of the FVL is based on internal models that include assumptions regarding future policyholder behavior, including lapse, annuitization, and asset allocation. These assumptions impact both the absolute level of the FVL as well as the sensitivities to changes in market factors shown below. Actual sensitivity of our net income may differ from those disclosed in the tables below due to differences between short-term market movements and management judgment regarding the long-term assumptions implicit in our benefit ratios.
- In addition, the tables below do not reflect the expected quarterly run rate of net income generated by the variable annuity guarantee reinsurance portfolio if markets remain unchanged during the period. All else equal, if markets remain unchanged during the period, the Gross FVL will increase, resulting in a realized loss. The Gross FVL increases primarily because future premiums are lower by the amount collected in the quarter, and also because future claims are discounted for a shorter period. We refer to this increase in Gross FVL as “timing effect”. The unfavorable impact of timing effect on our Gross FVL in a quarter is not reflected in the sensitivity tables below. For this reason, when using the tables below to estimate the sensitivity of Gross FVL in the first quarter 2019 to various changes, it is necessary to assume an additional $5 million to $45 million increase in Gross FVL and realized losses. The impact to Net income is partially mitigated because this realized loss is partially offset by the positive quarterly run rate of Life insurance underwriting income generated by the variable annuity guarantee reinsurance portfolio if markets remain unchanged during the period. Note that both the timing effect and the quarterly run rate of Life insurance underwriting income change over time as the book ages.

Interest Rate Shock (in millions of U.S. dollars)		Worldwide Equity Shock +10%	Flat	-10%	-20%	-30%	-40%
+100 bps	(Increase)/decrease in Gross FVL	$ 326	$ 196	$ 47	$ (124)	$ (317)	$ (527)
	Increase/(decrease) in hedge value	(48)	—	48	97	145	194
	Increase/(decrease) in net income	$ 278	$ 196	$ 95	$ (27)	$ (172)	$ (333)
Flat	(Increase)/decrease in Gross FVL	$ 149	$ —	$ (170)	$ (364)	$ (578)	$ (804)
	Increase/(decrease) in hedge value	(48)	—	48	97	145	194
	Increase/(decrease) in net income	$ 101	$ —	$ (122)	$ (267)	$ (433)	$ (610)
-100 bps	(Increase)/decrease in Gross FVL	$ (77)	$ (245)	$ (435)	$ (646)	$ (873)	$ (1,105)
	Increase/(decrease) in hedge value	(48)	—	48	97	145	194
	Increase/(decrease) in net income	$ (125)	$ (245)	$ (387)	$ (549)	$ (728)	$ (911)

Sensitivities to Other Economic Variables	AA-rated Credit Spreads		Interest Rate Volatility		Equity Volatility	
(in millions of U.S. dollars)	+100 bps	-100 bps	+2%	-2%	+2%	-2%
(Increase)/decrease in Gross FVL	$ 70	$ (78)	$ —	$ —	$ (8)	$ 7

Sensitivities to Actuarial Assumptions	Mortality			
(in millions of U.S. dollars)	+20%	+10%	-10%	-20%
(Increase)/decrease in Gross FVL	$ 18	$ 9	$ (9)	$ (19)

	Lapses			
(in millions of U.S. dollars)	+50%	+25%	-25%	-50%
(Increase)/decrease in Gross FVL	$ 95	$ 50	$ (54)	$ (113)

	Annuitization			
(in millions of U.S. dollars)	+50%	+25%	-25%	-50%
(Increase)/decrease in Gross FVL	$ (498)	$ (264)	$ 300	$ 548

Variable Annuity Net Amount at Risk

All our VA reinsurance treaties include annual or aggregate claim limits and many include an aggregate deductible which limit the net amount at risk under these programs. The tables below present the net amount at risk at December 31, 2018 following an immediate change in equity market levels, assuming all global equity markets are impacted equally. For further information on the net amount at risk, refer to Note 4 c) to the Consolidated Financial Statements.

a) Reinsurance covering the GMDB risk only

	Equity Shock					
(in millions of U.S. dollars)	+20%	Flat	-20%	-40%	-60%	-80%
GMDB net amount at risk	$ 275	$ 408	$ 772	$ 923	$ 868	$ 736
Claims at 100% immediate mortality	174	177	168	152	136	122

The treaty claim limits function as a ceiling as equity markets fall. As the shocks in the table above become incrementally more negative, the impact on the NAR and claims at 100 percent mortality begin to drop due to the specific nature of these claim limits, many of which are annual claim limits calculated as a percentage of the reinsured account value. There is also some impact due to a small portion of the GMDB reinsurance under which claims are positively correlated to equity markets (claims decrease as equity markets fall).

b) Reinsurance covering the GLB risk only

	Equity Shock					
(in millions of U.S. dollars)	+20%	Flat	-20%	-40%	-60%	-80%
GLB net amount at risk	$ 794	$ 1,233	$ 1,952	$ 2,672	$ 3,083	$ 3,388

The treaty claim limits cause the net amount at risk to increase at a declining rate as equity markets fall.

c) Reinsurance covering both the GMDB and GLB risks on the same underlying policyholders

	Equity Shock					
(in millions of U.S. dollars)	+20%	Flat	-20%	-40%	-60%	-80%
GMDB net amount at risk	$ 87	$ 103	$ 117	$ 126	$ 131	$ 132
GLB net amount at risk	381	517	689	878	1,069	1,195
Claims at 100% immediate mortality	17	18	18	18	18	18

The treaty limits control the increase in the GMDB net amount at risk as equity markets fall. The GMDB net amount at risk continues to grow as equity markets fall because most of these reinsurance treaties do not have annual claim limits calculated as a percentage of the underlying account value. The treaty limits cause the GLB net amount at risk to increase at a declining rate as equity markets fall.

ITEM 8. Financial Statements and Supplementary Data

The financial statements and supplementary data are included in this Form 10-K commencing on page F-1.

ITEM 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

ITEM 9A. Controls and Procedures

Chubb's management, with the participation of Chubb's Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of Chubb's disclosure controls and procedures as defined in Rule 13a-15(e) and Rule 15d-15(e) under the Securities Exchange Act of 1934 as of December 31, 2018. Based upon that evaluation, Chubb's Chief Executive Officer and Chief Financial Officer concluded that Chubb's disclosure controls and procedures are effective in allowing information required to be disclosed in reports filed under the Securities Exchange Act of 1934 to be recorded, processed, summarized, and reported within time periods specified in the rules and forms of the SEC, and that such information is accumulated and communicated to Chubb's management, including its Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

In 2016, Chubb completed the acquisition of The Chubb Corporation. For the year ended December 31, 2018, we continued to integrate the information technology environments of the two companies.

There were no other changes to Chubb's internal controls over financial reporting for the year ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, Chubb's internal controls over financial reporting. Chubb's management report on internal control over financial reporting is included on page F-3 and PricewaterhouseCoopers LLP's audit report is included on page F-4.

ITEM 9B. Other Information

Disclosure of Certain Activities Under Section 13(r) of the Securities Exchange Act of 1934

Section 13(r) of the Securities Exchange Act of 1934, as amended, requires an issuer to disclose in its annual or quarterly reports whether it or an affiliate knowingly engaged in certain activities described in that section, including certain activities related to Iran during the period covered by the report.

Chubb, through certain of its non-U.S. subsidiaries, provides insurance and reinsurance coverage relating to marine risks for policyholders with global operations. As a result of the modification of U.S. and European sanctions on Iran in 2016, several marine policyholders have informed us that they are shipping cargo to and from Iran, including transporting crude oil, petrochemicals and refined petroleum products. As the activities of our insureds and reinsureds are permitted under applicable laws and regulations, including U. S. Department of Treasury General License H, Chubb intends for its non-U.S. subsidiaries to continue providing such coverage to its insureds and reinsureds to the extent permitted by applicable law. Since these policies insure multiple voyages and fleets containing multiple ships, we are unable to attribute gross revenues and net profits from such marine policies to these activities involving Iran.

PART III

ITEM 10. Directors, Executive Officers and Corporate Governance

Information pertaining to this item is incorporated by reference to the sections entitled “Agenda Item 5 - Election of the Board of Directors”, “Corporate Governance - The Board of Directors - Director Nomination Process”, “Corporate Governance - The Committees of the Board - Audit Committee”, and “Corporate Governance - Did Our Officers and Directors Comply with Section 16(a) Beneficial Ownership Reporting in 2018?” of the definitive proxy statement for the 2019 Annual General Meeting of Shareholders which will be filed with the SEC not later than 120 days after the close of the fiscal year pursuant to Regulation 14A. Also incorporated herein by reference is the text under the caption “Executive Officers of the Registrant” appearing at the end of Part I Item 1 of the Annual Report on Form 10-K.

Code of Ethics

Chubb has adopted a Code of Conduct, which sets forth standards by which all Chubb employees, officers, and directors must abide as they work for Chubb. Chubb has posted this Code of Conduct on its Internet site (investors.chubb.com, under Corporate Governance/Highlights and Governance Documents/The Chubb Code of Conduct). Chubb intends to disclose on its Internet site any amendments to, or waivers from, its Code of Conduct that are required to be publicly disclosed pursuant to the rules of the SEC or the New York Stock Exchange.

ITEM 11. Executive Compensation

This item is incorporated by reference to the sections entitled “Executive Compensation”, “Compensation Committee Report” and “Director Compensation” of the definitive proxy statement for the 2019 Annual General Meeting of Shareholders which will be filed with the SEC not later than 120 days after the close of the fiscal year pursuant to Regulation 14A.

ITEM 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants, and rights	Weighted-average exercise price of outstanding options, warrants, and rights (3)	Number of securities remaining available for future issuance under equity compensation plans
Equity compensation plans approved by security holders (1)	11,965,165	$ 108.26	16,205,809
Equity compensation plans not approved by security holders (2)	34,521		

(1) These totals include securities available for future issuance under the following plans:

(i) Chubb Limited 2016 Long-Term Incentive Plan (LTIP). A total of 19,500,000 shares are authorized to be issued pursuant to awards made as options, stock appreciation rights, stock units, performance shares, performance units, restricted stock, and restricted stock units. The maximum number of shares that may be delivered to participants and their beneficiaries under the LTIP shall be equal to the sum of: (x) 19,500,000 shares of stock; and (y) any shares of stock that have not been delivered pursuant to the ACE LTIP (as defined in clause (ii) of this footnote (1) below) and remain available for grant pursuant to the ACE LTIP, including shares of stock represented by awards granted under the ACE LTIP that are forfeited, expire or are canceled after the effective date of the LTIP without delivery of shares of stock or which result in the forfeiture of the shares of stock back to the Company to the extent that such shares would have been added back to the reserve under the terms of the ACE LTIP. As of December 31, 2018, a total of 3,340,842 option awards and 481,357 restricted stock unit awards are outstanding, and 14,100,867 shares remain available for future issuance under this plan.

(ii) ACE Limited 2004 Long-Term Incentive Plan (ACE LTIP). As of December 31, 2018, a total of 7,159,680 option awards and 210,121 restricted stock unit awards are outstanding. No additional grants will be made pursuant to the ACE LTIP.

(iii) The Chubb Corporation Long-Term Incentive Plan (2014) (Chubb Corp. LTIP). As of December 31, 2018, a total of 506,778 option awards, 72,077 restricted stock unit awards, nil performance unit awards (representing 100% of the aggregate target in accordance with the Chubb Corp. merger agreement) and 151,171 deferred stock unit awards are outstanding. No additional grants will be made pursuant to the Chubb Corp. LTIP.

(iv) ESPP. A total of 6,500,000 shares have been authorized for purchase at a discount. As of December 31, 2018, 2,104,942 shares remain available for future issuance under this plan.

(2) These plans are the Chubb Corp. CCAP Excess Benefit Plan (CCAP Excess Benefit Plan) and the Chubb Corp. Deferred Compensation Plan for Directors, under which no Common Shares are available for future issuance other than with respect to outstanding rewards. The CCAP Excess Benefit Plan is a nonqualified, defined contribution plan and covers those participants in the Capital Accumulation Plan of The Chubb Corporation (CCAP) (Chubb Corp.'s legacy 401(k) plan) and Chubb Corp.'s legacy employee stock ownership plan (ESOP) whose total benefits under those plans are limited by certain provisions of the Internal Revenue Code. A participant in the CCAP Excess Benefit Plan is entitled to a benefit equaling the difference between the participant's benefits under the CCAP and the ESOP, without considering the applicable limitations of the Code, and the participant's actual benefits under such plans. A participant's excess ESOP benefit is expressed as Common Shares. Payments under the CCAP Excess Benefit Plan are generally made: (i) for excess benefits related to the CCAP, in cash annually as soon as practical after the amount of excess benefit can be determined; and (ii) for excess benefits related to the ESOP, in Common Shares as soon as practicable after the participant's termination of employment. Allocations under the ESOP ceased in 2004. Accordingly, other than dividends, no new contributions are made to the ESOP or the CCAP Excess Benefit Plan with respect to excess ESOP benefits.

(3) Weighted average exercise price excludes shares issuable under performance unit awards and restricted stock unit awards.

ITEM 13. Certain Relationships and Related Transactions and Director Independence

This item is incorporated by reference to the sections entitled "Corporate Governance - What Is Our Related Party Transactions Approval Policy And What Procedures Do We Use To Implement It?", "Corporate Governance - What Related Party Transactions Do We Have?", and "Corporate Governance - The Board of Directors - Director Independence" of the definitive proxy statement for the 2019 Annual General Meeting of Shareholders which will be filed with the SEC not later than 120 days after the close of the fiscal year pursuant to Regulation 14A.

ITEM 14. Principal Accounting Fees and Services

This item is incorporated by reference to the section entitled "Agenda Item 4 – Election of Auditors – 4.2 – Ratification of appointment of PricewaterhouseCoopers LLP (United States) as independent registered public accounting firm for purposes of U.S. securities law reporting" of the definitive proxy statement for the 2019 Annual General Meeting of Shareholders which will be filed with the SEC not later than 120 days after the close of the fiscal year pursuant to Regulation 14A.

PART IV

ITEM 15. Exhibits, Financial Statement Schedules

(a) Financial Statements, Schedules, and Exhibits

Other schedules have been omitted as they are not applicable to Chubb, or the required information has been included in the Consolidated Financial Statements and related notes.

3. Exhibits

		Incorporated by Reference			
Exhibit Number	Exhibit Description	Form	Original Number	Date Filed	Filed Herewith
2.1	Agreement and Plan of Merger, by and among ACE Limited, William Investment Holdings Corporation and The Chubb Corporation, dated as of June 30, 2015	8-K	2.1	July 7, 2015	
3.1	Articles of Association of the Company, as amended and restated	8-K	3.1	May 18, 2018	
3.2	Organizational Regulations of the Company as amended	8-K	3.1	November 21, 2016	
4.1	Articles of Association of the Company, as amended and restated	8-K	4.1	May 18, 2018	
4.2	Organizational Regulations of the Company as amended	8-K	3.1	November 21, 2016	
4.3	Specimen share certificate representing Common Shares	8-K	4.3	July 18, 2008	
4.4	Form of 2.6 percent Senior Notes due 2015	8-K	4.1	November 23, 2010	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Original Number	Date Filed	Filed Herewith
4.5	Indenture, dated March 15, 2002, between ACE Limited and Bank One Trust Company, N.A.	8-K	4.1	March 22, 2002	
4.6	Senior Indenture, dated August 1, 1999, among ACE INA Holdings, Inc., ACE Limited and Bank of New York Mellon Trust Company, N.A. (as successor), as trustee	S-3 ASR	4.4	December 10, 2014	
4.7	Indenture, dated November 30, 1999, among ACE INA Holdings, Inc. and Bank One Trust Company, N.A., as trustee	10-K	10.38	March 29, 2000	
4.8	Indenture, dated December 1, 1999, among ACE INA Holdings, Inc., ACE Limited and Bank One Trust Company, National Association, as trustee	10-K	10.41	March 29, 2000	
4.9	Amended and Restated Trust Agreement, dated March 31, 2000, among ACE INA Holdings, Inc., Bank One Trust Company, National Association, as property trustee, Bank One Delaware Inc., as Delaware trustee and the administrative trustees named therein	10-K	4.17	March 16, 2006	
4.10	Common Securities Guarantee Agreement, dated March 31, 2000	10-K	4.18	March 16, 2006	
4.11	Capital Securities Guarantee Agreement, dated March 31, 2000	10-K	4.19	March 16, 2006	
4.12	Form of 2.70 percent Senior Notes due 2023	8-K	4.1	March 13, 2013	
4.13	Form of 4.15 percent Senior Notes due 2043	8-K	4.2	March 13, 2013	
4.14	First Supplemental Indenture dated as of March 13, 2013 to the Indenture dated as of August 1, 1999 among ACE INA Holdings, Inc., as Issuer, ACE Limited, as Guarantor, and The Bank of New York Mellon Trust Company, N.A., as Successor Trustee	8-K	4.3	March 13, 2013	
4.15	Form of 3.35 percent Senior Notes due 2024	8-K	4.1	May 27, 2014	
4.16	Form of 3.150 percent Senior Notes due 2025	8-K	4.1	March 16, 2015	
4.17	Form of 2.30 percent Senior Notes due 2020	8-K	4.1	November 3, 2015	
4.18	Form of 2.875 percent Senior Notes due 2022	8-K	4.2	November 3, 2015	
4.19	Form of 3.35 percent Senior Notes due 2026	8-K	4.3	November 3, 2015	
4.20	Form of 4.35 percent Senior Notes due 2045	8-K	4.4	November 3, 2015	
4.21	First Supplemental Indenture to the Chubb Corp Senior Indenture dated as of January 15, 2016 to the Indenture dated as of October 25, 1989 among ACE INA Holdings, Inc., as Successor Issuer, ACE Limited, as Guarantor, and The Bank of New York Mellon Trust Company, N.A., as Trustee	8-K	4.1	January 15, 2016	
4.22	Second Supplemental Indenture to the Chubb Corp Junior Subordinated Indenture dated as of January 15, 2016 to the Indenture dated as of March 29, 2007 among ACE INA Holdings, Inc., as Successor Issuer, ACE Limited, as Guarantor, and The Bank of New York Mellon Trust Company, N.A., as Trustee	8-K	4.2	January 15, 2016	
4.23	Chubb Corp Senior Indenture (incorporated by reference to Exhibit 4(a) to Chubb Corp's Registration Statement on Form S-3 filed on October 27, 1989) (File No. 33-31796)	S-3	4(a)	October 27, 1989	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Original Number	Date Filed	Filed Herewith
4.24	Chubb Corp Junior Subordinated Indenture (incorporated by reference to Exhibit 4.1 to Chubb Corp's Current Report on Form 8-K filed on March 30, 2007) (File No. 001-08661)	8-K	4.1	March 30, 2007	
4.25	First Supplemental Indenture to the Chubb Corp Junior Subordinated Indenture dated as of March 29, 2007 between the Chubb Corporation and The Bank of New York Trust Company, N.A., as Trustee (incorporated by reference to Exhibit 4.2 to Chubb Corp's Current Report on Form 8-K filed on March 30, 2007) (File No. 001-08661)	8-K	4.2	March 30, 2007	
4.26	Form of 5.75 percent Chubb Corp Senior Notes due 2018 (incorporated by reference to Exhibit 4.1 to Chubb Corp's Current Report on Form 8-K filed on May 6, 2008) (File No. 001-08661)	8-K	4.1	May 6, 2008	
4.27	Form of 6.60 percent Chubb Corp Debentures due 2018 (incorporated by reference to Exhibit 4(a) to Chubb Corp's Registration Statement on Form S-3 filed on October 27, 1989) (File No. 33-31796)	S-3	4(a)	October 27, 1989	
4.28	Form of 6.80 percent Chubb Corp Debentures due 2031 (incorporated by reference to Exhibit 4(a) to Chubb Corp's Registration Statement on Form S-3 filed on October 27, 1989) (File No. 33-31796)	S-3	4(a)	October 27, 1989	
4.29	Form of 6.00 percent Chubb Corp Senior Notes due 2037 (incorporated by reference to Exhibit 4.1 to Chubb Corp's Current Report on Form 8-K filed on May 11, 2007) (File No. 001-08661)	8-K	4.1	May 11, 2007	
4.30	Form of 6.50 percent Chubb Corp Senior Notes due 2038 (incorporated by reference to Exhibit 4.2 to Chubb Corp's Current Report on Form 8-K filed on May 6, 2008) (File No. 001-08661)	8-K	4.2	May 6, 2008	
4.31	Form of debenture for the 6.375 percent Chubb Corp DISCs (incorporated by reference to Exhibit 4.3 to Chubb Corp's Current Report on Form 8-K filed on March 30, 2007) (File No. 001-08661)	8-K	4.3	March 30, 2007	
4.32	Procedures regarding the registration of shareholders in the share register of Chubb Limited	10-K	4.32	February 28, 2017	
4.33	Form of Officer's Certificate related to the 1.550% Senior Notes due 2028 and 2.500% Senior Notes due 2038	8-K	4.1	March 6, 2018	
4.34	Form of Global Note for the 1.550% Senior Notes due 2028	8-K	4.2	March 6, 2018	
4.35	Form of Global Note for the 2.500% Senior Notes due 2038	8-K	4.3	March 6, 2018	
10.1*	Form of Indemnification Agreement between the Company and the directors of the Company, dated August 13, 2015	10-K	10.1	February 26, 2016	
10.2	Credit Agreement for $1,000,000,000 Senior Unsecured Letter of Credit Facility, dated as of November 6, 2012, among ACE Limited, and certain subsidiaries and Wells Fargo Bank, National Association as Administrative Agent, the Swingline Bank and an Issuing Bank	10-K	10.13	February 28, 2013	
10.3*	Employment Terms dated October 29, 2001, between ACE Limited and Evan Greenberg	10-K	10.64	March 27, 2003	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Original Number	Date Filed	Filed Herewith
10.4*	Employment Terms dated November 2, 2001, between ACE Limited and Philip V. Bancroft	10-K	10.65	March 27, 2003	
10.5*	Executive Severance Agreement between ACE Limited and Philip Bancroft, effective January 2, 2002	10-Q	10.1	May 10, 2004	
10.6*	Letter Regarding Executive Severance between ACE Limited and Philip V. Bancroft	10-K	10.17	February 25, 2011	
10.7*	Employment Terms dated April 10, 2006, between ACE and John Keogh	10-K	10.29	February 29, 2008	
10.8*	Executive Severance Agreement between ACE and John Keogh	10-K	10.30	February 29, 2008	
10.9*	ACE Limited Executive Severance Plan as amended effective May 18, 2011	10-K	10.21	February 24, 2012	
10.10*	Form of employment agreement between the Company (or subsidiaries of the Company) and executive officers of the Company to allocate a percentage of aggregate salary to the Company (or subsidiaries of the Company)	8-K	10.1	July 16, 2008	
10.11*	Description of Executive Officer Cash Compensation for 2011	10-Q	10.1	November 3, 2011	
10.12*	Outside Directors Compensation Parameters				X
10.13*	ACE Limited Annual Performance Incentive Plan	S-1	10.13	January 21, 1993	
10.14*	ACE Limited Elective Deferred Compensation Plan (as amended and restated effective January 1, 2005)	10-K	10.24	March 16, 2006	
10.15*	ACE USA Officer Deferred Compensation Plan (as amended through January 1, 2001)	10-K	10.25	March 16, 2006	
10.16*	ACE USA Officer Deferred Compensation Plan (as amended and restated effective January 1, 2011)	10-Q	10.7	October 30, 2013	
10.17*	ACE USA Officer Deferred Compensation Plan (as amended and restated effective January 1, 2009)	10-K	10.36	February 27, 2009	
10.18*	First Amendment to the Amended and Restated ACE USA Officers Deferred Compensation Plan	10-K	10.28	February 25, 2010	
10.19*	Form of Swiss Mandatory Retirement Benefit Agreement (for Swiss-employed named executive officers)	10-Q	10.2	May 7, 2010	
10.20*	ACE Limited Supplemental Retirement Plan (as amended and restated effective July 1, 2001)	10-Q	10.1	November 14, 2001	
10.21*	ACE Limited Supplemental Retirement Plan (as amended and restated effective January 1, 2011)	10-Q	10.6	October 30, 2013	
10.22*	Amendments to the ACE Limited Supplemental Retirement Plan and the ACE Limited Elective Deferred Compensation Plan	10-K	10.38	February 29, 2008	
10.23*	ACE Limited Elective Deferred Compensation Plan (as amended and restated effective January 1, 2009)	10-K	10.39	February 27, 2009	
10.24*	ACE Limited Elective Deferred Compensation Plan (as amended and restated effective January 1, 2011)	10-Q	10.5	October 30, 2013	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Original Number	Date Filed	Filed Herewith
10.25*	Deferred Compensation Plan amendments, effective January 1, 2009	10-K	10.40	February 27, 2009	
10.26*	Amendment to the ACE Limited Supplemental Retirement Plan	10-K	10.39	February 29, 2008	
10.27*	Amendment and restated ACE Limited Supplemental Retirement Plan, effective January 1, 2009	10-K	10.42	February 27, 2009	
10.28*	ACE USA Supplemental Employee Retirement Savings Plan (see exhibit 10.6 to Form 10-Q filed with the SEC on May 15, 2000)	10-Q	10.6	May 15, 2000	
10.29*	ACE USA Supplemental Employee Retirement Savings Plan (as amended through the Second Amendment)	10-K	10.30	March 1, 2007	
10.30*	ACE USA Supplemental Employee Retirement Savings Plan (as amended through the Third Amendment)	10-K	10.31	March 1, 2007	
10.31*	ACE USA Supplemental Employee Retirement Savings Plan (as amended and restated)	10-K	10.46	February 27, 2009	
10.32*	First Amendment to the Amended and Restated ACE USA Supplemental Employee Retirement Savings Plan	10-K	10.39	February 25, 2010	
10.33*	The ACE Limited 1995 Outside Directors Plan (as amended through the Seventh Amendment)	10-Q	10.1	August 14, 2003	
10.34*	ACE Limited 1998 Long-Term Incentive Plan (as amended through the Fourth Amendment)	10-K	10.34	March 1, 2007	
10.35*	ACE Limited 2004 Long-Term Incentive Plan (as amended through the Fifth Amendment)	8-K	10	May 21, 2010	
10.36*	ACE Limited 2004 Long-Term Incentive Plan (as amended through the Sixth Amendment)	8-K	10.1	May 20, 2013	
10.37*	ACE Limited Rules of the Approved U.K. Stock Option Program (see exhibit 10.2 to Form 10-Q filed with the SEC on February 13, 1998)	10-Q	10.2	February 13, 1998	
10.38*	Form of Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-K	10.54	February 27, 2009	
10.39*	Form of Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-K	10.55	February 27, 2009	
10.40*	Director Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.1	November 9, 2009	
10.41*	Form of Restricted Stock Unit Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.1	May 8, 2008	
10.42*	Form of Restricted Stock Unit Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.2	May 8, 2008	
10.43*	Form of Restricted Stock Unit Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-K	10.60	February 27, 2009	
10.44*	Form of Restricted Stock Unit Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.2	October 30, 2013	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Original Number	Date Filed	Filed Herewith
10.45*	Form of Restricted Stock Unit Award Terms under the ACE Limited 2004 Long-Term Incentive Plan for Chief Executive Officer, Chief Financial Officer and the General Counsel	10-K	10.56	February 28, 2014	
10.46*	Form of Incentive Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan	8-K	10.4	September 13, 2004	
10.47*	Form of Incentive Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.4	May 8, 2008	
10.48*	Form of Incentive Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-K	10.63	February 27, 2009	
10.49*	Form of Incentive Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.3	October 30, 2013	
10.50*	Form of Non-Qualified Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan	8-K	10.5	September 13, 2004	
10.51*	Form of Non-Qualified Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.3	May 8, 2008	
10.52*	Form of Non-Qualified Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.4	October 30, 2013	
10.53*	Form of Performance Based Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan, as updated through May 4, 2006	10-Q	10.3	May 5, 2006	
10.54*	Revised Form of Performance Based Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.2	November 8, 2006	
10.55*	Revised Form of Performance Based Restricted Stock Award Terms under The ACE Limited 2004 Long-Term Incentive Plan	10-K	10.65	February 25, 2011	
10.56*	Form of Performance Based Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-K	10.67	February 28, 2014	
10.57*	Form of Performance Based Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan for Chief Executive Officer, Chief Financial Officer and the General Counsel	10-K	10.68	February 28, 2014	
10.58*	Form of Restricted Stock Unit Award Terms (for outside directors) under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.2	November 7, 2007	
10.59*	Form of Restricted Stock Unit Award Terms (for outside directors) under the ACE Limited 2004 Long-Term Incentive Plan	10-Q	10.2	August 7, 2009	
10.60*	Form of Incentive Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan for Messrs. Greenberg and Cusumano	10-Q	10.1	August 4, 2011	
10.61*	Form of Non-Qualified Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan for Messrs. Greenberg and Cusumano	10-Q	10.2	August 4, 2011	
10.62*	Form of Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan for Messrs. Greenberg and Cusumano	10-Q	10.3	August 4, 2011	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Original Number	Date Filed	Filed Herewith
10.63*	ACE Limited Employee Stock Purchase Plan, as amended	8-K	10.1	May 22, 2012	
10.64*	Form of Performance Based Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan for Messrs. Greenberg and Cusumano	10-K	10.72	February 24, 2012	
10.65*	Separation and Release Agreement between the Company and Robert Cusumano, dated July 24, 2013	10-Q	10.8	October 30, 2013	
10.66*	Form of Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.68	February 27, 2015	
10.67*	Form of Performance Based Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.69	February 27, 2015	
10.68*	Form of Restricted Stock Unit Award Terms under the ACE Limited 2004 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.70	February 27, 2015	
10.69*	Form of Incentive Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.71	February 27, 2015	
10.70*	Form of Non-Qualified Stock Option Terms under the ACE Limited 2004 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.72	February 27, 2015	
10.71*	Form of Executive Management Non-Competition Agreement	8-K	10.1	May 22, 2015	
10.72	Commitment Increase Agreement to increase the credit capacity under the Credit Agreement originally entered into on November 6, 2012 to $1,500,000,000 under the Senior Unsecured Letter of Credit Facility, dated as of December 11, 2015, among ACE Limited, and certain subsidiaries, and Wells Fargo Bank, National Association as Administrative Agent, the Swingline Bank and an Issuing Bank	10-K	10.72	February 26, 2016	
10.73*	Form of Performance Based Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan	10-K	10.73	February 26, 2016	
10.74*	Form of Performance Based Restricted Stock Award Terms under the ACE Limited 2004 Long-Term Incentive Plan for Special Award for Messrs. Greenberg and Keogh	10-K	10.74	February 26, 2016	
10.75*	Chubb Limited 2016 Long-Term Incentive Plan	S-8	4.4	May 26, 2016	
10.76*	Form of Incentive Stock Option Terms under the Chubb Limited 2016 Long-Term Incentive Plan	10-Q	10.2	August 5, 2016	
10.77*	Form of Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan	10-Q	10.3	August 5, 2016	
10.78*	Form of Restricted Stock Unit Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan	10-Q	10.4	August 5, 2016	
10.79*	Form of Non-Qualified Stock Option Terms under the Chubb Limited 2016 Long-Term Incentive Plan	10-Q	10.5	August 5, 2016	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Original Number	Date Filed	Filed Herewith
10.80*	Form of Incentive Stock Option Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-Q	10.6	August 5, 2016	
10.81*	Form of Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-Q	10.7	August 5, 2016	
10.82*	Form of Restricted Stock Unit Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-Q	10.8	August 5, 2016	
10.83*	Form of Non-Qualified Stock Option Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-Q	10.9	August 5, 2016	
10.84*	Form of Performance Based Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.84	February 28, 2017	
10.85*	Form of Performance Based Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan	10-K	10.85	February 28, 2017	
10.86*	Chubb Limited Employee Stock Purchase Plan, as amended and restated	S-8	4.4	May 25, 2017	
10.87*	Director Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan	10-Q	10.1	August 3, 2017	
10.88	Amended and Restated Credit Agreement for $1,000,000 Senior Unsecured Letter of Credit Facility, dated as of October 25, 2017, among Chubb Limited, and certain subsidiaries and Wells Fargo Bank, National Association as Administrative Agent, the Swingline Bank and an Issuing Bank	10-K	10.88	February 23, 2018	
10.89*	Form of Incentive Stock Option Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Executive Officers	10-K	10.89	February 23, 2018	
10.90*	Form of Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Executive Officers	10-K	10.90	February 23, 2018	
10.91*	Form of Performance Based Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Executive Officers	10-K	10.91	February 23, 2018	
10.92*	Form of Non-Qualified Stock Option Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Executive Officers	10-K	10.92	February 23, 2018	
10.93*	Form of Restricted Stock Unit Award Terms under the Chubb Limited 2016 Long-Term Plan for Executive Officers	10-K	10.93	February 23, 2018	
10.94*	Form of Incentive Stock Option Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.94	February 23, 2018	
10.95*	Form of Non-Qualified Stock Option Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.95	February 23, 2018	
10.96*	Form of Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.96	February 23, 2018	

Exhibit Number	Exhibit Description	Incorporated by Reference Form	Original Number	Date Filed	Filed Herewith
10.97*	Form of Restricted Stock Unit Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.97	February 23, 2018	
10.98*	Form of Performance Based Restricted Stock Award Terms under the Chubb Limited 2016 Long-Term Incentive Plan for Swiss Executive Management	10-K	10.98	February 23, 2018	
10.99*	Chubb Limited Clawback Policy	10-K	10.99	February 23, 2018	
21.1	Subsidiaries of the Company				X
23.1	Consent of Independent Registered Public Accounting Firm				X
31.1	Certification Pursuant to Section 302 of The Sarbanes-Oxley Act of 2002				X
31.2	Certification Pursuant to Section 302 of The Sarbanes-Oxley Act of 2002				X
32.1	Certification Pursuant to 18 U.S.C. Section 1350, As Adopted Pursuant to Section 906 of The Sarbanes-Oxley Act of 2002				X
32.2	Certification Pursuant to 18 U.S.C. Section 1350, As Adopted Pursuant to Section 906 of The Sarbanes-Oxley Act of 2002				X
101	The following financial information from Chubb Limited's Annual Report on Form 10-K for the year ended December 31, 2018, formatted in XBRL: (i) Consolidated Balance Sheets at December 31, 2018 and 2017; (ii) Consolidated Statements of Operations and Comprehensive Income for the years ended December 31, 2018, 2017, and 2016; (iii) Consolidated Statements of Shareholders' Equity for the years ended December 31, 2018, 2017, and 2016; (iv) Consolidated Statements of Cash Flows for the years ended December 31, 2018, 2017, and 2016; and (v) Notes to the Consolidated Financial Statements				X

* Management contract, compensatory plan or arrangement

ITEM 16. Form 10-K Summary

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

CHUBB LIMITED

By: /s/ Philip V. Bancroft

Philip V. Bancroft
Executive Vice President and Chief Financial Officer

February 28, 2019

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Evan G. Greenberg **Evan G. Greenberg**	Chairman, President, Chief Executive Officer, and Director	February 28, 2019
/s/ Philip V. Bancroft **Philip V. Bancroft**	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	February 28, 2019
/s/ Paul B. Medini **Paul B. Medini**	Chief Accounting Officer (Principal Accounting Officer)	February 28, 2019
/s/ Michael G. Atieh **Michael G. Atieh**	Director	February 28, 2019
/s/ Sheila P. Burke **Sheila P. Burke**	Director	February 28, 2019
/s/ James I. Cash **James I. Cash**	Director	February 28, 2019
/s/ Mary A. Cirillo **Mary A. Cirillo**	Director	February 28, 2019
/s/ Michael P. Connors **Michael P. Connors**	Director	February 28, 2019

Signature	Title	Date
/s/ John Edwardson **John Edwardson**	Director	February 28, 2019
/s/ Robert M. Hernandez **Robert M. Hernandez**	Director	February 28, 2019
/s/ Kimberly Ross **Kimberly Ross**	Director	February 28, 2019
/s/ Robert Scully **Robert Scully**	Director	February 28, 2019
/s/ Eugene B. Shanks, Jr. **Eugene B. Shanks, Jr.**	Director	February 28, 2019
/s/ Theodore E. Shasta **Theodore E. Shasta**	Director	February 28, 2019
/s/ David Sidwell **David Sidwell**	Director	February 28, 2019
/s/ Olivier Steimer **Olivier Steimer**	Director	February 28, 2019
/s/ James M. Zimmerman **James M. Zimmerman**	Director	February 28, 2019

CHUBB LIMITED AND SUBSIDIARIES

CONSOLIDATED FINANCIAL STATEMENTS

December 31, 2018

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

MANAGEMENT'S RESPONSIBILITY FOR FINANCIAL STATEMENTS AND INTERNAL CONTROL OVER FINANCIAL REPORTING

Financial Statements

The consolidated financial statements of Chubb Limited (Chubb) were prepared by management, which is responsible for their reliability and objectivity. The statements have been prepared in conformity with accounting principles generally accepted in the United States of America and, as such, include amounts based on informed estimates and judgments of management. Financial information elsewhere in this annual report is consistent with that in the consolidated financial statements.

The Board of Directors (Board), operating through its Audit Committee, which is composed entirely of directors who are not officers or employees of Chubb, provides oversight of the financial reporting process and safeguarding of assets against unauthorized acquisition, use or disposition. The Audit Committee annually recommends the appointment of an independent registered public accounting firm and submits its recommendation to the Board for approval.

The Audit Committee meets with management, the independent registered public accountants and the internal auditor; approves the overall scope of audit work and related fee arrangements; and reviews audit reports and findings. In addition, the independent registered public accountants and the internal auditor meet separately with the Audit Committee, without management representatives present, to discuss the results of their audits; the adequacy of Chubb's internal control; the quality of its financial reporting; and the safeguarding of assets against unauthorized acquisition, use or disposition.

The consolidated financial statements have been audited by an independent registered public accounting firm, PricewaterhouseCoopers LLP, which has been given access to all financial records and related data, including minutes of all meetings of the Board and committees of the Board. Chubb believes that all representations made to our independent registered public accountants during their audits were valid and appropriate.

Internal Control over Financial Reporting

The management of Chubb is responsible for establishing and maintaining adequate internal control over financial reporting. Pursuant to the rules and regulations of the Securities and Exchange Commission, internal control over financial reporting is a process designed by, or under the supervision of our Chief Executive Officer and Chief Financial Officer to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our consolidated financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America.

As of December 31, 2018, management has evaluated the effectiveness of Chubb's internal control over financial reporting based on the criteria for effective internal control over financial reporting established in "Internal Control - Integrated Framework," issued by the Committee of Sponsoring Organizations of the Treadway Commission in 2013. Based on this evaluation, we have concluded that Chubb's internal control over financial reporting was effective as of December 31, 2018.

PricewaterhouseCoopers LLP, the independent registered public accounting firm that audited the consolidated financial statements of Chubb included in this Annual Report, has issued a report on the effectiveness of Chubb's internal controls over financial reporting as of December 31, 2018. The report, which expresses an unqualified opinion on the effectiveness of Chubb's internal control over financial reporting as of December 31, 2018, is included in this Item under "Report of Independent Registered Public Accounting Firm" and follows this statement.

/s/ Evan G. Greenberg	/s/ Philip V. Bancroft
Evan G. Greenberg	Philip V. Bancroft
Chairman, President and Chief Executive Officer	Executive Vice President and Chief Financial Officer

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of Chubb Limited

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Chubb Limited and its subsidiaries (the "Company") as of December 31, 2018 and 2017, and the related consolidated statements of operations and comprehensive income, shareholders' equity and cash flows for each of the three years in the period ended December 31, 2018, including the related notes and financial statement schedules listed in the index appearing under Item 15(a)(2) (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Responsibility for Financial Statements and Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
Philadelphia, PA
February 28, 2019

We have served as the Company's auditor since 1985, which includes periods before the Company became subject to SEC reporting requirements.

CONSOLIDATED BALANCE SHEETS

Chubb Limited and Subsidiaries

(in millions of U.S. dollars, except share and per share data)	**December 31 2018**	December 31 2017
Assets		
Investments		
Fixed maturities available for sale, at fair value (amortized cost – $79,323 and $77,835) (includes hybrid financial instruments of $9 and $5)	**$ 78,470**	$ 78,939
Fixed maturities held to maturity, at amortized cost (fair value – $13,259 and $14,474)	**13,435**	14,335
Equity securities, at fair value (cost – $770 and $737)	**770**	937
Short-term investments, at fair value and amortized cost	**3,016**	3,561
Other investments (cost – $5,277 and $4,417)	**5,277**	4,672
Total investments	**100,968**	102,444
Cash	**1,247**	728
Restricted cash	**93**	123
Securities lending collateral	**1,926**	1,737
Accrued investment income	**883**	909
Insurance and reinsurance balances receivable	**10,075**	9,334
Reinsurance recoverable on losses and loss expenses	**15,993**	15,034
Reinsurance recoverable on policy benefits	**202**	184
Deferred policy acquisition costs	**4,922**	4,723
Value of business acquired	**295**	326
Goodwill	**15,271**	15,541
Other intangible assets	**6,143**	6,513
Prepaid reinsurance premiums	**2,544**	2,529
Investments in partially-owned insurance companies	**678**	662
Other assets	**6,531**	6,235
Total assets	**$ 167,771**	$ 167,022
Liabilities		
Unpaid losses and loss expenses	**$ 62,960**	$ 63,179
Unearned premiums	**15,532**	15,216
Future policy benefits	**5,506**	5,321
Insurance and reinsurance balances payable	**6,437**	5,868
Securities lending payable	**1,926**	1,737
Accounts payable, accrued expenses, and other liabilities	**10,472**	9,545
Deferred tax liabilities	**304**	699
Repurchase agreements	**1,418**	1,408
Short-term debt	**509**	1,013
Long-term debt	**12,087**	11,556
Trust preferred securities	**308**	308
Total liabilities	**117,459**	115,850
Commitments and contingencies		
Shareholders' equity		
Common Shares (CHF 24.15 par value; 479,783,864 shares issued; 459,203,378 and 463,833,179 shares outstanding)	**11,121**	11,121
Common Shares in treasury (20,580,486 and 15,950,685 shares)	**(2,618)**	(1,944)
Additional paid-in capital	**12,557**	13,978
Retained earnings	**31,700**	27,474
Accumulated other comprehensive income (loss) (AOCI)	**(2,448)**	543
Total shareholders' equity	**50,312**	51,172
Total liabilities and shareholders' equity	**$ 167,771**	$ 167,022

See accompanying notes to the consolidated financial statements

CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME

Chubb Limited and Subsidiaries

For the years ended December 31, 2018, 2017, and 2016 (in millions of U.S. dollars, except per share data)	2018	2017	2016
Revenues			
Net premiums written	$ 30,579	$ 29,244	$ 28,145
(Increase) decrease in unearned premiums	(515)	(210)	604
Net premiums earned	30,064	29,034	28,749
Net investment income	3,305	3,125	2,865
Net realized gains (losses):			
Other-than-temporary impairment (OTTI) losses gross	(52)	(46)	(111)
Portion of OTTI losses recognized in other comprehensive income (OCI)	3	1	8
Net OTTI losses recognized in income	(49)	(45)	(103)
Net realized gains (losses) excluding OTTI losses	(603)	129	(42)
Total net realized gains (losses) (includes $(302), $(15), and $(119) reclassified from AOCI)	(652)	84	(145)
Total revenues	32,717	32,243	31,469
Expenses			
Losses and loss expenses	18,067	18,454	16,052
Policy benefits	590	676	588
Policy acquisition costs	5,912	5,781	5,904
Administrative expenses	2,886	2,833	3,081
Interest expense	641	607	605
Other (income) expense	(434)	(400)	(222)
Amortization of purchased intangibles	339	260	19
Chubb integration expenses	59	310	492
Total expenses	28,060	28,521	26,519
Income before income tax	4,657	3,722	4,950
Income tax expense (benefit) (includes $(41), $(13), and $28 on reclassified unrealized gains and losses)	695	(139)	815
Net income	$ 3,962	$ 3,861	$ 4,135
Other comprehensive income (loss)			
Unrealized appreciation (depreciation)	$ (2,298)	$ 618	$ (35)
Reclassification adjustment for net realized (gains) losses included in net income	302	15	119
	(1,996)	633	84
Change in:			
Cumulative foreign currency translation adjustment	(802)	471	(154)
Postretirement benefit liability adjustment	(321)	(16)	545
Other comprehensive income (loss), before income tax	(3,119)	1,088	475
Income tax (expense) benefit related to OCI items	399	(231)	(54)
Other comprehensive income (loss)	(2,720)	857	421
Comprehensive income	$ 1,242	$ 4,718	$ 4,556
Earnings per share			
Basic earnings per share	$ 8.55	$ 8.26	$ 8.94
Diluted earnings per share	$ 8.49	$ 8.19	$ 8.87

See accompanying notes to the consolidated financial statements

CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

Chubb Limited and Subsidiaries

For the years ended December 31, 2018, 2017, and 2016 (in millions of U.S. dollars)	2018	2017	2016
Common Shares			
Balance – beginning of year	**$ 11,121**	$ 11,121	$ 7,833
Shares issued for Chubb Corp acquisition	**—**	—	3,288
Balance – end of year	**11,121**	11,121	11,121
Common Shares in treasury			
Balance – beginning of year	**(1,944)**	(1,480)	(1,922)
Common Shares repurchased	**(1,021)**	(830)	—
Net shares redeemed under employee share-based compensation plans	**347**	366	442
Balance – end of year	**(2,618)**	(1,944)	(1,480)
Additional paid-in capital			
Balance – beginning of year	**13,978**	15,335	4,481
Shares issued for Chubb Corp acquisition	**—**	—	11,916
Equity awards assumed in Chubb Corp acquisition	**—**	—	323
Net shares redeemed under employee share-based compensation plans	**(313)**	(313)	(382)
Exercise of stock options	**(49)**	(58)	(64)
Share-based compensation expense	**285**	331	313
Funding of dividends declared to Retained earnings	**(1,344)**	(1,317)	(1,284)
Tax benefit on share-based compensation expense	**—**	—	32
Balance – end of year	**12,557**	13,978	15,335
Retained earnings			
Balance – beginning of year	**27,474**	23,613	19,478
Cumulative effect of adoption of accounting standards (refer to Note 1)	**264**	—	—
Balance – beginning of year, as adjusted	**27,738**	23,613	19,478
Net income	**3,962**	3,861	4,135
Funding of dividends declared from Additional paid-in capital	**1,344**	1,317	1,284
Dividends declared on Common Shares	**(1,344)**	(1,317)	(1,284)
Balance – end of year	**31,700**	27,474	23,613
Accumulated other comprehensive income (loss)			
Net unrealized appreciation on investments			
Balance – beginning of year	**1,450**	1,058	874
Cumulative effect of adoption of accounting standards (refer to Note 1)	**(296)**	—	—
Balance – beginning of year, as adjusted	**1,154**	1,058	874
Change in year, before reclassification from AOCI, net of income tax benefit (expense) of $338, $(228), and $72	**(1,960)**	390	37
Amounts reclassified from AOCI, net of income tax benefit (expense) of $(41), $(13), and $28	**261**	2	147
Change in year, net of income tax benefit (expense) of $297, $(241), and $100	**(1,699)**	392	184
Balance – end of year	**(545)**	1,450	1,058
Cumulative foreign currency translation adjustment			
Balance – beginning of year	**(1,187)**	(1,663)	(1,539)
Cumulative effect of adoption of accounting standards (refer to Note 1)	**(22)**	—	—
Balance – beginning of year, as adjusted	**(1,209)**	(1,663)	(1,539)
Change in year, net of income tax benefit of $35, $5, and $30	**(767)**	476	(124)
Balance – end of year	**(1,976)**	(1,187)	(1,663)
Postretirement benefit liability adjustment			
Balance – beginning of year	**280**	291	(70)
Cumulative effect of adoption of accounting standards (refer to Note 1)	**47**	—	—
Balance – beginning of year, as adjusted	**327**	291	(70)
Change in year, net of income tax benefit (expense) of $67, $5, and $(184)	**(254)**	(11)	361
Balance – end of year	**73**	280	291
Accumulated other comprehensive income (loss)	**(2,448)**	543	(314)
Total shareholders' equity	**$ 50,312**	$ 51,172	$ 48,275

See accompanying notes to the consolidated financial statements

CONSOLIDATED STATEMENTS OF CASH FLOWS

Chubb Limited and Subsidiaries

For the years ended December 31, 2018, 2017, and 2016 (in millions of U.S. dollars)	**2018**	2017	2016
Cash flows from operating activities			
Net income	**$ 3,962**	$ 3,861	$ 4,135
Adjustments to reconcile net income to net cash flows from operating activities			
Net realized (gains) losses	**652**	(84)	145
Amortization of premiums/discounts on fixed maturities	**592**	694	737
Amortization of purchased intangibles	**339**	260	1,578
Deferred income taxes	**16**	(527)	96
Unpaid losses and loss expenses	**570**	2,137	332
Unearned premiums	**654**	264	(680)
Future policy benefits	**235**	217	188
Insurance and reinsurance balances payable	**722**	271	848
Accounts payable, accrued expenses, and other liabilities	**375**	(517)	(97)
Income taxes payable	**161**	(365)	147
Insurance and reinsurance balances receivable	**(981)**	(243)	(616)
Reinsurance recoverable	**(1,165)**	(1,248)	(358)
Deferred policy acquisition costs	**(301)**	(317)	(1,449)
Other	**(351)**	100	286
Net cash flows from operating activities	**5,480**	4,503	5,292
Cash flows from investing activities			
Purchases of fixed maturities available for sale	**(24,700)**	(25,720)	(30,759)
Purchases of to be announced mortgage-backed securities	**(35)**	(27)	(56)
Purchases of fixed maturities held to maturity	**(456)**	(352)	(282)
Purchases of equity securities	**(207)**	(173)	(146)
Sales of fixed maturities available for sale	**14,001**	13,228	16,621
Sales of to be announced mortgage-backed securities	**29**	27	56
Sales of equity securities	**315**	187	1,000
Maturities and redemptions of fixed maturities available for sale	**7,352**	10,425	9,349
Maturities and redemptions of fixed maturities held to maturity	**1,124**	879	958
Net change in short-term investments	**516**	(537)	12,350
Net derivative instruments settlements	**16**	(265)	(168)
Private equity contributions	**(1,337)**	(648)	(553)
Private equity distributions	**980**	1,084	958
Acquisition of subsidiaries (net of cash acquired of nil, nil, and $71)	**—**	—	(14,248)
Other	**(533)**	(530)	(402)
Net cash flows used for investing activities	**(2,935)**	(2,422)	(5,322)
Cash flows from financing activities			
Dividends paid on Common Shares	**(1,337)**	(1,308)	(1,173)
Common Shares repurchased	**(1,044)**	(801)	—
Proceeds from issuance of long-term debt	**2,171**	—	—
Proceeds from issuance of repurchase agreements	**2,029**	2,353	2,310
Repayment of long-term debt	**(2,001)**	(501)	—
Repayment of repurchase agreements	**(2,019)**	(2,348)	(2,311)
Proceeds from share-based compensation plans	**115**	151	167
Policyholder contract deposits	**453**	442	522
Policyholder contract withdrawals	**(358)**	(307)	(253)
Other	**—**	—	(4)
Net cash flows used for financing activities	**(1,991)**	(2,319)	(742)
Effect of foreign currency rate changes on cash and restricted cash	**(65)**	1	(25)
Net increase (decrease) in cash and restricted cash	**489**	(237)	(797)
Cash and restricted cash – beginning of year	**851**	1,088	1,885
Cash and restricted cash – end of year	**$ 1,340**	$ 851	$ 1,088
Supplemental cash flow information			
Taxes paid	**$ 503**	$ 736	$ 662
Interest paid	**$ 621**	$ 644	$ 642

See accompanying notes to the consolidated financial statements

1. Summary of significant accounting policies

a) Basis of presentation

Chubb Limited is a holding company incorporated in Zurich, Switzerland. Chubb Limited, through its subsidiaries, provides a broad range of insurance and reinsurance products to insureds worldwide. Our results are reported through the following business segments: North America Commercial P&C Insurance, North America Personal P&C Insurance, North America Agricultural Insurance, Overseas General Insurance, Global Reinsurance, and Life Insurance. Refer to Note 14 for additional information.

The accompanying consolidated financial statements, which include the accounts of Chubb Limited and its subsidiaries (collectively, Chubb, we, us, or our), have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP) and, in the opinion of management, reflect all adjustments (consisting of normally recurring accruals) necessary for a fair statement of the results and financial position for such periods. All significant intercompany accounts and transactions, including internal reinsurance transactions, have been eliminated.

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Amounts included in the Consolidated financial statements reflect our best estimates and assumptions; actual amounts could differ materially from these estimates. Chubb's principal estimates include:

- unpaid loss and loss expense reserves, including long-tail asbestos and environmental (A&E) reserves;
- future policy benefits reserves;
- amortization of deferred policy acquisition costs and value of business acquired (VOBA);
- reinsurance recoverable, including a provision for uncollectible reinsurance;
- the assessment of risk transfer for certain structured insurance and reinsurance contracts;
- the valuation of the investment portfolio and assessment of other than temporary impairment (OTTI);
- the valuation of deferred income taxes;
- the valuation of derivative instruments related to guaranteed living benefits (GLB);
- the valuation and amortization of purchased intangibles; and
- the assessment of goodwill for impairment.

b) Premiums

Premiums are generally recorded as written upon inception of the policy. For multi-year policies for which premiums written are payable in annual installments, only the current annual premium is included as written at policy inception due to the ability of the insured/reinsured to commute or cancel coverage within the policy term. The remaining annual premiums are recorded as written at each successive anniversary date within the multi-year term.

For property and casualty (P&C) insurance and reinsurance products, premiums written are primarily earned on a pro-rata basis over the policy terms to which they relate. Unearned premiums represent the portion of premiums written applicable to the unexpired portion of the policies in force. For retrospectively-rated policies, written premiums are adjusted to reflect expected ultimate premiums consistent with changes to incurred losses, or other measures of exposure as stated in the policy, and earned over the policy coverage period. For retrospectively-rated multi-year policies, premiums recognized in the current period are computed using a with-and-without method as the difference between the ceding enterprise's total contract costs before and after the experience under the contract at the reporting date. Accordingly, for retrospectively-rated multi-year policies, additional premiums are generally written and earned when losses are incurred.

Mandatory reinstatement premiums assessed on reinsurance policies are earned in the period of the loss event that gave rise to the reinstatement premiums. All remaining unearned premiums are recognized over the remaining coverage period.

Premiums from long-duration contracts such as certain traditional term life, whole life, endowment, and long-duration personal accident and health (A&H) policies are generally recognized as revenue when due from policyholders. Traditional life policies include those contracts with fixed and guaranteed premiums and benefits. Benefits and expenses are matched with income to result in the recognition of profit over the life of the contracts.

Retroactive loss portfolio transfer (LPT) contracts in which the insured loss events occurred prior to contract inception are evaluated to determine whether they meet criteria for reinsurance accounting. If reinsurance accounting is appropriate, written premiums are fully earned and corresponding losses and loss expenses recognized at contract inception. These contracts can cause significant variances in gross premiums written, net premiums written, net premiums earned, and net incurred losses in the years in which they are written. Reinsurance contracts sold not meeting the criteria for reinsurance accounting are recorded using the deposit method as described below in Note 1 k).

Reinsurance premiums assumed are based on information provided by ceding companies supplemented by our own estimates of premium when we have not received ceding company reports. Estimates are reviewed and adjustments are recorded in the period in which they are determined. Premiums are earned over the coverage terms of the related reinsurance contracts and range from one to three years.

c) Deferred policy acquisition costs and value of business acquired
Policy acquisition costs consist of commissions (direct and ceded), premium taxes, and certain underwriting costs related directly to the successful acquisition of new or renewal insurance contracts. A VOBA intangible asset is established upon the acquisition of blocks of long-duration contracts in a business combination and represents the present value of estimated net cash flows for the contracts in force at the acquisition date. Acquisition costs and VOBA, collectively policy acquisition costs, are deferred and amortized. Amortization is recorded in Policy acquisition costs in the Consolidated statements of operations. Policy acquisition costs on P&C contracts are generally amortized ratably over the period in which premiums are earned. Policy acquisition costs on traditional long-duration contracts are amortized over the estimated life of the contracts, generally in proportion to premium revenue recognized based upon the same assumptions used in estimating the liability for future policy benefits. For non-traditional long-duration contracts, we amortize policy acquisition costs over the expected life of the contracts in proportion to expected gross profits. The effect of changes in estimates of expected gross profits is reflected in the period the estimates are revised. Policy acquisition costs are reviewed to determine if they are recoverable from future income, including investment income. Unrecoverable policy acquisition costs are expensed in the period identified.

Advertising costs are expensed as incurred except for direct-response campaigns that qualify for cost deferral, principally related to long-duration A&H business produced by the Overseas General Insurance segment, which are deferred and recognized as a component of Policy acquisition costs. For individual direct-response marketing campaigns that we can demonstrate have specifically resulted in incremental sales to customers and such sales have probable future economic benefits, incremental costs directly related to the marketing campaigns are capitalized as Deferred policy acquisition costs. Deferred policy acquisition costs, including deferred marketing costs, are reviewed regularly for recoverability from future income, including investment income, and amortized in proportion to premium revenue recognized, primarily over a ten-year period, the expected economic future benefit period based upon the same assumptions used in estimating the liability for future policy benefits. The expected future benefit period is evaluated periodically based on historical results and adjusted prospectively. The amount of deferred marketing costs reported in Deferred policy acquisition costs in the Consolidated balance sheets was $255 million and $271 million at December 31, 2018 and 2017, respectively. Amortization expense for deferred marketing costs was $114 million, $116 million, and $92 million for the years ended December 31, 2018, 2017, and 2016, respectively.

d) Reinsurance
Chubb assumes and cedes reinsurance with other insurance companies to provide greater diversification of business and minimize the net loss potential arising from large risks. Ceded reinsurance contracts do not relieve Chubb of its primary obligation to policyholders.

For both ceded and assumed reinsurance, risk transfer requirements must be met in order to account for a contract as reinsurance, principally resulting in the recognition of cash flows under the contract as premiums and losses. To meet risk transfer requirements, a reinsurance contract must include insurance risk, consisting of both underwriting and timing risk, and a reasonable possibility of a significant loss for the assuming entity. To assess risk transfer for certain contracts, Chubb generally develops expected discounted cash flow analyses at contract inception. Deposit accounting is used for contracts that do not meet risk transfer requirements. Deposit accounting requires that consideration received or paid be recorded in the balance sheet as opposed to recording premiums written or losses incurred in the statement of operations. Non-refundable fees on deposit contracts are earned based on the terms of the contract described below in Note 1 k).

Reinsurance recoverable includes balances due from reinsurance companies for paid and unpaid losses and loss expenses and future policy benefits that will be recovered from reinsurers, based on contracts in force. The method for determining the reinsurance recoverable on unpaid losses and loss expenses incurred but not reported (IBNR) involves actuarial estimates consistent with those used to establish the associated liability for unpaid losses and loss expenses as well as a determination of Chubb's ability to cede unpaid losses and loss expenses under the terms of the reinsurance agreement.

Reinsurance recoverable is presented net of a provision for uncollectible reinsurance determined based upon a review of the financial condition of reinsurers and other factors. The provision for uncollectible reinsurance is based on an estimate of the reinsurance recoverable balance that will ultimately be unrecoverable due to reinsurer insolvency, a contractual dispute, or any other reason. The valuation of this provision includes several judgments including certain aspects of the allocation of reinsurance recoverable on IBNR claims by reinsurer and a default analysis to estimate uncollectible reinsurance. The primary components of the default analysis are reinsurance recoverable balances by reinsurer, net of collateral, and default factors used to determine the portion of a reinsurer's balance deemed uncollectible. The definition of collateral for this purpose requires some judgment and is generally limited to assets held in a Chubb-only beneficiary trust, letters of credit, and liabilities held with the same legal entity for which Chubb believes there is a contractual right of offset. The determination of the default factor is principally based on the financial strength rating of the reinsurer. Default factors require considerable judgment and are determined using the current financial strength rating, or rating equivalent, of each reinsurer as well as other key considerations and assumptions. The more significant considerations include, but are not necessarily limited to, the following:

- For reinsurers that maintain a financial strength rating from a major rating agency, and for which recoverable balances are considered representative of the larger population (i.e., default probabilities are consistent with similarly rated reinsurers and payment durations conform to averages), the financial rating is based on a published source and the default factor is based on published default statistics of a major rating agency applicable to the reinsurer's particular rating class. When a recoverable is expected to be paid in a brief period of time by a highly rated reinsurer, such as certain property catastrophe claims, a default factor may not be applied;
- For balances recoverable from reinsurers that are both unrated by a major rating agency and for which management is unable to determine a credible rating equivalent based on a parent, affiliate, or peer company, we determine a rating equivalent based on an analysis of the reinsurer that considers an assessment of the creditworthiness of the particular entity, industry benchmarks, or other factors as considered appropriate. We then apply the applicable default factor for that rating class. For balances recoverable from unrated reinsurers for which the ceded reserve is below a certain threshold, we generally apply a default factor of 34 percent, consistent with published statistics of a major rating agency;
- For balances recoverable from reinsurers that are either insolvent or under regulatory supervision, we establish a default factor and resulting provision for uncollectible reinsurance based on reinsurer-specific facts and circumstances. Upon initial notification of an insolvency, we generally recognize an expense for a substantial portion of all balances outstanding, net of collateral, through a combination of write-offs of recoverable balances and increases to the provision for uncollectible reinsurance. When regulatory action is taken on a reinsurer, we generally recognize a default factor by estimating an expected recovery on all balances outstanding, net of collateral. When sufficient credible information becomes available, we adjust the provision for uncollectible reinsurance by establishing a default factor pursuant to information received; and
- For other recoverables, management determines the provision for uncollectible reinsurance based on the specific facts and circumstances.

The methods used to determine the reinsurance recoverable balance and related provision for uncollectible reinsurance are regularly reviewed and updated, and any resulting adjustments are reflected in earnings in the period identified.

Prepaid reinsurance premiums represent the portion of premiums ceded to reinsurers applicable to the unexpired coverage terms of the reinsurance contracts in-force.

The value of reinsurance business assumed of $14 million and $18 million at December 31, 2018 and 2017, respectively, included in Other assets in the accompanying Consolidated balance sheets, represents the excess of estimated ultimate value of the liabilities assumed under retroactive reinsurance contracts over consideration received. The value of reinsurance business assumed is amortized and recorded to Losses and loss expenses based on the payment pattern of the losses assumed and ranges between 9 and 40 years. The unamortized value is reviewed regularly to determine if it is recoverable based upon the terms of the contract, estimated losses and loss expenses, and anticipated investment income. Unrecoverable amounts are expensed in the period identified.

e) Investments

Fixed maturities, equity securities, and short-term investments

Fixed maturities are classified as either available for sale or held to maturity.

- Available for sale (AFS) portfolio is reported at fair value with changes in fair value recorded as a separate component of AOCI in Shareholders' equity.
- Held to maturity (HTM) portfolio includes securities for which we have the ability and intent to hold to maturity or redemption and is reported at amortized cost.

Equity securities are reported at fair value with changes in fair value recorded in net realized gains (losses) on the Consolidated statement of operations. Prior to January 1, 2018, changes in fair value were recorded as a separate component of AOCI in Shareholders' equity.

Short-term investments comprise securities due to mature within one year of the date of purchase and are recorded at fair value which typically approximates cost.

Interest, dividend income, amortization of fixed maturity market premiums and discounts related to these securities are recorded in Net investment income, net of investment management and custody fees, in the Consolidated statement of operations.

In addition, net investment income includes the amortization of the fair value adjustment related to the acquired invested assets of The Chubb Corporation (Chubb Corp). An adjustment of $1,652 million related to the fair value of Chubb Corp's fixed maturities securities was recorded (fair value adjustment) at the date of acquisition. At December 31, 2018, the remaining balance of this fair value adjustment was $520 million which is expected to amortize over the next three years; however, the estimate could vary materially based on current market conditions, bond calls, and the duration of the acquired investment portfolio. In addition, sales of these acquired fixed maturities would also reduce the fair value adjustment balance. For mortgage-backed securities and any other holdings for which there is a prepayment risk, prepayment assumptions are evaluated and revised as necessary. Any adjustments required due to the resultant change in effective yields and maturities are recognized prospectively. Prepayment fees or call premiums that are only payable when a security is called prior to its maturity are earned when received and reflected in Net investment income.

We regularly review our fixed maturities for other than temporary impairment (OTTI). Refer to Note 2 for additional information. With respect to fixed maturities where the decline in value is determined to be temporary and is not written down, a subsequent decision may be made to sell that security and realize a loss. Subsequent decisions on fixed maturities sales are the result of changing or unforeseen facts and circumstances (i.e., arising from a large insured loss such as a catastrophe), deterioration of the creditworthiness of the issuer or its industry, or changes in regulatory requirements. We believe that subsequent decisions to sell such securities are consistent with the classification of the majority of the portfolio as available for sale.

Other investments

Other investments principally comprise investment funds, limited partnerships, partially-owned investment companies, life insurance policies, policy loans, and non-qualified separate account assets.

<u>Investment funds and limited partnerships</u>

Investment funds, limited partnerships, and all other investments over which Chubb cannot exercise significant influence are accounted for as follows. Generally, we own less than three percent of the investee's shares.

- Income and expenses from these funds are reported within Net investment income.
- These funds are carried at net asset value, which approximates fair value with changes in fair value recorded in net realized gains (losses) on the Consolidated statement of operations. Refer to Note 3 for a further discussion on net asset value. Prior to January 1, 2018, changes in fair value were recorded as a separate component of AOCI in Shareholders' equity.
- As a result of the timing of the receipt of valuation data from the investment managers, these investments are generally reported on a three-month lag.
- Sales of these investments are reported within Net realized gains (losses).

Partially-owned investment companies

Partially-owned investment companies where our ownership interest is in excess of three percent are accounted for under the equity method because Chubb exerts significant influence. These investments apply investment company accounting to determine operating results, and Chubb retains the investment company accounting in applying the equity method.

- This means that investment income, realized gains or losses, and unrealized gains or losses are included in the portion of equity earnings reflected in Other (income) expense.
- As a result of the timing of the receipt of valuation data from the investment managers, these investments are generally reported on a three-month lag.

Other

- Policy loans are carried at outstanding balance and interest income is reflected in Net investment income.
- Life insurance policies are carried at policy cash surrender value and income is reflected in Other (income) expense.
- Non-qualified separate account assets are supported by assets that do not qualify for separate accounting reporting under GAAP. The underlying securities are recorded on a trade date basis and carried at fair value. Unrealized gains and losses on non-qualified separate account assets are reflected in Other (income) expense.

Investments in partially-owned insurance companies
Investments in partially-owned insurance companies primarily represent direct investments in which Chubb has significant influence and as such, meet the requirements for equity accounting. We report our share of the net income or loss of the partially-owned insurance companies in Other (income) expense.

Derivative instruments
Chubb recognizes all derivatives at fair value in the Consolidated balance sheets in either Accounts payable, accrued expenses, and other liabilities or Other assets. Changes in fair value are included in Net realized gains (losses) in the Consolidated statements of operations. We did not designate any derivatives as accounting hedges during 2018, 2017, or 2016. We participate in derivative instruments in two principal ways:

(i) To sell protection to customers as an insurance or reinsurance contract that meets the definition of a derivative for accounting purposes. The reinsurance of GLBs was our primary product falling into this category; and

(ii) To mitigate financial risks and manage certain investment portfolio risks and exposures, including assets and liabilities held in foreign currencies. We use derivative instruments including futures, options, swaps, and foreign currency. Refer to Note 9 for additional information.

Securities lending program
Chubb participates in a securities lending program operated by a third-party banking institution whereby certain assets are loaned to qualified borrowers and from which we earn an incremental return which is recorded within Net investment income in the Consolidated statement of operations.

Borrowers provide collateral, in the form of either cash or approved securities, at a minimum of 102 percent of the fair value of the loaned securities. Each security loan is deemed to be an overnight transaction. Cash collateral is invested in a collateral pool which is managed by the banking institution. The collateral pool is subject to written investment guidelines with key objectives which include the safeguard of principal and adequate liquidity to meet anticipated redemptions. The fair value of the loaned securities is monitored on a daily basis, with additional collateral obtained or refunded as the fair value of the loaned securities changes. The collateral is held by the third-party banking institution, and the collateral can only be accessed in the event that the institution borrowing the securities is in default under the lending agreement. As a result of these restrictions, we consider our securities lending activities to be non-cash investing and financing activities. An indemnification agreement with the lending agent protects us in the event a borrower becomes insolvent or fails to return any of the securities on loan.

The fair value of the securities on loan is included in fixed maturities and equity securities in the Consolidated balance sheets. The securities lending collateral is reported as a separate line in the Consolidated balance sheets with a related liability reflecting our obligation to return the collateral plus interest.

Repurchase agreements
Similar to securities lending arrangements, securities sold under repurchase agreements, whereby Chubb sells securities and repurchases them at a future date for a predetermined price, are accounted for as collateralized investments and borrowings and are recorded at the contractual repurchase amounts plus accrued interest. Assets to be repurchased are the same or substantially the same as the assets transferred, and the transferor, through right of substitution, maintains the right and ability to redeem the collateral on short notice. The fair value of the underlying securities is included in fixed maturities and equity securities. In contrast to securities lending programs, the use of cash received is not restricted. We report the obligation to return the cash as Repurchase agreements in the Consolidated balance sheets and record the fees under these repurchase agreements within Interest expense on the Consolidated statement of operations.

Refer to Note 3 for a discussion on the determination of fair value for Chubb's various investment securities.

f) Cash
Cash includes cash on hand and deposits with an original maturity of three months or less at time of purchase.

We have agreements with a third-party bank provider which implemented two international multi-currency notional cash pooling programs. In each program, participating Chubb entities establish deposit accounts in different currencies with the bank provider and each day the credit or debit balances in every account are notionally translated into a single currency (U.S. dollars) and then notionally pooled. The bank extends overdraft credit to any participating Chubb entity as needed, provided that the overall notionally-pooled balance of all accounts in each pool at the end of each day is at least zero. Actual cash balances are not physically converted and are not commingled between legal entities. Any overdraft balances incurred under this program by a Chubb entity would be guaranteed by Chubb Limited (up to $300 million in the aggregate). Our syndicated letter of credit facility allows for same day drawings to fund a net pool overdraft should participating Chubb entities overdraw contributed funds from the pool.

Restricted cash
Restricted cash in the Consolidated balance sheets represents amounts held for the benefit of third parties and is legally or contractually restricted as to withdrawal or usage. Amounts include deposits with U.S. and non-U.S. regulatory authorities, trust funds set up for the benefit of ceding companies, and amounts pledged as collateral to meet financing arrangements.

Effective January 1, 2018, we retrospectively adopted guidance on "Restricted Cash" that clarified the presentation of restricted cash on the Consolidated statement of cash flows. As a result, we revised the Consolidated statement of cash flows for the years ended December 31, 2017 and 2016 to include restricted cash in the beginning and ending cash balances. In addition, we reclassified $123 million of Restricted cash from Other assets to a separate line in the Consolidated balance sheets as of December 31, 2017.

The following table provides a reconciliation of cash and restricted cash reported within the Consolidated balance sheets that total to the amounts shown in the Consolidated statements of cash flows:

	December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Cash	**$ 1,247**	$ 728	$ 985
Restricted cash	**93**	123	103
Total cash and restricted cash shown in the Consolidated statements of cash flows	**$ 1,340**	$ 851	$ 1,088

g) Goodwill and Other intangible assets
Goodwill represents the excess of the cost of acquisitions over the fair value of net assets acquired and is not amortized. Goodwill is assigned at acquisition to the applicable reporting unit of the acquired entities giving rise to the goodwill. Goodwill impairment tests are performed annually or more frequently if circumstances indicate a possible impairment. For goodwill impairment testing, we use a qualitative assessment to determine whether it is more likely than not (i.e., more than a 50 percent probability) that the fair value of a reporting unit is greater than its carrying amount. If our assessment indicates less than a 50 percent probability that fair value exceeds carrying value, we quantitatively estimate a reporting unit's fair value. Goodwill recorded in connection with investments in partially-owned insurance companies is recorded in Investments in partially-owned insurance companies and is also measured for impairment annually.

Indefinite lived intangible assets are not subject to amortization. Finite lived intangible assets are amortized over their useful lives, generally ranging from 1 to 30 years. Intangible assets are regularly reviewed for indicators of impairment. Impairment is recognized if the carrying amount is not recoverable from its undiscounted cash flows and is measured as the difference between the carrying amount and fair value.

h) Unpaid losses and loss expenses

A liability is established for the estimated unpaid losses and loss expenses under the terms of, and with respect to, Chubb's policies and agreements. Similar to premiums that are recognized as revenues over the coverage period of the policy, a liability for unpaid losses and loss expenses is recognized as expense when insured events occur over the coverage period of the policy. This liability includes a provision for both reported claims (case reserves) and incurred but not reported claims (IBNR reserves). IBNR reserve estimates are generally calculated by first projecting the ultimate cost of all losses that have occurred (expected losses), and then subtracting paid losses, case reserves, and loss expenses. The methods of determining such estimates and establishing the resulting liability are reviewed regularly and any adjustments are reflected in operations in the period in which they become known. Future developments may result in losses and loss expenses materially greater or less than recorded amounts.

Except for net loss and loss expense reserves of $33 million, net of discount, held at December 31, 2018, representing certain structured settlements for which the timing and amount of future claim payments are reliably determinable and $40 million, net of discount, of certain reserves for unsettled claims that are discounted in statutory filings, Chubb does not discount its P&C loss reserves. This compares with reserves of $36 million for certain structured settlements and $41 million of certain reserves for unsettled claims at December 31, 2017. Structured settlements represent contracts purchased from life insurance companies primarily to settle workers' compensation claims, where payments to the claimant by the life insurance company are expected to be made in the form of an annuity. Chubb retains the liability to the claimant in the event that the life insurance company fails to pay. At December 31, 2018, the liability due to claimants was $581 million, net of discount, and reinsurance recoverables due from the life insurance companies was $548 million, net of discount. For structured settlement contracts where payments are guaranteed regardless of claimant life expectancy, the amounts recoverable from the life insurance companies at December 31, 2018 are included in Other assets in the Consolidated balance sheets, as they do not meet the requirements for reinsurance accounting.

Included in Unpaid losses and loss expenses are liabilities for asbestos and environmental (A&E) claims and expenses. These unpaid losses and loss expenses are principally related to claims arising from remediation costs associated with hazardous waste sites and bodily-injury claims related to asbestos products and environmental hazards. The estimation of these liabilities is particularly sensitive to changes in the legal environment including specific settlements that may be used as precedents to settle future claims. However, Chubb does not anticipate future changes in laws and regulations in setting its A&E reserve levels.

Also included in Unpaid losses and loss expenses is the fair value adjustment of $207 million and $309 million at December 31, 2018 and December 31, 2017, respectively, related to Chubb Corp's historical unpaid losses and loss expenses. The estimated fair value consists of the present value of the expected net unpaid loss and loss adjustment expense payments adjusted for an estimated risk margin. The estimated cash flows are discounted at a risk free rate. The estimated risk margin varies based on the inherent risks associated with each type of reserve. The fair value is amortized through Amortization of purchased intangibles on the consolidated statements of operations through the year 2032, based on the estimated payout patterns of unpaid loss and loss expenses at the acquisition date.

Prior period development arises from changes to loss estimates recognized in the current year that relate to loss reserves first reported in previous calendar years and excludes the effect of losses from the development of earned premiums from previous accident years.

For purposes of analysis and disclosure, management views prior period development to be changes in the nominal value of loss estimates from period to period, net of premium and profit commission adjustments on loss sensitive contracts. Prior period development generally excludes changes in loss estimates that do not arise from the emergence of claims, such as those related to uncollectible reinsurance, interest, unallocated loss adjustment expenses, or foreign currency. Accordingly, specific items excluded from prior period development include the following: gains/losses related to foreign currency remeasurement; losses recognized from the early termination or commutation of reinsurance agreements that principally relate to the time value of money; changes in the value of reinsurance business assumed reflected in losses incurred but principally related to the time value of money; and losses that arise from changes in estimates of earned premiums from prior accident years. Except for foreign currency remeasurement, which is included in Net realized gains (losses), these items are included in current year losses.

i) Future policy benefits
The valuation of long-duration contract reserves requires management to make estimates and assumptions regarding expenses, mortality, persistency, and investment yields. Estimates are primarily based on historical experience and information provided by ceding companies and include a margin for adverse deviation. Interest rates used in calculating reserves range from less than 1.0 percent to 11.0 percent and less than 1.0 percent to 8.0 percent at December 31, 2018 and 2017, respectively. Actual results could differ materially from these estimates. Management monitors actual experience and where circumstances warrant, will revise assumptions and the related reserve estimates. Revisions are recorded in the period they are determined.

Certain of our long-duration contracts are supported by assets that do not qualify for separate account reporting under GAAP. These assets are classified as non-qualified separate account assets and reported in Other investments and the offsetting liabilities are reported in Future policy benefits in the Consolidated balance sheets. Changes in the fair value of separate account assets that do not qualify for separate account reporting under GAAP are reported in Other income (expense) and the offsetting movements in the liabilities are included in Policy benefits in the Consolidated statements of operations.

j) Assumed reinsurance programs involving minimum benefit guarantees under variable annuity contracts
Chubb reinsures various death and living benefit guarantees associated with variable annuities issued primarily in the United States. We generally receive a monthly premium during the accumulation phase of the covered annuities (in-force) based on a percentage of either the underlying accumulated account values or the underlying accumulated guaranteed values. Depending on an annuitant's age, the accumulation phase can last many years. To limit our exposure under these programs, all reinsurance treaties include annual or aggregate claim limits and many include an aggregate deductible.

The guarantees which are payable on death, referred to as guaranteed minimum death benefits (GMDB), principally cover shortfalls between accumulated account value at the time of an annuitant's death and either i) an annuitant's total deposits; ii) an annuitant's total deposits plus a minimum annual return; or iii) the highest accumulated account value attained at any policy anniversary date. In addition, a death benefit may be based on a formula specified in the variable annuity contract that uses a percentage of the growth of the underlying contract value. Liabilities for GMDBs are based on cumulative assessments or premiums to date multiplied by a benefit ratio that is determined by estimating the present value of benefit payments and related adjustment expenses divided by the present value of cumulative assessment or expected premiums during the contract period.

Under reinsurance programs covering GLBs, we assume the risk of guaranteed minimum income benefits (GMIB) associated with variable annuity contracts. The GMIB risk is triggered if, at the time the contract holder elects to convert the accumulated account value to a periodic payment stream (annuitize), the accumulated account value is not sufficient to provide a guaranteed minimum level of monthly income. We also assume the risk of guaranteed minimum accumulation benefits (GMAB). However, at December 31, 2018, the risks related to our GMAB programs are minimal given that the majority of these policies are no longer in force. Our GLB reinsurance products meet the definition of a derivative for accounting purposes and are carried at fair value with changes in fair value recognized in Realized gains (losses) in the Consolidated statement of operations. Refer to Notes 4 c) and 9 a) for additional information.

k) Deposit assets and liabilities
Deposit assets arise from ceded reinsurance contracts purchased that do not transfer significant underwriting or timing risk. Deposit liabilities include reinsurance deposit liabilities and contract holder deposit funds. The reinsurance deposit liabilities arise from contracts sold for which there is not a significant transfer of risk. Contract holder deposit funds represent a liability for investment contracts sold that do not meet the definition of an insurance contract, and certain of these contracts are sold with a guaranteed rate of return. Under deposit accounting, consideration received or paid is recorded as a deposit asset or liability in the balance sheet as opposed to recording premiums and losses in the statement of operations.

Interest income on deposit assets, representing the consideration received or to be received in excess of cash payments related to the deposit contract, is earned based on an effective yield calculation. The calculation of the effective yield is based on the amount and timing of actual cash flows at the balance sheet date and the estimated amount and timing of future cash flows. The effective yield is recalculated periodically to reflect revised estimates of cash flows. When a change in the actual or estimated cash flows occurs, the resulting change to the carrying amount of the deposit asset is reported as income or expense. Deposit assets of $97 million and $89 million at December 31, 2018 and 2017, respectively, are reflected in Other assets in the Consolidated balance sheets and the accretion of deposit assets related to interest pursuant to the effective yield calculation is reflected in Net investment income in the Consolidated statements of operations.

Deposit liabilities include reinsurance deposit liabilities of $97 million and $100 million and contract holder deposit funds of $1.8 billion at both December 31, 2018 and 2017. Deposit liabilities are reflected in Accounts payable, accrued expenses, and other liabilities in the Consolidated balance sheets. At contract inception, the deposit liability equals net cash received. An accretion rate is established based on actuarial estimates whereby the deposit liability is increased to the estimated amount payable over the contract term. The deposit accretion rate is the rate of return required to fund expected future payment obligations. We periodically reassess the estimated ultimate liability and related expected rate of return. Changes to the deposit liability are generally reflected through Interest expense to reflect the cumulative effect of the period the contract has been in force, and by an adjustment to the future accretion rate of the liability over the remaining estimated contract term.

The liability for contract holder deposit funds equals accumulated policy account values, which consist of the deposit payments plus credited interest less withdrawals and amounts assessed through the end of the period.

l) Property and Equipment
Property and equipment used in operations are capitalized and carried at cost less accumulated depreciation and are reported within Other assets in the Consolidated balance sheets. At December 31, 2018, property and equipment totaled $1.7 billion, consisting principally of capitalized software costs of $970 million incurred to develop or obtain computer software for internal use and company-owned facilities of $277 million. Depreciation is calculated using the straight-line method over the estimated useful lives of the assets. For capitalized software, the estimated useful life is generally three to five years, but can be as long as 15 years and for company-owned facilities the estimated useful life is 39 years. At December 31, 2017, property and equipment totaled $1.3 billion.

m) Foreign currency remeasurement and translation
The functional currency for each of our foreign operations is generally the currency of the local operating environment. Transactions in currencies other than a foreign operation's functional currency are remeasured into the functional currency, and the resulting foreign exchange gains and losses are reflected in Net realized gains (losses) in the Consolidated statements of operations. Functional currency assets and liabilities are translated into the reporting currency, U.S. dollars, using period end exchange rates and the related translation adjustments are recorded as a separate component of AOCI in Shareholders' equity. Functional statement of operations amounts expressed in functional currencies are translated using average exchange rates.

n) Administrative expenses
Administrative expenses generally include all operating costs other than policy acquisition costs. The North America Commercial P&C Insurance segment manages and uses an in-house third-party claims administrator, ESIS Inc. (ESIS). ESIS performs claims management and risk control services for domestic and international organizations that self-insure P&C exposures as well as internal P&C exposures. The net operating results of ESIS are included within Administrative expenses in the Consolidated statements of operations and were $49 million, $38 million, and $32 million for the years ended December 31, 2018, 2017, and 2016, respectively.

o) Income taxes
Income taxes have been recorded related to those operations subject to income tax. Deferred tax assets and liabilities result from temporary differences between the amounts recorded in the consolidated financial statements and the tax basis of our assets and liabilities. The effect on deferred tax assets and liabilities of a change in tax law or rates is recognized in the period that includes the enactment date. A valuation allowance against deferred tax assets is recorded if it is more likely than not that all, or some portion, of the benefits related to these deferred tax assets will not be realized. The valuation allowance assessment considers tax planning strategies, where appropriate.

We recognize uncertain tax positions deemed more likely than not of being sustained upon examination. Recognized income tax positions are measured at the largest amount that has a greater than 50 percent likelihood of being realized. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs.

p) Earnings per share
Basic earnings per share is calculated using the weighted-average shares outstanding, including participating securities with non-forfeitable rights to dividends such as unvested restricted stock. All potentially dilutive securities, including stock options are excluded from the basic earnings per share calculation. In calculating diluted earnings per share, the weighted-average shares outstanding is increased to include all potentially dilutive securities. Basic and diluted earnings per share are calculated by dividing net income by the applicable weighted-average number of shares outstanding during the year.

q) Cash flow information
Premiums received and losses paid associated with the GLB reinsurance products, which as discussed previously, meet the definition of a derivative instrument for accounting purposes, are included within Cash flows from operating activities. Cash flows, such as settlements and collateral requirements, associated with GLB and all other derivative instruments, are included on a net basis within Cash flows from investing activities. Purchases, sales, and maturities of short-term investments are recorded on a net basis within Cash flows from investing activities.

r) Share-based compensation
Chubb measures and records compensation cost for all share-based payment awards at grant-date fair value. Compensation costs are recognized for vesting of share-based payment awards with only service conditions on a straight-line basis over the requisite service period for each separately vesting portion of the award as if the award were, in substance, multiple awards. For retirement-eligible participants, compensation costs for certain share-based payment awards are recognized immediately at the date of grant. Refer to Note 11 for additional information.

s) Chubb integration expenses
Direct costs related to the Chubb Corp acquisition were expensed as incurred. Chubb integration expenses were $59 million, $310 million, and $492 million for the years ended December 31, 2018, 2017 and 2016, respectively, and include all internal and external costs directly related to the integration activities of the Chubb Corp acquisition. These expenses principally consisted of personnel-related expenses, consulting fees, and rebranding.

t) New accounting pronouncements
Adopted in 2018
Revenue from Contracts with Customers
Effective January 2018, we adopted new accounting guidance on "Revenue from Contracts with Customers" on a prospective basis. The standard excludes from its scope the accounting for insurance contracts, leases, financial instruments, and certain other agreements that are governed under other GAAP guidance, but could affect the revenue recognition for certain of our claims management and risk control services. The updated guidance requires an entity to recognize revenue as performance obligations are met, in order to reflect the transfer of promised goods or services to customers in an amount that reflects the consideration the entity is entitled to receive for those goods or services. The adoption of this guidance did not have a material impact on our financial condition or results of operations given that the majority of our business is outside the scope of this guidance.

Financial Instruments – Recognition and Measurement of Financial Assets and Financial Liabilities
Effective January 2018, we adopted new accounting guidance on "Recognition and Measurement of Financial Assets and Financial Liabilities" on a modified-retrospective basis. The guidance requires equity investments, other than those accounted for under the equity method of accounting, to be measured at fair value with changes in fair value recognized through net income. The guidance impacts our public equities and cost-method private equities. As a result, we recorded a cumulative-effect adjustment to increase beginning Retained earnings by $417 million after tax ($454 million pre-tax), representing the unrealized appreciation on our equity investments as of December 31, 2017 with an offsetting adjustment to decrease beginning Accumulated other comprehensive income. All subsequent changes in fair value of our equity investments are recognized within realized gains (losses) on the Consolidated statement of operations. Prior period amounts have not been adjusted and continue to be reported in accordance with the previous accounting guidance.

Income Tax Accounting Implications of the Tax Cuts and Jobs Act
The Tax Cuts and Jobs Act (2017 Tax Act) was enacted in December 2017. Among other things, the 2017 Tax Act reduced the U.S. Federal income tax rate to 21 percent from 35 percent effective in 2018, and instituted a dividends received deduction for foreign earnings with a related tax for the deemed repatriation of unremitted foreign earnings. The 2017 Tax Act also included provisions for Global Intangible Low-Taxed Income (GILTI) under which taxes may be imposed on income of foreign subsidiaries, and for a Base Erosion and Anti-Abuse Tax (BEAT) under which taxes may be imposed on certain payments to affiliated foreign companies.

The Securities and Exchange Commission issued Staff Accounting Bulletin No. 118 (SAB 118), Income Tax Accounting Implications of the Tax Cuts and Jobs Act, which provided guidance for the application of the 2017 Tax Act and allowed companies up to one year to complete their accounting. In connection with the 2017 Tax Act, we recorded a $450 million income tax provisional benefit in the fourth quarter of 2017. In 2018, we recorded an additional benefit of $25 million as a measurement period adjustment, resulting in a final transition benefit of $475 million. This change reflected the favorable impact of changes to certain tax only accounting methods offset by updates to provisional amounts recorded related to foreign tax credits and withholding taxes as a result of additional guidance issued during 2018. Refer to Note 7 for additional information.

Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income
In February 2018, the FASB issued guidance that allows the optional reclassification from Accumulated other comprehensive income (AOCI) to Retained earnings of the stranded tax effects resulting from the 2017 Tax Act for all items accounted for in AOCI. We adopted the standard in 2018 and elected to reclassify $146 million of stranded tax effects from beginning AOCI to beginning Retained earnings. The stranded tax effects included $121 million of tax expense related to Net unrealized appreciation of investments, $47 million of tax expense related to Postretirement benefit liability, and a tax benefit of $22 million related to Cumulative foreign currency translation losses as of December 31, 2017.

Intra-Entity Transfers of Assets Other than Inventory
Effective January 2018, we adopted new accounting guidance on “Intra-Entity Transfers of Assets Other Than Inventory” on a modified-retrospective basis. Under the new guidance, we will no longer defer taxes on intra-company asset transfers and will recognize any related income tax expense (benefit) immediately through the Consolidated statement of operations. As a result, we recorded a cumulative-effect adjustment to decrease beginning Retained earnings by $7 million, representing the removal of the deferred tax assets for previous intra-company asset transfer transactions not yet recognized through earnings.

Changes to the Disclosure Requirements for Fair Value Measurements
In August 2018, the FASB issued amendments to modify the disclosure requirements on fair value measurements. The amendments allow for the removal of (1) the amount and reasons for transfer between Level 1 and Level 2 of the fair value hierarchy; (2) the policy for transfers between levels; and (3) the valuation processes for Level 3 fair value measurements. This update also requires the expanded discussion on unobservable inputs that are significant to the fair value measurement. We have early adopted the amendments that allow the removal of certain disclosures and deferred the adoption of the additional disclosure until the effective date in the first quarter of 2020, as permitted. The guidance changes disclosure only and did not have an impact on our financial condition or results of operations.

Changes to the Disclosure Requirements for Defined Benefit Plans
In August 2018, the FASB issued amendments to allow for the removal and addition of various disclosure requirements related to defined benefit pension or other postretirement plans. We elected to early adopt this guidance in the fourth quarter of 2018, as permitted. The guidance changes disclosures only and did not have an impact on our financial condition or results of operations.

Adopted in 2019
Premium Amortization on Purchased Callable Debt Securities
In March 2017, the FASB issued guidance on the amortization period for purchased callable debt securities held at a premium. The guidance requires the premium to be amortized to the earliest call date. Under current guidance, premiums generally are amortized over the contracted life of the security. We adopted this guidance on January 1, 2019 on a modified retrospective basis through a cumulative effect adjustment which decreased beginning retained earnings by approximately $15 million pre-tax, or $11 million after-tax. Securities held at a discount do not require an accounting change.

Lease Accounting
In February 2016, the FASB issued accounting guidance requiring leases with lease terms of more than 12 months to recognize a right of use asset and a corresponding lease liability on the balance sheets. We adopted this guidance on January 1, 2019 on a modified retrospective basis and recognized a right of use asset and a corresponding lease liability for our real estate leases of approximately $800 million. The adoption of this guidance did not have a material effect on our results of operations, financial condition or liquidity.

Accounting guidance not yet adopted
Financial Instruments – Credit Losses: Measurement of Credit Losses on Financial Instruments
In June 2016, the FASB issued guidance on the accounting for credit losses of financial instruments that are measured at amortized cost, including held to maturity securities and reinsurance recoverables, by applying an approach based on the current expected credit losses (CECL). The estimate of expected credit losses should consider historical information, current information, as well as reasonable and supportable forecasts, including estimates of prepayments. The allowance for credit losses is a valuation account that is deducted from the amortized cost basis of the financial asset in order to present the net carrying value at the amount expected to be collected on the financial asset on the Consolidated balance sheet.

The guidance also amends the current debt security other-than-temporary impairment model by requiring an estimate of the expected credit loss (ECL) only when the fair value is below the amortized cost of the asset. The length of time the fair value of an AFS debt security has been below the amortized cost will no longer impact the determination of whether a potential credit loss exists. The AFS debt security model will also require the use of a valuation allowance as compared to the current practice of writing down the asset.

The standard is effective for us in the first quarter of 2020 with early adoption permitted. We will be able to assess the effect of adopting this guidance on our financial condition and results of operations closer to the date of adoption.

Targeted Improvements to the Accounting for Long-Duration Contracts
In August 2018, the FASB issued guidance to improve the existing recognition, measurement, presentation, and disclosure requirements for long-duration contracts issued by an insurance entity. The amendments in this update require more frequent updating of assumptions and a standardized discount rate for the future policy benefit liability, a requirement to use the fair value measurement model for policies with market risk benefits, simplified amortization of deferred acquisition costs, and enhanced disclosures.

This standard will be effective for us in the first quarter of 2021 with early adoption permitted. We are currently assessing the effect of adopting this guidance on our financial condition and results of operations. We will be better able to quantify the effect of adopting this standard as we progress in our implementation process and draw nearer to the date of adoption.

2. Investments

a) Fixed maturities

December 31, 2018 (in millions of U.S. dollars)	Amortized Cost	Gross Unrealized Appreciation	Gross Unrealized Depreciation	Fair Value	OTTI Recognized in AOCI
Available for sale					
U.S. Treasury and agency	$ 4,158	$ 30	$ (43)	$ 4,145	$ —
Foreign	21,370	395	(349)	21,416	—
Corporate securities	27,183	150	(750)	26,583	(6)
Mortgage-backed securities	15,758	66	(284)	15,540	(1)
States, municipalities, and political subdivisions	10,854	49	(117)	10,786	—
	$ 79,323	$ 690	$ (1,543)	$ 78,470	$ (7)
Held to maturity					
U.S. Treasury and agency	$ 1,185	$ 8	$ (11)	$ 1,182	$ —
Foreign	1,549	11	(18)	1,542	—
Corporate securities	2,601	11	(104)	2,508	—
Mortgage-backed securities	2,524	5	(43)	2,486	—
States, municipalities, and political subdivisions	5,576	16	(51)	5,541	—
	$ 13,435	$ 51	$ (227)	$ 13,259	$ —

December 31, 2017 (in millions of U.S. dollars)	Amortized Cost	Gross Unrealized Appreciation	Gross Unrealized Depreciation	Fair Value	OTTI Recognized in AOCI
Available for sale					
U.S. Treasury and agency	$ 3,701	$ 32	$ (35)	$ 3,698	$ —
Foreign	20,514	622	(106)	21,030	(1)
Corporate securities	23,453	638	(95)	23,996	(4)
Mortgage-backed securities	15,279	111	(100)	15,290	(1)
States, municipalities, and political subdivisions	14,888	125	(88)	14,925	—
	$ 77,835	$ 1,528	$ (424)	$ 78,939	$ (6)
Held to maturity					
U.S. Treasury and agency	$ 908	$ 12	$ (5)	$ 915	$ —
Foreign	1,738	27	(8)	1,757	—
Corporate securities	3,159	67	(7)	3,219	—
Mortgage-backed securities	2,724	23	(5)	2,742	—
States, municipalities, and political subdivisions	5,806	50	(15)	5,841	—
	$ 14,335	$ 179	$ (40)	$ 14,474	$ —

As discussed in Note 2 c), if a credit loss is incurred on an impaired fixed maturity, an OTTI is considered to have occurred and the portion of the impairment not related to credit losses (non-credit OTTI) is recognized in OCI. Included in the "OTTI Recognized in AOCI" columns above are the cumulative amounts of non-credit OTTI recognized in OCI adjusted for subsequent sales, maturities, and redemptions. OTTI recognized in AOCI does not include the impact of subsequent changes in fair value of the related securities. In periods subsequent to a recognition of OTTI in OCI, changes in the fair value of the related fixed maturities are reflected in Net unrealized appreciation on investments in the Consolidated statements of shareholders' equity. For the years ended December 31, 2018 and 2017, net unrealized depreciation of $4 million and $2 million, respectively, related to such securities are included in OCI. At December 31, 2018 and 2017, AOCI included cumulative net unrealized appreciation of $1 million and $7 million, respectively, related to securities remaining in the investment portfolio for which a non-credit OTTI was recognized.

Mortgage-backed securities (MBS) issued by U.S. government agencies are combined with all other to be announced mortgage-backed securities held (refer to Note 9 b) (iv)) and are included in the category, "Mortgage-backed securities". Approximately 81 percent and 83 percent of the total mortgage-backed securities at December 31, 2018 and 2017, respectively, are represented by investments in U.S. government agency bonds. The remainder of the mortgage exposure consists of collateralized mortgage obligations and non-government mortgage-backed securities, the majority of which provide a planned structure for principal and interest payments and carry a rating of AAA by the major credit rating agencies.

The following table presents fixed maturities by contractual maturity:

	December 31 2018		December 31 2017	
(in millions of U.S. dollars)	**Amortized Cost**	**Fair Value**	Amortized Cost	Fair Value
Available for sale				
Due in 1 year or less	**$ 3,569**	**$ 3,568**	$ 3,164	$ 3,182
Due after 1 year through 5 years	**27,134**	**27,005**	24,749	25,068
Due after 5 years through 10 years	**24,095**	**23,543**	25,388	25,704
Due after 10 years	**8,767**	**8,814**	9,255	9,695
	63,565	**62,930**	62,556	63,649
Mortgage-backed securities	**15,758**	**15,540**	15,279	15,290
	$ 79,323	**$ 78,470**	$ 77,835	$ 78,939
Held to maturity				
Due in 1 year or less	**$ 536**	**$ 537**	$ 743	$ 746
Due after 1 year through 5 years	**3,122**	**3,106**	2,669	2,688
Due after 5 years through 10 years	**4,468**	**4,407**	4,744	4,756
Due after 10 years	**2,785**	**2,723**	3,455	3,542
	10,911	**10,773**	11,611	11,732
Mortgage-backed securities	**2,524**	**2,486**	2,724	2,742
	$ 13,435	**$ 13,259**	$ 14,335	$ 14,474

Expected maturities could differ from contractual maturities because borrowers may have the right to call or prepay obligations, with or without call or prepayment penalties.

b) Equity securities and Other investments
Effective January 1, 2018, we adopted new accounting guidance that requires any changes in fair value of equity securities and other investments that are accounted for under the cost-method to be recognized immediately in realized gains and losses in net income. As a result, beginning on January 1, 2018, realized gains and losses from these investments include both sales of securities and unrealized gains and losses as follows:

	Year Ended December 31, 2018		
(in millions of U.S. dollars)	**Equity Securities**	**Other Investments**	**Total**
Net losses recognized during the period	**$ (59)**	**$ (5)**	**$ (64)**
Less: Net gains recognized from sales of securities	**70**	**121**	**191**
Unrealized losses recognized for securities still held at reporting date	**$ (129)**	**$ (126)**	**$ (255)**

At December 31, 2017, the cost, gross unrealized appreciation, gross unrealized depreciation, and fair value of equity securities was $737 million, $212 million, $12 million, and $937 million, respectively. At December 31, 2017, the net unrealized appreciation (depreciation) was recorded within accumulated other comprehensive income on the balance sheet.

c) Net realized gains (losses)
In accordance with guidance related to the recognition and presentation of OTTI, when an impairment related to a fixed maturity has occurred, OTTI is required to be recorded in Net income if management has the intent to sell the security or it is more likely than not that we will be required to sell the security before the recovery of its amortized cost. Further, in cases where we do not intend to sell the security and it is more likely than not that we will not be required to sell the security, we must evaluate the security to determine the portion of the impairment, if any, related to credit losses. If a credit loss is incurred, an OTTI is considered to have occurred and any portion of the OTTI related to credit losses must be reflected in Net income while the portion of OTTI related to all other factors is recognized in OCI. For fixed maturities held to maturity, OTTI recognized in OCI is accreted from AOCI to the amortized cost of the fixed maturity prospectively over the remaining term of the securities.

Each quarter, securities in an unrealized loss position (impaired securities), including fixed maturities and securities lending collateral are reviewed to identify impaired securities to be specifically evaluated for a potential OTTI.

Evaluation of potential credit losses related to fixed maturities
We review each fixed maturity in an unrealized loss position to assess whether the security is a candidate for credit loss. Specifically, we consider credit rating, market price, and issuer-specific financial information, among other factors, to assess the likelihood of collection of all principal and interest as contractually due. Securities, for which we determine that credit loss is likely, are subjected to further analysis to estimate the credit loss recognized in Net income, if any. In general, credit loss recognized in Net income equals the difference between the security's amortized cost and the net present value of its projected future cash flows discounted at the effective interest rate implicit in the debt security. All significant assumptions used in determining credit losses are subject to change as market conditions evolve.

U.S. Treasury and agency obligations (including agency mortgage-backed securities); foreign government obligations; and states, municipalities, and political subdivisions obligations
U.S. Treasury and agency obligations (including agency mortgage-backed securities); foreign government obligations; and states, municipalities, and political subdivisions obligations represent $630 million of gross unrealized loss at December 31, 2018. These securities were evaluated for credit loss primarily using qualitative assessments of the likelihood of credit loss considering credit rating of the issuers and level of credit enhancement, if any. We concluded that the high level of creditworthiness of the issuers coupled with credit enhancement, where applicable, supports recognizing no credit loss in Net income.

Corporate securities
Projected cash flows for corporate securities (principally senior unsecured bonds) are driven primarily by assumptions regarding probability of default and also the timing and amount of recoveries associated with defaults. Chubb developed projected cash flows for corporate securities using market observable data, issuer-specific information, and credit ratings. We use historical default data by Moody's Investors Service (Moody's) rating category to calculate a 1-in-100 year probability of default, which results in a default assumption in excess of the historical mean default rate. Consistent with management's approach, Chubb assumed a 32 percent recovery rate (the par value of a defaulted security that will be recovered) across all rating categories, rather than using Moody's historical mean recovery rate of 42 percent. We believe that use of a default assumption, in excess of the historical mean is conservative.

The following table presents default assumptions by Moody's rating category (historical mean default rate provided for comparison):

Moody's Rating Category	1-in-100 Year Default Rate	Historical Mean Default Rate
Investment Grade:		
Aaa-Baa	0.0 - 1.3%	0.0 - 0.3%
Below Investment Grade:		
Ba	4.8%	1.0%
B	12.0%	3.2%
Caa-C	36.6%	10.5%

Application of the methodology and assumptions described above resulted in credit losses recognized in Net income for corporate securities of $25 million, $5 million, and $30 million for the years ended December 31, 2018, 2017, and 2016, respectively.

Mortgage-backed securities
For mortgage-backed securities, credit impairment is assessed using a cash flow model that estimates the cash flows on the underlying mortgages, using the security-specific collateral and transaction structure. The model estimates cash flows from the underlying mortgage loans and distributes those cash flows to various tranches of securities, considering the transaction structure and any subordination and credit enhancements that exist in that structure. The cash flow model incorporates actual cash flows on the mortgage-backed securities through the current period and then projects the remaining cash flows using a number of assumptions, including default rates, prepayment rates, and loss severity rates (the par value of a defaulted security that will not be recovered) on foreclosed properties.

We develop specific assumptions using market data, where available, and include internal estimates as well as estimates published by rating agencies and other third-party sources. We project default rates by mortgage sector considering current underlying mortgage loan performance, generally assuming lower loss severity for Prime sector bonds versus ALT-A and Sub-prime bonds.

These estimates are extrapolated along a default timing curve to estimate the total lifetime pool default rate. Other assumptions used contemplate the actual collateral attributes, including geographic concentrations, rating agency loss projections, rating actions, and current market prices. If cash flow projections indicate that losses will exceed the credit enhancement for a given tranche, then we do not expect to recover our amortized cost basis, and we recognize an estimated credit loss in Net income.

For the years ended December 31, 2018 and 2017, there were no credit losses recognized in Net income for mortgage-backed securities. For the year ended December 31, 2016, there was $1 million of credit losses recognized in Net income for mortgage-backed securities.

The following table presents the components of Net realized gains (losses) and the change in net unrealized appreciation (depreciation) of investments:

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Fixed maturities:			
OTTI on fixed maturities, gross	**$ (52)**	$ (24)	$ (89)
OTTI on fixed maturities recognized in OCI (pre-tax)	**3**	1	8
OTTI on fixed maturities, net	**(49)**	(23)	(81)
Gross realized gains excluding OTTI	**334**	149	183
Gross realized losses excluding OTTI	**(587)**	(157)	(265)
Total fixed maturities	**(302)**	(31)	(163)
Equity securities:			
OTTI on equity securities	**—**	(10)	(8)
Gross realized gains excluding OTTI	**74**	28	65
Gross realized losses excluding OTTI	**(133)**	(2)	(13)
Total equity securities	**(59)**	16	44
OTTI on other investments	**—**	(12)	(14)
Other investments	**(5)**	—	—
Foreign exchange gains	**131**	36	118
Investment and embedded derivative instruments	**(75)**	(11)	(33)
Fair value adjustments on insurance derivative	**(248)**	364	53
S&P put options and futures	**(4)**	(261)	(136)
Other derivative instruments	**(3)**	(5)	(10)
Other	**(87)**	(12)	(4)
Net realized gains (losses) (pre-tax)	**$ (652)**	$ 84	$ (145)
Change in net unrealized appreciation (depreciation) on investments (pre-tax):			
Fixed maturities available for sale	**$ (1,958)**	$ 519	$ 142
Fixed maturities held to maturity	**(38)**	18	(59)
Equity securities	**—**	88	52
Other	**—**	8	(51)
Income tax (expense) benefit	**297**	(241)	100
Change in net unrealized appreciation (depreciation) on investments (after-tax)	**$ (1,699)**	$ 392	$ 184

Other net realized gains (losses) for the year ended December 31, 2018, included a $36 million loss from the extinguishment of debt as discussed in Note 8 to the Consolidated Financial Statements, a $24 million loss related to lease impairments, and a $23 million loss related to the impairment of fixed assets.

The following table presents a roll-forward of pre-tax credit losses related to fixed maturities for which a portion of OTTI was recognized in OCI:

(in millions of U.S. dollars)	Year Ended December 31 2018	2017	2016
Balance of credit losses related to securities still held – beginning of year	**$ 22**	$ 35	$ 53
Additions where no OTTI was previously recorded	**20**	4	17
Additions where an OTTI was previously recorded	**5**	2	14
Reductions for securities sold during the period	**(13)**	(19)	(49)
Balance of credit losses related to securities still held – end of year	**$ 34**	$ 22	$ 35

d) Other investments

(in millions of U.S. dollars)	**December 31 2018** Fair Value	**Cost**	December 31 2017 Fair Value	Cost
Partially-owned investment companies	**$ 3,623**	**$ 3,623**	$ 2,803	$ 2,803
Limited partnerships	**538**	**538**	549	441
Investment funds	**83**	**83**	270	123
Other				
Life insurance policies	**304**	**304**	305	305
Policy loans	**243**	**243**	244	244
Non-qualified separate account assets	**252**	**252**	333	333
Other	**234**	**234**	168	168
Total	**$ 5,277**	**$ 5,277**	$ 4,672	$ 4,417

Included in limited partnerships and partially-owned investment companies are 145 individual limited partnerships covering a broad range of investment strategies including large cap buyouts, specialist buyouts, growth capital, distressed, mezzanine, real estate, and co-investments. The underlying portfolio consists of various public and private debt and equity securities of publicly traded and privately held companies and real estate assets. The underlying investments across various partnerships, geographies, industries, asset types, and investment strategies provide risk diversification within the limited partnership portfolio and the overall investment portfolio. Investment funds include one highly diversified fund investment as well as several direct funds that employ a variety of investment styles such as long/short equity and arbitrage/distressed. Non-qualified separate account assets are comprised of mutual funds, supported by assets that do not qualify for separate account reporting under GAAP.

During 2018, we converted a $28 million loan into additional ownership interest in an investment classified within Other in the table above. This was a non-cash transaction and therefore excluded from our Consolidated statements of cash flows.

e) Investments in partially-owned insurance companies

The following table presents Investments in partially-owned insurance companies:

	December 31, 2018			December 31, 2017			
(in millions of U.S. dollars, except for percentages)	Carrying Value	Issued Share Capital	Ownership Percentage	Carrying Value	Issued Share Capital	Ownership Percentage	Domicile
Huatai Group	$ 452	$ 587	20%	$ 438	$ 616	20%	China
Huatai Life Insurance Company	106	472	20%	105	495	20%	China
Freisenbruch-Meyer	9	—	40%	9	—	40%	Bermuda
Chubb Arabia Cooperative Insurance Company	18	27	30%	15	27	30%	Saudi Arabia
Russian Reinsurance Company	2	4	23%	2	4	23%	Russia
ABR Reinsurance Ltd.	91	774	12%	93	800	11%	Bermuda
Total	$ 678	$ 1,864		$ 662	$ 1,942		

Huatai Group and Huatai Life Insurance Company provide a range of P&C, life, and investment products.

f) Gross unrealized loss

At December 31, 2018, there were 19,606 fixed maturities out of a total of 31,054 fixed maturities in an unrealized loss position. The largest single unrealized loss in the fixed maturities was $10 million. Fixed maturities in an unrealized loss position at December 31, 2018, comprised both investment grade and below investment grade securities for which fair value declined primarily due to widening credit spreads since the date of purchase.

The following tables present, for all securities in an unrealized loss position (including securities on loan), the aggregate fair value and gross unrealized loss by length of time the security has continuously been in an unrealized loss position:

December 31, 2018	0 – 12 Months		Over 12 Months		Total	
(in millions of U.S. dollars)	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss
U.S. Treasury and agency	$ 523	$ (4)	$ 2,859	$ (50)	$ 3,382	$ (54)
Foreign	6,764	(208)	5,349	(159)	12,113	(367)
Corporate securities	16,538	(599)	4,873	(255)	21,411	(854)
Mortgage-backed securities	6,103	(98)	6,913	(229)	13,016	(327)
States, municipalities, and political subdivisions	5,024	(44)	7,768	(124)	12,792	(168)
Total fixed maturities	$ 34,952	$ (953)	$ 27,762	$ (817)	$ 62,714	$ (1,770)

December 31, 2017	0 – 12 Months		Over 12 Months		Total	
(in millions of U.S. dollars)	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss
U.S. Treasury and agency	$ 2,172	$ (14)	$ 1,249	$ (26)	$ 3,421	$ (40)
Foreign	5,657	(65)	1,693	(49)	7,350	(114)
Corporate securities	5,210	(56)	1,332	(46)	6,542	(102)
Mortgage-backed securities	6,194	(31)	3,209	(74)	9,403	(105)
States, municipalities, and political subdivisions	9,259	(71)	1,402	(32)	10,661	(103)
Total fixed maturities	28,492	(237)	8,885	(227)	37,377	(464)
Equity securities	115	(12)	—	—	115	(12)
Other investments	78	(8)	—	—	78	(8)
Total	$ 28,685	$ (257)	$ 8,885	$ (227)	$ 37,570	$ (484)

g) Net investment income

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Fixed maturities	**$ 3,128**	$ 2,987	$ 2,779
Short-term investments	**90**	56	58
Other interest income	**118**	75	35
Equity securities	**33**	38	36
Other investments	**104**	133	98
Gross investment income [(1)]	**3,473**	3,289	3,006
Investment expenses	**(168)**	(164)	(141)
Net investment income [(1)]	**$ 3,305**	$ 3,125	$ 2,865
[(1)] Includes amortization expense related to fair value adjustment of acquired invested assets related to the Chub Corp acquisition	**$ (248)**	$ (332)	$ (393)

h) Restricted assets

Chubb is required to maintain assets on deposit with various regulatory authorities to support its insurance and reinsurance operations. These requirements are generally promulgated in the statutory regulations of the individual jurisdictions. The assets on deposit are available to settle insurance and reinsurance liabilities. Chubb is also required to restrict assets pledged under repurchase agreements, which represent Chubb's agreement to sell securities and repurchase them at a future date for a predetermined price. We use trust funds in certain large reinsurance transactions where the trust funds are set up for the benefit of the ceding companies and generally take the place of letter of credit (LOC) requirements. We have investments in segregated portfolios primarily to provide collateral or guarantees for LOC and derivative transactions. Included in restricted assets at December 31, 2018 and 2017, are investments, primarily fixed maturities, totaling $21.0 billion and $23.3 billion, and cash of $93 million and $123 million, respectively.

The following table presents the components of restricted assets:

(in millions of U.S. dollars)	**December 31 2018**	December 31 2017
Trust funds	**$ 13,988**	$ 17,011
Deposits with U.S. regulatory authorities	**2,405**	2,345
Deposits with non-U.S. regulatory authorities	**2,531**	2,250
Assets pledged under repurchase agreements	**1,468**	1,434
Other pledged assets	**692**	414
Total	**$ 21,084**	$ 23,454

3. Fair value measurements

a) Fair value hierarchy
Fair value of financial assets and financial liabilities is estimated based on the framework established in the fair value accounting guidance. The guidance defines fair value as the price to sell an asset or transfer a liability (an exit price) in an orderly transaction between market participants and establishes a three-level valuation hierarchy based on the reliability of the inputs. The fair value hierarchy gives the highest priority to quoted prices in active markets and the lowest priority to unobservable data.

The three levels of the hierarchy are as follows:

- Level 1 – Unadjusted quoted prices for identical assets or liabilities in active markets;
- Level 2 – Includes, among other items, inputs other than quoted prices that are observable for the asset or liability such as interest rates and yield curves, quoted prices for similar assets and liabilities in active markets, and quoted prices for identical or similar assets and liabilities in markets that are not active; and
- Level 3 – Inputs that are unobservable and reflect management's judgments about assumptions that market participants would use in pricing an asset or liability.

We categorize financial instruments within the valuation hierarchy at the balance sheet date based upon the lowest level of inputs that are significant to the fair value measurement.

We use pricing services to obtain fair value measurements for the majority of our investment securities. Based on management's understanding of the methodologies used, these pricing services only produce an estimate of fair value if there is observable market information that would allow them to make a fair value estimate. Based on our understanding of the market inputs used by the pricing services, all applicable investments have been valued in accordance with GAAP. We do not adjust prices obtained from pricing services. The following is a description of the valuation techniques and inputs used to determine fair values for financial instruments carried at fair value, as well as the general classification of such financial instruments pursuant to the valuation hierarchy.

Fixed maturities
We use pricing services to estimate fair value measurements for the majority of our fixed maturities. The pricing services use market quotations for fixed maturities that have quoted prices in active markets; such securities are classified within Level 1. For fixed maturities other than U.S. Treasury securities that generally do not trade on a daily basis, the pricing services prepare estimates of fair value measurements using their pricing applications, which include available relevant market information, benchmark curves, benchmarking of like securities, sector groupings, and matrix pricing. Additional valuation factors that can be taken into account are nominal spreads, dollar basis, and liquidity adjustments. The pricing services evaluate each asset class based on relevant market and credit information, perceived market movements, and sector news. The market inputs used in the pricing evaluation, listed in the approximate order of priority include: benchmark yields, reported trades, broker/dealer quotes, issuer spreads, two-sided markets, benchmark securities, bids, offers, reference data, and industry and economic events. The extent of the use of each input is dependent on the asset class and the market conditions. Given the asset class, the priority of the use of inputs may change, or some market inputs may not be relevant. Additionally, fixed maturities valuation is more subjective when markets are less liquid due to the lack of market based inputs (i.e., stale pricing), which may increase the potential that an investment's estimated fair value is not reflective of the price at which an actual transaction would occur. The overwhelming majority of fixed maturities are classified within Level 2 because the most significant inputs used in the pricing techniques are observable. For a small number of fixed maturities, we obtain a single broker quote (typically from a market maker). Due to the disclaimers on the quotes that indicate that the price is indicative only, we include these fair value estimates in Level 3.

Equity securities
Equity securities with active markets are classified within Level 1 as fair values are based on quoted market prices. For equity securities in markets which are less active, fair values are based on market valuations and are classified within Level 2. Equity securities for which pricing is unobservable are classified within Level 3.

Short-term investments
Short-term investments, which comprise securities due to mature within one year of the date of purchase that are traded in active markets, are classified within Level 1 as fair values are based on quoted market prices. Securities such as commercial paper and discount notes are classified within Level 2 because these securities are typically not actively traded due to their approaching maturity, and as such, their cost approximates fair value. Short-term investments for which pricing is unobservable are classified within Level 3.

Other investments
Fair values for the majority of Other investments including investments in partially-owned investment companies, investment funds, and limited partnerships are based on their respective net asset values or equivalent (NAV) and are excluded from the fair value hierarchy table below. Certain of our long-duration contracts are supported by assets that do not qualify for separate account reporting under GAAP. These assets comprise mutual funds, classified within Level 1 in the valuation hierarchy on the same basis as other equity securities traded in active markets. Other investments also include equity securities, classified within Level 1 and fixed maturities, classified within Level 2, held in rabbi trusts maintained by Chubb for deferred compensation and supplemental retirement plans and are classified within the valuation hierarchy on the same basis as other equity securities and fixed maturities. Other investments for which pricing is unobservable are classified within Level 3.

Securities lending collateral
The underlying assets included in Securities lending collateral in the Consolidated balance sheets are fixed maturities which are classified in the valuation hierarchy on the same basis as other fixed maturities. Excluded from the valuation hierarchy is the corresponding liability related to Chubb's obligation to return the collateral plus interest as it is reported at contract value and not fair value in the Consolidated balance sheets.

Investment derivative instruments
Actively traded investment derivative instruments, including futures, options, and forward contracts are classified within Level 1 as fair values are based on quoted market prices. The fair value of cross-currency swaps and interest rate swaps is based on market valuations and is classified within Level 2. Investment derivative instruments are recorded in either Other assets or Accounts payable, accrued expenses, and other liabilities in the Consolidated balance sheets.

Other derivative instruments
We maintain positions in exchange-traded equity futures contracts designed to limit exposure to a severe equity market decline, which would cause an increase in expected claims and, therefore, an increase in reserves for our guaranteed minimum death benefits (GMDB) and guaranteed living benefits (GLB) reinsurance business. Our positions in exchange-traded equity futures contracts are classified within Level 1. The fair value of the majority of the remaining positions in other derivative instruments is based on significant observable inputs including equity security and interest rate indices. Accordingly, these are classified within Level 2. Other derivative instruments based on unobservable inputs are classified within Level 3. Other derivative instruments are recorded in either Other assets or Accounts payable, accrued expenses, and other liabilities in the Consolidated balance sheets.

Separate account assets
Separate account assets represent segregated funds where investment risks are borne by the customers, except to the extent of certain guarantees made by Chubb. Separate account assets comprise mutual funds classified within Level 1 in the valuation hierarchy on the same basis as other equity securities traded in active markets. Separate account assets also include fixed maturities classified within Level 2 because the most significant inputs used in the pricing techniques are observable. Excluded from the valuation hierarchy are the corresponding liabilities as they are reported at contract value and not fair value in the Consolidated balance sheets. Separate account assets are recorded in Other assets in the Consolidated balance sheets.

Guaranteed living benefits
The GLB arises from life reinsurance programs covering living benefit guarantees whereby we assume the risk of guaranteed minimum income benefits (GMIB) associated with variable annuity contracts. GLB's are recorded in Accounts payable, accrued expenses, and other liabilities and Future policy benefits in the Consolidated balance sheets. For GLB reinsurance, Chubb estimates fair value using an internal valuation model which includes current market information and estimates of policyholder behavior. All of the treaties contain claim limits, which are factored into the valuation model. The fair value depends on a number of factors, including interest rates, equity markets, credit risk, current account value, market volatility, expected annuitization rates and other policyholder behavior, and changes in policyholder mortality.

The most significant policyholder behavior assumptions include lapse rates and the GMIB annuitization rates. Assumptions regarding lapse rates and GMIB annuitization rates differ by treaty, but the underlying methodologies to determine rates applied to each treaty are comparable.

A lapse rate is the percentage of in-force policies surrendered in a given calendar year. All else equal, as lapse rates increase, ultimate claim payments will decrease. In general, the base lapse function assumes low lapse rates (ranging from about 3 percent to 9 percent per annum) during the surrender charge period of the GMIB contract, followed by a "spike" lapse rate (ranging from about 9 percent to 33 percent per annum) in the year immediately following the surrender charge period, and then reverting to an ultimate lapse rate (generally around 10 percent per annum), typically over a 2-year period. This base rate is adjusted downward for policies with more valuable guarantees (policies with guaranteed values far in excess of their account values) by multiplying the base lapse rate by a factor ranging from 15 percent to 75 percent. Partial withdrawals and the impact of older policyholders with tax-qualified contracts (due to required minimum distributions) are also reflected in our modeling.

The GMIB annuitization rate is the percentage of policies for which the policyholder will elect to annuitize using the guaranteed benefit provided under the GMIB. All else equal, as GMIB annuitization rates increase, ultimate claim payments will increase, subject to treaty claim limits. All GMIB reinsurance treaties include claim limits to protect Chubb in the event that actual annuitization behavior is significantly higher than expected. In general, Chubb assumes that GMIB annuitization rates will be higher for policies with more valuable guarantees (policies with guaranteed values far in excess of their account values). Chubb also assumes that GMIB annuitization rates increase as policyholders get older. In addition, we also assume that GMIB annuitization rates are higher in the first year immediately following the waiting period (the first year the policies are eligible to annuitize using the GMIB) in comparison to all subsequent years. We do not yet have fully credible annuitization experience for all clients.

The level of annuitization assumptions at December 31, 2018 are as follows:

% of total GMIB guaranteed value	Policyholder age	Maximum annuitization rate(s) (per year)
19%	Under 65 years old	1% - 21%
81%	Over 65 years old	3% - 42%

The effect of changes in key market factors on assumed lapse and annuitization rates reflect emerging trends using data available from cedants. For treaties with limited experience, rates are established in line with data received from other ceding companies adjusted, as appropriate, with industry estimates. The model and related assumptions are regularly re-evaluated by management and enhanced, as appropriate, based upon additional experience obtained related to policyholder behavior and availability of updated information such as market conditions, market participant assumptions, and demographics of in-force annuities. Because of the significant use of unobservable inputs including policyholder behavior, GLB reinsurance is classified within Level 3.

In the fourth quarter of 2018, we completed a review of policyholder behavior related to annuitizations, partial withdrawals, lapses, and mortality for our variable annuity reinsurance business.

- As annuitization experience continued to emerge, we refined our annuitization assumptions including age-based behavior. The change in annuitization assumptions had an insignificant impact on the fair value of GLB liabilities.
- We also refined our lapse assumptions based on additional emerging experience, with a focus on underlying policies eligible for annuitization. These refinements resulted in a net increase to the fair value of GLB liabilities generating a realized loss of approximately $20 million.
- Reinsured policies allow for policyholders to make periodic withdrawals from their account values without lapsing the policy. The partial withdrawal results in a reduction to the associated guaranteed value that is either equal or proportional to the amount of the reduction in account value. We further refined our assumptions around the types of partial withdrawals according to their impact on guaranteed value. This resulted in an increase to the fair value of GLB liabilities generating a realized loss of approximately $11 million.
- After having performed a mortality study for the first time in 2017, we performed a second study this year and enhanced our analysis by increasing the weight given to emerging experience, which resulted in lower mortality assumptions. The updated mortality rates increased the fair value of GLB liabilities generating a realized loss of approximately $28 million.

During the year ended December 31, 2018, we also made minor model refinements to the internal valuation model which resulted in no material impact on income.

Financial instruments measured at fair value on a recurring basis, by valuation hierarchy

December 31, 2018 (in millions of U.S. dollars)	Level 1	Level 2	Level 3	Total
Assets:				
Fixed maturities available for sale				
U.S. Treasury and agency	$ 3,400	$ 745	$ —	$ 4,145
Foreign	—	21,071	345	21,416
Corporate securities	—	25,284	1,299	26,583
Mortgage-backed securities	—	15,479	61	15,540
States, municipalities, and political subdivisions	—	10,786	—	10,786
	3,400	73,365	1,705	78,470
Equity securities	713	—	57	770
Short-term investments	1,575	1,440	1	3,016
Other investments [(1)]	381	303	11	695
Securities lending collateral	—	1,926	—	1,926
Investment derivative instruments	28	—	—	28
Other derivative instruments	25	—	—	25
Separate account assets	2,686	137	—	2,823
Total assets measured at fair value [(1)]	$ 8,808	$ 77,171	$ 1,774	$ 87,753
Liabilities:				
Investment derivative instruments	$ 38	$ 115	$ —	$ 153
GLB [(2)]	—	—	452	452
Total liabilities measured at fair value	$ 38	$ 115	$ 452	$ 605

(1) Excluded from the table above are partially-owned investments, investment funds, and limited partnerships of $4,244 million and other investments of $95 million at December 31, 2018 measured using NAV as a practical expedient.

(2) Our GLB reinsurance product meets the definition of a derivative instrument for accounting purposes and is accordingly carried at fair value. Excluded from the table above is the portion of the GLB derivative liability classified as Future policy benefits in the Consolidated balance sheets. Refer to Note 4 c) for additional information.

December 31, 2017 (in millions of U.S. dollars)	Level 1	Level 2	Level 3	Total
Assets:				
Fixed maturities available for sale				
U.S. Treasury and agency	$ 3,129	$ 569	$ —	$ 3,698
Foreign	—	20,937	93	21,030
Corporate securities	—	22,959	1,037	23,996
Mortgage-backed securities	—	15,212	78	15,290
States, municipalities, and political subdivisions	—	14,925	—	14,925
	3,129	74,602	1,208	78,939
Equity securities	893	—	44	937
Short-term investments	2,309	1,252	—	3,561
Other investments [(1)]	466	305	263	1,034
Securities lending collateral	—	1,737	—	1,737
Investment derivative instruments	18	—	—	18
Other derivative instruments	1	—	—	1
Separate account assets	2,635	99	—	2,734
Total assets measured at fair value [(1)]	$ 9,451	$ 77,995	$ 1,515	$ 88,961
Liabilities:				
Investment derivative instruments	$ 30	$ —	$ —	$ 30
Other derivative instruments	21	—	2	23
GLB [(2)]	—	—	204	204
Total liabilities measured at fair value	$ 51	$ —	$ 206	$ 257

(1) Excluded from the table above are partially-owned investments, investment funds, and limited partnerships of $3,623 million and other investments of $15 million at December 31, 2017 measured using NAV as a practical expedient.

(2) Our GLB reinsurance product meets the definition of a derivative instrument for accounting purposes and is accordingly carried at fair value. Excluded from the table above is the portion of the GLB derivative liability classified as Future policy benefits in the Consolidated balance sheets. Refer to Note 4 c) for additional information.

Fair value of alternative investments

Alternative investments include investment funds, limited partnerships, and partially-owned investment companies measured at fair value using NAV as a practical expedient. The following table presents, by investment category, the expected liquidation period, fair value, and maximum future funding commitments of alternative investments:

	December 31 2018			December 31 2017	
(in millions of U.S. dollars)	**Expected Liquidation Period of Underlying Assets**	**Fair Value**	**Maximum Future Funding Commitments**	Fair Value	Maximum Future Funding Commitments
Financial	**2 to 9 Years**	**$ 596**	**$ 193**	$ 540	$ 330
Real Assets	**2 to 11 Years**	**704**	**362**	651	114
Distressed	**2 to 7 Years**	**296**	**105**	289	141
Private Credit	**3 to 8 Years**	**147**	**310**	187	327
Traditional	**2 to 14 Years**	**2,362**	**2,735**	1,656	3,149
Vintage	**1 to 2 Years**	**56**	**—**	30	—
Investment funds	**Not Applicable**	**83**	**—**	270	—
		$ 4,244	**$ 3,705**	$ 3,623	$ 4,061

Included in all categories in the above table, except for Investment funds, are investments for which Chubb will never have the contractual option to redeem but receives distributions based on the liquidation of the underlying assets. Further, for all categories except for Investment funds, Chubb does not have the ability to sell or transfer the investments without the consent from the general partner of individual funds.

Investment Category	Consists of investments in private equity funds:
Financial	targeting financial services companies, such as financial institutions and insurance services worldwide
Real Assets	targeting investments related to hard physical assets, such as real estate, infrastructure, and natural resources
Distressed	targeting distressed corporate debt/credit and equity opportunities in the U.S.
Private Credit	targeting privately originated corporate debt investments, including senior secured loans and subordinated bonds
Traditional	employing traditional private equity investment strategies such as buyout and growth equity globally
Vintage	made before 2002 or where the funds' commitment periods have already expired

Investment funds

Chubb's investment funds employ various investment strategies such as long/short equity and arbitrage/distressed. Included in this category are investments for which Chubb has the option to redeem at agreed upon value as described in each investment fund's subscription agreement. Depending on the terms of the various subscription agreements, investment fund investments may be redeemed monthly, quarterly, semi-annually, or annually. If Chubb wishes to redeem an investment fund investment, it must first determine if the investment fund is still in a lock-up period (a time when Chubb cannot redeem its investment so that the investment fund manager has time to build the portfolio). If the investment fund is no longer in its lock-up period, Chubb must then notify the investment fund manager of its intention to redeem by the notification date prescribed by the subscription agreement. Subsequent to notification, the investment fund can redeem Chubb's investment within several months of the notification. Notice periods for redemption of the investment funds range between 5 and 120 days. Chubb can redeem its investment funds without consent from the investment fund managers.

Level 3 financial instruments

The following table presents the significant unobservable inputs used in the Level 3 liability valuations. Excluded from the table below are inputs used to determine the fair value of Level 3 assets which are based on single broker quotes and contain no quantitative unobservable inputs developed by management. The majority of our fixed maturities classified as Level 3 used external pricing when markets are less liquid due to the lack of market inputs (i.e., stale pricing, broker quotes).

(in millions of U.S. dollars, except for percentages)	Fair Value at December 31, 2018	Valuation Technique	Significant Unobservable Inputs	Ranges
GLB[(1)]	**$ 452**	**Actuarial model**	**Lapse rate**	**3% – 32%**
			Annuitization rate	**0% – 42%**

(1) Discussion of the most significant inputs used in the fair value measurement of GLB and the sensitivity of those assumptions is included within Note 3 a) Guaranteed living benefits.

The following tables present a reconciliation of the beginning and ending balances of financial instruments measured at fair value using significant unobservable inputs (Level 3):

	Assets						Liabilities	
	Available-for-Sale Debt Securities							
Year Ended December 31, 2018 (in millions of U.S. dollars)	**Foreign**	**Corporate securities**	**MBS**	**Equity securities**	**Short-term investments**	**Other investments**	**Other derivative instruments**	**GLB [1]**
Balance, beginning of year	**$ 93**	**$ 1,037**	**$ 78**	**$ 44**	**$ —**	**$ 263**	**$ 2**	**$ 204**
Transfers into Level 3	**13**	**24**	**1**	**—**	**5**	**—**	**—**	**—**
Transfers out of Level 3	**(2)**	**(31)**	**(3)**	**—**	**—**	**(252)**	**—**	**—**
Change in Net Unrealized Gains/Losses included in OCI	**(12)**	**(4)**	**—**	**(2)**	**—**	**(2)**	**—**	**—**
Net Realized Gains/Losses	**(3)**	**(5)**	**—**	**6**	**—**	**1**	**(2)**	**248**
Purchases	**334**	**672**	**5**	**37**	**9**	**50**	**—**	**—**
Sales	**(69)**	**(164)**	**—**	**(28)**	**—**	**—**	**—**	**—**
Settlements	**(9)**	**(230)**	**(20)**	**—**	**(13)**	**(49)**	**—**	**—**
Balance, end of year	**$ 345**	**$ 1,299**	**$ 61**	**$ 57**	**$ 1**	**$ 11**	**$ —**	**$ 452**
Net Realized Gains/Losses Attributable to Changes in Fair Value at the Balance Sheet Date	**$ (1)**	**$ (7)**	**$ —**	**$ (1)**	**$ —**	**$ 1**	**$ —**	**$ 248**

(1) Our GLB reinsurance product meets the definition of a derivative instrument for accounting purposes and is accordingly carried at fair value. Excluded from the table above is the portion of the GLB derivative liability classified as Future policy benefits in the Consolidated balance sheets. Refer to Note 4 c) for additional information.

	Assets						Liabilities	
	Available-for-Sale Debt Securities							
Year Ended December 31, 2017 (in millions of U.S. dollars)	Foreign	Corporate securities [1]	MBS	Equity securities	Short-term investments	Other investments	Other derivative instruments	GLB [2]
Balance, beginning of year	$ 74	$ 681	$ 45	$ 41	$ 25	$ 225	$ 13	$ 559
Transfers into Level 3	—	231	50	—	—	—	—	9
Transfers out of Level 3	(3)	(93)	—	—	—	—	(9)	—
Change in Net Unrealized Gains/Losses included in OCI	3	(12)	—	(1)	—	6	—	—
Net Realized Gains/Losses	—	—	—	2	—	—	(2)	(364)
Purchases	84	521	8	24	16	56	—	—
Sales	(59)	(111)	(1)	(22)	—	—	—	—
Settlements	(6)	(180)	(24)	—	(41)	(24)	—	—
Balance, end of year	$ 93	$ 1,037	$ 78	$ 44	$ —	$ 263	$ 2	$ 204
Net Realized Gains/Losses Attributable to Changes in Fair Value at the Balance Sheet Date	$ (1)	$ (2)	$ —	$ (1)	$ —	$ —	$ (2)	$ (364)

(1) Transfers into and Purchases in Level 3 primarily consist of privately-placed fixed income securities.

(2) Our GLB reinsurance product meets the definition of a derivative instrument for accounting purposes and is accordingly carried at fair value. Excluded from the table above is the portion of the GLB derivative liability classified as Future policy benefits in the Consolidated balance sheets. The liability for GLB reinsurance was $550 million at December 31, 2017 and $853 million at December 31, 2016, which includes a fair value derivative adjustment of $204 million and $559 million, respectively.

	Assets							Liabilities
	Available-for-Sale Debt Securities							
Year Ended December 31, 2016 (in millions of U.S. dollars)	Foreign	Corporate securities	MBS	Equity securities	Short-term investments	Other investments	Other derivative instruments	GLB[1]
Balance, beginning of year	$ 57	$ 174	$ 53	$ 16	$ —	$ 212	$ 6	$ 609
Transfers into Level 3	9	53	—	—	—	—	—	—
Transfers out of Level 3	(24)	(10)	—	—	(50)	—	—	—
Change in Net Unrealized Gains/Losses included in OCI	1	15	(1)	2	—	(2)	—	—
Net Realized Gains/Losses	(6)	(13)	—	1	—	1	5	(50)
Purchases [2]	70	566	1	27	75	33	2	—
Sales	(17)	(59)	(8)	(5)	—	—	—	—
Settlements	(16)	(45)	—	—	—	(19)	—	—
Balance, end of year	$ 74	$ 681	$ 45	$ 41	$ 25	$ 225	$ 13	$ 559
Net Realized Gains/Losses Attributable to Changes in Fair Value at the Balance Sheet Date	$ (5)	$ (11)	$ —	$ —	$ —	$ 1	$ 5	$ (50)

(1) Our GLB reinsurance product meets the definition of a derivative instrument for accounting purposes and is accordingly carried at fair value. Excluded from the table above is the portion of the GLB derivative liability classified as Future policy benefits in the Consolidated balance sheets. The liability for GLB reinsurance was $853 million at December 31, 2016 and $888 million at December 31, 2015, which includes a fair value derivative adjustment of $559 million and $609 million, respectively.

(2) Includes acquired invested assets as a result of the Chubb Corp acquisition.

b) Financial instruments disclosed, but not measured, at fair value

Chubb uses various financial instruments in the normal course of its business. Our insurance contracts are excluded from fair value of financial instruments accounting guidance, and therefore, are not included in the amounts discussed below.

The carrying values of cash, other assets, other liabilities, and other financial instruments not included below approximated their fair values.

Investments in partially-owned insurance companies

Fair values for investments in partially-owned insurance companies are based on Chubb's share of the net assets based on the financial statements provided by those companies and are excluded from the valuation hierarchy tables below.

Short- and long-term debt, repurchase agreements, and trust preferred securities

Where practical, fair values for short-term debt, long-term debt, repurchase agreements, and trust preferred securities are estimated using discounted cash flow calculations based principally on observable inputs including incremental borrowing rates, which reflect Chubb's credit rating, for similar types of borrowings with maturities consistent with those remaining for the debt being valued.

The following tables present fair value, by valuation hierarchy, and carrying value of the financial instruments not measured at fair value:

December 31, 2018				Fair Value	
(in millions of U.S. dollars)	**Level 1**	**Level 2**	**Level 3**	**Total**	**Carrying Value**
Assets:					
Fixed maturities held to maturity					
U.S. Treasury and agency	**$ 1,128**	**$ 54**	**$ —**	**$ 1,182**	**$ 1,185**
Foreign	**—**	**1,542**	**—**	**1,542**	**1,549**
Corporate securities	**—**	**2,477**	**31**	**2,508**	**2,601**
Mortgage-backed securities	**—**	**2,486**	**—**	**2,486**	**2,524**
States, municipalities, and political subdivisions	**—**	**5,541**	**—**	**5,541**	**5,576**
Total assets	**$ 1,128**	**$ 12,100**	**$ 31**	**$ 13,259**	**$ 13,435**
Liabilities:					
Repurchase agreements	**$ —**	**$ 1,418**	**$ —**	**$ 1,418**	**$ 1,418**
Short-term debt	**—**	**516**	**—**	**516**	**509**
Long-term debt	**—**	**12,181**	**—**	**12,181**	**12,087**
Trust preferred securities	**—**	**409**	**—**	**409**	**308**
Total liabilities	**$ —**	**$ 14,524**	**$ —**	**$ 14,524**	**$ 14,322**

December 31, 2017				Fair Value	
(in millions of U.S. dollars)	Level 1	Level 2	Level 3	Total	Carrying Value
Assets:					
Fixed maturities held to maturity					
U.S. Treasury and agency	$ 857	$ 58	$ —	$ 915	$ 908
Foreign	—	1,757	—	1,757	1,738
Corporate securities	—	3,184	35	3,219	3,159
Mortgage-backed securities	—	2,742	—	2,742	2,724
States, municipalities, and political subdivisions	—	5,841	—	5,841	5,806
Total assets	$ 857	$ 13,582	$ 35	$ 14,474	$ 14,335
Liabilities:					
Repurchase agreements	$ —	$ 1,408	$ —	$ 1,408	$ 1,408
Short-term debt	—	1,013	—	1,013	1,013
Long-term debt	—	12,332	—	12,332	11,556
Trust preferred securities	—	468	—	468	308
Total liabilities	$ —	$ 15,221	$ —	$ 15,221	$ 14,285

4. Reinsurance

a) Consolidated reinsurance

Chubb purchases reinsurance to manage various exposures including catastrophe risks. Although reinsurance agreements contractually obligate Chubb's reinsurers to reimburse it for the agreed-upon portion of its gross paid losses, they do not discharge Chubb's primary liability. The amounts for net premiums written and net premiums earned in the Consolidated statements of operations are net of reinsurance. The following table presents direct, assumed, and ceded premiums:

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Premiums written			
Direct	**$ 34,782**	$ 33,137	$ 31,543
Assumed	**3,186**	3,239	3,440
Ceded	**(7,389)**	(7,132)	(6,838)
Net	**$ 30,579**	$ 29,244	$ 28,145
Premiums earned			
Direct	**$ 34,108**	$ 32,782	$ 31,811
Assumed	**3,175**	3,332	3,744
Ceded	**(7,219)**	(7,080)	(6,806)
Net	**$ 30,064**	$ 29,034	$ 28,749

Ceded losses and loss expenses incurred were $5.6 billion, $5.5 billion, and $4.1 billion for the years ended December 31, 2018, 2017, and 2016, respectively.

b) Reinsurance recoverable on ceded reinsurance

	December 31, 2018		December 31, 2017	
(in millions of U.S. dollars)	**Net Reinsurance Recoverable** [(1)]	**Provision for Uncollectible**	Net Reinsurance Recoverable [(1)]	Provision for Uncollectible
Reinsurance recoverable on unpaid losses and loss expenses	**$ 14,689**	**$ 251**	$ 14,014	$ 247
Reinsurance recoverable on paid losses and loss expenses	**1,304**	**72**	1,020	74
Reinsurance recoverable on losses and loss expenses	**$ 15,993**	**$ 323**	$ 15,034	$ 321
Reinsurance recoverable on policy benefits	**$ 202**	**$ 4**	$ 184	$ 4

(1) Net of provision for uncollectible reinsurance.

The increase in reinsurance recoverable on loss and loss expenses was principally related to an increase in catastrophe loss recoveries and favorable reinsurance settlements that were not collected as of December 31, 2018.

We evaluate the financial condition of our reinsurers and potential reinsurers on a regular basis and also monitor concentrations of credit risk with reinsurers. The provision for uncollectible reinsurance is required principally due to the potential failure of reinsurers to indemnify Chubb, primarily because of disputes under reinsurance contracts and insolvencies. We have established provisions for amounts estimated to be uncollectible on both unpaid and paid losses as well as future policy benefits.

The following tables present a listing, at December 31, 2018, of the categories of Chubb's reinsurers:

December 31, 2018 (in millions of U.S. dollars, except for percentages)	Gross Reinsurance Recoverable on Loss and Loss Expenses	Provision for Uncollectible Reinsurance	% of Gross Reinsurance Recoverable
Categories			
Largest reinsurers	$ 6,578	$ 70	1.1%
Other reinsurers rated A- or better	5,339	63	1.2%
Other reinsurers with ratings lower than A- or not rated	558	68	12.2%
Pools	429	16	3.7%
Structured settlements	548	18	3.3%
Captives	2,590	16	0.6%
Other	274	72	26.3%
Total	$ 16,316	$ 323	2.0%

Largest Reinsurers

ABR Reinsurance Capital Holdings	HDI Group (Hannover Re)	Munich Re Group	Swiss Re Group
Berkshire Hathaway Insurance Group	Lloyd's of London	Starr International Group	

Categories of Chubb's reinsurers	Comprises:
Largest reinsurers	• All groups of reinsurers or captives where the gross recoverable exceeds one percent of Chubb's total shareholders' equity.
Other reinsurers rated A- or better	• All reinsurers rated A- or better that were not included in the largest reinsurer category.
Other reinsurers rated lower than A- or not rated	• All reinsurers rated lower than A- or not rated that were not included in the largest reinsurer category.
Pools	• Related to Chubb's voluntary pool participation and Chubb's mandatory pool participation required by law in certain states.
Structured settlements	• Annuities purchased from life insurance companies to settle claims. Since we retain ultimate liability in the event that the life company fails to pay, we reflect the amounts as both a liability and a recoverable/receivable for GAAP purposes.
Captives	• Companies established and owned by our insurance clients to assume a significant portion of their direct insurance risk from Chubb; structured to allow clients to self-insure a portion of their reinsurance risk. It generally is our policy to obtain collateral equal to expected losses. Where appropriate, exceptions are granted but only with review and approval at a senior officer level. Excludes captives included in the largest reinsurer category.
Other	• Amounts recoverable that are in dispute or are from companies that are in supervision, rehabilitation, or liquidation.

The provision for uncollectible reinsurance is principally based on an analysis of the credit quality of the reinsurer and collateral balances. We establish the provision for uncollectible reinsurance for the Other category based on a case-by-case analysis of individual situations including the merits of the underlying matter, credit and collateral analysis, and consideration of our collection experience in similar situations.

c) Assumed life reinsurance programs involving minimum benefit guarantees under variable annuity contracts
The following table presents income and expenses relating to GMDB and GLB reinsurance. GLBs include GMIBs.

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
GMDB			
Net premiums earned	**$ 47**	$ 49	$ 55
Policy benefits and other reserve adjustments	**$ 20**	$ 40	$ 45
GLB			
Net premiums earned	**$ 96**	$ 110	$ 118
Policy benefits and other reserve adjustments	**110**	105	52
Net realized gains (losses)	**(250)**	363	48
Gain (loss) recognized in Net income	**$ (264)**	$ 368	$ 114
Net cash received and other	**47**	65	79
Net decrease (increase) in liability	**$ (311)**	$ 303	$ 35

Net realized gains (losses) in the table above include gains (losses) related to foreign exchange and fair value adjustments on insurance derivatives and exclude gains (losses) on S&P futures used to partially offset the risk in the GLB reinsurance portfolio. Refer to Note 9 for additional information.

At December 31, 2018 and 2017, the reported liability for GMDB reinsurance was $117 million and $129 million, respectively. At December 31, 2018 and 2017, the reported liability for GLB reinsurance was $861 million and $550 million, respectively, which includes a fair value derivative adjustment of $452 million and $204 million, respectively. Reported liabilities for both GMDB and GLB reinsurance are determined using internal valuation models. Such valuations require considerable judgment and are subject to significant uncertainty. The valuation of these products is subject to fluctuations arising from, among other factors, changes in interest rates, changes in equity markets, changes in credit markets, changes in the allocation of the investments underlying annuitants' account values, and assumptions regarding future policyholder behavior. These models and the related assumptions are regularly reviewed by management and enhanced, as appropriate, based upon improvements in modeling assumptions and availability of updated information, such as market conditions and demographics of in-force annuities.

Variable Annuity Net Amount at Risk

The net amount at risk is defined as the present value of future claim payments assuming policy account values and guaranteed values are fixed at the valuation date (December 31, 2018 and 2017, respectively) and reinsurance coverage ends at the earlier of the maturity of the underlying variable annuity policy or the reinsurance treaty. In addition, the following assumptions were used:

(in millions of U.S. dollars, except for percentages)		Net amount at risk				
Reinsurance covering		December 31 2018	December 31 2017	2018 Future claims discount rate	Other assumptions	Total claims at 100% mortality at December 31, 2018[1]
GMDB Risk Only		$ 408	$ 279	3.3% - 3.5%	No lapses or withdrawals	$ 177
					Mortality according to 100% of the Annuity 2000 mortality table	
GLB Risk Only		$ 1,233	$ 691	4.0% - 4.3%	No deaths, lapses or withdrawals	N/A
					Annuitization at a frequency most disadvantageous to Chubb[2]	
					Claim calculated using interest rates in line with rates used to calculate reserve	
Both Risks: [3]	GMDB	$ 103	$ 81	4.0% - 4.3%	No lapses or withdrawals	$ 18
					Mortality according to 100% of the Annuity 2000 mortality table	
	GLB	$ 517	$ 392	4.0% - 4.3%	Annuitization at a frequency most disadvantageous to Chubb[2]	N/A
					Claim calculated using interest rates in line with rates used to calculate reserve	

(1) Takes into account all applicable reinsurance treaty claim limits.
(2) Annuitization at a level that maximizes claims taking into account the treaty limits.
(3) Covering both the GMDB and GLB risks on the same underlying policyholders.

The average attained age of all policyholders for all risk categories above, weighted by the guaranteed value of each reinsured policy, is approximately 71 years.

5. Goodwill and Other intangible assets

At December 31, 2018 and 2017, Goodwill was $15.3 billion and $15.5 billion, respectively, and Other intangible assets were $6.1 billion and $6.5 billion, respectively.

a) Goodwill
The following table presents a roll-forward of Goodwill by segment:

(in millions of U.S. dollars)	North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Life Insurance	Chubb Consolidated
Balance at December 31, 2016	$ 6,961	$ 2,235	$ 134	$ 4,817	$ 365	$ 820	$ 15,332
Foreign exchange revaluation and other	15	5	—	187	—	2	209
Balance at December 31, 2017	$ 6,976	$ 2,240	$ 134	$ 5,004	$ 365	$ 822	$ 15,541
Foreign exchange revaluation and other	**(30)**	**(10)**	**—**	**(234)**	**6**	**(2)**	**(270)**
Balance at December 31, 2018	**$ 6,946**	**$ 2,230**	**$ 134**	**$ 4,770**	**$ 371**	**$ 820**	**$ 15,271**

b) Other intangible assets

The majority of the Other intangible assets balance at December 31, 2018 relates to the Chubb Corp acquisition and comprised of $3.2 billion that are subject to amortization, principally Agency distribution relationships and renewal rights, and $2.9 billion that are not subject to amortization, principally trademarks. This compares to $3.5 billion and $3.0 billion at December 31, 2017, respectively.

Amortization of purchased intangibles

Amortization expense related to purchased intangibles were $339 million, $260 million, and $19 million for the years ended December 31, 2018, 2017, and 2016, respectively. The increase in amortization expense of purchased intangibles in 2018 and 2017 compared to 2016, primarily reflects a lower amortization benefit from the fair value adjustment on acquired Unpaid losses and loss expenses related to the Chubb Corp acquisition.

The following table presents, as of December 31, 2018, the expected estimated pre-tax amortization expense (benefit) of purchased intangibles, at current foreign currency exchange rates, for the next five years:

	Associated with the Chubb Corp Acquisition				
For the Year Ending December 31 (in millions of U.S. dollars)	Agency distribution relationships and renewal rights	Fair value adjustment on Unpaid losses and loss expense [(1)]	Total	Other intangible assets	Total Amortization of purchased intangibles
2019	$ 280	$ (62)	$ 218	$ 80	$ 298
2020	239	(35)	204	76	280
2021	216	(20)	196	70	266
2022	196	(14)	182	64	246
2023	177	(7)	170	62	232
Total	$ 1,108	$ (138)	$ 970	$ 352	$ 1,322

(1) In connection with the Chubb Corp acquisition, we recorded an increase to Unpaid losses and loss expenses acquired to adjust the carrying value of Chubb Corp's historical Unpaid losses and loss expenses to fair value as of the acquisition date. This fair value adjustment amortizes through Amortization of purchased intangibles on the Consolidated statements of operations through the year 2032. The balance of the fair value adjustment on Unpaid losses and loss expense was $207 million and $309 million at December 31, 2018 and 2017, respectively. Refer to Note 1(h) for additional information.

c) VOBA

The following table presents a roll-forward of VOBA:

(in millions of U.S. dollars)	**2018**	2017	2016
Balance, beginning of year	**$ 326**	$ 355	$ 395
Amortization of VOBA [(1)]	**(25)**	(35)	(41)
Foreign exchange revaluation	**(6)**	6	1
Balance, end of year	**$ 295**	$ 326	$ 355

(1) Recognized in Policy acquisition costs in the Consolidated statements of operations.

The following table presents, as of December 31, 2018, the expected estimated pre-tax amortization expense related to VOBA for the next five years:

For the Year Ending December 31 (in millions of U.S. dollars)	VOBA
2019	$ 26
2020	24
2021	22
2022	20
2023	18
Total	$ 110

6. Unpaid losses and loss expenses

Chubb establishes reserves for the estimated unpaid ultimate liability for losses and loss expenses under the terms of its policies and agreements. Reserves include estimates for both claims that have been reported and for IBNR claims, and include estimates of expenses associated with processing and settling these claims. Reserves are recorded in Unpaid losses and loss expenses in the consolidated balance sheets. While we believe that our reserves for unpaid losses and loss expenses at December 31, 2018 are adequate, new information or trends may lead to future developments in incurred loss and loss expenses significantly greater or less than the reserves provided. Any such revisions could result in future changes in estimates of losses or reinsurance recoverable and would be reflected in our results of operations in the period in which the estimates are changed.

The following table presents a reconciliation of beginning and ending Unpaid losses and loss expenses:

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Gross unpaid losses and loss expenses, beginning of year	**$ 63,179**	$ 60,540	$ 37,303
Reinsurance recoverable on unpaid losses (1)	**(14,014)**	(12,708)	(10,741)
Net unpaid losses and loss expenses, beginning of year	**49,165**	47,832	26,562
Acquisition of subsidiaries	**—**	—	21,402
Total	**49,165**	47,832	47,964
Net losses and loss expenses incurred in respect of losses occurring in:			
Current year	**19,048**	19,391	17,256
Prior years (2)	**(981)**	(937)	(1,204)
Total	**18,067**	18,454	16,052
Net losses and loss expenses paid in respect of losses occurring in:			
Current year	**7,544**	6,575	5,899
Prior years	**10,796**	10,873	9,816
Total	**18,340**	17,448	15,715
Foreign currency revaluation and other	**(621)**	327	(469)
Net unpaid losses and loss expenses, end of year	**48,271**	49,165	47,832
Reinsurance recoverable on unpaid losses (1)	**14,689**	14,014	12,708
Gross unpaid losses and loss expenses, end of year	**$ 62,960**	$ 63,179	$ 60,540

(1) Net of provision for uncollectible reinsurance.

(2) Relates to prior period loss reserve development only and excludes prior period development related to reinstatement premiums, expense adjustments and earned premiums totaling $85 million, $108 million and $69 million for 2018, 2017, and 2016, respectively.

The decrease in gross and net unpaid losses and loss expenses in 2018 was primarily driven by payments related to the 2017 catastrophic events, favorable prior period development and foreign exchange movement, partially offset by catastrophic events in 2018.

The increase in gross and net unpaid losses and loss expenses in 2017 primarily reflects the significant catastrophic events, principally from California wildfires, hurricanes Harvey, Irma, and Maria and the earthquakes in Mexico.

The loss development tables under section c) below, present Chubb's historical incurred and paid claims development by broad product line through December 31, 2018, net of reinsurance, as well as the cumulative number of reported claims, IBNR balances, and other supplementary information.

The following table presents a reconciliation of the loss development tables to the liability for unpaid losses and loss expenses in the consolidated balance sheet:

Reconciliation of Reserve Balances to Liability for Unpaid Loss and Loss Expenses

(in millions of U.S. dollars)	December 31 2018
Presented in the loss development tables:	
North America Commercial P&C Insurance — Workers' Compensation	$ 9,183
North America Commercial P&C Insurance — Liability	16,485
North America Commercial P&C Insurance — Other Casualty	1,884
North America Commercial P&C Insurance — Non-Casualty	1,871
North America Personal P&C Insurance	2,319
Overseas General Insurance — Casualty	5,833
Overseas General Insurance — Non-Casualty	2,265
Global Reinsurance — Casualty	1,218
Global Reinsurance — Non-Casualty	390
Excluded from the loss development tables:	
Other	4,399
Net unpaid loss and allocated loss adjustment expense	45,847
Ceded unpaid loss and allocated loss adjustment expense:	
North America Commercial P&C Insurance — Workers' Compensation	$ 1,766
North America Commercial P&C Insurance — Liability	4,812
North America Commercial P&C Insurance — Other Casualty	544
North America Commercial P&C Insurance — Non-Casualty	1,531
North America Personal P&C Insurance	895
Overseas General Insurance — Casualty	2,070
Overseas General Insurance — Non-Casualty	1,208
Global Reinsurance — Casualty	58
Global Reinsurance — Non-Casualty	99
Other	1,874
Ceded unpaid loss and allocated loss adjustment expense	14,857
Unpaid loss and loss expense on other than short-duration contracts (1)	831
Unpaid unallocated loss adjustment expenses	1,425
Unpaid losses and loss expenses	$ 62,960

(1) Primarily includes the claims reserve of our International A&H business and Life Insurance segment reserves.

Business excluded from the loss development tables
"Other" shown in the reconciliation table above comprises businesses excluded from the loss development tables below:

- North America Agricultural Insurance segment business, which is short-tailed with the majority of the liabilities expected to be resolved in the ensuing twelve months;
- Corporate segment business, which includes run-off liabilities such as asbestos and environmental and other mass tort exposures and which impact accident years older than those shown in the exhibits below;
- Life Insurance segment business, which is generally written using long-duration contracts; and
- Certain subsets of our business due to data limitations or unsuitability to the development table presentation, including:
    - We underwrite loss portfolio transfers at various times; by convention, all premium and losses associated with these transactions are recorded to the policy period of the transaction, even though the accident dates of the claims covered may be a decade or more in the past. We also underwrite certain high attachment, high limit, multiple-line and excess of aggregate coverages for large commercial clients. Changes in incurred loss and cash flow patterns are volatile and sufficiently different from those of typical insureds. This category includes the loss portfolio transfer of Fireman's Fund personal lines run-off liabilities and Alternative Risk Solutions business within the North America Commercial P&C segment;
    - 2015 and prior paid history on a subset of previously acquired international businesses, within the Overseas General Insurance segment, due to limitations on the data prior to the acquisition;
    - Reinsurance recoverable bad debt;
    - Purchase accounting adjustments related to unpaid losses and loss expenses for Chubb Corp.

a) Description of Reserving Methodologies
Our recorded reserves represent management's best estimate of the provision for unpaid claims as of the balance sheet date. Management's best estimate is developed after collaboration with actuarial, underwriting, claims, legal, and finance departments and culminates with the input of reserve committees. Each business unit reserve committee includes the participation of the relevant parties from actuarial, finance, claims, and unit senior management and has the responsibility for finalizing, recommending and approving the estimate to be used as management's best estimate. Reserves are further reviewed by Chubb's Chief Actuary and senior management. The objective of such a process is to determine a single estimate that we believe represents a better estimate than any other and which is viewed by management to be the best estimate of ultimate loss settlements.

This estimate is based on a combination of exposure and experience-based actuarial methods (described below) and other considerations such as claims reviews, reinsurance recovery assumptions and/or input from other knowledgeable parties such as underwriting. Exposure-based methods are most commonly used on relatively immature origin years (i.e., the year in which the losses were incurred — "accident year" or "report year"), while experience-based methods provide a view based on the projection of loss experience that has emerged as of the valuation date. Greater reliance is placed upon experience-based methods as the pool of emerging loss experience grows and where it is deemed sufficiently credible and reliable as the basis for the estimate. In comparing the held reserve for any given origin year to the actuarial projections, judgment is required as to the credibility, uncertainty and inherent limitations of applying actuarial techniques to historical data to project future loss experience. Examples of factors that impact such judgments include, but are not limited to, the following:

- nature and complexity of underlying coverage provided and net limits of exposure provided;
- segmentation of data to provide sufficient homogeneity and credibility for loss projection methods;
- extent of credible internal historical loss data and reliance upon industry information as required;
- historical variability of actual loss emergence compared with expected loss emergence;
- extent of emerged loss experience relative to the remaining expected period of loss emergence;
- rate monitor information for new and renewal business;
- facts and circumstances of large claims;
- impact of applicable reinsurance recoveries; and
- nature and extent of underlying assumptions.

We have actuarial staff within each of our business units who analyze loss reserves (including loss expenses) and regularly project estimates of ultimate losses and the corresponding indications of the required IBNR reserve. Our reserving approach is a comprehensive ground-up process using data at a detailed level that reflects the specific types and coverages of the diverse products written by our various operations. The data presented in this disclosure was prepared on a more aggregated basis and with a focus on changes in incurred loss estimates over time as well as associated cash flows. We note that data prepared on this basis may not demonstrate the full spectrum of characteristics that are evident in the more detailed level studied internally.

We perform an actuarial reserve review for each product line at least once a year. For most product lines, one or more standard actuarial reserving methods may be used to determine estimates of ultimate losses and loss expenses, and from these estimates, a single actuarial central estimate is selected. The actuarial central estimate is an input to the reserve committee process described above. For the few product lines that do not lend themselves to standard actuarial reserving methods, appropriate techniques are applied to produce the actuarial central estimates. For example, run-off asbestos and environmental liability estimates are better suited to the application of account-specific exposure-based analyses to best evaluate their associated aggregate reserve levels.

b) Standard actuarial reserving methods
Standard actuarial reserving methods include, but are not limited to, expected loss ratio, paid and reported loss development, and Bornhuetter-Ferguson methods. A general description of these methods is provided below. In addition to these standard methods, depending upon the product line characteristics and available data, we may use other recognized actuarial methods and approaches. Implicit in the standard actuarial methods that we generally utilize is the need for two fundamental assumptions: first, the pattern by which losses are expected to emerge over time for each origin year, and second the expected loss ratio for each origin year.

The expected loss ratio for any particular origin year is selected after consideration of a number of factors, including historical loss ratios adjusted for rate changes, premium and loss trends, industry benchmarks, the results of policy level loss modeling at the time of underwriting, and/or other more subjective considerations for the product line (e.g., terms and conditions) and external environment as noted above. The expected loss ratio for a given origin year is initially established at the start of the origin year as part of the planning process. This analysis is performed in conjunction with underwriters and management. The expected loss ratio method arrives at an ultimate loss estimate by multiplying the expected ultimate loss ratio by the corresponding premium base. This method is most commonly used as the basis for the actuarial central estimate for immature origin periods on product lines where the actual paid or reported loss experience is not yet deemed sufficiently credible to serve as the principal basis for the selection of ultimate losses. The expected loss ratio for a given origin year may be modified over time if the underlying assumptions differ from the original assumptions (e.g., the assessment of prior year loss ratios, loss trend, rate changes, actual claims, or other information).

Our selected paid and reported development patterns provide a benchmark against which the actual emerging loss experience can be monitored. Where possible, development patterns are selected based on historical loss emergence by origin year. For product lines where the historical data is viewed to have low statistical credibility, the selected development patterns also reflect relevant industry benchmarks and/or experience from similar product lines written elsewhere within Chubb. This most commonly occurs for relatively new product lines that have limited historical data or for high severity/low frequency portfolios where our historical experience exhibits considerable volatility and/or lacks credibility. The paid and reported loss development methods convert the selected loss emergence pattern to a set of multiplicative factors which are then applied to actual paid or reported losses to arrive at an estimate of ultimate losses for each period. Due to their multiplicative nature, the paid and reported loss development methods will leverage differences between actual and expected loss emergence. These methods tend to be utilized for more mature origin periods and for those portfolios where the loss emergence has been relatively consistent over time.

The Bornhuetter-Ferguson method is a combination of the expected loss ratio method and the loss development method, where the loss development method is given more weight as the origin year matures. This approach allows a logical transition between the expected loss ratio method which is generally utilized at earlier maturities and the loss development methods which are typically utilized at later maturities. We usually apply this method using reported loss data although paid data may also be used.

Short-tail business
Short-tail business generally describes product lines for which losses are typically known and paid shortly after the loss actually occurs. This would include, for example, most property, personal accident, and automobile physical damage policies that we write. Due to the short reporting and development pattern for these product lines, the uncertainty associated with our estimate of ultimate losses for any particular accident period diminishes relatively quickly as actual loss experience emerges. We typically assign credibility to methods that incorporate actual loss emergence, such as the paid and reported loss development and Bornhuetter-Ferguson methods, sooner than would be the case for long-tail lines at a similar stage of development for a given origin year. The reserving process for short-tail losses arising from catastrophic events typically involves an assessment by the claims department, in conjunction with underwriters and actuaries, of our exposure and estimated losses immediately following an event and then subsequent revisions of the estimated losses as our insureds provide updated actual loss information.

Long-tail business

Long-tail business describes lines of business for which specific losses may not be known/reported for some period and for which claims can take significant time to settle/close. This includes most casualty lines such as general liability, D&O, and workers' compensation. There are various factors contributing to the uncertainty and volatility of long-tail business. Among these are:

- The nature and complexity of underlying coverage provided and net limits of exposure provided;
- Our historical loss data and experience is sometimes too immature and lacking in credibility to rely upon for reserving purposes. Where this is the case, in our reserve analysis we may utilize industry loss ratios or industry benchmark development patterns that we believe reflect the nature and coverage of the underwritten business and its future development, where available. For such product lines, actual loss experience may differ from industry loss statistics as well as loss experience for previous underwriting years;
- The difficulty in estimating loss trends, claims inflation (e.g., medical and judicial) and underlying economic conditions;
- The need for professional judgment to estimate loss development patterns beyond that represented by historical data using supplemental internal or industry data, extrapolation, or a blend of both;
- The need to address shifts in mix over time when applying historical paid and reported loss development patterns from older origin years to more recent origin years. For example, changes over time in the processes and procedures for establishing case reserves can distort reported loss development patterns or changes in ceded reinsurance structures by origin year can alter the development of paid and reported losses;
- Loss reserve analyses typically require loss or other data be grouped by common characteristics in some manner. If data from two combined lines of business exhibit different characteristics, such as loss payment patterns, the credibility of the reserve estimate could be affected. Additionally, since casualty lines of business can have significant intricacies in the terms and conditions afforded to the insured, there is an inherent risk as to the homogeneity of the underlying data used in performing reserve analyses; and
- The applicability of the price change data used to estimate ultimate loss ratios for most recent origin years.

As described above, various factors are considered when determining appropriate data, assumptions, and methods used to establish the loss reserve estimates for long-tail product lines. These factors may also vary by origin year for given product lines. The derivation of loss development patterns from data and the selection of a tail factor to project ultimate losses from actual loss emergence require considerable judgment, particularly with respect to the extent to which historical loss experience is relied upon to support changes in key reserving assumptions.

c) Loss Development Tables

The tables were designed to present business with similar risk characteristics which exhibit like development patterns and generally similar trends, in order to provide insight into the nature, amount, timing and uncertainty of cash flows related to our claims liabilities.

Each table follows a similar format and reflects the following:

- The incurred loss triangle includes both reported case reserves and IBNR liabilities.
- Both the incurred and paid loss triangles include allocated loss adjustment expense (i.e., defense and investigative costs particular to individual claims) but exclude unallocated loss adjustment expense (i.e., the costs associated with internal claims staff and third-party administrators).
- The amounts in both triangles for the years ended December 31, 2009, to December 31, 2017 and average historical claim duration as of December 31, 2018, are presented as supplementary information.
- All data presented in the triangles is net of reinsurance recoverables.
- The IBNR reserves shown to the right of each incurred loss development exhibit reflect the net IBNR recorded as of December 31, 2018.
- The tables are presented retrospectively with respect to acquisitions where these are material and doing so is practicable. Most notably, the Chubb Corp acquisition is presented retrospectively. The unaudited consolidated data is presented solely for informational purposes and is not necessarily indicative of the consolidated data that might have been observed had the transactions been completed prior to the date indicated.

Historical dollar amounts are presented in this footnote on a constant-dollar basis, which is achieved by assuming constant foreign exchange rates for all periods in the loss triangles, translating prior period amounts using the same local currency exchange rates as the current year end. The impact of this conversion is to show the change between periods exclusive of the effect of fluctuations in exchange rates, which would otherwise distort the change in incurred loss and cash flow patterns shown. The change in incurred loss shown will differ from other GAAP disclosures of incurred prior period reserve development amounts, which include the effect of fluctuations in exchanges rates.

We provided guidance above on key assumptions that should be considered when reviewing this disclosure and information relating to how loss reserve estimates are developed. We believe the information provided in the "Loss Development Tables" section of the disclosure is of limited use for independent analysis or application of standard actuarial estimations.

In 2018, we further refined prior year information in our loss development triangles to better align results by line of business and accident year. The most significant refinement is a reclassification of $63 million from North America Commercial P&C Insurance - Liability - Long-tail to North America Commercial P&C Insurance - Non-Casualty - Short tail.

Cumulative Number of Reported Claims
Reported claim counts, on a cumulative basis, are provided to the far right of each paid loss development table. We generally consider a reported claim to be one claim per coverage per claimant. We exclude claims closed without payment. Use of the presented claim counts in analysis of company experience has significant limitations, including:

- High deductible workers' compensation claim counts include claims below the applicable policy deductible.
- Professional liability and certain other lines have a high proportion of claims reported which will be closed without any payment; shifts in total reported counts may not meaningfully impact reported and ultimate loss experience.
- Claims for certain events and/or product lines, such as portions of assumed reinsurance and A&H business, are not reported on an individual basis, but rather in bulk and thus not available for inclusion in this disclosure. For certain A&H business, where bulk reporting affected only the oldest few accident years, presented claim counts for these years were estimated.
- Each of the segments below typically has a mixture of primary and excess experience which has shifted over time.

Reported claim counts include open claims which have case reserves and exclude claims that have been incurred but not reported. As such the reported claims are consistent with reported losses, which can be calculated by subtracting incurred but not reported losses from incurred losses. Reported claim counts are inconsistent with losses in the incurred loss triangle, which include incurred but not reported losses, and are also inconsistent with losses in the paid loss triangle, which exclude case reserves.

North America Commercial P&C Insurance — Workers' Compensation — Long-tail
This product line has a substantial geographic spread and a broad mix across industries. Types of coverage include risk management business predominantly with high deductible policies, loss sensitive business (i.e., retrospectively-rated policies), business fronted for captives, as well as excess and primary guaranteed cost coverages.

The triangle below shows all loss and allocated expense development for the workers' compensation product line. In our prior period development disclosure, we exclude any loss development where there is a directly related premium adjustment. For workers' compensation, changes in the exposure base due to payroll audits will drive changes in ultimate losses. In addition, we record involuntary pool assumptions (premiums and losses) on a lagged basis. Both of these items will influence the development in the triangle, particularly the first prior accident year, and are included in the reconciliation table presented on page F-61.

North America Commercial P&C Insurance — Workers' Compensation — Long-tail (continued)
Net Incurred Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31										December 31 2018
	Unaudited										Net IBNR Reserves
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 1,029	$ 998	$ 997	$ 990	$ 980	$ 977	$ 966	$ 972	$ 965	**$ 964**	**$ 218**
2010		1,049	1,037	1,050	1,065	1,064	1,052	1,028	1,020	**1,018**	**248**
2011			1,037	1,030	1,046	1,049	1,053	1,022	1,012	**1,008**	**271**
2012				1,050	1,011	1,030	1,040	1,011	989	**986**	**292**
2013					1,109	1,108	1,122	1,127	1,086	**1,073**	**358**
2014						1,207	1,201	1,217	1,215	**1,163**	**465**
2015							1,282	1,259	1,276	**1,279**	**594**
2016								1,366	1,361	**1,383**	**743**
2017									1,412	**1,380**	**831**
2018										**1,359**	**995**
Total										**$ 11,613**	

Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31										December 31 2018
	Unaudited										Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 107	$ 258	$ 348	$ 416	$ 475	$ 519	$ 550	$ 597	$ 617	**$ 633**	**282**
2010		123	300	411	493	551	592	617	641	**666**	**303**
2011			119	294	411	484	533	567	595	**616**	**286**
2012				111	271	365	436	486	532	**574**	**287**
2013					107	286	422	506	553	**587**	**299**
2014						113	295	410	484	**532**	**336**
2015							116	301	418	**501**	**334**
2016								122	326	**452**	**304**
2017									120	**313**	**338**
2018										**130**	**321**
Total										**$ 5,004**	

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ 2,574**
All Accident years	**$ 9,183**

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ (73)**
All Accident years	**$ (155)**

North America Commercial P&C Insurance — Workers' Compensation — Long-tail (continued)

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	10%	16%	10%	7%	5%	4%	3%	3%	2%	2%

North America Commercial P&C Insurance — Liability — Long-tail
This line consists of primary and excess liability exposures, including medical liability and professional lines, including directors and officers (D&O) liability, errors and omissions (E&O) liability, employment practices liability (EPL), fidelity bonds, and fiduciary liability.

The primary and excess liability business represents the largest part of these exposures. The former includes both monoline and commercial package liability. The latter includes a substantial proportion of commercial umbrella, excess and high excess business, where loss activity can produce significant volatility in the loss triangles at later ages within an accident year (and sometimes across years) due to the size of the limits afforded and the complex nature of the underlying losses.

This line includes management and professional liability products provided to a wide variety of clients, from national accounts to small firms along with private and not-for-profit organizations, distributed through brokers, agents, wholesalers and MGAs. Many of these coverages, particularly D&O and E&O, are typically written on a claims-made form. While most of the coverages are underwritten on a primary basis, there are significant amounts of excess exposure with large policy limits.

Net Incurred Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										**December 31 2018**
(in millions of U.S. dollars)	Unaudited										**Net IBNR Reserves**
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 3,791	$ 3,777	$ 3,764	$ 3,737	$ 3,636	$ 3,386	$ 3,309	$ 3,237	$ 3,096	**$ 3,082**	**$ 221**
2010		3,571	3,576	3,594	3,554	3,413	3,245	3,123	3,103	**2,991**	**234**
2011			3,494	3,579	3,623	3,658	3,588	3,492	3,377	**3,309**	**473**
2012				3,546	3,622	3,606	3,557	3,517	3,419	**3,323**	**626**
2013					3,541	3,536	3,536	3,526	3,423	**3,209**	**748**
2014						3,529	3,580	3,668	3,711	**3,649**	**1,148**
2015							3,553	3,702	3,812	**3,968**	**1,570**
2016								3,528	3,589	**3,686**	**1,726**
2017									3,317	**3,492**	**2,442**
2018										**3,369**	**2,950**
Total										**$ 34,078**	

North America Commercial P&C Insurance — Liability — Long-tail (continued)
Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										December 31 2018
(in millions of U.S. dollars)	Unaudited										Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 134	$ 587	$1,159	$1,670	$2,017	$2,354	$2,541	$2,673	$2,725	**$ 2,766**	**20**
2010		126	611	1,107	1,557	1,891	2,257	2,423	2,523	**2,658**	**19**
2011			160	651	1,207	1,802	2,211	2,473	2,655	**2,736**	**20**
2012				166	654	1,170	1,677	2,089	2,322	**2,497**	**20**
2013					129	547	1,190	1,594	2,004	**2,229**	**19**
2014						164	679	1,249	1,802	**2,200**	**19**
2015							138	604	1,204	**1,853**	**21**
2016								171	662	**1,335**	**21**
2017									161	**616**	**21**
2018										**189**	**24**
Total										**$19,079**	

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ 1,486**
All Accident years	**$ 16,485**

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ (3)**
All Accident years	**$ (141)**

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	5%	14%	17%	16%	12%	9%	6%	3%	3%	1%

North America Commercial P&C Insurance — Other Casualty — Long-tail
This product line consists of the remaining commercial casualty coverages such as automobile liability and aviation. There is also a small portion of commercial multi-peril (CMP) business in accident years 2014 and prior. The paid and reported data are impacted by some catastrophe loss activity primarily on the CMP exposures just noted.

North America Commercial P&C Insurance — Other-Casualty — Long-tail (continued)

Net Incurred Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31										December 31 2018
	Unaudited										Net IBNR Reserves
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 599	$ 589	$ 555	$ 535	$ 492	$ 458	$ 452	$ 450	$ 445	**$ 452**	**$ 12**
2010		613	607	600	545	506	478	480	492	**483**	**8**
2011			580	589	580	548	532	524	516	**510**	**17**
2012				633	605	576	560	519	518	**508**	**17**
2013					526	530	522	515	468	**461**	**27**
2014						594	582	580	596	**554**	**68**
2015							486	469	501	**514**	**148**
2016								503	501	**527**	**196**
2017									531	**565**	**265**
2018										**535**	**383**
Total										**$ 5,109**	

Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31										December 31 2018
	Unaudited										Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 70	$ 206	$ 287	$ 336	$ 373	$ 401	$ 413	$ 422	$ 427	**$ 431**	**15**
2010		97	236	321	363	392	433	443	448	**452**	**15**
2011			86	235	341	400	436	460	465	**479**	**16**
2012				69	222	319	386	435	470	**486**	**16**
2013					68	196	270	348	385	**411**	**18**
2014						80	220	317	391	**454**	**17**
2015							47	137	214	**304**	**15**
2016								52	145	**246**	**15**
2017									66	**175**	**16**
2018										**74**	**14**
Total										**$ 3,512**	

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ 287**
All Accident years	**$ 1,884**

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ 14**
All Accident years	**$ 20**

North America Commercial P&C Insurance — Other-Casualty — Long-tail (continued)

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	14%	25%	18%	13%	8%	6%	2%	2%	1%	1%

North America Commercial P&C Insurance — Non-Casualty — Short-tail

This product line represents first party commercial product lines that are short-tailed in nature, such as property, inland marine, ocean marine, surety and A&H. There is a wide diversity of products, primary and excess coverages, and policy sizes. During this ten-year period, this product line was also impacted by natural catastrophes mainly in the 2012, 2017, and 2018 accident years.

Net Incurred Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31										December 31 2018
	Unaudited										Net IBNR Reserves
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$1,302	$1,298	$1,243	$1,213	$1,196	$1,189	$1,189	$1,186	$1,185	**$ 1,183**	**$ 1**
2010		1,500	1,535	1,459	1,423	1,421	1,413	1,409	1,403	**1,393**	**—**
2011			1,956	1,930	1,873	1,852	1,831	1,835	1,831	**1,831**	**11**
2012				2,029	1,911	1,878	1,860	1,854	1,842	**1,840**	**10**
2013					1,428	1,418	1,331	1,354	1,335	**1,334**	**13**
2014						1,640	1,656	1,574	1,554	**1,544**	**20**
2015							1,732	1,741	1,646	**1,634**	**39**
2016								1,906	1,885	**1,795**	**68**
2017									2,700	**2,604**	**207**
2018										**2,048**	**474**
Total										**$ 17,206**	

Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31										December 31 2018
	Unaudited										Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 618	$1,032	$1,122	$1,146	$1,160	$1,168	$1,176	$1,178	$1,178	**$ 1,178**	**1,124**
2010		722	1,221	1,319	1,356	1,381	1,389	1,393	1,393	**1,390**	**1,058**
2011			938	1,570	1,714	1,773	1,783	1,807	1,812	**1,817**	**1,052**
2012				713	1,573	1,694	1,762	1,790	1,817	**1,812**	**1,036**
2013					648	1,134	1,233	1,280	1,306	**1,319**	**1,073**
2014						817	1,369	1,479	1,501	**1,527**	**1,101**
2015							725	1,340	1,485	**1,553**	**1,170**
2016								844	1,500	**1,651**	**1,291**
2017									977	**2,084**	**1,372**
2018										**1,026**	**1,326**
Total										**$ 15,357**	

North America Commercial P&C Insurance — Non-Casualty — Short-tail (continued)

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	December 31, 2018
Accident years prior to 2009	$ 22
All Accident years	$ 1,871

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	December 31, 2018
Accident years prior to 2009	$ (1)
All Accident years	$ (224)

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	47%	38%	8%	3%	1%	1%	—%	—%	— %	— %

North America Personal P&C Insurance — Short-tail

Chubb provides personal lines coverages for high-net-worth individuals and families in North America including homeowners, automobile, valuable articles (including fine art), umbrella liability, and recreational marine insurance offered through independent regional agents and brokers. A portfolio acquired from Fireman's Fund is presented on a prospective basis beginning in May of accident year 2015. Reserves associated with prior accident periods were acquired through a loss portfolio transfer, which does not allow for a retrospective presentation. During this ten-year period, this segment was also impacted by natural catastrophes, mainly in 2012, 2017 and 2018 accident years.

Net Incurred Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										December 31 2018
(in millions of U.S. dollars)	Unaudited										Net IBNR Reserves
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2018
2009	$1,606	$1,593	$1,563	$1,549	$1,541	$1,534	$1,534	$1,530	$1,529	$ 1,527	$ 5
2010		1,866	1,875	1,852	1,834	1,830	1,827	1,821	1,819	1,820	8
2011			2,203	2,205	2,181	2,169	2,160	2,156	2,155	2,154	9
2012				2,181	2,179	2,179	2,187	2,182	2,182	2,185	10
2013					1,851	1,879	1,887	1,890	1,915	1,927	16
2014						2,199	2,201	2,187	2,140	2,154	35
2015							2,489	2,544	2,555	2,538	48
2016								2,434	2,530	2,539	190
2017									3,029	3,064	291
2018										3,003	428 [1]
Total										$22,911	

[1] At December 31, 2018, ceded reinsurance recoveries on aggregate catastrophe treaties of approximately $200 million on reported losses have been reflected as a reduction to net IBNR.

North America Personal P&C Insurance — Short-tail (continued)

Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31										December 31 2018
	Unaudited										Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 884	$1,233	$1,343	$1,435	$1,482	$1,499	$1,509	$1,517	$1,519	**$ 1,520**	**125**
2010		1,151	1,519	1,667	1,726	1,768	1,790	1,801	1,807	**1,809**	**149**
2011			1,357	1,831	1,968	2,048	2,101	2,125	2,134	**2,141**	**168**
2012				1,174	1,803	1,954	2,059	2,113	2,146	**2,160**	**173**
2013					1,038	1,496	1,679	1,778	1,834	**1,876**	**126**
2014						1,307	1,760	1,921	2,029	**2,074**	**135**
2015							1,495	2,079	2,266	**2,386**	**139**
2016								1,450	2,047	**2,206**	**140**
2017									1,694	**2,515**	**144**
2018										**1,923** (1)	**129**
Total										**$20,610**	

(1) At December 31, 2018, ceded reinsurance recoveries on aggregate catastrophe treaties of approximately $200 million on reported losses have been reflected as a reduction to net IBNR.

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ 18**
All Accident years	**$ 2,319**

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ (7)**
All Accident years	**$ 47**

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	59%	24%	7%	5%	3%	1%	1%	—%	—%	—%

Overseas General Insurance — Casualty — Long-tail

This product line is comprised of D&O liability, E&O liability, financial institutions (including crime/fidelity coverages), and non-U.S. general liability as well as aviation and political risk. Exposures are located around the world, including Europe, Latin America, and Asia. Approximately 45 percent of Chubb Overseas General business is generated by European accounts, exclusive of Lloyd's market. There is some U.S. exposure in Casualty from multinational accounts and in financial lines for Lloyd's market. The financial lines coverages are typically written on a claims-made form, while general liability coverages are typically on an occurrence basis and comprised of a mix of primary and excess businesses.

Overseas General Insurance — Casualty — Long-tail (continued)

Net Incurred Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31 Unaudited										December 31 2018 Net IBNR Reserves
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 1,231	$ 1,367	$ 1,414	$ 1,421	$ 1,422	$ 1,309	$ 1,205	$ 1,204	$ 1,152	**$ 1,138**	**$ 29**
2010		1,180	1,259	1,304	1,375	1,312	1,260	1,138	1,134	**1,139**	**83**
2011			1,210	1,216	1,209	1,199	1,116	1,052	1,038	**988**	**62**
2012				1,252	1,220	1,283	1,301	1,297	1,278	**1,258**	**166**
2013					1,247	1,243	1,240	1,283	1,227	**1,192**	**221**
2014						1,248	1,318	1,327	1,337	**1,253**	**333**
2015							1,170	1,267	1,293	**1,314**	**387**
2016								1,179	1,278	**1,345**	**555**
2017									1,186	**1,287**	**676**
2018										**1,287**	**989**
Total										**$12,201**	

Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	Years Ended December 31 Unaudited										December 31 2018 Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 117	$ 327	$ 502	$ 641	$ 733	$ 791	$ 861	$ 952	$ 978	**$ 1,007**	**38**
2010		102	264	461	603	709	797	847	899	**942**	**40**
2011			87	239	382	511	610	688	760	**811**	**41**
2012				73	244	424	572	683	818	**888**	**43**
2013					85	260	414	559	695	**796**	**44**
2014						112	287	462	591	**704**	**44**
2015							86	282	482	**659**	**46**
2016								123	316	**521**	**46**
2017									96	**314**	**44**
2018										**109**	**32**
Total										**$ 6,751**	

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ 383**
All Accident years	**$ 5,833**

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ (55)**
All Accident years	**$ (64)**

Overseas General Insurance — Casualty — Long-tail (continued)

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	8%	15%	15%	12%	9%	8%	6%	6%	3%	3%

Overseas General Insurance — Non-Casualty — Short-tail

This product line is comprised of commercial fire, marine (predominantly cargo), surety, personal automobile (in Latin America, Asia Pacific and Japan), personal cell phones, personal residential (including high net worth), energy and construction. In general, these lines have relatively stable payment and reporting patterns although they are impacted by natural catastrophes mainly in the 2010, 2011, 2017, and 2018 accident years. Latin America and Europe each make up about 30 percent of the Chubb Overseas General non-casualty book.

Net Incurred Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										December 31 2018
(in millions of U.S. dollars)	Unaudited										Net IBNR Reserves
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 1,492	$ 1,464	$ 1,380	$ 1,350	$ 1,331	$ 1,313	$ 1,313	$ 1,302	$ 1,301	**$ 1,303**	**$ —**
2010		1,638	1,660	1,635	1,623	1,617	1,603	1,590	1,573	**1,575**	**13**
2011			1,861	1,951	1,894	1,855	1,838	1,826	1,818	**1,808**	**2**
2012				1,694	1,683	1,644	1,590	1,583	1,572	**1,557**	**15**
2013					1,780	1,773	1,705	1,659	1,649	**1,619**	**42**
2014						1,868	1,938	1,879	1,852	**1,814**	**29**
2015							1,992	2,117	2,071	**2,036**	**63**
2016								2,032	2,009	**1,998**	**24**
2017									2,199	**2,236**	**29**
2018										**2,161**	**437**
Total										**$18,107**	

Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										December 31 2018
(in millions of U.S. dollars)	Unaudited										Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 572	$ 1,043	$ 1,177	$ 1,241	$ 1,265	$ 1,275	$ 1,281	$ 1,284	$ 1,283	**$ 1,287**	**516**
2010		664	1,218	1,415	1,477	1,515	1,528	1,534	1,535	**1,541**	**560**
2011			753	1,453	1,654	1,709	1,739	1,754	1,762	**1,766**	**578**
2012				676	1,220	1,407	1,465	1,488	1,497	**1,509**	**599**
2013					695	1,271	1,464	1,495	1,531	**1,550**	**620**
2014						755	1,421	1,630	1,693	**1,724**	**591**
2015							850	1,548	1,772	**1,853**	**621**
2016								1,016	1,654	**1,851**	**619**
2017									1,040	**1,822**	**659**
2018										**987**	**627**
Total										**$15,890**	

Overseas General Insurance — Non-Casualty — Short-tail (continued)

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	December 31, 2018
Accident years prior to 2009	$ 48
All Accident years	$ 2,265

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	December 31, 2018
Accident years prior to 2009	$ (11)
All Accident years	$ (109)

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	44%	35%	11%	4%	2%	1%	1%	—%	—%	—%

Global Reinsurance

Chubb analyzes its Global Reinsurance business on a treaty year basis rather than on an accident year basis. Treaty year data was converted to an accident year basis for the purposes of this disclosure. Mix shifts are an important consideration in these product line groupings. As proportional business and excess of loss business have different earning and loss reporting and payment patterns, this change in mix will affect the cash flow patterns across the accident years. In addition, the shift from excess to proportional business over time will make the cash flow patterns of older and more recent years difficult to compare. In general, the proportional business will pay out more quickly than the excess of loss business, as such, using older years development patterns may overstate the ultimate loss estimates in more recent years.

Global Reinsurance — Casualty — Long-tail

This product line includes proportional and excess coverages in general, automobile liability, professional liability, medical malpractice, workers' compensation and aviation, with exposures located around the world. In general, reinsurance exhibits less stable development patterns than primary business. In particular general casualty reinsurance and excess coverages are long-tailed and can be very volatile.

Net Incurred Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										December 31 2018
(in millions of U.S. dollars)	Unaudited										Net IBNR Reserves
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 316	$ 348	$ 360	$ 367	$ 363	$ 344	$ 328	$ 318	$ 313	**$ 303**	**$ 11**
2010		398	418	429	440	429	423	413	399	**386**	**39**
2011			404	411	426	430	425	416	412	**406**	**34**
2012				383	380	388	391	376	369	**368**	**15**
2013					318	324	327	327	328	**321**	**30**
2014						330	331	336	339	**341**	**36**
2015							281	286	296	**297**	**30**
2016								219	223	**231**	**38**
2017									210	**211**	**65**
2018										**239**	**139**
Total										**$ 3,103**	

Global Reinsurance — Casualty — Long-tail (continued)
Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										December 31 2018
(in millions of U.S. dollars)	Unaudited										Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 34	$ 79	$ 116	$ 154	$ 187	$ 208	$ 226	$ 239	$ 255	**$ 262**	**0.864**
2010		56	124	179	220	249	273	291	306	**314**	**0.796**
2011			70	145	195	235	266	290	310	**323**	**0.668**
2012				76	166	220	259	290	306	**321**	**0.464**
2013					64	142	185	221	240	**258**	**0.342**
2014						91	183	216	247	**263**	**0.389**
2015							89	157	190	**215**	**0.316**
2016								57	111	**141**	**0.324**
2017									46	**99**	**0.401**
2018										**40**	**0.196**
Total										**$ 2,236**	

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ 351**
All Accident years	**$ 1,218**

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ (48)**
All Accident years	**$ (73)**

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	20%	22%	13%	10%	7%	6%	5%	4%	3%	3%

Global Reinsurance — Non-Casualty — Short-tail
This product line includes property, property catastrophe, marine, credit/surety, A&H and energy. This product line is impacted by natural catastrophes, particularly in the 2011, 2017 and 2018 accident years. Of the non-catastrophe book, the mixture of business varies by year with approximately 69 percent of loss on proportional treaties in treaty year 2009 and after. This percentage has increased over time with the proportion being approximately 54 percent for treaty years 2009 to 2012 growing to an average of 80 percent for treaty years 2013 to 2018, with the remainder being written on an excess of loss basis.

Global Reinsurance — Non-Casualty — Short-tail (continued)
Net Incurred Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										December 31 2018
(in millions of U.S. dollars)	Unaudited										Net IBNR Reserves
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 139	$ 170	$ 150	$ 149	$ 142	$ 140	$ 138	$ 138	$ 138	**$ 137**	**$ 3**
2010		197	232	221	215	219	221	222	223	**222**	**6**
2011			271	272	270	260	261	262	261	**261**	**2**
2012				230	210	200	190	189	187	**184**	**1**
2013					160	158	146	141	142	**140**	**1**
2014						162	178	178	181	**180**	**6**
2015							145	153	160	**160**	**8**
2016								179	185	**187**	**13**
2017									396	**422**	**32**
2018										**283**	**93**
Total										**$ 2,176**	

Net Cumulative Paid Loss and Allocated Loss Adjustment Expenses

	Years Ended December 31										December 31 2018
(in millions of U.S. dollars)	Unaudited										Reported Claims (in thousands)
Accident Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	**2018**	**2018**
2009	$ 52	$ 105	$ 121	$ 128	$ 130	$ 132	$ 133	$ 133	$ 133	**$ 133**	**0.113**
2010		56	160	186	197	203	213	211	214	**214**	**0.102**
2011			85	174	205	230	248	253	255	**257**	**0.131**
2012				44	129	155	165	171	176	**179**	**0.112**
2013					46	102	119	129	132	**134**	**0.119**
2014						64	128	151	161	**167**	**0.100**
2015							56	103	132	**142**	**0.114**
2016								56	130	**157**	**0.177**
2017									191	**322**	**0.290**
2018										**94**	**0.151**
Total										**$ 1,799**	

Net Liabilities for Loss and Allocated Loss Adjustment Expenses

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ 13**
All Accident years	**$ 390**

Supplementary Information: (Favorable)/ Adverse Prior Period Development

(in millions of U.S. dollars)	**December 31, 2018**
Accident years prior to 2009	**$ (2)**
All Accident years	**$ 18**

Global Reinsurance — Non-Casualty — Short-tail (continued)

Supplementary Information: Average Annual Percentage Payout of Net Incurred Claims by Age, as of December 31, 2018

Age in Years	1	2	3	4	5	6	7	8	9	10
Percentage	34%	37%	13%	7%	4%	3%	1%	1%	— %	—%

Prior Period Development — Supplementary Information

The following table presents a reconciliation of the loss development triangles above to prior period development:

Year Ended December 31, 2018 (in millions of U.S. dollars) (favorable)/unfavorable	Components of PPD: 2009 - 2017 accident years (implied PPD per loss triangles)	Accident years prior to 2009	Other [(1)]	PPD on loss reserves	RIPs, Expense adjustments, and earned premiums	Total
North America Commercial P&C Insurance						
Long-tail	$ (214)	$ (62)	$ (149)	$ (425)	$ 30	$ (395)
Short-tail	(223)	(1)	(4)	(228)	13	(215)
	(437)	(63)	(153) [(2)]	(653)	43	(610)
North America Personal P&C Insurance (Short-tail)	54	(7)	(7)	40	1	41
Overseas General Insurance						
Long-tail	(9)	(55)	(3)	(67)	—	(67)
Short-tail	(98)	(11)	(40)	(149)	4	(145)
	(107)	(66)	(43) [(3)]	(216)	4	(212)
Global Reinsurance						
Long-tail	(25)	(48)	(1)	(74)	5	(69)
Short-tail	20	(2)	(1)	17	2	19
	(5)	(50)	(2)	(57)	7	(50)
Subtotal	$ (495)	$ (186)	$ (205)	$ (886)	$ 55	$ (831)
North America Agricultural Insurance (Short-tail)				$ (140)	$ 30	$ (110)
Corporate (Long-tail)				45	—	45
Consolidated PPD				$ (981)	$ 85	$ (896)

(1) Other includes the impact of foreign exchange.

(2) Includes favorable development of $81 million related to our Alternative Risk Solutions business (U.S. and Bermuda) and an adjustment to exclude $42 million in unfavorable development in the workers' compensation line associated with an increase in exposure for which additional premiums were collected; the remaining difference relates to a number of other items, none of which are individually material.

(3) Includes favorable development of $31 million related to International A&H business; the remaining difference relates to a number of other items, none of which are individually material.

Prior Period Development

Prior period development arises from changes to loss estimates recognized in the current year that relate to loss events that occurred in previous calendar years and excludes the effect of losses from the development of earned premium from previous accident years. Long-tail lines include lines such as workers' compensation, general liability, and professional liability; while short-tail lines include lines such as most property lines, energy, personal accident, and agriculture.

The following table summarizes (favorable) and adverse prior period development (PPD) by segment.

Years Ended December 31 (in millions of U.S. dollars, except for percentages)		Long-tail		Short-tail		Total	% of beginning net unpaid reserves (1)
2018							
North America Commercial P&C Insurance	**$**	**(395)**	**$**	**(215)**	**$**	**(610)**	**1.2%**
North America Personal P&C Insurance		**—**		**41**		**41**	**0.1%**
North America Agricultural Insurance		**—**		**(110)**		**(110)**	**0.2%**
Overseas General Insurance		**(67)**		**(145)**		**(212)**	**0.4%**
Global Reinsurance		**(69)**		**19**		**(50)**	**0.1%**
Corporate		**45**		**—**		**45**	**0.1%**
Total	**$**	**(486)**	**$**	**(410)**	**$**	**(896)**	**1.8%**
2017							
North America Commercial P&C Insurance	$	(562)	$	(184)	$	(746)	1.6%
North America Personal P&C Insurance		—		69		69	0.1%
North America Agricultural Insurance		—		(119)		(119)	0.2%
Overseas General Insurance		(71)		(181)		(252)	0.5%
Global Reinsurance		(68)		9		(59)	0.1%
Corporate		278		—		278	0.6%
Total	$	(423)	$	(406)	$	(829)	1.7%
2016							
North America Commercial P&C Insurance	$	(693)	$	(85)	$	(778)	1.6%
North America Personal P&C Insurance		—		27		27	0.1%
North America Agricultural Insurance		—		(72)		(72)	0.2%
Overseas General Insurance		(236)		(187)		(423)	0.9%
Global Reinsurance		(77)		(1)		(78)	0.2%
Corporate		189		—		189	0.4%
Total	$	(817)	$	(318)	$	(1,135)	2.4%

(1) Calculated based on the beginning of period consolidated net unpaid losses and loss expenses. For 2016, the percent of beginning net unpaid reserves is calculated inclusive of the net unpaid losses and loss expenses acquired in the Chubb Corp acquisition of $21.4 billion.

Significant prior period movements by segment, principally driven by reserve reviews completed during each respective period, are discussed in more detail below. The remaining net development for long-tail lines and short-tail business for each segment and Corporate comprises numerous favorable and adverse movements across a number of lines and accident years, none of which is significant individually or in the aggregate.

North America Commercial P&C Insurance
2018
North America Commercial P&C Insurance experienced net favorable PPD of $610 million, which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net favorable development of $395 million in long-tail business, primarily from:

- Net favorable development of $199 million in our management liability portfolios, favorably impacting accident years 2013 and prior where paid and reported loss activity was lower than expected, partially offset by adverse development in the 2014 through 2017 accident years, mostly as a result of higher severity claim costs compared to prior expectations in certain lines or coverages, particularly in our Directors and Officers (D&O) portfolio;

- Net favorable development of $194 million in workers' compensation lines with favorable development of $56 million in the 2017 accident year mainly related to our annual assessment of multi-claimant events including industrial accidents. Consistent with prior years, we reviewed these potential exposures after the close of the accident year to allow for late reporting or identification of significant losses. The net remaining favorable development of $138 million was principally due to lower than expected loss experience, mainly impacting accident years 2014 and prior;

- Net favorable development of $100 million in our commercial excess and umbrella portfolios, primarily in accident years 2012 and prior. This was driven by lower than expected reported loss activity, and an increase in weighting towards experience-based methods, partly offset by higher than expected claim activity in the 2014, 2015 and 2017 accident years which led to reserve strengthening in those years;

- Favorable development of $33 million in a runoff professional liability portfolio, impacting accident years 2002 and prior, owing mainly to the favorable disposition of a specific claim;

- Net favorable development of $28 million in our foreign casualty lines, primarily impacting accident years 2014 and prior, driven by reported loss activity that was generally lower than expected;

- Favorable development of $23 million in our political risk and trade credit portfolios, mainly impacting the 2014 accident year, primarily due to favorable reported experience and an increased in weighting towards experience-based methods;

- Net favorable development of $3 million on several lines of business due to favorable claim development on the 2017 natural catastrophes;

- Net adverse development of $91 million in our medical portfolios, mainly impacting accident years 2015, 2016 and 2017. The increase was driven by a combination of several large claims and generally higher than expected paid and reported case incurred activity; and

- Net adverse development of $109 million, mainly in our automobile liability, commercial-multi peril (CMP) liability, products and general liability lines, driven by adverse paid and reported loss activity relative to prior expectations in accident years 2015 through 2017, partly offset by favorable emergence in older accident years.

- Net favorable development of $215 million in short-tail business, primarily from:

  - Net favorable development of $155 million in our commercial property and marine businesses due to favorable claim development, including $129 million net favorable development on the 2017 natural catastrophes; and

  - Net favorable development of $60 million in other short-tail business, including $19 million in surety and also including several smaller net favorable movements from lower than expected case activity in other classes, such as accident and commercial automobile physical damage, none of which were significant individually or in the aggregate.

2017

North America Commercial P&C Insurance experienced net favorable PPD of $746 million, which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net favorable development of $562 million in long-tail business, primarily from:

  - Net favorable development of $184 million in our commercial excess and umbrella portfolios, primarily in accident years 2011 and prior, driven by lower than expected case activity and an increase in weighting towards experience-based methods. Large loss activity in accident year 2015 led to adverse development in that year, partially offsetting the favorable development in the older years;

  - Net favorable development of $181 million in our management liability portfolios, favorably impacting accident years 2012 and prior where paid and reported loss activity was lower than expected, partially offset by adverse development in accident years 2014 through 2016, mostly as a result of higher severity claim costs compared to prior expectations in certain lines or coverages;

  - Net favorable development of $123 million in our workers' compensation businesses (including excess workers' compensation) with favorable development of $57 million in the 2016 accident year related to our annual assessment of multi-claimant events including industrial accidents. Consistent with prior years, we reviewed these potential exposures after the close of the accident year to allow for late reporting or identification of significant losses. Net favorable development of $65 million was principally due to lower than expected loss experience and updates to development patterns used in our loss projection methods, mainly impacting accident years 2013 and prior, and partially offset by smaller adverse development in the more recent prior accident years;

- Net favorable development of $32 million in our professional Errors and Omissions (E&O) portfolios, primarily in the 2012 and 2013 accident years, arising from lower than expected reported loss activity, partially offset by claim-specific adverse development in other years;
- Net favorable development of $28 million on several large multi-line prospective deals primarily impacting the 2012 and 2013 accident years, due to lower than expected reported loss activity. These structured deals typically cover large clients for multiple product lines and with varying loss limitations; this development is net of premium adjustments of $26 million tied to the loss performance of the particular deals;
- Net favorable development of $21 million in our political risk portfolio, primarily impacting the 2013 accident year, principally due to reported experience below expectations and an increase in weighting towards experience-based methods; and
- Net adverse development of $21 million in our auto liability lines, primarily in the 2012 through 2015 accident years, driven by higher than expected paid and reported experience.

- Net favorable development of $184 million in short-tail business, primarily from:
  - Net favorable development of $98 million in our property and inland marine portfolios, impacting the 2012 through 2016 accident years, resulting from lower than expected loss emergence;
  - Net favorable development of $45 million in our surety business, primarily due to lower than expected claims severity in the 2015 accident year; and
  - Net favorable development of $20 million in our accident & health (A&H) business, primarily due to lower than expected loss emergence in the 2015 and 2016 accident years.

2016
North America Commercial P&C Insurance experienced net favorable PPD of $778 million, representing 1.6 percent of the beginning consolidated net unpaid losses and loss expense reserves.

North America Personal P&C Insurance
2018
North America Personal P&C Insurance incurred net adverse PPD of $41 million, which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net adverse development of $63 million in our homeowners and valuables lines, primarily impacting the 2017 accident year. Overall, non-catastrophe losses were $136 million higher than expected, partially offset by favorable claim development of $73 million on the 2017 natural catastrophes. The higher than expected non-catastrophe homeowners losses were primarily severity driven and included water-related claims, large fire losses, and non-catastrophe weather claims;
- Net favorable development of $24 million in our personal excess lines primarily impacting the 2015 accident year, due to lower than expected loss emergence and an increase in weighting towards experience-based methods; and
- Favorable development of $10 million from claim development on the 2017 natural catastrophes from other personal lines.

2017
North America Personal P&C Insurance incurred net adverse PPD of $69 million, which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net adverse development of $105 million in our homeowners lines, primarily impacting the 2013 and 2016 accident years, due to higher than expected loss severity; and

- Net favorable development of $58 million in our personal excess lines primarily impacting the 2014 accident year, due to lower than expected loss experience and an increased weighting towards experience-based methods.

2016
North America Personal P&C Insurance incurred net adverse PPD of $27 million, representing 0.1 percent of the beginning consolidated net unpaid losses and loss expense reserves.

North America Agricultural Insurance
North America Agricultural Insurance experienced net favorable PPD of $110 million, $119 million, and $72 million in 2018, 2017, and 2016, respectively. Actual claim development relates to our Multiple Peril Crop Insurance business and was favorable due to better than expected crop yield results in certain states at the prior year-end period (i.e., 2018 results based on crop yield results at year-end 2017). 2018 also included $1 million of favorable claim development on the 2017 natural catastrophes.

Overseas General Insurance
2018
Overseas General Insurance experienced net favorable PPD of $212 million, which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net favorable development of $67 million in long-tail business, primarily from:

  - Net favorable development of $70 million in casualty lines, with net favorable development of $107 million in accident years 2014 and prior, resulting from lower than expected loss emergence across primary and excess lines, partially offset by adverse development of $38 million in accident years 2015 through 2017, primarily due to large loss experience in U.K. excess lines and wholesale business;

  - Favorable development of $32 million, primarily including $12 million in political risks, $10 million in aviation and $10 million in environmental; and

  - Net adverse development of $38 million in financial lines, with net favorable development of $93 million in accident years 2014 and prior, resulting from lower than expected loss emergence including favorable development due to specific large claim reductions in Asia financial institutions including wholesale bankers D&O and bankers professional indemnity, and adverse development of $131 million in accident years 2015 through 2017, primarily due to adverse large loss experience in specific D&O and financial institutions portfolios in Australia, Continental Europe and the U.K.

- Net favorable development of $145 million in short-tail business, primarily from:

  - Net favorable development of $99 million in property and marine (excluding technical lines), primarily in accident years 2013 through 2016, driven mainly by favorable loss emergence across all regions, including favorable claim-specific loss settlements and salvage/subrogation recoveries;

  - Net favorable development of $33 million in A&H, primarily in accident years 2015 through 2017, driven by favorable development across Asia Pacific direct marketing and Continental Europe corporate lines; and

  - Adverse development of $1 million from claim development on the 2017 natural catastrophes.

2017
Overseas General Insurance experienced net favorable PPD of $252 million, which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net favorable development of $71 million in long-tail business, primarily from:

  - Net favorable development of $34 million in financial lines, with favorable development of $124 million in accident years 2013 and prior, resulting from lower than expected loss emergence including favorable development on specific, litigated claims, partially offset by adverse development of $90 million in accident years 2014 through 2016, primarily due to large loss experience in specific D&O portfolios within the U.K., Continental Europe, and Australia and Financial Institutions lines in the U.K. and Continental Europe; and

    - Net favorable development of $10 million in casualty lines, with favorable development of $69 million in accident years 2013 and prior, resulting from lower than expected loss emergence, partially offset by adverse development of $32 million driven by a change in the discount rate in the U.K. (Ogden rate) impacting the 2016 and prior accident years and adverse development of $27 million in accident years 2014 to 2016, primarily due to large loss experience in U.K. excess lines and wholesale business.

- Net favorable development of $181 million in short-tail business, primarily from:

    - Net favorable development of $48 million in A&H lines, primarily from favorable loss emergence in Asia Pacific and Continental Europe in accident years 2014 through 2016;

    - Net favorable development of $43 million in technical and energy lines, primarily from favorable loss emergence in accident years 2014 through 2016 primarily in offshore and power generation where experience has been better than expected;

    - Favorable development of $42 million in marine, primarily in accident years 2015 and 2016, driven mainly by favorable cargo loss emergence, including favorable claim-specific loss settlements and recoveries; and

    - Favorable development of $25 million in property (excluding technical lines), primarily in accident years 2013 through 2015, driven mainly by favorable loss emergence, including claim-specific loss settlements in all regions except Asia Pacific, partially offset by adverse Asia Pacific large loss experience in accident year 2016.

2016
Overseas General Insurance experienced net favorable PPD of $423 million, representing 0.9 percent of the beginning consolidated net unpaid losses and loss expense reserves.

Global Reinsurance
2018
Global Reinsurance experienced net favorable PPD of $50 million, which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net favorable development of $69 million in long-tail business, primarily in our casualty, professional liability, medical malpractice, and workers' compensation lines primarily from treaty years 2013 and prior principally resulting from lower than expected loss emergence; and

- Net adverse development of $19 million in short-tail business, which included $18 million of net adverse claim development on the 2017 natural catastrophes.

2017
Global Reinsurance experienced net favorable PPD of $59 million, which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net favorable development of $68 million on long-tail lines of business, primarily from:

    - Net favorable development of $67 million in our casualty (excluding motor), professional liability, and medical malpractice lines, primarily from treaty years 2013 and prior, principally resulting from lower than expected loss emergence in the U.S. portfolios; and

    - Net adverse development of $10 million in our motor and excess liability lines, primarily due to adverse development of $9 million driven by a change in the discount rate in the U.K. (Ogden rate) primarily impacting the 2015 and prior treaty years.

- Net adverse development of $9 million in our short-tail business, none of which was significant individually or in the aggregate.

2016
Global Reinsurance experienced net favorable PPD of $78 million, representing 0.2 percent of the beginning consolidated net unpaid losses and loss expense reserves.

Corporate
2018
Corporate incurred adverse development of $45 million in long-tail lines, driven by the following principal changes:

- Adverse development of $216 million in run-off liabilities, driven primarily by increased exposure on a limited number of direct asbestos claims and environmental sites, somewhat greater than expected defense cost spending and increases in reported claims and settlements with respect to molestation exposures;
- Adverse development of $35 million on unallocated loss adjustment expenses due to run-off operating expenses paid and incurred in 2018; and
- Favorable development of $205 million as a result of the settlements of certain previously disputed reinsurance balances.

2017
Corporate incurred adverse development of $278 million in long-tail lines, driven by the following principal changes:

- Adverse development of $239 million in asbestos, environmental, and other run-off liabilities, driven primarily by resolution of a limited number of direct cases, increases in severity trends, somewhat greater than expected defense spending and increases in reported claims for certain assumed reinsurance portfolios; and
- Adverse development of $39 million on unallocated loss adjustment expenses due to run-off operating expenses paid and incurred in 2017.

2016
Corporate incurred adverse PPD of $189 million, representing 0.4 percent of the beginning consolidated net unpaid losses and loss expense reserves.

Asbestos and environmental (A&E)
Chubb's exposure to A&E claims principally arises out of liabilities acquired when it purchased Westchester Specialty in 1998, CIGNA's P&C business in 1999, and Chubb Corp in 2016. The following table presents a roll-forward of consolidated A&E loss reserves including allocated loss expense reserves for A&E exposures, and the provision for uncollectible paid and unpaid reinsurance recoverables:

	Asbestos		Environmental		Total	
(in millions of U.S. dollars)	Gross	Net	Gross	Net	Gross	Net
Balance at December 31, 2017	$ 1,621	$ 1,051	$ 607	$ 476	$ 2,228	$ 1,527
Incurred activity	136	75	101	(97)	237	(22) [1]
Paid activity	(265)	(162)	(83)	104	(348)	(58)
Balance at December 31, 2018	**$ 1,492**	**$ 964**	**$ 625**	**$ 483**	**$ 2,117**	**$ 1,447**

(1) Excludes unallocated loss expenses and the net activity reflects third-party reinsurance other than the aggregate excess of loss reinsurance provided by National Indemnity Company (NICO) to Westchester Specialty (see Westchester Specialty section below).

The positive development of $22 million in 2018 principally reflects favorable reinsurance settlements.

The A&E net loss reserves including allocated loss expense reserves and provision for uncollectible reinsurance at December 31, 2018 and 2017 shown in the table above is comprised of:

	December 31	
(in millions of U.S. dollars)	**2018**	2017
Brandywine operations	**$ 807**	$ 849
Westchester Specialty	**120**	113
Chubb Corp	**442**	486
Other, mainly Overseas General Insurance	**78**	79
Total	**$ 1,447**	$ 1,527

Brandywine Run-off entities – The Restructuring Plan and uncertainties relating to Chubb's ultimate Brandywine exposure

In 1996, the Pennsylvania Insurance Commissioner approved a plan to restructure INA Financial Corporation and its subsidiaries (the Restructuring) which included the division of Insurance Company of North America (INA) into two separate corporations:

(1) An active insurance company that retained the INA name and continued to write P&C business; and
(2) An inactive run-off company, now called Century Indemnity Company (Century).

As a result of the division, predominantly all A&E and certain other liabilities of INA were ascribed to Century and extinguished, as a matter of Pennsylvania law, as liabilities of INA.

As part of the Restructuring, most A&E liabilities of various U.S. affiliates of INA were reinsured to Century. Century and certain other run-off companies having A&E and other liabilities were contributed to Brandywine Holdings.

The U.S.-based Chubb INA companies assumed two contractual obligations in respect of the Brandywine operations in connection with the Restructuring: a surplus maintenance obligation in the form of the excess of loss (XOL) agreement and a dividend retention fund obligation.

XOL Agreement
In 1996, in connection with the Restructuring, a Chubb INA insurance subsidiary provided reinsurance coverage to Century in the amount of $800 million under an Aggregate Excess of Loss Reinsurance Agreement (XOL Agreement), triggerable if the statutory capital and surplus of Century falls below $25 million or if Century lacks liquid assets with which to pay claims as they become due.

Dividend Retention Fund
INA Financial Corporation established and funded a dividend retention fund (the Dividend Retention Fund) consisting of $50 million plus investment earnings. The full balance of the Dividend Retention Fund was contributed to Century as of December 31, 2002. Under the Restructuring Order, while any obligation to maintain the Dividend Retention Fund is in effect, to the extent dividends are paid by INA Holdings Corporation to its parent, INA Financial Corporation, and to the extent INA Financial Corporation then pays such dividends to INA Corporation, a portion of those dividends must be withheld to replenish the principal of the Dividend Retention Fund to $50 million. During 2018, 2011 and 2010, $50 million, $35 million and $15 million, respectively, were withheld from such dividends and deposited into the Dividend Retention Fund as a result of dividends paid up to the INA Corporation. Pursuant to a 2011 amendment to the Restructuring Order, capital contributions from the Dividend Retention Fund to Century are not required until the XOL Agreement has less than $200 million of capacity remaining on an incurred basis for statutory reporting purposes. The amount of the capital contribution shall be the lesser of the amount necessary to restore the XOL Agreement remaining capacity to $200 million or the Dividend Retention Fund balance. In 2018 and 2017, the Pennsylvania Department of Insurance approved a capital contribution of $39 million and $49 million, respectively, from the Dividend Retention Fund to Century in order to restore the XOL capacity to $200 million. The Dividend Retention Fund may not be terminated without prior written approval from the Pennsylvania Insurance Commissioner.

Effective December 31, 2004, Chubb INA contributed $100 million to Century in exchange for a surplus note. After giving effect to the contribution and issuance of the surplus note, the statutory surplus of Century at December 31, 2018 was $25 million and $634 million in statutory-basis losses have been ceded to the XOL Agreement on an inception-to-date basis.

Century reports the amount ceded under the XOL Agreement in accordance with statutory accounting principles, which differ from GAAP by, among other things, allowing Century to discount its liabilities, including certain asbestos related and environmental pollution liabilities and Century's reinsurance payable to active companies. For GAAP reporting purposes, intercompany reinsurance recoverables related to the XOL are eliminated upon consolidation.

While Chubb believes it has no legal obligation to fund Century losses above the XOL limit of coverage, Chubb's consolidated results would nevertheless continue to include any losses above the limit of coverage for so long as the Brandywine companies remain consolidated subsidiaries of Chubb.

Certain active Chubb companies are primarily liable for asbestos, environmental, and other exposures that they have reinsured to Century. Accordingly, if Century were to become insolvent and placed into rehabilitation or liquidation, some or all of the recoverables due to these active Chubb companies from Century could become uncollectible. At December 31, 2018 and 2017, the aggregate reinsurance recoverables owed by Century to certain active Chubb companies were approximately $1.5 billion and $1.4 billion, on an undiscounted basis, respectively. Chubb believes the active company intercompany reinsurance recoverables, which relate to direct liabilities payable over many years, are not impaired. At December 31, 2018 and 2017, Century's carried gross reserves (including reserves assumed from the active Chubb companies) were $2.0 billion. Should Century's loss reserves experience adverse development in the future and should Century be placed into rehabilitation or liquidation, the reinsurance recoverables due from Century to certain active Chubb companies would be payable only after the payment in full of certain expenses and liabilities, including administrative expenses and direct policy liabilities. Thus, the intercompany reinsurance recoverables would be at risk to the extent of the shortage of assets remaining to pay these recoverables.

Westchester Specialty – impact of NICO contracts on Chubb's run-off entities

As part of the Westchester Specialty acquisition in 1998, NICO provided a 75 percent pro-rata share of $1.0 billion of reinsurance protection on losses and loss adjustment expenses incurred on or before December 31, 1996, in excess of a retention of $721 million. At December 31, 2018, the remaining unused incurred limit under the Westchester NICO agreement was $395 million.

7. Taxation

Under current Swiss law, a resident company is subject to income tax at the federal, cantonal, and communal levels that is levied on net worldwide income. Income attributable to permanent establishments or real estate located abroad is excluded from the Swiss tax base. Chubb Limited is a holding company and, therefore, is exempt from cantonal and communal income tax. As a result, Chubb Limited is subject to Swiss income tax only at the federal level. Furthermore, participation relief (i.e., tax relief) is granted to Chubb Limited at the federal level for qualifying dividend income and capital gains related to the sale of qualifying participations (i.e., subsidiaries). It is expected that the participation relief will result in a full exemption of participation income from federal income tax. Chubb Limited is subject to an annual cantonal and communal capital tax on the taxable equity of Chubb Limited in Switzerland.

Chubb has two Swiss operating subsidiaries, an insurance company, Chubb Insurance (Switzerland) Limited and a reinsurance company, Chubb Reinsurance (Switzerland) Limited. Both are subject to federal, cantonal, and communal income tax and to annual cantonal and communal capital tax.

Under current Bermuda law, Chubb Limited and its Bermuda subsidiaries are not required to pay any taxes on income or capital gains. If a Bermuda law were enacted that would impose taxes on income or capital gains, Chubb Limited and the Bermuda subsidiaries have received an undertaking from the Minister of Finance in Bermuda that would exempt such companies from Bermudian taxation until March 2035.

Income from Chubb's operations at Lloyd's is subject to United Kingdom (U.K.) corporation taxes. Lloyd's is required to pay U.S. income tax on U.S. connected income (U.S. income) written by Lloyd's syndicates. Lloyd's has a closing agreement with the Internal Revenue Service (IRS) whereby the amount of tax due on this business is calculated by Lloyd's and remitted directly to the IRS. These amounts are then charged to the accounts of Chubb's Corporate Members in proportion to their participation in the relevant syndicates. Chubb's Corporate Members are subject to this arrangement but, as U.K. domiciled companies, will receive U.K. corporation tax credits for any U.S. income tax incurred up to the value of the equivalent U.K. corporation income tax charge on the U.S. income.

Chubb Group Holdings and its respective subsidiaries are subject to income taxes imposed by U.S. authorities and file a consolidated U.S. Federal income tax return. Should Chubb Group Holdings pay a dividend to Chubb Limited, withholding taxes would apply. Currently, however, no withholding taxes are accrued with respect to such un-remitted earnings as management has no intention of remitting these earnings. Similarly, no taxes have been provided on the un-remitted earnings of certain foreign subsidiaries (Hong Kong and Korea life companies) as management has no intention of remitting these earnings. The cumulative amount that would be subject to withholding tax, if distributed, as well as the determination of the associated tax liability are not practicable to compute; however, such amount would be material. Certain international operations of Chubb are also subject to income taxes imposed by the jurisdictions in which they operate.

Chubb's domestic operations are in Switzerland, the jurisdiction where we are legally organized, incorporated, and registered.

The following table presents pre-tax income and the related provision for income taxes:

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Pre-tax income:			
Switzerland	**$ 950**	$ 527	$ 766
Outside Switzerland	**3,707**	3,195	4,184
Total pre-tax income	**$ 4,657**	$ 3,722	$ 4,950
Provision for income taxes			
Current tax expense:			
Switzerland	**$ 89**	$ 46	$ 97
Outside Switzerland	**563**	313	727
Total current tax expense	**652**	359	824
Deferred tax expense (benefit):			
Switzerland	**3**	2	(27)
Outside Switzerland	**40**	(500)	18
Total deferred tax expense (benefit)	**43**	(498)	(9)
Provision for income taxes	**$ 695**	$ (139)	$ 815

The most significant jurisdictions contributing to the overall taxation of Chubb are calculated using the following rates in 2018: Switzerland 7.83 percent, Bermuda 0.0 percent, U.S. 21.0 percent, and U.K. 19.0 percent.

The following table presents a reconciliation of the difference between the provision for income taxes and the expected tax provision at the Swiss statutory income tax rate:

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Expected tax provision at Swiss statutory tax rate	**$ 365**	$ 291	$ 388
Permanent differences:			
Taxes on earnings subject to rate other than Swiss statutory rate	**372**	263	582
Tax-exempt interest and dividends received deduction, net of proration	**(75)**	(199)	(200)
Net withholding taxes	**33**	30	20
Excess tax benefit on share-based compensation	**(19)**	(48)	—
Impact of 2017 Tax Act	**(25)**	(450)	—
Corporate owned life insurance	**2**	(37)	—
Other	**42**	11	25
Provision for income taxes	**$ 695**	$ (139)	$ 815

The following table presents the components of net deferred tax assets and liabilities:

(in millions of U.S. dollars)	**December 31 2018**	December 31 2017
Deferred tax assets:		
Loss reserve discount	**$ 584**	$ 715
Unearned premiums reserve	**471**	231
Foreign tax credits	**262**	340
Provision for uncollectible balances	**37**	45
Loss carry-forwards	**137**	90
Debt related amounts	**71**	77
Compensation related amounts	**263**	260
Cumulative translation adjustments	**43**	30
Unrealized depreciation on investments	**102**	—
Other, net	**95**	70
Total deferred tax assets	**2,065**	1,858
Deferred tax liabilities:		
Deferred policy acquisition costs	**621**	635
Other intangible assets, including VOBA	**1,440**	1,437
Un-remitted foreign earnings	**47**	66
Investments	**59**	53
Unrealized appreciation on investments	**—**	184
Depreciation	**123**	83
Total deferred tax liabilities	**2,290**	2,458
Valuation allowance	**79**	99
Net deferred tax liabilities	**$ (304)**	$ (699)

The 2017 Tax Act, enacted in December 2017, among other things, reduced the U.S. Federal income tax rate from 35 percent to 21 percent effective in 2018. In the fourth quarter of 2017, we recorded a $450 million income tax benefit on a provisional basis, and an additional $25 million in 2018, principally reflecting this reduction in the U.S. corporate tax rate from 35 percent to 21 percent. Our final $475 million income tax benefit was comprised of a $743 million reduction in the deferred tax liabilities principally related to certain intangible assets, a $250 million reduction in net deferred tax assets related to other net assets, a net charge of $18 million related to the impact of excess foreign tax credits, withholding taxes associated with unremitted earnings and the impact of the reduced rate on our foreign branches. The 2018 change reflected the favorable impact of changes to certain tax only accounting methods offset by updates to provisional amounts recorded related to foreign tax credits and withholding taxes as a result of additional guidance issued during 2018.

The 2017 Tax Act also included provisions for Global Intangible Low-Taxed Income (GILTI) under which taxes may be imposed on income of foreign subsidiaries and for a Base Erosion and Anti-Abuse Tax (BEAT) under which taxes may be imposed on certain payments to affiliated foreign companies. We have evaluated the accounting policy election required with regard to the BEAT and GILTI provisions, and have concluded we will treat both as a period cost. As a result, we have recorded no related deferred taxes.

The valuation allowance of $79 million at December 31, 2018, and $99 million at December 31, 2017, reflects management's assessment, based on available information, that it is more likely than not that a portion of the deferred tax assets will not be realized due to the inability of certain foreign subsidiaries to generate sufficient taxable income. Adjustments to the valuation allowance are made when there is a change in management's assessment of the amount of deferred tax assets that are realizable.

At December 31, 2018, Chubb has net operating loss carry-forwards of $491 million which, if unused, will expire starting in 2019, and a foreign tax credit carry-forward in the amount of $262 million which, if unused, will expire starting in 2025.

The following table presents a reconciliation of the beginning and ending amount of gross unrecognized tax benefits:

(in millions of U.S. dollars)	**December 31 2018**	December 31 2017
Balance, beginning of year	**$ 13**	$ 17
Additions based on tax positions related to the current year	**1**	3
Additions based on tax positions related to prior years	**—**	—
Reductions for tax positions of prior years	**—**	(4)
Reductions for the lapse of the applicable statutes of limitations	**—**	(3)
Balance, end of year	**$ 14**	$ 13

At December 31, 2018 and 2017, the total amount of unrecognized tax benefits that would affect the effective tax rate, if recognized, were $14 million and $13 million, respectively.

Chubb recognizes accruals for interest and penalties, if any, related to unrecognized tax benefits in income tax expense in the Consolidated statements of operations. Tax-related interest expense (income) and penalties reported in the Consolidated statements of operations were immaterial for December 31, 2018, 2017, and 2016. Liabilities for tax-related interest and penalties in our Consolidated balance sheets were $3 million at both December 31, 2018 and 2017.

In September 2016, the IRS completed its examination of Chubb Group Holdings' (formerly ACE Group Holdings) U.S. Federal income tax returns for the 2010-2012 tax years. No material adjustments resulted from this examination. During 2017, the IRS commenced its field examination of Chubb Group Holdings U.S. Federal income tax returns for 2014 and 2015 and Chubb Corp's U.S. Federal income tax return for 2014 all of which were still ongoing at December 31, 2018. As a multinational company, we also have examinations under way in several foreign jurisdictions. It is reasonably possible that over the next twelve months, that the amount of unrecognized tax benefits may change resulting from the re-evaluation of unrecognized tax benefits arising from examinations by taxing authorities and the lapsing of statutes of limitations. With few exceptions, Chubb is no longer subject to income tax examinations for years before 2010.

8. Debt

(in millions of U.S. dollars)	December 31 2018	December 31 2017	Early Redemption Option
Repurchase agreements (weighted average interest rate of 2.5% in 2018 and 1.5% in 2017)	$ 1,418	$ 1,408	None
Short-term debt			
Chubb INA senior notes:			
$300 million 5.8% due March 2018	$ —	$ 300	Make-whole premium plus 0.35%
$600 million 5.75% due May 2018	—	610	Make-whole premium plus 0.30%
$100 million 6.6% due August 2018	—	103	None
$500 million 5.9% due June 2019	500	—	Make-whole premium plus 0.40%
Other short-term debt (7.1% due December 2019)	9	—	None
Total short-term debt	$ 509	$ 1,013	
Long-term debt			
Chubb INA senior notes:			
$500 million 5.9% due June 2019	$ —	$ 499	Make-whole premium plus 0.40%
$1,300 million 2.3% due November 2020	1,297	1,296	Make-whole premium plus 0.15%
$1,000 million 2.875% due November 2022	996	995	Make-whole premium plus 0.20%
$475 million 2.7% due March 2023	473	472	Make-whole premium plus 0.10%
$700 million 3.35% due May 2024	696	695	Make-whole premium plus 0.15%
$800 million 3.15% due March 2025	796	795	Make-whole premium plus 0.15%
$1,500 million 3.35% due May 2026	1,491	1,489	Make-whole premium plus 0.20%
€900 million 1.55% due March 2028	1,008	—	Make-whole premium plus 0.15%
$100 million 8.875% due August 2029	100	100	None
$200 million 6.8% due November 2031	250	254	Make-whole premium plus 0.25%
$300 million 6.7% due May 2036	297	297	Make-whole premium plus 0.20%
$800 million 6.0% due May 2037	962	971	Make-whole premium plus 0.20%
€900 million 2.5% due March 2038	1,008	—	Make-whole premium plus 0.25%
$600 million 6.5% due May 2038	759	768	Make-whole premium plus 0.30%
$475 million 4.15% due March 2043	470	469	Make-whole premium plus 0.15%
$1,500 million 4.35% due November 2045	1,483	1,482	Make-whole premium plus 0.25%
Chubb INA $1,000 million 6.375% capital securities due March 2067(1)	—	964	Make-whole premium plus 0.25%-0.50%
Other long-term debt (2.75% to 7.1% due December 2019 to September 2020)	1	10	None
Total long-term debt	$ 12,087	$ 11,556	
Trust preferred securities			
Chubb INA capital securities due April 2030	$ 308	$ 308	Redemption prices(2)

(1) 6.375% interest rate through April 14, 2017; interest rate equal to three-month LIBOR rate plus 2.25% thereafter.

(2) Redemption prices are equal to accrued and unpaid interest to the redemption date plus the greater of (i) 100 percent of the principal amount thereof, or (ii) sum of present value of scheduled payments of principal and interest on the capital securities from the redemption date to April 1, 2030.

a) Repurchase agreements
Chubb has executed repurchase agreements with certain counterparties under which Chubb agreed to sell securities and repurchase them at a future date for a predetermined price.

b) Short-term debt
Short-term debt comprises the current maturities of our long-term debt instruments described below. These short-term debt instruments were reclassified from long-term debt during 2018 and are reflected in the table above. Chubb INA Holdings Inc.'s (Chubb INA) $300 million of 5.8 percent senior notes due March 2018, $600 million of 5.75 percent senior notes due May 2018, and $100 million of 6.6 percent senior notes due August 2018 were paid upon maturity.

c) Long-term debt
Certain of Chubb INA's senior notes and capital securities are redeemable at any time at Chubb INA's option subject to the provisions described in the table above. A "make-whole" premium is the present value of the remaining principal and interest discounted at the applicable U.S. Treasury rate. The senior notes and capital securities are also redeemable at par plus accrued and unpaid interest in the event of certain changes in tax law.

The senior notes do not have the benefit of any sinking fund. These senior unsecured notes are guaranteed on a senior basis by Chubb Limited and they rank equally with all of Chubb's other senior obligations. They also contain customary limitations on lien provisions as well as customary events of default provisions which, if breached, could result in the accelerated maturity of such senior debt.

In March 2018, Chubb INA issued €900 million ($1.1 billion based on the foreign exchange rate at the date of issuance) of 1.55 percent Euro denominated senior notes due March 2028 and €900 million ($1.1 billion based on the foreign exchange rate at the date of issuance) of 2.5 percent Euro denominated senior notes due March 2038. These senior notes are redeemable at any time at Chubb INA's option subject to a “make-whole” premium (the present value of the remaining principal and interest discounted at the applicable comparable government bond rate plus 0.15 percent for the senior notes due 2028 and 0.25 percent for the senior notes due 2038). The notes are also redeemable at par plus accrued and unpaid interest in the event of certain changes in tax law. These notes do not have the benefit of any sinking fund. These senior unsecured notes are guaranteed on a senior basis by Chubb and they rank equally with all of Chubb's other senior obligations. They also contain customary limitations on lien provisions as well as customary events of default provisions which, if breached, could result in the accelerated maturity of such senior debt.

During April 2018, we redeemed $1.0 billion of 6.375 percent unsecured junior subordinated capital securities with the final maturity date of March 2067 and recorded a loss of $36 million from the extinguishment of debt, which is included in Net realized gains (losses) in the Consolidated statement of operations.

d) Trust preferred securities
In March 2000, ACE Capital Trust II, a Delaware statutory business trust, publicly issued $300 million of 9.7 percent Capital Securities (the Capital Securities) due to mature in April 2030. At the same time, Chubb INA purchased $9.2 million of common securities of ACE Capital Trust II. The sole assets of ACE Capital Trust II consist of $309 million principal amount of 9.7 percent Junior Subordinated Deferrable Interest Debentures (the Subordinated Debentures) issued by Chubb INA due to mature in April 2030.

Distributions on the Capital Securities are payable semi-annually and may be deferred for up to ten consecutive semi-annual periods (but no later than April 1, 2030). Any deferred payments would accrue interest compounded semi-annually if Chubb INA defers interest on the Subordinated Debentures. Interest on the Subordinated Debentures is payable semi-annually. Chubb INA may defer such interest payments (but no later than April 1, 2030), with such deferred payments accruing interest compounded semi-annually. The Capital Securities and the ACE Capital Trust II Common Securities will be redeemed upon repayment of the Subordinated Debentures.

Chubb Limited has guaranteed, on a subordinated basis, Chubb INA's obligations under the Subordinated Debentures, and distributions and other payments due on the Capital Securities. These guarantees, when taken together with Chubb's obligations under expense agreements entered into with ACE Capital Trust II, provide a full and unconditional guarantee of amounts due on the Capital Securities.

9. Commitments, contingencies, and guarantees

a) Derivative instruments

Foreign currency management

As a global company, Chubb entities transact business in multiple currencies. Our policy is to generally match assets, liabilities, and required capital for each individual jurisdiction in local currency, which would include the use of derivatives discussed below. We do not hedge our net asset non-U.S. dollar capital positions; however, we do consider economic hedging for planned cross border transactions.

Derivative instruments employed

Chubb maintains positions in derivative instruments such as futures, options, swaps, and foreign currency forward contracts for which the primary purposes are to manage duration and foreign currency exposure, yield enhancement, or to obtain an exposure to a particular financial market. Chubb also maintains positions in convertible securities that contain embedded derivatives. Investment derivative instruments are recorded in either Other assets (OA) or Accounts payable, accrued expenses, and other liabilities (AP), convertible bonds are recorded in Fixed maturities available for sale (FM AFS), and convertible equity securities are recorded in Equity securities (ES) in the Consolidated balance sheets. These are the most numerous and frequent derivative transactions. In addition, Chubb purchases to be announced mortgage-backed securities (TBAs) as part of its investing activities.

Under reinsurance programs covering GLBs, Chubb assumes the risk of GLBs, (principally GMIB) associated with variable annuity contracts. The GMIB risk is triggered if, at the time the contract holder elects to convert the accumulated account value to a periodic payment stream (annuitize), the accumulated account value is not sufficient to provide a guaranteed minimum level of monthly income. The GLB reinsurance product meets the definition of a derivative instrument. Benefit reserves in respect of GLBs are classified as Future policy benefits (FPB) while the fair value derivative adjustment is classified within AP. Chubb also generally maintains positions in exchange-traded equity futures contracts on equity market indices to limit equity exposure in the GMDB and GLB books of business. All derivative instruments are carried at fair value with changes in fair value recorded in Net realized gains (losses) in the Consolidated statements of operations. None of the derivative instruments are designated as hedges for accounting purposes. The following table presents the balance sheet locations, fair values of derivative instruments in an asset or (liability) position, and notional values/payment provisions of our derivative instruments:

		December 31, 2018			December 31, 2017		
		Fair Value			Fair Value		
(in millions of U.S. dollars)	**Consolidated Balance Sheet Location**	**Derivative Asset**	**Derivative (Liability)**	**Notional Value/ Payment Provision**	Derivative Asset	Derivative (Liability)	Notional Value/ Payment Provision
Investment and embedded derivative instruments:							
Foreign currency forward contracts	**OA / (AP)**	**$ 15**	**$ (19)**	**$ 2,185**	$ 14	$ (27)	$ 2,064
Cross-currency swaps	**OA / (AP)**	**—**	**—**	**45**	—	—	45
Interest rate swaps	**OA / (AP)**	**—**	**(115)**	**5,250**	—	—	—
Options/Futures contracts on notes, bonds, and equities	**OA / (AP)**	**13**	**(19)**	**1,046**	4	(3)	1,007
Convertible securities [1]	**FM AFS / ES**	**9**	**—**	**11**	5	—	6
TBAs	**FM AFS**	**6**	**—**	**6**	—	—	—
		$ 43	**$ (153)**	**$ 8,543**	$ 23	$ (30)	$ 3,122
Other derivative instruments:							
Futures contracts on equities [2]	**OA / (AP)**	**$ 23**	**$ —**	**$ 507**	$ —	$ (21)	$ 1,553
Other	**OA / (AP)**	**2**	**—**	**74**	1	(2)	75
		$ 25	**$ —**	**$ 581**	$ 1	$ (23)	$ 1,628
GLB [3]	**(AP) / (FPB)**	**$ —**	**$ (861)**	**$ 1,750**	$ —	$ (550)	$ 1,083

(1) Includes fair value of embedded derivatives.
(2) Related to GMDB and GLB blocks of business.
(3) Includes both future policy benefits reserves and fair value derivative adjustment. Refer to Note 4 c) for additional information. Note that the payment provision related to GLB is the net amount at risk. The concept of a notional value does not apply to the GLB reinsurance contracts.

At December 31, 2018 and 2017, derivative liabilities of $95 million and $24 million, respectively, included in the table above were subject to a master netting agreement. The remaining derivatives included in the table above were not subject to a master netting agreement.

b) Derivative instrument objectives
(i) Foreign currency exposure management
A foreign currency forward contract (forward) is an agreement between participants to exchange specific foreign currencies at a future date. Chubb uses forwards to minimize the effect of fluctuating foreign currencies as discussed above.

(ii) Duration management and market exposure
Futures
Futures contracts give the holder the right and obligation to participate in market movements, determined by the index or underlying security on which the futures contract is based. Settlement is made daily in cash by an amount equal to the change in value of the futures contract times a multiplier that scales the size of the contract. Exchange-traded futures contracts on money market instruments, notes and bonds are used in fixed maturity portfolios to more efficiently manage duration, as substitutes for ownership of the money market instruments, bonds and notes without significantly increasing the risk in the portfolio. Investments in futures contracts may be made only to the extent that there are assets under management not otherwise committed.

Exchange-traded equity futures contracts are used to limit exposure to a severe equity market decline, which would cause an increase in expected claims and therefore, an increase in reserves for GMDB and GLB reinsurance business.

Options
An option contract conveys to the holder the right, but not the obligation, to purchase or sell a specified amount or value of an underlying security at a fixed price. Option contracts are used in our investment portfolio as protection against unexpected shifts in interest rates, which would affect the duration of the fixed maturity portfolio. By using options in the portfolio, the overall interest rate sensitivity of the portfolio can be reduced. Option contracts may also be used as an alternative to futures contracts in the synthetic strategy as described above.

The price of an option is influenced by the underlying security, expected volatility, time to expiration, and supply and demand.

The credit risk associated with the above derivative financial instruments relates to the potential for non-performance by counterparties. Although non-performance is not anticipated, in order to minimize the risk of loss, management monitors the creditworthiness of its counterparties and obtains collateral. The performance of exchange-traded instruments is guaranteed by the exchange on which they trade. For non-exchange-traded instruments, the counterparties are principally banks which must meet certain criteria according to our investment guidelines.

Interest rate swaps
An interest rate swap is a contract between two counterparties in which interest payments are made based on a notional principal amount, which itself is never paid or received. Under the terms of an interest rate swap, one counterparty makes interest payments based on a fixed interest rate and the other counterparty's payments are based on a floating rate. Interest rate swap contracts are used occasionally in our investment portfolio as protection against unexpected shifts in interest rates, which would affect the fair value of the fixed maturity portfolio. By using interest rate swaps in the portfolio, the overall duration or interest rate sensitivity of the portfolio can be impacted.

Cross-currency swaps
Cross-currency swaps are agreements under which two counterparties exchange interest payments and principal denominated in different currencies at a future date. We use cross-currency swaps to reduce the foreign currency and interest rate risk by converting cash flows back into local currency. We invest in foreign currency denominated investments to improve credit diversification and also to obtain better duration matching to our liabilities that is limited in the local currency market.

Other
Included within Other are derivatives intended to reduce potential losses which may arise from certain exposures in our insurance business. The economic benefit provided by these derivatives is similar to purchased reinsurance. For example, Chubb may enter into crop derivative contracts to protect underwriting results in the event of a significant decline in commodity prices.

(iii) Convertible security investments
A convertible security is a debt instrument or preferred stock that can be converted into a predetermined amount of the issuer's equity. The convertible option is an embedded derivative within the host instruments which are classified in the investment portfolio as either available for sale or as an equity security. Chubb purchases convertible securities for their total return and not specifically for the conversion feature.

(iv) TBA
By acquiring TBAs, we make a commitment to purchase a future issuance of mortgage-backed securities. For the period between purchase of the TBAs and issuance of the underlying security, we account for our position as a derivative in the consolidated financial statements. Chubb purchases TBAs both for their total return and for the flexibility they provide related to our mortgage-backed security strategy.

(v) GLB
Under the GLB program, as the assuming entity, Chubb is obligated to provide coverage until the expiration or maturity of the underlying deferred annuity contracts or the expiry of the reinsurance treaty. Premiums received under the reinsurance treaties are classified as premium. Expected losses allocated to premiums received are classified as Future policy benefits and valued similar to GMDB reinsurance. Other changes in fair value arise principally from changes in expected losses allocated to expected future premiums. Fair value represents management's estimate of an exit price and thus, includes a risk margin. We may recognize a realized loss for other changes in fair value due to adverse changes in the capital markets (e.g., declining interest rates and/or declining U.S. and/or international equity markets) and changes in actual or estimated future policyholder behavior (e.g., increased annuitization or decreased lapse rates) although we expect the business to be profitable.

To mitigate adverse changes in the capital markets, we maintain positions in exchange-traded equity futures contracts, as noted under section "(ii) Futures" above. These futures increase in fair value when the S&P 500 index decreases (and decrease in fair value when the S&P 500 index increases). The net impact of gains or losses related to changes in fair value of the GLB liability and the exchange-traded equity futures are included in Net realized gains (losses).

c) Securities lending and secured borrowings
Chubb participates in a securities lending program operated by a third-party banking institution whereby certain assets are loaned to qualified borrowers and from which we earn an incremental return. The securities lending collateral can only be drawn down by Chubb in the event that the institution borrowing the securities is in default under the lending agreement. An indemnification agreement with the lending agent protects us in the event a borrower becomes insolvent or fails to return any of the securities on loan. The collateral is recorded in Securities lending collateral and the liability is recorded in Securities lending payable in the Consolidated balance sheets.

The following table presents the carrying value of collateral held under securities lending agreements by investment category and remaining contractual maturity of the underlying agreements:

	Remaining contractual maturity	
	December 31, 2018	December 31, 2017
(in millions of U.S. dollars)	Overnight and Continuous	
Collateral held under securities lending agreements:		
Cash	**$ 756**	$ 828
U.S. Treasury and agency	**64**	36
Foreign	**795**	712
Corporate securities	**15**	—
Mortgage-backed securities	**45**	74
Equity securities	**251**	87
	$ 1,926	$ 1,737
Gross amount of recognized liability for securities lending payable	**$ 1,926**	$ 1,737

At December 31, 2018 and 2017, our repurchase agreement obligations of $1,418 million and $1,408 million, respectively, were fully collateralized. In contrast to securities lending programs, the use of cash received is not restricted for the repurchase obligations. The fair value of the underlying securities sold remains in Fixed maturities available for sale, and the repurchase agreement obligation is recorded in Repurchase agreements in the Consolidated balance sheets.

The following table presents the carrying value of collateral pledged under repurchase agreements by investment category and remaining contractual maturity of the underlying agreements:

	Remaining contractual maturity					
	December 31, 2018			December 31, 2017		
(in millions of U.S. dollars)	**30-90 Days**	**Greater than 90 Days**	**Total**	Up to 30 Days	Greater than 90 Days	Total
Collateral pledged under repurchase agreements:						
U.S. Treasury and agency	**$ —**	**$ 259**	**$ 259**	$ 9	$ 230	$ 239
Mortgage-backed securities	**496**	**713**	**1,209**	369	826	1,195
	$ 496	**$ 972**	**$ 1,468**	$ 378	$ 1,056	$ 1,434
Gross amount of recognized liabilities for repurchase agreements			**$ 1,418**			$ 1,408
Difference (1)			**$ 50**			$ 26

(1) Per the repurchase agreements, the amount of collateral posted is required to exceed the amount of gross liability.

Potential risks exist in our secured borrowing transactions due to market conditions and counterparty exposure. With collateral that we pledge, there is a risk that the collateral may not be returned at the expiration of the agreement. If the counterparty fails to return the collateral, Chubb will have free use of the borrowed funds until our collateral is returned. In addition, we may encounter the risk that Chubb may not be able to renew outstanding borrowings with a new term or with an existing counterparty due to market conditions including a decrease in demand as well as more restrictive terms from banks due to increased regulatory and capital constraints. Should this condition occur, Chubb may seek alternative borrowing sources or reduce borrowings. Additionally, increased margins and collateral requirements due to market conditions would increase our restricted assets as we are required to provide additional collateral to support the transaction.

The following table presents net realized gains (losses) related to derivative instrument activity in the Consolidated statements of operations:

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Investment and embedded derivative instruments:			
Foreign currency forward contracts	**$ 3**	$ 9	$ (31)
Interest rate swaps	**(115)**	—	—
All other futures contracts, options, and equities	**39**	(21)	(10)
Convertible securities (1)	**(2)**	1	8
Total investment and embedded derivative instruments	**$ (75)**	$ (11)	$ (33)
GLB and other derivative instruments:			
GLB (2)	**$ (248)**	$ 364	$ 53
Futures contracts on equities (3)	**(4)**	(261)	(136)
Other	**(3)**	(5)	(10)
Total GLB and other derivative instruments	**$ (255)**	$ 98	$ (93)
	$ (330)	$ 87	$ (126)

(1) Includes embedded derivatives.
(2) Excludes foreign exchange gains (losses) related to GLB.
(3) Related to GMDB and GLB blocks of business.

d) Concentrations of credit risk
Our investment portfolio is managed following prudent standards of diversification. Specific provisions limit the allowable holdings of a single issue and issuer. We believe that there are no significant concentrations of credit risk associated with our investments. Our three largest corporate exposures by issuer at December 31, 2018, were Wells Fargo & Co., Bank of America Corp, and JP Morgan Chase & Co. Our largest exposure by industry at December 31, 2018 was financial services.

We market our insurance and reinsurance worldwide primarily through insurance and reinsurance brokers. We assume a degree of credit risk associated with brokers with whom we transact business. For the year ended December 31, 2018, approximately 10 percent of our gross premiums written was generated from or placed by Marsh & McLennan Companies, Inc. This entity is a large, well-established company, and there are no indications that it is financially troubled at December 31, 2018. No broker or one insured accounted for more than 10 percent of our gross premiums written for the years ended December 31, 2017 and 2016.

e) Fixed maturities
At December 31, 2018, we have commitments to purchase fixed income securities of $711 million over the next several years.

f) Other investments
At December 31, 2018, included in Other investments in the Consolidated balance sheet are investments in limited partnerships and partially-owned investment companies with a carrying value of $4.2 billion. In connection with these investments, we have commitments that may require funding of up to $3.7 billion over the next several years.

g) Letters of credit
On October 25, 2017, we entered into a credit facility that provides for up to $1.0 billion of availability, all of which may be used for the issuance of letters of credit and for revolving loans. We have the ability to increase the capacity under our existing credit facility to $2.0 billion under certain conditions, but any such increase would not raise the sub-limit for revolving loans above $1.0 billion. Our existing credit facility has a remaining term expiring in October 2022. At December 31, 2018, our LOC usage was $398 million.

h) Legal proceedings
Our insurance subsidiaries are subject to claims litigation involving disputed interpretations of policy coverages and, in some jurisdictions, direct actions by allegedly-injured persons seeking damages from policyholders. These lawsuits, involving claims on policies issued by our subsidiaries which are typical to the insurance industry in general and in the normal course of business, are considered in our loss and loss expense reserves. In addition to claims litigation, we are subject to lawsuits and regulatory actions in the normal course of business that do not arise from or directly relate to claims on insurance policies. This category of business litigation typically involves, among other things, allegations of underwriting errors or misconduct, employment claims, regulatory activity, or disputes arising from our business ventures. In the opinion of management, our ultimate liability for these matters could be, but we believe is not likely to be, material to our consolidated financial condition and results of operations.

i) Lease commitments
We lease office space and equipment under operating leases which expire at various dates through 2033. Rent expense was $169 million, $211 million, and $209 million for the years ended December 31, 2018, 2017, and 2016, respectively. Future minimum lease payments under the leases are expected to be as follows:

For the years ending December 31 (in millions of U.S. dollars)	
2019	$ 173
2020	151
2021	126
2022	100
2023	86
Thereafter	184
Total minimum future lease commitments	$ 820

10. Shareholders' equity

a) Common Shares

All of Chubb's Common Shares are authorized under Swiss corporate law. Though the par value of Common Shares is stated in Swiss francs, Chubb continues to use U.S. dollars as its reporting currency for preparing the consolidated financial statements. Under Swiss corporate law, we are generally prohibited from issuing Common Shares below their par value. If there were a need to raise common equity at a time when the trading price of Chubb's Common Shares is below par value, we would need in advance to obtain shareholder approval to decrease the par value of the Common Shares.

Dividend approval

At our May 2017 and 2016 annual general meetings, our shareholders approved an annual dividend for the following year of up to $2.84 and $2.76 per share, respectively, which was paid in four quarterly installments of $0.71 per share and $0.69 per share, respectively, at dates determined by the Board of Directors (Board) after the annual general meeting by way of a distribution from capital contribution reserves, transferred to free reserves for payment.

At our May 2018 annual general meeting, our shareholders approved an annual dividend for the following year of up to $2.92 per share, expected to be paid in four quarterly installments of $0.73 per share after the annual general meeting by way of distribution from capital contribution reserves, transferred to free reserves for payment. The Board will determine the record and payment dates at which the annual dividend may be paid until the date of the 2019 annual general meeting, and is authorized to abstain from distributing a dividend at its discretion. The first three quarterly installments each of $0.73 per share, have been distributed by the Board as expected.

Dividend distributions

Under Swiss corporate law, dividends must be stated in Swiss francs though dividend payments are made by Chubb in U.S. dollars. We issue dividends without subjecting them to withholding tax by way of distributions from capital contribution reserves and payment out of free reserves.

The following table presents dividend distributions per Common Share in Swiss francs (CHF) and U.S. dollars (USD):

	Year Ended December 31					
	2018		2017		2016	
	CHF	**USD**	CHF	USD	CHF	USD
Total dividend distributions per common share	**2.84**	**$ 2.90**	2.76	$ 2.82	2.70	$ 2.74

b) Shares issued, outstanding, authorized, and conditional

	Year Ended December 31		
	2018	2017	2016
Shares issued, beginning of year	**479,783,864**	479,783,864	342,832,412
Shares issued for Chubb Corp acquisition	**—**	—	136,951,452
Shares issued, end of year	**479,783,864**	479,783,864	479,783,864
Common Shares in treasury, end of year (at cost)	**(20,580,486)**	(15,950,685)	(13,815,148)
Shares issued and outstanding, end of year	**459,203,378**	463,833,179	465,968,716

Increases in Common Shares in treasury are due to open market repurchases of Common Shares and the surrender of Common Shares to satisfy tax withholding obligations in connection with the vesting of restricted stock and the forfeiture of unvested restricted stock. Decreases in Common Shares in treasury are principally due to grants of restricted stock, exercises of stock options, and purchases under the Employee Stock Purchase Plan (ESPP).

Authorized share capital for general purposes

The Board has shareholder-approved authority as set forth in the Articles of Association to increase for general purposes Chubb's share capital from time to time until May 17, 2020, by the issuance of up to 200,000,000 fully paid up Common Shares, with a par value equal to the par value of Chubb's Common Shares as set forth in the Articles of Association at the time of any such issuance.

Conditional share capital for bonds and similar debt instruments
Chubb's share capital may be increased through the issuance of a maximum of 33,000,000 fully paid up Common Shares (with a par value of CHF 24.15 as of December 31, 2018) through the exercise of conversion and/or option or warrant rights granted in connection with bonds, notes, or similar instruments, issued or to be issued by Chubb, including convertible debt instruments.

Conditional share capital for employee benefit plans
Chubb's share capital may be increased through the issuance of a maximum of 25,410,929 fully paid up Common Shares (with a par value of CHF 24.15 as of December 31, 2018) in connection with the exercise of option rights granted to any employee of Chubb, and any consultant, director, or other person providing services to Chubb.

c) Chubb Limited securities repurchases
From time to time, we repurchase shares as part of our capital management program and to partially offset potential dilution from the exercise of stock options and the granting of restricted stock under share-based compensation plans. Our Board of Directors has authorized share repurchase programs as follows:

- $1.0 billion of Chubb Common Shares from November 17, 2016 through December 31, 2017
- $1.0 billion of Chubb Common Shares from January 1, 2018 through December 31, 2018
- $1.5 billion of Chubb Common Shares from December 1, 2018 through December 31, 2019

Share repurchases may be in the open market, in privately negotiated transactions, block trades, accelerated repurchases and/or through option or other forward transactions.

The following table presents repurchases of Chubb's Common Shares conducted in a series of open market transactions under the Board authorizations:

	Year Ended December 31			January 1, 2019 through
(in millions of U.S. dollars, except share data)	**2018**	2017	2016	February 27, 2019
Number of shares repurchased	**7,719,035**	5,866,612	—	1,328,754
Cost of shares repurchased	**$ 1,021**	$ 830	$ —	$ 174

d) General restrictions
The holders of the Common Shares are entitled to receive dividends as approved by the shareholders. Holders of Common Shares are allowed one vote per share provided that, if the controlled shares of any shareholder constitute ten percent or more of the outstanding Common Shares of Chubb, only a fraction of the vote will be allowed so as not to exceed ten percent in aggregate. Entry of acquirers of Common Shares as shareholders with voting rights in the share register may be refused if it would confer voting rights with respect to ten percent or more of the registered share capital recorded in the commercial register.

11. Share-based compensation

Chubb has share-based compensation plans which currently provide the Board the ability to grant awards of stock options, restricted stock, and restricted stock units to its employees, consultants, and members of the Board.

In connection with the Chubb Corp acquisition in 2016, we assumed outstanding equity awards consisting of service-based restricted stock units, performance-based restricted stock units, and stock options issued by Chubb Corp to employees and directors with a fair value of $525 million, of which $323 million is attributed to purchase consideration for the acquisition. These awards were generally granted with a 3-year vesting period, and the stock options generally have a 10-year term.

In May 2016, our shareholders approved the Chubb Limited 2016 Long-Term Incentive Plan (the 2016 LTIP), which replaced both the ACE Limited 2004 LTIP (the 2004 LTIP) and The Chubb Corporation Long-Term Incentive Plan (2014). The 2016 LTIP is substantially similar to the 2004 LTIP in its operation and the types of awards that may be granted. Under the 2016 LTIP, Common Shares of Chubb were authorized to be issued pursuant to awards made as stock options, stock appreciation rights, performance shares, performance units, restricted stock, and restricted stock units.

Chubb principally issues restricted stock grants and stock options on a graded vesting schedule, with equal percentages of the award subject to vesting over a number of years (typically three or four). Chubb recognizes compensation cost for vesting of restricted stock and stock option grants with only service conditions on a straight-line basis over the requisite service period for each separately vesting portion of the award as if the award were, in-substance, multiple awards. We incorporate an estimate of future forfeitures in determining compensation cost for both grants of restricted stock and stock options.

Under the 2016 LTIP, 19,500,000 Common Shares are authorized to be issued. This is in addition to any shares that have not been delivered pursuant to the 2004 LTIP and remain available for grant pursuant to the 2004 LTIP and includes any shares covered by awards granted under the 2004 LTIP that have forfeited, expired or canceled after the effective date of the 2016 LTIP. At December 31, 2018, a total of 14,100,867 shares remain available for future issuance under the 2016 LTIP, which includes shares canceled or forfeited from the 2004 LTIP, in addition to common shares that were previously registered and authorized to be issued.

Under the Employee Stock Purchase Plan (ESPP), 6,500,000 shares are authorized to be issued. At December 31, 2018, a total of 2,104,942 shares remain available for issuance under the ESPP.

Chubb generally issues Common Shares for the exercise of stock options, restricted stock, and purchases under the ESPP from un-issued reserved shares (conditional share capital) and Common Shares in treasury.

The following table presents pre-tax and after-tax share-based compensation expense:

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Stock options and shares issued under ESPP:			
Pre-tax	**$ 50**	$ 41	$ 33
After-tax [(1)]	**$ 40**	$ 26	$ 20
Restricted stock:			
Pre-tax	**$ 235**	$ 259	$ 268
After-tax	**$ 178**	$ 151	$ 167

(1) Excludes windfall tax benefit for share-based compensation recognized as a direct adjustment to Additional paid-in capital of $32 million for the year ended December 31, 2016. Beginning in 2017, windfall tax benefits for share-based compensation are recognized through Net income rather than Additional paid-in capital. The excess tax benefit recorded to Income tax expense in the Consolidated statement of operations was $19 million and $48 million for the years ended December 31, 2018 and 2017, respectively.

Unrecognized compensation expense related to the unvested portion of Chubb's employee share-based awards of restricted stock, restricted stock units, and stock options was $458 million at December 31, 2018 and is expected to be recognized over a weighted-average period of approximately 1 year.

Stock options
Both incentive and non-qualified stock options are principally granted at an option price per share equal to the grant date fair value of Chubb's Common Shares. Stock options are generally granted with a 3-year vesting period and a 10-year term. Stock options vest in equal annual installments over the respective vesting period, which is also the requisite service period.

Chubb's 2018 share-based compensation expense includes a portion of the cost related to the 2015 through 2018 stock option grants. Stock option fair value was estimated on the grant date using the Black-Scholes option-pricing model that uses the weighted-average assumptions noted below:

	Year Ended December 31		
	2018	2017	2016
Dividend yield	**2.0%**	2.0%	2.3%
Expected volatility	**23.2%**	19.7%	23.2%
Risk-free interest rate	**2.7%**	2.0%	1.3%
Expected life	**5.7 years**	5.8 years	5.6 years

The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the time of grant. The expected life (estimated period of time from grant to exercise date) was estimated using the historical exercise behavior of employees. Expected volatility was calculated as a blend of (a) historical volatility based on daily closing prices over a period equal to the expected life assumption, (b) long-term historical volatility based on daily closing prices over the period from Chubb's initial public trading date through the most recent quarter, and (c) implied volatility derived from Chubb's publicly traded options.

The following table presents a roll-forward of Chubb's stock options:

(Intrinsic Value in millions of U.S. dollars)	Number of Options	Weighted-Average Exercise Price	Weighted-Average Fair Value	Total Intrinsic Value
Options outstanding, December 31, 2015	9,853,496	$ 78.40		
Assumed in Chubb Corp Acquisition	339,896	$ 77.83	$ 36.07	
Granted	1,929,616	$ 118.39	$ 21.52	
Exercised	(1,728,949)	$ 66.65		$ 99
Forfeited	(213,339)	$ 110.01		
Options outstanding, December 31, 2016	10,180,720	$ 87.29		
Granted	2,079,522	$ 139.00	$ 22.97	
Exercised	(1,632,629)	$ 73.53		$ 111
Forfeited	(194,297)	$ 119.44		
Options outstanding, December 31, 2017	10,433,316	$ 99.20		
Granted	1,842,690	$ 143.07	$ 29.71	
Exercised	(1,065,384)	$ 73.57		$ 71
Forfeited	(202,900)	$ 133.92		
Options outstanding, December 31, 2018	**11,007,722**	**$ 108.25**		**$ 274**
Options exercisable, December 31, 2018	**7,405,354**	**$ 93.88**		**$ 268**

The weighted-average remaining contractual term was 6.0 years for stock options outstanding and 4.8 years for stock options exercisable at December 31, 2018. Cash received from the exercise of stock options for the year ended December 31, 2018 was $78 million.

Restricted stock and restricted stock units
Grants of restricted stock and restricted stock units awarded under both the 2004 LTIP and 2016 LTIP typically have a 4-year vesting period, subject to vesting as to one-quarter of the award each anniversary of grant. Restricted stock and restricted stock units are granted at market close price on the day of grant. Each restricted stock unit represents our obligation to deliver to the holder one Common Share upon vesting.

In addition, Chubb grants performance-based restricted stock to certain executives that vest based on certain performance criteria as compared to a defined group of peer companies. Performance-based stock awards comprise target awards and premium awards that cliff vest at the end of a 3-year performance period based on both our tangible book value (shareholders' equity less goodwill and intangible assets, net of tax) per share growth and P&C combined ratio compared to our peer group. Premium awards are subject to an additional vesting provision based on total shareholder return (TSR) compared to our peer group. Shares representing target awards and premium awards are issued when the awards are approved and are subject to forfeiture, if applicable performance criteria are not met at the end of the 3-year performance period. Prior to January 2017, performance-based restricted stock awards had a 4-year vesting period with the potential to vest as to a portion each year, and excluded the P&C combined ratio and TSR additional vesting criteria.

Chubb also grants restricted stock awards to non-management directors which vest at the following year's annual general meeting.

Chubb's 2018 share-based compensation expense includes a portion of the cost related to the restricted stock granted in the years 2014 through 2018.

The following table presents a roll-forward of our restricted stock awards. Included in the roll-forward below are 20,784 restricted stock awards, 22,013 restricted stock awards, and 23,812 restricted stock awards that were granted to non-management directors during the years ended December 31, 2018, 2017, and 2016, respectively:

	Service-based Restricted Stock Awards and Restricted Stock Units			Performance-based Restricted Stock Awards and Restricted Stock Units		
	Number of Shares		Weighted-Average Grant-Date Fair Value	Number of Shares		Weighted-Average Grant-Date Fair Value
Unvested restricted stock, December 31, 2015	3,489,169	$	97.01	595,210	$	101.73
Assumed in Chubb Corp Acquisition	3,706,639	$	111.02	—	$	—
Granted	1,622,065	$	118.70	517,507	$	118.96
Vested	(2,592,622)	$	100.87	(181,548)	$	102.43
Forfeited	(420,125)	$	109.42	—	$	—
Unvested restricted stock, December 31, 2016	5,805,126	$	109.39	931,169	$	111.17
Granted	1,707,094	$	139.18	267,282	$	138.90
Vested	(2,646,084)	$	107.73	(222,954)	$	113.30
Forfeited	(156,694)	$	114.54	—	$	—
Unvested restricted stock, December 31, 2017	4,709,442	$	121.16	975,497	$	118.28
Granted	1,326,979	$	142.76	180,065	$	143.07
Vested	(2,545,090)	$	114.83	(244,332)	$	103.03
Forfeited	(196,482)	$	131.06	—	$	—
Unvested restricted stock, December 31, 2018	**3,294,849**	**$**	**134.17**	**911,230**	**$**	**127.27**

Prior to 2009, legacy ACE granted restricted stock units with a 1-year vesting period to non-management directors. Delivery of Common Shares on account of these restricted stock units to non-management directors is deferred until after the date of the non-management directors' termination from the Board. Legacy Chubb Corp historically allowed directors and certain key employees of Chubb Corp and its subsidiaries to defer a portion of their compensation earned with respect to services performed in the form of deferred stock units. In addition, legacy Chubb Corp provided supplemental retirement benefits for certain employees through its Defined Contribution Excess Benefit Plan in the form of deferred shares of stock. The minimum vesting period under these legacy Chubb Corp deferred plans was 1-year and the maximum was 3-years. Employees and directors had the option to elect to receive their awards at a future specified date or upon their termination of service with Chubb. At December 31, 2018, there were 251,843 deferred restricted stock units.

ESPP

The ESPP gives participating employees the right to purchase Common Shares through payroll deductions during consecutive subscription periods at a purchase price of 85 percent of the fair value of a Common Share on the exercise date (Purchase Price). Annual purchases by participants are limited to the number of whole shares that can be purchased by an amount equal to ten percent of the participant's compensation or $25,000, whichever is less. The ESPP has two six-month subscription periods each year, the first of which runs between January 1 and June 30 and the second of which runs between July 1 and December 31. Legacy Chubb Corp employees were eligible to participate in the ESPP beginning in the July 1 to December 31 subscription period of 2016. The amounts collected from participants during a subscription period are used on the exercise date to purchase full shares of Common Shares. An exercise date is generally the last trading day of a subscription period. The number of shares purchased is equal to the total amount, at the exercise date, collected from the participants through payroll deductions for that subscription period, divided by the Purchase Price, rounded down to the next full share. Participants may withdraw from an offering before the exercise date and obtain a refund of amounts withheld through payroll deductions. Pursuant to the provisions of the ESPP, during the years ended December 31, 2018, 2017, and 2016, employees paid $37 million, $34 million, and $24 million to purchase 347,116 shares, 271,185 shares, and 211,492 shares, respectively.

12. Postretirement benefits

Chubb provides postretirement benefits to eligible employees and their dependents through various defined benefit pension plans, other postretirement benefit plans, and defined contribution plans sponsored by Chubb.

Defined benefit pension plans
We maintain non-contributory defined benefit pension plans that cover certain employees located in the U.S., U.K., Canada, and various other statutorily required countries. We account for pension benefits using the accrual method. Benefits under these plans are based on employees' years of service and compensation during final years of service. All underlying plans are subject to periodic actuarial valuations by qualified actuarial firms using actuarial models to calculate the expense and liability for each plan. We use December 31 as the measurement date for our defined benefit pension plans.

Under the Chubb Corp plans, prior to 2001, benefits were generally based on an employee's years of service and average compensation during the last five years of employment. Effective January 1, 2001, the formula for providing pension benefits was changed from the final average pay formula to a cash balance formula. Under the cash balance formula, a notional account is established for each employee, which is credited semi-annually with an amount equal to a percentage of eligible compensation based on age and years of service plus interest based on the account balance. Chubb Corp employees hired prior to 2001 will generally be eligible to receive vested benefits based on the higher of the final average pay or cash balance formulas.

Other postretirement benefit plans
Our assumption of Chubb Corp's other postretirement benefit plans, principally healthcare and life insurance, covers retired employees, their beneficiaries, and covered dependents. Healthcare coverage is contributory. Retiree contributions vary based upon the retiree's age, type of coverage, and years of service requirements. Life insurance coverage is non-contributory. Chubb funds a portion of the healthcare benefits obligation where such funding can be accomplished on a tax-effective basis. Benefits are paid as covered expenses are incurred.

Amendments to U.S. Qualified and Excess Pension Plans and U.S. Retiree Healthcare Plan
On October 31, 2016, we harmonized and amended several of our U.S. retirement programs to create a unified retirement savings program. In 2020, we will transition from a traditional defined benefit pension program that had been in effect for certain employees to a defined contribution program. Additionally, after 2025, we plan to eliminate a subsidized U.S. retiree healthcare and life insurance plan that had been in place for certain employees. Both amendments required a remeasurement of the plan assets and benefit obligations with updated assumptions, including discount rates and the expected return on assets.

The plan amendments and related remeasurement of the obligation at October 31, 2016 resulted in a net decrease to the benefit obligations of $496 million as follows:

- The amendment of the pension plan and excess pension plan resulted in a pre-tax curtailment gain of $113 million immediately recognized in income during the fourth quarter of 2016 as it reduced expected years of future service of active plan participants.
- The amendment of the retiree healthcare plan resulted in a reduction in the obligation of $383 million, of which $410 million will be amortized as a reduction to expense through 2021 as it relates to benefits already accrued. For the years ended December 31, 2018, 2017, and 2016, $80 million, $89 million, and $15 million, respectively, were amortized as a reduction to expense. Additionally, during 2017, the number of involuntary departures due to the Chubb integration met our established threshold for recognition in income. As a result, for the years ended December 31, 2018 and 2017, we recognized $3 million and $39 million, respectively, of accelerated amortization. At December 31, 2018, the remaining curtailment benefit balance was $184 million which will be amortized as a reduction to expense over the next 2.5 years.

Obligations and funded status

The funded status of the pension and other postretirement benefit plans as well as the amounts recognized in Accumulated other comprehensive income at December 31, 2018 and 2017 was as follows:

	Pension Benefit Plans				Other Postretirement Benefit Plans	
	2018		2017		**2018**	2017
(in millions of U.S. dollars)	**U.S. Plans**	**Non-U.S. Plans**	U.S. Plans	Non-U.S. Plans		
Benefit obligation, beginning of year	**$ 3,285**	**$ 1,077**	$ 3,035	$ 1,025	**$ 137**	$ 165
Service cost	**57**	**12**	63	17	**1**	2
Interest cost	**105**	**27**	105	27	**3**	4
Actuarial loss (gain)	**(214)**	**(71)**	232	(4)	**(20)**	(2)
Benefits paid	**(108)**	**(26)**	(132)	(28)	**(15)**	(14)
Amendments	**—**	**4**	—	—	**—**	(23)
Curtailments	**—**	**—**	—	(32)	**—**	2
Settlements	**(33)**	**(27)**	(18)	(8)	**—**	—
Foreign currency revaluation and other	**—**	**(54)**	—	80	**7**	3
Benefit obligation, end of year	**$ 3,092**	**$ 942**	$ 3,285	$ 1,077	**$ 113**	$ 137
Plan assets at fair value, beginning of year	**$ 3,109**	**$ 1,172**	$ 2,765	$ 962	**$ 157**	$ 159
Actual return on plan assets	**(218)**	**(63)**	441	100	**1**	6
Employer contributions	**34**	**14**	53	63	**—**	6
Benefits paid	**(108)**	**(26)**	(132)	(28)	**(15)**	(14)
Settlements	**(33)**	**(27)**	(18)	(8)	**—**	—
Foreign currency revaluation and other	**—**	**(62)**	—	83	**—**	—
Plan assets at fair value, end of year	**$ 2,784**	**$ 1,008**	$ 3,109	$ 1,172	**$ 143**	$ 157
Funded status at end of year	**$ (308)**	**$ 66**	$ (176)	$ 95	**$ 30**	$ 20
Amounts recognized in Accumulated other comprehensive income, not yet recognized in net periodic cost (benefit):						
Net actuarial loss (gain)	**$ (15)**	**$ 112**	$ (227)	$ 82	**$ —**	$ 12
Prior service cost (benefit)	**—**	**9**	—	6	**(200)**	(288)
Total	**$ (15)**	**$ 121**	$ (227)	$ 88	**$ (200)**	$ (276)

For the U.S. pension plans, the $214 million actuarial gain experienced in 2018 was principally driven by the increase in the discount rate from 2017 that was used to determine the projected benefit obligation at December 31, 2018. The $232 million actuarial loss experienced in 2017 was largely driven by the decrease in the discount rate from 2016 that was used to determine the projected benefit obligation at December 31, 2017.

The accumulated benefit obligation for the pension benefit plans was $4.0 billion and $4.3 billion at December 31, 2018 and 2017, respectively. The accumulated benefit obligation is the present value of pension benefits earned as of the measurement date based on employee service and compensation prior to that date. It differs from the pension (projected) benefit obligation in the table above in that the accumulated benefit obligation includes no assumptions regarding future compensation levels.

The net components of the funded status of the pension and other postretirement benefit plans are included in Accounts payable, accrued expenses, and other liabilities in the Consolidated balance sheets.

Chubb's funding policy is to contribute amounts that meet regulatory requirements plus additional amounts determined based on actuarial valuations, market conditions and other factors. All benefit plans satisfy minimum funding requirements of the Employee Retirement Income Security Act of 1974 (ERISA).

The following table provides information on pension plans where the benefit obligation is in excess of plan assets at December 31, 2018 and 2017:

	2018		2017	
(in millions of U.S. dollars)	**U.S. Plans**	**Non-U.S. Plans**	U.S. Plans	Non-U.S. Plans
Plans with projected benefit obligation in excess of plan assets:				
Projected benefit obligation	**$ 3,092**	**$ 222**	$ 3,285	$ 216
Fair value of plan assets	**2,784**	**170**	3,109	166
Net funded status	**$ (308)**	**$ (52)**	$ (176)	$ (50)
Plans with accumulated benefit obligation in excess of plan assets:				
Accumulated benefit obligation	**$ 3,066**	**$ 115**	$ 3,223	$ 152
Fair value of plan assets	**$ 2,784**	**$ 86**	$ 3,109	$ 123

For other postretirement benefit plans with an accumulated benefit obligation in excess of plan assets, the accumulated benefit obligation was $23 million and $21 million at December 31, 2018 and 2017, respectively. These plans have no plan assets.

At December 31, 2018, we estimate that we will contribute $22 million to the pension plans and $1 million to the other postretirement benefits plan in 2019. The estimate is subject to change due to contribution decisions that are affected by various factors including our liquidity, market performance and management discretion.

The weighted-average assumptions used to determine the projected benefit obligation were as follows:

	Pension Benefit Plans		
	U.S. Plans	Non-U.S. Plans	Other Postretirement Benefit Plans
December 31, 2018			
Discount rate	**4.20%**	**3.10%**	**3.78%**
Rate of compensation increase	**4.00%**	**3.37%**	**N/A**
Interest crediting rate	**4.10%**		
December 31, 2017			
Discount rate	3.59%	2.76%	2.77%
Rate of compensation increase	4.00%	3.46%	N/A
Interest crediting rate	4.10%		

The projected benefit cash flows were discounted using the corresponding spot rates derived from a yield curve, which resulted in a single discount rate that would produce the same liability at the respective measurement dates. The same process was applied to service cost cash flows to determine the discount rate associated with the service cost. In general, the discount rates for the non-U.S. plans were developed using a similar methodology by using country-specific yield curves.

The components of net pension and other postretirement benefit costs reflected in Net income and other changes in plan assets and benefit obligations recognized in other comprehensive income were as follows:

	Pension Benefit Plans						Other Postretirement Benefit Plans		
	U.S. Plans			Non-U.S. Plans					
Year Ended December 31 (in millions of U.S. dollars)	**2018**	2017	2016	**2018**	2017	2016	**2018**	2017	2016
Costs reflected in Net income:									
Service cost	**$ 57**	$ 63	$ 75	**$ 12**	$ 17	$ 18	**$ 1**	$ 2	$ 10
Non-service cost:									
Interest cost	**105**	105	103	**27**	27	30	**3**	4	17
Expected return on plan assets	**(212)**	(189)	(165)	**(50)**	(42)	(39)	**(5)**	(5)	(8)
Amortization of net actuarial loss (gain)	**—**	—	—	**1**	3	2	**—**	—	(1)
Amortization of prior service cost	**—**	—	—	**—**	—	(1)	**(85)**	(89)	(15)
Curtailments	**—**	—	(117)	**—**	(27)	—	**(2)**	(37)	—
Settlements	**2**	—	(2)	**3**	—	1	**—**	—	—
Total non-service (benefit) cost	**(105)**	(84)	(181)	**(19)**	(39)	(7)	**(89)**	(127)	(7)
Net periodic (benefit) cost	**$ (48)**	$ (21)	$(106)	**$ (7)**	$ (22)	$ 11	**$ (88)**	$(125)	$ 3
Changes in plan assets and benefit obligations recognized in other comprehensive income									
Net actuarial loss (gain)	**$ 214**	$ (21)	$(326)	**$ 34**	$ (57)	$ 49	**$ (11)**	$ (3)	$ 17
Prior service cost (benefit)	**—**	—	—	**3**	—	(8)	**—**	(23)	(395)
Amortization of net actuarial loss	**—**	—	—	**(1)**	(3)	—	**(1)**	—	—
Amortization of prior service cost	**—**	—	—	**—**	—	—	**85**	89	—
Curtailments	**—**	—	117	**—**	(6)	—	**3**	39	—
Settlements	**(2)**	1	2	**(3)**	—	(1)	**—**	—	—
Total decrease (increase) in other comprehensive income	**$ 212**	$ (20)	$(207)	**$ 33**	$ (66)	$ 40	**$ 76**	$ 102	$ (378)

The service and non-service cost components of net periodic (benefit) cost reflected in the Consolidated statements of operations were as follows:

	Pension Benefit Plans			Other Postretirement Benefit Plans		
Year Ended December 31 (in millions of U.S. dollars)	**2018**	2017	2016	**2018**	2017	2016
Service Cost:						
Losses and loss expenses	**$ 7**	$ 7	$ 8	**$ —**	$ —	$ —
Administrative expenses	**62**	73	85	**1**	2	10
Total service cost	**69**	80	93	**1**	2	10
Non-Service Cost:						
Losses and loss expenses	**(10)**	(8)	(18)	**(9)**	(13)	—
Administrative expenses	**(114)**	(115)	(170)	**(80)**	(114)	(7)
Total non-service (benefit) cost	**(124)**	(123)	(188)	**(89)**	(127)	(7)
Net periodic (benefit) cost	**$ (55)**	$ (43)	$ (95)	**$ (88)**	$ (125)	$ 3

The weighted-average assumptions used to determine the net periodic pension and other postretirement benefit costs were as follows:

	Pension Benefit Plans		
Year Ended December 31	U.S. Plans	Non-U.S. Plans	Other Postretirement Benefit Plans
2018			
Discount rate in effect for determining service cost	**3.62%**	**3.97%**	**2.84%**
Discount rate in effect for determining interest cost	**3.27%**	**2.55%**	**2.62%**
Rate of compensation increase	**4.00%**	**3.46%**	**N/A**
Expected long-term rate of return on plan assets	**7.00%**	**4.32%**	**2.59%**
Interest crediting rate	**4.10%**		
2017			
Discount rate in effect for determining service cost	4.20%	3.55%	2.84%
Discount rate in effect for determining interest cost	3.53%	2.61%	2.44%
Rate of compensation increase	4.00%	3.57%	N/A
Expected long-term rate of return on plan assets	7.00%	4.23%	3.00%
Interest crediting rate	4.10%		
2016			
Discount rate in effect for determining service cost	4.38%	3.85%	4.32%
Discount rate in effect for determining interest cost	3.59%	3.44%	4.02%
Rate of compensation increase	4.00%	3.33%	N/A
Expected long-term rate of return on plan assets	7.00%	4.79%	6.34%
Interest crediting rate	4.10%		

The weighted-average healthcare cost trend rate assumptions used to measure the expected cost of healthcare benefits were as follows:

	U.S. Plans			Non-U.S. Plans		
	2018	2017	2016	**2018**	2017	2016
Healthcare cost trend rate	**6.68%**	7.01%	7.28%	**6.29%**	6.61%	6.61%
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	**4.50%**	4.50%	4.50%	**4.50%**	4.50%	4.50%
Year that the rate reaches the ultimate trend rate	**2038**	2038	2038	**2029**	2029	2029

Plan Assets

The long term objective of the pension plan is to provide sufficient funding to cover expected benefit obligations, while assuming a prudent level of portfolio risk. The assets of the pension plan are invested, either directly or through pooled funds, in a diversified portfolio of predominately equity securities and fixed maturities. We seek to obtain a rate of return that over time equals or exceeds the returns of the broad markets in which the plan assets are invested. The target allocation of plan assets is 55 percent to 65 percent invested in equity securities (including certain other investments measured using NAV), with the remainder primarily invested in fixed maturities. We rebalance our pension assets to the target allocation as market conditions permit. We determined the expected long term rate of return assumption for each asset class based on an analysis of the historical returns and the expectations for future returns. The expected long term rate of return for the portfolio is a weighted aggregation of the expected returns for each asset class.

In order to minimize risk, the Plan maintains a listing of permissible and prohibited investments. In addition, the Plan has certain concentration limits and investment quality requirements imposed on permissible investments options. Investment risk is measured and monitored on an ongoing basis.

The following tables present the fair values of the pension plan assets, by valuation hierarchy. For additional information on how we classify these assets within the valuation hierarchy, refer to Note 3 to the Consolidated financial statements.

December 31, 2018				**Pension Benefit Plans**
(in millions of U.S. dollars)	**Level 1**	**Level 2**	**Level 3**	**Total**
U.S. Plans:				
Short-term investments	**$ 10**	**$ 74**	**$ —**	**$ 84**
U.S. Treasury and agency	**433**	**82**	**—**	**515**
Foreign and corporate bonds	**—**	**641**	**—**	**641**
Equity securities	**1,050**	**—**	**—**	**1,050**
Total U.S. Plan assets [(1)]	**$ 1,493**	**$ 797**	**$ —**	**$ 2,290**
Non-U.S. Plans:				
Short-term investments	**$ 7**	**$ —**	**$ —**	**$ 7**
Foreign and corporate bonds	**—**	**418**	**—**	**418**
Equity securities	**103**	**371**	**—**	**474**
Total Non-U.S. Plan assets [(1)]	**$ 110**	**$ 789**	**$ —**	**$ 899**

(1) Excluded from the table above are $494 million and $109 million of other investments measured using NAV as a practical expedient related to the U.S. Plans and Non-U.S. Plans, respectively.

December 31, 2017				Pension Benefit Plans
(in millions of U.S. dollars)	Level 1	Level 2	Level 3	Total
U.S. Plans:				
Short-term investments	$ 9	$ 52	$ —	$ 61
U.S. Treasury and agency	446	79	—	525
Foreign and corporate bonds	—	692	—	692
Equity securities	1,154	—	—	1,154
Total U.S. Plan assets [(1)]	$ 1,609	$ 823	$ —	$ 2,432
Non-U.S. Plans:				
Short-term investments	$ 5	$ —	$ —	$ 5
Foreign and corporate bonds	—	456	—	456
Equity securities	122	492	—	614
Total Non-U.S. Plan assets [(1)]	$ 127	$ 948	$ —	$ 1,075

(1) Excluded from the table above are $677 million and $95 million of other investments measured using NAV as a practical expedient related to the U.S. Plans and Non-U.S. Plans, respectively.

We had other postretirement benefit plan assets of $143 million and $157 million at December 31, 2018 and 2017, respectively, all of which are held in equity securities and categorized as Level 1.

Benefit payments were $209 million and $200 million for the years ended December 31, 2018 and 2017, respectively. Expected future payments are as follows:

For the years ending December 31 (in millions of U.S. dollars)	Pension Benefit Plans U.S. Plans	Pension Benefit Plans Non-U.S. Plans	Other Postretirement Benefit Plans
2019	$ 140	$ 26	$ 18
2020	148	28	19
2021	155	27	21
2022	162	26	22
2023	168	28	18
2024-2028	909	155	19

Defined contribution plans (including 401(k))
Under these plans, employees' contributions may be supplemented by Chubb matching contributions based on the level of employee contribution. These contributions are invested at the election of each employee in one or more of several investment portfolios offered by a third-party investment advisor. Expenses for these plans totaled $171 million, $166 million, and $150 million for the years ended December 31, 2018, 2017, and 2016, respectively.

13. Other (income) expense

(in millions of U.S. dollars)	Year Ended December 31 **2018**	2017	2016
Equity in net (income) loss of partially-owned entities	**$ (514)**	$ (418)	$ (264)
(Gains) losses from fair value changes in separate account assets [1]	**38**	(97)	(11)
One-time contribution to the Chubb Charitable Foundation	**—**	50	—
Federal excise and capital taxes	**12**	35	19
Other	**30**	30	34
Other (income) expense	**$ (434)**	$ (400)	$ (222)

(1) Related to (gains) losses from fair value changes in separate account assets that do not qualify for separate account reporting under GAAP.

Other (income) expense includes equity in net (income) loss of partially-owned entities, which includes our share of net (income) loss related to partially-owned investment companies (private equity) and partially-owned insurance companies. Also included in Other (income) expense are (Gains) losses from fair value changes in separate account assets that do not qualify for separate account reporting under GAAP. The offsetting movement in the separate account liabilities is included in Policy benefits in the Consolidated statements of operations. Certain federal excise and capital taxes incurred as a result of capital management initiatives are included in Other (income) expense as these are considered capital transactions and are excluded from underwriting results.

14. Segment information

Chubb operates through six business segments: North America Commercial P&C Insurance, North America Personal P&C Insurance, North America Agricultural Insurance, Overseas General Insurance, Global Reinsurance, and Life Insurance. These segments distribute their products through various forms of brokers, agencies, and direct marketing programs. All business segments have established relationships with reinsurance intermediaries.

- The North America Commercial P&C Insurance segment includes the business written by Chubb divisions that provide property and casualty (P&C) insurance and services to large, middle market and small commercial businesses in the U.S., Canada, and Bermuda. This segment includes our retail divisions: Major Accounts, Commercial Insurance, including Small Commercial Insurance; and our wholesale and specialty divisions: Westchester and Chubb Bermuda. These divisions write a variety of coverages, including traditional commercial property, marine, general casualty, workers' compensation, package policies, and risk management; specialty categories such as professional lines, marine, construction, environmental, medical, cyber risk, surety, and excess casualty; as well as group accident and health (A&H) insurance.

- The North America Personal P&C Insurance segment includes the business written by Chubb Personal Risk Services division, which includes high net worth personal lines business, with operations in the U.S. and Canada. This segment provides affluent and high net worth individuals and families with homeowners, automobile and collector cars, valuable articles (including fine arts), personal and excess liability, travel insurance, and recreational marine insurance and services.

- The North America Agricultural Insurance segment includes the business written by Rain and Hail Insurance Service, Inc. in the U.S. and Canada, which provides comprehensive multiple peril crop insurance (MPCI) and crop-hail insurance, and Chubb Agribusiness, which offers farm and ranch property as well as specialty P&C coverages, including commercial agriculture products.

- The Overseas General Insurance segment includes the business written by two Chubb divisions that provide P&C insurance and services in the 51 countries and territories outside of North America where the company operates. Chubb International provides commercial P&C, A&H and traditional and specialty personal lines for large corporations, middle markets and small customers through retail brokers, agents and other channels locally around the world. Chubb Global Markets (CGM) provides commercial P&C excess and surplus lines and A&H through wholesale brokers in the London market and through Lloyd's. These divisions write a variety of coverages, including traditional commercial P&C, specialty categories such as financial lines, marine, energy, aviation, political risk and construction risk, as well as group A&H and traditional and specialty personal lines.

- The Global Reinsurance segment primarily includes the reinsurance business written by Chubb Tempest Re. Chubb Tempest Re provides a broad range of traditional and specialty reinsurance coverages to a diverse array of primary P&C companies.

- The Life Insurance segment includes Chubb's international life operations written by Chubb Life, Chubb Tempest Life Re and the North American supplemental A&H and life business of Combined Insurance.

Corporate primarily includes the results of all run-off asbestos and environmental (A&E) exposures, our run-off Brandywine business, and our Westchester specialty operations for 1996 and prior years, and certain other run-off exposures. In addition, Corporate includes the results of our non-insurance companies including Chubb Limited, Chubb Group Management and Holdings Ltd., and Chubb INA Holdings Inc. Our exposure to A&E claims principally arises out of liabilities acquired when we purchased Westchester Specialty in 1998, CIGNA's P&C business in 1999, and the Chubb Corp run-off business in 2016.

In addition, revenue and expenses managed at the corporate level, including realized gains and losses, interest expense, the non-operating income of our partially-owned entities, and income taxes are reported within Corporate. Chubb integration expenses and other merger-related expenses (both included in Chubb integration expenses in the Consolidated statements of operations), and the one-time benefit recorded in 2016 related to the harmonization of our U.S. pension plans, are also reported within Corporate. Chubb integration expenses are one-time costs that are directly attributable to the achievement of the annualized savings, including employee severance, third-party consulting fees, and systems integration expenses. Other merger-related expenses are one-time costs directly attributable to the merger, including rebranding, employee retention costs and other professional and legal fees related to the Chubb Corp acquisition. These items will not be allocated to the segment level as they are one-time in nature and are not related to the ongoing business activities of the segment. The Chief Executive Officer does not manage segment results or allocate resources to segments when considering these costs and they are therefore excluded from our definition of segment income. Therefore, segment income will only include underwriting income, net investment income, and other operating income and expense items such as each segment's share of the operating income (loss) related to partially-owned entities and miscellaneous income and expense items for which the segments are held accountable. Segment income also includes amortization of purchased intangibles related to business combination intangible assets acquired by the segment and other purchase accounting related intangible assets, including agency relationships, renewal rights, and client lists. The amortization of intangible assets purchased as part of the Chubb Corp acquisition is considered a Corporate cost as these are incurred by the overall company. We determined that this definition of segment income is appropriate and aligns with how the business is managed. We continue to evaluate our segments as our business continues to evolve and may further refine our segments and segment income measures.

For segment reporting purposes, certain items are presented in a different manner below than in the consolidated financial statements. Management uses underwriting income as the main measures of segment performance. Chubb calculates underwriting income by subtracting Losses and loss expenses, Policy benefits, Policy acquisition costs, and Administrative expenses from Net premiums earned. To calculate segment income, include Net investment income, Other (income) expense, and Amortization of purchased intangibles. For the North America Agricultural Insurance segment, management includes gains and losses on crop derivatives as a component of underwriting income. For example, for the year ended December 31, 2018, underwriting income in our North America Agricultural Insurance segment was $385 million. This amount includes $3 million of realized losses related to crop derivatives which are reported in Net realized gains (losses) in the Corporate column below.

For the Life Insurance segment, management includes Net investment income and (Gains) losses from fair value changes in separate account assets that do not qualify for separate account reporting under GAAP as components of Life Insurance underwriting income. For example, for the year ended December 31, 2018, Life Insurance underwriting income of $298 million includes Net investment income of $341 million and losses from fair value changes in separate account assets of $38 million. The losses from fair value changes in separate account assets are reported in Other (income) expense in the table below.

The following tables present the Statement of Operations by segment:

For the Year Ended December 31, 2018 (in millions of U.S. dollars)	North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Life Insurance	Corporate	Chubb Consolidated
Net premiums written	$ 12,485	$ 4,674	$ 1,577	$ 8,902	$ 671	$ 2,270	$ —	$ 30,579
Net premiums earned	12,402	4,593	1,569	8,612	670	2,218	—	30,064
Losses and loss expenses	8,000	3,229	1,111	4,429	479	766	53	18,067
Policy benefits	—	—	—	—	—	590	—	590
Policy acquisition costs	1,829	939	79	2,346	162	557	—	5,912
Administrative expenses	966	269	(9)	1,014	41	310	295	2,886
Underwriting income (loss)	1,607	156	388	823	(12)	(5)	(348)	2,609
Net investment income (loss)	2,033	236	28	619	257	341	(209)	3,305
Other (income) expense	(25)	1	2	—	(32)	26	(406)	(434)
Amortization expense of purchased intangibles	—	13	28	41	—	2	255	339
Segment income (loss)	$ 3,665	$ 378	$ 386	$ 1,401	$ 277	$ 308	$ (406)	$ 6,009
Net realized gains (losses) including OTTI							(652)	(652)
Interest expense							641	641
Chubb integration expenses							59	59
Income tax expense							695	695
Net income (loss)							$ (2,453)	$ 3,962

For the Year Ended December 31, 2017 (in millions of U.S. dollars)	North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Life Insurance	Corporate	Chubb Consolidated
Net premiums written	$ 12,019	$ 4,533	$ 1,516	$ 8,350	$ 685	$ 2,141	$ —	$ 29,244
Net premiums earned	12,191	4,399	1,508	8,131	704	2,101	—	29,034
Losses and loss expenses	8,287	3,265	1,036	4,281	561	739	285	18,454
Policy benefits	—	—	—	—	—	676	—	676
Policy acquisition costs	1,873	899	81	2,221	177	530	—	5,781
Administrative expenses	981	264	(8)	982	44	303	267	2,833
Underwriting income (loss)	1,050	(29)	399	647	(78)	(147)	(552)	1,290
Net investment income (loss)	1,961	226	25	610	273	313	(283)	3,125
Other (income) expense	1	4	2	(4)	(1)	(84)	(318)	(400)
Amortization expense of purchased intangibles	—	16	29	45	—	2	168	260
Segment income (loss)	$ 3,010	$ 177	$ 393	$ 1,216	$ 196	$ 248	$ (685)	$ 4,555
Net realized gains (losses) including OTTI							84	84
Interest expense							607	607
Chubb integration expense							310	310
Income tax benefit							(139)	(139)
Net income (loss)							$ (1,379)	$ 3,861

For the Year Ended December 31, 2016 (in millions of U.S. dollars)	North America Commercial P&C Insurance	North America Personal P&C Insurance	North America Agricultural Insurance	Overseas General Insurance	Global Reinsurance	Life Insurance	Corporate	Chubb Consolidated
Net premiums written	$ 11,740	$ 4,153	$ 1,328	$ 8,124	$ 676	$ 2,124	$ —	$ 28,145
Net premiums earned	12,217	4,319	1,316	8,132	710	2,055	—	28,749
Losses and loss expenses	7,439	2,558	893	4,005	325	663	169	16,052
Policy benefits	—	—	—	—	—	588	—	588
Policy acquisition costs	2,023	966	83	2,136	187	509	—	5,904
Administrative expenses	1,125	363	(6)	1,057	52	307	183	3,081
Underwriting income (loss)	1,630	432	346	934	146	(12)	(352)	3,124
Net investment income (loss)	1,860	207	20	600	263	283	(368)	2,865
Other (income) expense	(2)	6	1	(11)	(4)	5	(217)	(222)
Amortization expense (benefit) of purchased intangibles	—	19	29	48	—	3	(80)	19
Segment income (loss)	$ 3,492	$ 614	$ 336	$ 1,497	$ 413	$ 263	$ (423)	$ 6,192
Net realized gains (losses) including OTTI							(145)	(145)
Interest expense							605	605
Chubb Integration Expense							492	492
Income tax expense							815	815
Net income (loss)							$ (2,480)	$ 4,135

Underwriting assets are reviewed in total by management for purposes of decision-making. Other than Unpaid losses and loss expenses, Reinsurance recoverables, Goodwill and Other intangible assets, Chubb does not allocate assets to its segments.

The following table presents net premiums earned for each segment by line of business:

	For the Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
North America Commercial P&C Insurance			
Property & other short-tail lines	**$ 1,861**	$ 1,899	$ 1,963
Casualty & all other	**9,773**	9,554	9,552
A&H	**768**	738	702
Total North America Commercial P&C Insurance	**12,402**	12,191	12,217
North America Personal P&C Insurance			
Personal automobile	**803**	742	699
Personal homeowners	**3,127**	3,014	3,007
Personal other	**663**	643	613
Total North America Personal P&C Insurance	**4,593**	4,399	4,319
North America Agricultural Insurance	**1,569**	1,508	1,316
Overseas General Insurance			
Property & other short-tail lines	**2,134**	2,076	2,133
Casualty & all other	**2,429**	2,266	2,177
Personal lines	**1,784**	1,609	1,626
A&H	**2,265**	2,180	2,196
Total Overseas General Insurance	**8,612**	8,131	8,132
Global Reinsurance			
Property & other short-tail lines	**123**	132	118
Property catastrophe	**170**	198	185
Casualty & all other	**377**	374	407
Total Global Reinsurance	**670**	704	710
Life Insurance			
Life	**1,022**	980	1,002
A&H	**1,196**	1,121	1,053
Total Life Insurance	**2,218**	2,101	2,055
Total net premiums earned	**$ 30,064**	$ 29,034	$ 28,749

The following table presents net premiums earned by geographic region. Allocations have been made on the basis of location of risk:

	North America	Europe [(1)]	Asia Pacific / Far East	Latin America
2018	**70%**	**11%**	**12%**	**7%**
2017	70%	11%	12%	7%
2016	70%	12%	11%	7%

(1) Europe includes Eurasia and Africa regions.

15. Earnings per share

(in millions of U.S. dollars, except share and per share data)	Year Ended December 31 2018	2017	2016
Numerator:			
Net income	**$ 3,962**	$ 3,861	$ 4,135
Denominator:			
Denominator for basic earnings per share:			
Weighted-average shares outstanding	**463,629,203**	467,145,716	462,519,789
Denominator for diluted earnings per share:			
Share-based compensation plans	**3,173,145**	4,051,185	3,429,610
Weighted-average shares outstanding and assumed conversions	**466,802,348**	471,196,901	465,949,399
Basic earnings per share	**$ 8.55**	$ 8.26	$ 8.94
Diluted earnings per share	**$ 8.49**	$ 8.19	$ 8.87
Potential anti-dilutive share conversions	**3,543,188**	1,776,025	1,206,828

Excluded from weighted-average shares outstanding and assumed conversions is the impact of securities that would have been anti-dilutive during the respective years.

16. Related party transactions

Starr Indemnity & Liability Company and its affiliates (collectively, Starr)

We have a number of agency and reinsurance agreements with Starr, the Chairman of which is related to a member of our senior management team. Our Board has reviewed and approved our arrangements with Starr. We have agency, claims services and underwriting services agreements with various Starr subsidiaries. Under the agency agreements, we secure the ability to sell our insurance policies through Starr as one of our non-exclusive agents for writing policies, contracts, binders, or agreements of insurance or reinsurance. Under the claims services agreements, Starr adjusts the claims under policies and arranges for third party treaty and facultative agreements covering such policies. Under the underwriting services agreements, Starr underwrites insurance policies on our behalf and we agree to reinsure such policies to Starr under one or more quota reinsurance agreements.

Certain agency agreements also contain a profit-sharing arrangement based on loss ratios, triggered if Starr underwrites a minimum of $20 million of annual program business net premiums written on our behalf. No profit share commission has been payable yet under this arrangement. Another agency agreement contains a profit-sharing arrangement based on the earned premiums for the business underwritten by Starr (excluding workers' compensation) and the reinsurance recoveries associated with excess of loss reinsurance agreements placed by Starr for the business underwritten. No profit share commission under this arrangement has been payable yet. Transactions generated under Starr agreements were as follows:

(in millions of U.S. dollars)	Year Ended December 31 2018	2017	2016
Consolidated statement of operations			
Gross premiums written	**$ 411**	$ 464	$ 658
Ceded premiums written	**$ 188**	$ 175	$ 208
Commissions paid	**$ 84**	$ 101	$ 145
Commissions received	**$ 42**	$ 37	$ 56
Losses and loss expenses incurred	**$ 188**	$ 438	$ 313
Consolidated balance sheets			
Reinsurance recoverable on losses and loss expenses	**$ 514**	$ 557	
Ceded reinsurance premium payable	**$ 75**	$ 44	

ABR Re

We own 11.7 percent of the common equity of ABR Reinsurance Capital Holdings Ltd. and warrants to acquire 0.5 percent of additional equity. ABR Reinsurance Capital Holdings Ltd., is the parent company of ABR Reinsurance Ltd. (ABR Re), an independent reinsurance company. Through long-term arrangements, Chubb will be the sole source of reinsurance risks ceded to ABR Re, and BlackRock, Inc. will be ABR Re's exclusive investment management service provider. As an investor, Chubb is expected to benefit from underwriting profit generated by ABR Re's reinsuring a wide range of Chubb's primary insurance business and the income and capital appreciation BlackRock, Inc. seeks to deliver through its investment management services. In addition, Chubb has entered into an arrangement with BlackRock, Inc. under which both Chubb and BlackRock, Inc. will be entitled to an equal share of the aggregate amount of certain fees, including underwriting and investment management performance related fees, in connection with their respective reinsurance and investment management arrangements with ABR Re.

ABR Re is a variable interest entity; however, Chubb is not the primary beneficiary and does not consolidate ABR Re because Chubb does not have the power to control and direct ABR Re's most significant activities, including investing and underwriting. Our minority ownership interest is accounted for under the equity method of accounting. Chubb cedes premiums to ABR Re and recognizes the associated commissions.

Transactions generated under ABR Re agreements were as follows:

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Consolidated statement of operations			
Ceded premiums written	**$ 329**	$ 342	$ 288
Commissions received	**$ 96**	$ 94	$ 66
Consolidated balance sheets			
Reinsurance recoverable on losses and loss expenses	**$ 557**	$ 365	
Ceded reinsurance premium payable	**$ 47**	$ 51	

17. Statutory financial information

Our subsidiaries file financial statements prepared in accordance with statutory accounting practices prescribed or permitted by insurance regulators. Statutory accounting differs from GAAP in the reporting of certain reinsurance contracts, investments, subsidiaries, acquisition expenses, fixed assets, deferred income taxes, and certain other items. Some jurisdictions impose complex regulatory requirements on insurance companies while other jurisdictions impose fewer requirements. In some jurisdictions, we must obtain licenses issued by governmental authorities to conduct local insurance business. These licenses may be subject to reserves and minimum capital and solvency tests. Jurisdictions may impose fines, censure, and/or criminal sanctions for violation of regulatory requirements. The 2018 amounts below are based on estimates.

Chubb's insurance and reinsurance subsidiaries are subject to insurance laws and regulations in the jurisdictions in which they operate. These regulations include restrictions that limit the amount of dividends or other distributions, such as loans or cash advances, available to shareholders without prior approval of the local insurance regulatory authorities. The amount of dividends available to be paid in 2019 without prior approval totals $6.1 billion.

The statutory capital and surplus of our insurance subsidiaries met regulatory requirements for 2018, 2017, and 2016. The minimum amounts of statutory capital and surplus necessary to satisfy regulatory requirements was $25.9 billion and $23.9 billion for December 31, 2018 and 2017, respectively. These minimum regulatory capital requirements were significantly lower than the corresponding amounts required by the rating agencies which review Chubb’s insurance and reinsurance subsidiaries.

The following tables present the combined statutory capital and surplus and statutory net income (loss) of our Property and casualty and Life subsidiaries:

	December 31	
(in millions of U.S. dollars)	**2018**	2017
Statutory capital and surplus		
Property and casualty	**$ 40,985**	$ 39,927
Life	**$ 1,310**	$ 1,515

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Statutory net income (loss)			
Property and casualty	**$ 7,499**	$ 8,178	$ 6,903
Life	**$ (111)**	$ 49	$ 55

Several insurance subsidiaries follow accounting practices prescribed or permitted by the jurisdiction of domicile that differ from the applicable local statutory practice. The application of prescribed or permitted accounting practices does not have a material impact on Chubb's statutory surplus and income. As prescribed by the Restructuring discussed previously in Note 6, certain of our U.S. subsidiaries discount certain A&E liabilities, which increased statutory capital and surplus by approximately $160 million and $169 million at December 31, 2018 and 2017, respectively.

Federal Insurance Company (Federal), a direct subsidiary of Chubb INA Holdings Inc., has a permitted practice granted by the Indiana Department of Insurance that relates to its investments in foreign subsidiaries and affiliates. Under Statement of Statutory Accounting Principles No. 97, Investments in Subsidiary, Controlled and Affiliated Entities, A Replacement of SSAP No. 88, in order for a reporting entity to admit its investments in foreign subsidiaries and affiliates, audited financial statements of the subsidiary or affiliate must be obtained to support the carrying value. Such financial statements must be prepared in accordance with U.S. GAAP, or alternatively, in accordance with the local statutory requirements in the subsidiary’s or affiliate’s country of domicile, with an audited footnote reconciliation of net income and shareholder’s equity as reported to a U.S. GAAP basis. With the explicit permission of the Indiana Department of Insurance, Federal obtains audited financial statements for its admitted foreign subsidiaries and affiliates, which had an aggregate carrying value of approximately $183 million and $156 million at December 31, 2018 and 2017, respectively, prepared in accordance with their respective local statutory requirements and supplemented with a separate unaudited reconciliation of shareholder’s equity as reported to a U.S. GAAP basis.

18. Information provided in connection with outstanding debt of subsidiaries

The following tables present condensed consolidating financial information at December 31, 2018 and December 31, 2017, and for the years ended December 31, 2018, 2017, and 2016 for Chubb Limited (Parent Guarantor) and Chubb INA Holdings Inc. (Subsidiary Issuer). The Subsidiary Issuer is an indirect 100 percent-owned subsidiary of the Parent Guarantor. The Parent Guarantor fully and unconditionally guarantees certain of the debt of the Subsidiary Issuer. Condensed consolidating financial information of the Parent Guarantor and Subsidiary Issuer are presented on the equity method of accounting. The revenues and expenses and cash flows of the subsidiaries of the Subsidiary Issuer are presented in the Other Chubb Limited Subsidiaries column on a combined basis.

Condensed Consolidating Balance Sheet at December 31, 2018

(in millions of U.S. dollars)	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
Assets					
Investments	$ —	$ 214	$ 100,754	$ —	$ 100,968
Cash [1]	1	2	1,896	(652)	1,247
Restricted Cash	—	—	93	—	93
Insurance and reinsurance balances receivable	—	—	11,861	(1,786)	10,075
Reinsurance recoverable on losses and loss expenses	—	—	26,422	(10,429)	15,993
Reinsurance recoverable on policy benefits	—	—	306	(104)	202
Value of business acquired	—	—	295	—	295
Goodwill and other intangible assets	—	—	21,414	—	21,414
Investments in subsidiaries	43,531	50,209	—	(93,740)	—
Due from subsidiaries and affiliates, net	7,074	—	598	(7,672)	—
Other assets	3	1,007	18,102	(1,628)	17,484
Total assets	$ 50,609	$ 51,432	$ 181,741	$ (116,011)	$ 167,771
Liabilities					
Unpaid losses and loss expenses	$ —	$ —	$ 72,857	$ (9,897)	$ 62,960
Unearned premiums	—	—	16,611	(1,079)	15,532
Future policy benefits	—	—	5,610	(104)	5,506
Due to subsidiaries and affiliates, net	—	7,672	—	(7,672)	—
Affiliated notional cash pooling programs[1]	35	617	—	(652)	—
Repurchase agreements	—	—	1,418	—	1,418
Short-term debt	—	500	9	—	509
Long-term debt	—	12,086	1	—	12,087
Trust preferred securities	—	308	—	—	308
Other liabilities	262	2,545	19,199	(2,867)	19,139
Total liabilities	297	23,728	115,705	(22,271)	117,459
Total shareholders' equity	50,312	27,704	66,036	(93,740)	50,312
Total liabilities and shareholders' equity	$ 50,609	$ 51,432	$ 181,741	$ (116,011)	$ 167,771

(1) Chubb maintains two notional multicurrency cash pools (Pools) with a third-party bank. Refer to Note 1 f) for additional information. At December 31, 2018, the cash balance of one or more entities was negative; however, the overall Pool balances were positive.

Condensed Consolidating Balance Sheet at December 31, 2017

(in millions of U.S. dollars)	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
Assets					
Investments	$ —	$ 168	$ 102,276	$ —	$ 102,444
Cash [1]	3	1	839	(115)	728
Restricted Cash	—	—	123	—	123
Insurance and reinsurance balances receivable	—	—	10,820	(1,486)	9,334
Reinsurance recoverable on losses and loss expenses	—	—	27,514	(12,480)	15,034
Reinsurance recoverable on policy benefits	—	—	1,194	(1,010)	184
Value of business acquired	—	—	326	—	326
Goodwill and other intangible assets	—	—	22,054	—	22,054
Investments in subsidiaries	41,909	51,165	—	(93,074)	—
Due from subsidiaries and affiliates, net	9,639	—	—	(9,639)	—
Other assets	3	287	20,578	(4,073)	16,795
Total assets	$ 51,554	$ 51,621	$ 185,724	$ (121,877)	$ 167,022
Liabilities					
Unpaid losses and loss expenses	$ —	$ —	$ 74,767	$ (11,588)	$ 63,179
Unearned premiums	—	—	18,875	(3,659)	15,216
Future policy benefits	—	—	6,331	(1,010)	5,321
Due to subsidiaries and affiliates, net	—	9,432	207	(9,639)	—
Affiliated notional cash pooling programs[1]	—	115	—	(115)	—
Repurchase agreements	—	—	1,408	—	1,408
Short-term debt	—	1,013	—	—	1,013
Long-term debt	—	11,546	10	—	11,556
Trust preferred securities	—	308	—	—	308
Other liabilities	382	1,411	18,848	(2,792)	17,849
Total liabilities	382	23,825	120,446	(28,803)	115,850
Total shareholders' equity	51,172	27,796	65,278	(93,074)	51,172
Total liabilities and shareholders' equity	$ 51,554	$ 51,621	$ 185,724	$ (121,877)	$ 167,022

(1) Chubb maintains two notional multicurrency cash pools (Pools) with a third-party bank. Refer to Note 1 f) for additional information. At December 31, 2017, the cash balance of one or more entities was negative; however, the overall Pool balances were positive.

Condensed Consolidating Statements of Operations and Comprehensive Income (Loss)

For the Year Ended December 31, 2018 (in millions of U.S. dollars)	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
Net premiums written	$ —	$ —	$ 30,579	$ —	$ 30,579
Net premiums earned	—	—	30,064	—	30,064
Net investment income	6	13	3,286	—	3,305
Equity in earnings of subsidiaries	3,753	2,578	—	(6,331)	—
Net realized gains (losses) including OTTI	—	117	(769)	—	(652)
Losses and loss expenses	—	—	18,067	—	18,067
Policy benefits	—	—	590	—	590
Policy acquisition costs and administrative expenses	87	(58)	8,769	—	8,798
Interest (income) expense	(299)	806	134	—	641
Other (income) expense	(24)	26	(436)	—	(434)
Amortization of purchased intangibles	—	—	339	—	339
Chubb integration expenses	14	1	44	—	59
Income tax expense (benefit)	19	(148)	824	—	695
Net income	$ 3,962	$ 2,081	$ 4,250	$ (6,331)	$ 3,962
Comprehensive income (loss)	$ 1,242	$ (27)	$ 1,808	$ (1,781)	$ 1,242

Condensed Consolidating Statements of Operations and Comprehensive Income

For the Year Ended December 31, 2017 (in millions of U.S. dollars)	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
Net premiums written	$ —	$ —	$ 29,244	$ —	$ 29,244
Net premiums earned	—	—	29,034	—	29,034
Net investment income	4	14	3,107	—	3,125
Equity in earnings of subsidiaries	3,640	2,424	—	(6,064)	—
Net realized gains (losses) including OTTI	—	(25)	109	—	84
Losses and loss expenses	—	—	18,454	—	18,454
Policy benefits	—	—	676	—	676
Policy acquisition costs and administrative expenses	75	40	8,499	—	8,614
Interest (income) expense	(332)	847	92	—	607
Other (income) expense	(12)	93	(481)	—	(400)
Amortization of purchased intangibles	—	—	260	—	260
Chubb integration expenses	32	69	209	—	310
Income tax expense (benefit)	20	(742)	583	—	(139)
Net income	$ 3,861	$ 2,106	$ 3,958	$ (6,064)	$ 3,861
Comprehensive income	$ 4,718	$ 3,075	$ 4,430	$ (7,505)	$ 4,718

Condensed Consolidating Statements of Operations and Comprehensive Income

For the Year Ended December 31, 2016 (in millions of U.S. dollars)	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
Net premiums written	$ —	$ —	$ 28,145	$ —	$ 28,145
Net premiums earned	—	—	28,749	—	28,749
Net investment income	3	11	2,851	—	2,865
Equity in earnings of subsidiaries	3,901	2,555	—	(6,456)	—
Net realized gains (losses) including OTTI	—	3	(148)	—	(145)
Losses and loss expenses	—	—	16,052	—	16,052
Policy benefits	—	—	588	—	588
Policy acquisition costs and administrative expenses	64	82	8,839	—	8,985
Interest (income) expense	(353)	908	50	—	605
Other (income) expense	(25)	35	(232)	—	(222)
Amortization of purchased intangibles	—	—	19	—	19
Chubb integration expenses	62	126	304	—	492
Income tax expense (benefit)	21	(416)	1,210	—	815
Net income	$ 4,135	$ 1,834	$ 4,622	$ (6,456)	$ 4,135
Comprehensive income	$ 4,556	$ 2,001	$ 5,045	$ (7,046)	$ 4,556

Condensed Consolidating Statement of Cash Flows

For the Year Ended December 31, 2018 (in millions of U.S. dollars)	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
Net cash flows from operating activities	$ 256	$ 4,654	$ 5,878	$ (5,308)	$ 5,480
Cash flows from investing activities					
Purchases of fixed maturities available for sale	—	(38)	(24,697)	—	(24,735)
Purchases of fixed maturities held to maturity	—	—	(456)	—	(456)
Purchases of equity securities	—	—	(207)	—	(207)
Sales of fixed maturities available for sale	—	11	14,019	—	14,030
Sales of equity securities	—	—	315	—	315
Maturities and redemptions of fixed maturities available for sale	—	17	7,335	—	7,352
Maturities and redemptions of fixed maturities held to maturity	—	—	1,124	—	1,124
Net change in short-term investments	—	3	513	—	516
Net derivative instruments settlements	—	(7)	23	—	16
Private equity contribution	—	—	(1,337)	—	(1,337)
Private equity distribution	—	—	980	—	980
Capital contribution	(1,475)	(3,550)	—	5,025	—
Other	—	(18)	(515)	—	(533)
Net cash flows used for investing activities	(1,475)	(3,582)	(2,903)	5,025	(2,935)
Cash flows from financing activities					
Dividends paid on Common Shares	(1,337)	—	—	—	(1,337)
Common Shares repurchased	—	—	(1,044)	—	(1,044)
Proceeds from issuance of long-term debt	—	2,171	—	—	2,171
Proceeds from issuance of repurchase agreements	—	—	2,029	—	2,029
Repayment of long-term debt	—	(2,000)	(1)	—	(2,001)
Repayment of repurchase agreements	—	—	(2,019)	—	(2,019)
Proceeds from share-based compensation plans	—	—	115	—	115
Advances (to) from affiliates	2,519	(1,744)	(775)	—	—
Dividends to parent company	—	—	(5,308)	5,308	—
Capital contribution	—	—	5,025	(5,025)	—
Net payments to affiliated notional cash pooling programs[(1)]	35	502	—	(537)	—
Policyholder contract deposits	—	—	453	—	453
Policyholder contract withdrawals	—	—	(358)	—	(358)
Net cash flows from (used for) financing activities	1,217	(1,071)	(1,883)	(254)	(1,991)
Effect of foreign currency rate changes on cash and restricted cash	—	—	(65)	—	(65)
Net increase (decrease) in cash and restricted cash	(2)	1	1,027	(537)	489
Cash and restricted cash – beginning of year [(1)]	3	1	962	(115)	851
Cash and restricted cash – end of year [(1)]	$ 1	$ 2	$ 1,989	$ (652)	$ 1,340

(1) Chubb maintains two notional multi-currency cash pools (Pools) with a third-party bank. Refer to Note 1 f) for additional information. At December 31, 2018 and 2017, the cash balance of one or more entities was negative; however, the overall Pool balances were positive.

Condensed Consolidating Statement of Cash Flows

For the Year Ended December 31, 2017 (in millions of U.S. dollars)	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
Net cash flows from operating activities	$ 781	$ 1,648	$ 4,598	$ (2,524)	$ 4,503
Cash flows from investing activities					
Purchases of fixed maturities available for sale	—	(9)	(25,738)	—	(25,747)
Purchases of fixed maturities held to maturity	—	—	(352)	—	(352)
Purchases of equity securities	—	—	(173)	—	(173)
Sales of fixed maturities available for sale	—	99	13,156	—	13,255
Sales of equity securities	—	—	187	—	187
Maturities and redemptions of fixed maturities available for sale	—	29	10,396	—	10,425
Maturities and redemptions of fixed maturities held to maturity	—	—	879	—	879
Net change in short-term investments	—	189	(726)	—	(537)
Net derivative instruments settlements	—	(15)	(250)	—	(265)
Private equity contributions	—	—	(648)	—	(648)
Private equity distributions	—	—	1,084	—	1,084
Other	—	(10)	(520)	—	(530)
Net cash flows from (used for) investing activities	—	283	(2,705)	—	(2,422)
Cash flows from financing activities					
Dividends paid on Common Shares	(1,308)	—	—	—	(1,308)
Common Shares repurchased	—	—	(801)	—	(801)
Proceeds from issuance of long-term debt	—	—	—	—	—
Proceeds from issuance of repurchase agreements	—	—	2,353	—	2,353
Repayment of long-term debt	—	(500)	(1)	—	(501)
Repayment of repurchase agreements	—	—	(2,348)	—	(2,348)
Proceeds from share-based compensation plans	—	—	151	—	151
Advances (to) from affiliates	892	(927)	35	—	—
Dividends to parent company	—	—	(2,524)	2,524	—
Net payments to affiliated notional cash pooling programs[(1)]	(363)	(504)	—	867	—
Policyholder contract deposits	—	—	442	—	442
Policyholder contract withdrawals	—	—	(307)	—	(307)
Net cash flows used for financing activities	(779)	(1,931)	(3,000)	3,391	(2,319)
Effect of foreign currency rate changes on cash and restricted cash	—	—	1	—	1
Net increase (decrease) in cash and restricted cash	2	—	(1,106)	867	(237)
Cash and restricted cash – beginning of year [(1)]	1	1	2,068	(982)	1,088
Cash and restricted cash – end of year [(1)]	$ 3	$ 1	$ 962	$ (115)	$ 851

(1) Chubb maintains two notional multi-currency cash pools (Pools) with a third-party bank. Refer to Note 1 f) for additional information. At December 31, 2017 and 2016, the cash balance of one or more entities was negative; however, the overall Pool balances were positive.

Condensed Consolidating Statement of Cash Flows

For the Year Ended December 31, 2016 (in millions of U.S. dollars)	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
Net cash flows from operating activities	$ 3,618	$ 4,305	$ 5,536	$ (8,167)	$ 5,292
Cash flows from investing activities					
Purchases of fixed maturities available for sale	—	(156)	(30,659)	—	(30,815)
Purchases of fixed maturities held to maturity	—	—	(282)	—	(282)
Purchases of equity securities	—	—	(146)	—	(146)
Sales of fixed maturities available for sale	—	66	16,611	—	16,677
Sales of equity securities	—	—	1,000	—	1,000
Maturities and redemptions of fixed maturities available for sale	—	66	9,283	—	9,349
Maturities and redemptions of fixed maturities held to maturity	—	—	958	—	958
Net change in short-term investments	—	7,943	4,407	—	12,350
Net derivative instruments settlements	—	(9)	(159)	—	(168)
Private equity contributions	—	—	(553)	—	(553)
Private equity distributions	—	—	958	—	958
Acquisition of subsidiaries (net of cash acquired of $71)	—	(14,282)	34	—	(14,248)
Capital contribution	(2,330)	(215)	(2,330)	4,875	—
Other	—	(3)	(399)	—	(402)
Net cash flows used for investing activities	(2,330)	(6,590)	(1,277)	4,875	(5,322)
Cash flows from financing activities					
Dividends paid on Common Shares	(1,173)	—	—	—	(1,173)
Proceeds from issuance of repurchase agreements	—	—	2,310	—	2,310
Repayment of repurchase agreements	—	—	(2,311)	—	(2,311)
Proceeds from share-based compensation plans	—	—	167	—	167
Advances (to) from affiliates	404	(572)	168	—	—
Dividends to parent company	—	—	(8,167)	8,167	—
Capital contribution	—	2,330	2,545	(4,875)	—
Net proceeds from (payments to) affiliated notional cash pooling programs[(1)]	(519)	530	—	(11)	—
Policyholder contract deposits	—	—	522	—	522
Policyholder contract withdrawals	—	—	(253)	—	(253)
Other	—	(4)	—	—	(4)
Net cash flows (used for) from financing activities	(1,288)	2,284	(5,019)	3,281	(742)
Effect of foreign currency rate changes on cash and restricted cash	—	—	(25)	—	(25)
Net increase (decrease) in cash and restricted cash	—	(1)	(785)	(11)	(797)
Cash and restricted cash – beginning of year [(1)]	1	2	2,853	(971)	1,885
Cash and restricted cash – end of year [(1)]	$ 1	$ 1	$ 2,068	$ (982)	$ 1,088

(1) Chubb maintains two notional multi-currency cash pools (Pools) with a third-party bank. Refer to Note 1 f) for additional information. At December 31, 2016 and 2015, the cash balance of one or more entities was negative; however, the overall Pool balances were positive.

19. Condensed unaudited quarterly financial data

	Three Months Ended			
(in millions of U.S. dollars, except per share data)	March 31 2018	June 30 2018	September 30 2018	December 31 2018
Net premiums earned	**$ 7,027**	**$ 7,664**	**$ 7,908**	**$ 7,465**
Net investment income	**806**	**828**	**823**	**848**
Net realized gains (losses) including OTTI	**(2)**	**18**	**19**	**(687)**
Total revenues	**$ 7,831**	**$ 8,510**	**$ 8,750**	**$ 7,626**
Losses and loss expenses	**$ 4,102**	**$ 4,487**	**$ 4,868**	**$ 4,610**
Policy benefits	**$ 151**	**$ 150**	**$ 127**	**$ 162**
Net income	**$ 1,082**	**$ 1,294**	**$ 1,231**	**$ 355**
Basic earnings per share	**$ 2.32**	**$ 2.78**	**$ 2.66**	**$ 0.77**
Diluted earnings per share	**$ 2.30**	**$ 2.76**	**$ 2.64**	**$ 0.76**

Net income for the three months ended December 31, 2018 included after-tax catastrophe losses of $506 million.

	Three Months Ended			
(in millions of U.S. dollars, except per share data)	March 31 2017	June 30 2017	September 30 2017	December 31 2017
Net premiums earned	$ 6,772	$ 7,237	$ 7,807	$ 7,218
Net investment income	745	770	813	797
Net realized gains (losses) including OTTI	(7)	101	(10)	—
Total revenues	$ 7,510	$ 8,108	$ 8,610	$ 8,015
Losses and loss expenses	$ 3,789	$ 4,146	$ 6,247	$ 4,272
Policy benefits	$ 168	$ 163	$ 169	$ 176
Net income (loss)	$ 1,093	$ 1,305	$ (70)	$ 1,533
Basic earnings (loss) per share	$ 2.33	$ 2.79	$ (0.15)	$ 3.29
Diluted earnings (loss) per share	$ 2.31	$ 2.77	$ (0.15)	$ 3.27

Net income for the three months ended September 30, 2017 included after-tax catastrophe losses of $1.5 billion. Net income for the three months ended December 31, 2017 included a one-time income tax transition benefit of $450 million related to the 2017 Tax Act. Refer to Note 7 for additional information.

SCHEDULE I

Chubb Limited and Subsidiaries

SUMMARY OF INVESTMENTS – OTHER THAN INVESTMENTS IN RELATED PARTIES

December 31, 2018 (in millions of U.S. dollars)	Cost or Amortized Cost	Fair Value	Amount at Which Shown in the Balance Sheet
Fixed maturities available for sale			
U.S. Treasury and agency	$ 4,158	$ 4,145	$ 4,145
Foreign	21,370	21,416	21,416
Corporate securities	27,183	26,583	26,583
Mortgage-backed securities	15,758	15,540	15,540
States, municipalities, and political subdivisions	10,854	10,786	10,786
Total fixed maturities available for sale	79,323	78,470	78,470
Fixed maturities held to maturity			
U.S. Treasury and agency	1,185	1,182	1,185
Foreign	1,549	1,542	1,549
Corporate securities	2,601	2,508	2,601
Mortgage-backed securities	2,524	2,486	2,524
States, municipalities, and political subdivisions	5,576	5,541	5,576
Total fixed maturities held to maturity	13,435	13,259	13,435
Equity securities			
Industrial, miscellaneous, and all other	770	770	770
Short-term investments	3,016	3,016	3,016
Other investments [1]	5,153	5,153	5,153
Total investments - other than investments in related parties	$ 101,697	$ 100,668	$ 100,844

[1] Excludes $124 million of related party investments.

CONDENSED FINANCIAL INFORMATION OF REGISTRANT

BALANCE SHEETS (Parent Company Only)

(in millions of U.S. dollars)	December 31 2018	December 31 2017
Assets		
Investments in subsidiaries and affiliates on equity basis	$ 43,531	$ 41,909
Total investments	43,531	41,909
Cash	1	3
Due from subsidiaries and affiliates, net	7,074	9,639
Other assets	3	3
Total assets	$ 50,609	$ 51,554
Liabilities		
Affiliated notional cash pooling programs [1]	$ 35	$ —
Accounts payable, accrued expenses, and other liabilities	262	382
Total liabilities	297	382
Shareholders' equity		
Common Shares	11,121	11,121
Common Shares in treasury	(2,618)	(1,944)
Additional paid-in capital	12,557	13,978
Retained earnings	31,700	27,474
Accumulated other comprehensive income (loss)	(2,448)	543
Total shareholders' equity	50,312	51,172
Total liabilities and shareholders' equity	$ 50,609	$ 51,554

(1) Chubb maintains two notional multicurrency cash pools (Pools) with a third-party bank. Refer to Note 1 f) for additional information.

The condensed financial information should be read in conjunction with the consolidated financial statements and notes thereto.

CONDENSED FINANCIAL INFORMATION OF REGISTRANT

STATEMENTS OF OPERATIONS (Parent Company Only)

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Revenues			
Investment income, including interest income	**$ 305**	$ 336	$ 356
Equity in net income of subsidiaries and affiliates	**3,753**	3,640	3,901
	4,058	3,976	4,257
Expenses			
Administrative and other (income) expense	**63**	63	39
Chubb integration expenses	**14**	32	62
Income tax expense	**19**	20	21
	96	115	122
Net income	**$ 3,962**	$ 3,861	$ 4,135
Comprehensive income	**$ 1,242**	$ 4,718	$ 4,556

The condensed financial information should be read in conjunction with the consolidated financial statements and notes thereto.

CONDENSED FINANCIAL INFORMATION OF REGISTRANT

STATEMENTS OF CASH FLOWS (Parent Company Only)

	Year Ended December 31		
(in millions of U.S. dollars)	**2018**	2017	2016
Net cash flows from operating activities [1]	**$ 256**	$ 781	$ 3,618
Cash flows from investing activities			
Capital contribution	**(1,475)**	—	(2,330)
Net cash flows used for investing activities	**(1,475)**	—	(2,330)
Cash flows from financing activities			
Dividends paid on Common Shares	**(1,337)**	(1,308)	(1,173)
Advances from affiliates	**2,519**	892	404
Net proceeds from (payments to) affiliated notional cash pooling programs [2]	**35**	(363)	(519)
Net cash flows from (used for) financing activities	**1,217**	(779)	(1,288)
Net increase (decrease) in cash and restricted cash	**(2)**	2	—
Cash and restricted cash – beginning of year	**3**	1	1
Cash and restricted cash – end of year	**$ 1**	$ 3	$ 1

(1) Includes cash dividends received from subsidiaries of $75 million, $450 million, and $3.4 billion in 2018, 2017, and 2016, respectively.

(2) Chubb maintains two notional multicurrency cash pools (Pools) with a third-party bank. Refer to Note 1 f) for additional information.

The condensed financial information should be read in conjunction with the consolidated financial statements and notes thereto.

SUPPLEMENTAL INFORMATION CONCERNING REINSURANCE

Premiums Earned

For the years ended December 31, 2018, 2017, and 2016 (in millions of U.S. dollars, except for percentages)	Direct Amount	Ceded To Other Companies	Assumed From Other Companies	Net Amount	Percentage of Amount Assumed to Net
2018					
Property and Casualty	**$ 28,793**	**$ 6,792**	**$ 2,812**	**$ 24,813**	**11%**
Accident and Health	**4,409**	**342**	**162**	**4,229**	**4%**
Life	**906**	**85**	**201**	**1,022**	**20%**
Total	**$ 34,108**	**$ 7,219**	**$ 3,175**	**$ 30,064**	**11%**
2017					
Property and Casualty	$ 27,774	$ 6,650	$ 2,891	$ 24,015	12%
Accident and Health	4,167	349	221	4,039	5%
Life	841	81	220	980	22%
Total	$ 32,782	$ 7,080	$ 3,332	$ 29,034	11%
2016					
Property and Casualty	$ 26,919	$ 6,407	$ 3,284	$ 23,796	14%
Accident and Health	4,047	315	219	3,951	6%
Life	845	84	241	1,002	24%
Total	$ 31,811	$ 6,806	$ 3,744	$ 28,749	13%

SCHEDULE VI

Chubb Limited and Subsidiaries

SUPPLEMENTARY INFORMATION CONCERNING PROPERTY AND CASUALTY OPERATIONS

As of and for the years ended December 31, 2018, 2017, and 2016
(in millions of U.S. dollars)

						Net Losses and Loss Expenses Incurred Related to				
	Deferred Policy Acquisition Costs	Net Reserves for Unpaid Losses and Loss Expenses	Unearned Premiums	Net Premiums Earned	Net Investment Income	Current Year	Prior Year	Amortization of Deferred Policy Acquisition Costs	Net Paid Losses and Loss Expenses	Net Premiums Written
2018	**$ 3,926**	**$ 48,271**	**$ 15,532**	**$ 29,042**	**$ 3,047**	**$ 19,048**	**$ (981)**	**$ 5,630**	**$ 18,340**	**$ 29,505**
2017	$ 3,805	$ 49,165	$ 15,216	$ 28,054	$ 2,890	$ 19,391	$ (937)	$ 5,519	$ 17,448	$ 28,225
2016	$ 3,537	$ 47,832	$ 14,779	$ 27,747	$ 2,656	$ 17,256	$ (1,204)	$ 5,654	$ 15,715	$ 27,074

REPORT OF THE STATUTORY AUDITOR TO THE GENERAL MEETING OF CHUBB LIMITED, ZURICH ON THE (US GAAP) CONSOLIDATED FINANCIAL STATEMENTS

Report of the statutory auditor on the consolidated financial statements

As statutory auditor, we have audited the consolidated financial statements of Chubb Limited and its subsidiaries (the Company), which comprise the consolidated balance sheet as of December 31, 2018, and the consolidated statement of operations and comprehensive income, consolidated statement of shareholders' equity, and consolidated statement of cash flows for the year then ended, and the related notes to the consolidated financial statements (pages F-6 to F-106).

Board of Directors' responsibility

The Board of Directors is responsible for the preparation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America (US GAAP) and the requirements of Swiss law. This responsibility includes designing, implementing and maintaining an internal control system relevant to the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error. The Board of Directors is further responsible for selecting and applying appropriate accounting policies and making accounting estimates that are reasonable in the circumstances.

Auditor's responsibility

Our responsibility is to express an opinion on the consolidated financial statements based on our audit. We conducted our audit in accordance with Swiss law, Swiss Auditing Standards and auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers the internal control system relevant to the entity's preparation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control system. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made, as well as evaluating the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018, and the results of its operations and its cash flows for the year then ended in accordance with accounting principles generally accepted in the United States of America (US GAAP), and comply with Swiss law.

Report on key audit matters based on the circular 1/2015 of the Federal Audit Oversight Authority
Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the consolidated financial statements of the current period. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Key audit matter	How our audit addressed the key audit matter
Valuation of unpaid losses and loss expenses, net of reinsurance At December 31, 2018, the Company's liability for unpaid losses and loss expenses was approximately $63.0 billion on a gross of reinsurance basis and $47.0 billion on a net of reinsurance basis. The liability for unpaid losses and loss expenses is based on historical loss emergence adjusted for changes in the business mix, legal environment, claims handling processes, or ceded reinsurance. Further disclosures are provided in footnote 6 of the consolidated financial statements. We focused on this area as 85% of the Company's net unpaid losses and loss expenses arise from difficult to estimate liabilities, with 63% arising from the Company's long-tail business (such as general liability, professional liability and motor liability), 19% from US sourced workers' compensation, and 3% from asbestos-related, environmental pollution and other long-term exposure claims. Additionally, liabilities in the long-tail business typically take years to develop, and require significant management judgments involving credibility of historical development patterns, which could be impacted by judicial, regulatory, economic, social or other factors.	***In relation to the valuation of unpaid losses and loss expenses, we performed the following procedures:*** • We assessed and tested the design and operating effectiveness of the Company's controls over the valuation of unpaid losses and loss expenses, and concluded that these operate effectively. • We assessed and evaluated external third party actuarial studies to corroborate the Company's carried reserves for unpaid losses and loss expenses and evaluated where differences in view existed. • With the support of our actuarial specialists we tested the valuation of unpaid losses and loss expenses at December 31, 2018. Specifically, we independently estimated the ultimate losses for selected long-tail lines of businesses, based on the size of the balance and the risk of misstatement, and compared these estimates with the Company's carried reserves and the results of third-party actuarial studies to understand significant differences in methodologies and assumptions, and evaluated whether the Company's estimates are within a reasonable range. Where management's carried reserves were different than the actuarially determined estimate, we also evaluated judgments made by management to support such differences. • We evaluated and tested the Company's approach in determining when emerging loss data was sufficiently credible to warrant adjustments to previously established reserves. We also assessed the consistency of management's approach period-over-period. • We evaluated management's documentation supporting their conclusions of the reserves, including evidence supporting significant judgments made, and evaluated the transparency of the Company's US GAAP financial statement footnote disclosures. Based on our audit procedures, we determined the valuation of unpaid losses and loss expenses, net of reinsurance, as of December 31, 2018, is within a reasonable range of actuarial estimates.

Valuation of certain types of investments included in level 2 and 3 in the valuation hierarchy

At December 31, 2018, the Company had total investments of approximately $101.0 billion, of which $77.2 billion and $1.8 billion were categorized as level 2 and 3 in the valuation hierarchy, respectively. Further disclosures are provided in footnote 2 and 3 of the consolidated financial statements.

We focused on certain types of investments included in level 2 and 3 in the valuation hierarchy, such as asset-backed securities of various collateral types and issuers with credit ratings below investment grade, because such investments are more complex and more difficult to value than others. These types of investments are more likely to be priced using models or inputs other than quoted prices, as these investments are not always traded in an active market. As such, inherent risks in valuation of such investments are higher.

In relation to the valuation of certain types of investments included in level 2 and 3 in the valuation hierarchy, we performed the following procedures:

- We assessed and tested the design and operating effectiveness of the Company's controls over the assessment of valuation of investments.
- We tested the reasonableness of management's recorded fair value estimates for a sample of securities by obtaining corroborative pricing from sources other than those used by the Company.
- With the support of our valuation specialists we tested pricing by developing a range of reasonable prices for a sample of securities through the use of our own models and compared to the pricing obtained by the Company.
- We evaluated the Company's US GAAP footnote disclosures in relation to the valuation hierarchy level at which such securities are disclosed, based on the market observability of the inputs used in each model.

Based on our audit procedures we determined that the pricing used to value level 2 and level 3 investments, and related disclosures were reasonable.

Report on other legal requirements

We confirm that we meet the legal requirements on licensing according to the Auditor Oversight Act (AOA) and independence (article 728 CO and article 11 AOA) and that there are no circumstances incompatible with our independence.

In accordance with article 728a paragraph 1 item 3 CO and Swiss Auditing Standard 890, we confirm that an internal control system exists which has been designed for the preparation of consolidated financial statements according to the instructions of the Board of Directors.

We recommend that the consolidated financial statements submitted to you be approved.

PricewaterhouseCoopers AG

/s/ Ray Kunz
Ray Kunz

Audit expert
Auditor in charge

/s/ Nicolas Juillerat
Nicolas Juillerat

Audit expert

Zurich, March 1, 2019

CHUBB LIMITED

SWISS STATUTORY FINANCIAL STATEMENTS

December 31, 2018

SWISS STATUTORY BALANCE SHEETS (Unconsolidated)
Chubb Limited

(in millions of Swiss francs)	**December 31 2018**	December 31 2017
Assets		
Cash and cash equivalents	**1**	3
Prepaid expenses and other assets	**1**	1
Receivable from subsidiaries	**128**	10
Total current assets	**130**	14
Investments in subsidiaries	**30,402**	28,974
Loans to subsidiaries	**7,217**	9,303
Other assets	**9**	10
Total non-current assets	**37,628**	38,287
Total assets	**37,758**	38,301
Liabilities		
Accounts payable	**74**	52
Payable to subsidiaries	**949**	532
Capital distribution payable	**342**	331
Deferred unrealized exchange gain	**40**	—
Total short-term liabilities	**1,405**	915
Total liabilities	**1,405**	915
Shareholders' equity		
Share capital	**11,587**	11,587
Statutory capital reserves:		
Capital contribution reserves	**12,226**	13,545
Reserve for dividends from capital contributions	**1,045**	1,039
Reserve for treasury shares	**2,538**	1,873
Treasury shares	**(2)**	(2)
Statutory retained earnings:		
Retained earnings	**8,679**	8,804
Profit for the period	**280**	540
Total shareholders' equity	**36,353**	37,386
Total liabilities and shareholders' equity	**37,758**	38,301

The accompanying notes form an integral part of these statutory financial statements

SWISS STATUTORY STATEMENTS OF INCOME (Unconsolidated)
Chubb Limited

For the years ended December 31, 2018 and 2017 (in millions of Swiss francs)	**2018**	2017
Dividend income	**74**	443
Interest income from subsidiaries	**312**	329
Interest (expense) to subsidiaries	**(16)**	—
Debt guarantee fee income	**33**	28
Administrative and other expenses	**(107)**	(115)
Operating results	**296**	685
Interest income (expense) third party only	**2**	2
Foreign exchange translation losses	**—**	(127)
Earnings before taxes	**298**	560
Tax expense	**(18)**	(20)
Profit for the year	**280**	540

The accompanying notes form an integral part of these statutory financial statements

1. Basis of presentation

Chubb Limited (Chubb), domiciled in Zurich, Switzerland, is the holding company of Chubb Group (Group) with a listing on the New York Stock Exchange (NYSE). Chubb's principal activity is the holding of subsidiaries. Revenues consist mainly of dividend and interest income. The accompanying financial statements comply with Swiss Law. The financial statements present the financial position of the holding company on a standalone basis and do not represent the consolidated financial position of the holding company and its subsidiaries.

The financial statements have been prepared in accordance with the provisions of commercial accounting as set out in the Swiss Code of Obligations (Art. 957 to 963b CO, effective since January 1, 2013).

All amounts in the notes are shown in millions of Swiss francs unless otherwise stated.

2. Significant accounting policies

a) Cash and cash equivalents
Cash and cash equivalents includes cash on hand and deposits with an original maturity of three months or less at time of purchase.

Chubb and certain of its subsidiaries (participating entities) have agreements with a third-party bank provider which implemented two international multi-currency notional cash pooling programs. In each program, participating entities establish deposit accounts in different currencies with the bank provider and each day the credit or debit balances in every account are notionally translated into a single currency (U.S. dollars) and then notionally pooled. Participants of the notional pool either pay or receive interest from the third-party bank provider. The bank extends overdraft credit to any participating entity as needed, provided that the overall notionally-pooled balance of all accounts in each pool at the end of each day is at least zero. Actual cash balances are not physically converted and are not commingled between legal entities. Any overdraft balances incurred under this program by a participating entity would be guaranteed by Chubb (up to $300 million in the aggregate). Our syndicated letter of credit facility allows for same day drawings to fund a net pool overdraft should participating entities withdraw contributed funds from the pool.

b) Investments in subsidiaries
Investments in subsidiaries are equity interests, which are held on a long-term basis for the purpose of the holding company's business activities. They are carried at a value no higher than their cost less adjustments for impairment. An impairment analysis of the investments in subsidiaries is performed on an annual basis.

c) Translation of foreign currencies
The financial statements are translated from U.S. Dollar into Swiss francs using the following exchange rates:
- Investments in subsidiaries at historical exchange rates;
- Other assets and liabilities at period end exchange rates;
- Treasury shares and shareholders' equity at historical exchange rates; and
- Revenues and expenses at average exchange rates.

Exchange losses are recorded in the statement of income and unrealized exchange gains are recorded on the balance sheet and deferred until realized.

d) Dividend income
Chubb collects dividend income from its direct subsidiaries.

e) Interest income (expense) from subsidiaries
Chubb collects interest income from loans issued to its subsidiaries which are reflected within operating income. Additionally, Chubb either collects or pays interest related to a reciprocal line of credit with one of its subsidiaries.

f) Debt guarantee fee income
Chubb collects a fee for Chubb's guarantee of the debt issued by one of its subsidiaries.

g) Integration expenses
As part of the January 14, 2016 acquisition of The Chubb Corporation (Chubb Corp), direct costs related to the Chubb Corp acquisition are expensed as incurred and are reported within Administrative and other expenses. Chubb integration expenses were CHF 14 million ($14 million) and CHF 31 million ($32 million) for the years ended December 31, 2018 and 2017, respectively, and include one-time rebranding costs directly attributable to the merger.

3. Commitments, contingencies, and guarantees

a) Letters of credit (LOC)
On October 25, 2017, Chubb entered into a credit facility that provides for up to $1.0 billion of availability, all of which may be used for the issuance of letters of credit and for revolving loans. Chubb has the ability to increase the capacity under the existing credit facility to $2.0 billion under certain conditions, but any such increase would not raise the sub-limit for revolving loans above $1.0 billion. Chubb's existing credit facility has a remaining term expiring in October 2022. At December 31, 2018, Chubb's LOC usage was CHF 391 million ($398 million).

The letter of credit facility required that Chubb maintains certain financial covenants, all of which were met at December 31, 2018.

b) Lease commitments
Chubb leases property under an operating lease which expires in 2023. The following table presents future annual minimum lease payments as of December 31, 2018.

Year ending December 31 (in millions of Swiss francs)	
2019	1.49
2020	1.49
2021	1.49
2022	1.49
2023	1.18
Thereafter	—
Total minimum future lease commitments	7.14

At December 31, 2017, the total minimum future lease commitments were CHF 1.31 million as the prior lease agreement expired on October 1, 2018.

c) Guarantee of debt
Chubb fully and unconditionally guarantees certain subsidiary debt totaling CHF 12.7 billion ($12.9 billion) and CHF 12.5 billion ($12.9 billion) at December 31, 2018 and 2017, respectively, and receives a fee.

4. Significant investments

a) Share capital:
The following table presents information regarding share capital held of subsidiaries at both December 31, 2018 and 2017. Amounts are expressed in whole U.S. dollars or Swiss francs.

Holdings as of December 31, 2018 and 2017	Country	% of Possession	Currency	Share Capital	Purpose
Chubb Group Holdings, Inc.	U.S.A.	100%	USD	11	Holding company
Chubb INA Holdings	U.S.A.	20%	USD	1	Holding company
Chubb Insurance (Switzerland) Limited	Switzerland	100%	CHF	100,000,000	Insurance company
Chubb Reinsurance (Switzerland) Limited	Switzerland	100%	CHF	44,000,000	Reinsurance
Chubb Group Management and Holdings Ltd.	Bermuda	100%	USD	100	Holding company

b) Investments in subsidiaries:

The following table presents information regarding investments in subsidiaries at both December 31, 2018 and 2017. Investments in subsidiaries increased CHF 1.4 billion ($1.5 billion) in 2018 due to capital contributions primarily to fund the Chubb share repurchase program executed by Chubb Group Management Holdings Ltd.

(in millions of Swiss francs)	**2018**	2017
Chubb Group Holdings, Inc.	**17,004**	17,004
Chubb INA Holdings	**2,043**	2,043
Chubb Group Management Holdings Ltd.	**10,928**	9,500
Chubb Insurance (Switzerland) Limited	**185**	185
Chubb Reinsurance (Switzerland) Limited	**242**	242
Balance - end of year	**30,402**	28,974

5. Common Share ownership of the Board of Directors and Group Executives

a) Board of Directors

The following table presents information, at December 31, 2018 and 2017, with respect to the beneficial ownership of Common Shares by each of our directors. Although Evan G. Greenberg is Chairman of the Board as well as the Chief Executive Officer, details of Mr. Greenberg's Common share ownership are included in Note 5 b) below. Unless otherwise indicated, the named individual has sole voting and investment power over the Common Shares listed in the Common Shares Beneficially Owned column.

Name of Beneficial Owner	Year	Common Shares	Restricted Stock Units (1)	Restricted Common Stock (2)
Michael G. Atieh (3)	**2018**	**4,279**	**34,547**	**1,264**
	2017	5,479	33,822	1,227
Sheila P. Burke	**2018**	**2,079**	**39,130**	**1,264**
	2017	1,159	38,915	1,227
James Cash	**2018**	**1,881**	**19,317**	**1,264**
	2017	961	19,248	1,227
Mary A. Cirillo	**2018**	**20,338**	**14,385**	**2,306**
	2017	18,661	14,083	2,237
Michael P. Connors	**2018**	**11,114**	**—**	**1,264**
	2017	10,194	—	1,227
John A. Edwardson	**2018**	**6,827**	**—**	**2,157**
	2017	5,258	—	2,093
Robert M. Hernandez	**2018**	**62,344**	**25,244**	**1,264**
	2017	61,424	24,714	1,227
Leo F. Mullin (4)	**2018**	**—**	**—**	**—**
	2017	13,213	5,520	1,227
Kimberly A. Ross	**2018**	**6,859**	**—**	**1,264**
	2017	5,290	—	2,093
Robert W. Scully (5)	**2018**	**27,052**	**—**	**2,417**
	2017	25,483	—	2,093
Eugene B. Shanks, Jr.	**2018**	**8,204**	**—**	**1,264**
	2017	7,284	—	1,227
Theodore E. Shasta	**2018**	**10,191**	**—**	**1,264**
	2017	9,271	—	1,227
David H. Sidwell	**2018**	**7,985**	**—**	**1,264**
	2017	7,065	—	1,227
Olivier Steimer	**2018**	**15,320**	**3,485**	**1,264**
	2017	14,176	3,412	1,227
James Zimmerman	**2018**	**5,152**	**17,078**	**1,264**
	2017	4,232	17,078	1,227
Total	**2018**	**189,625**	**153,186**	**20,784**
	2017	189,150	156,792	22,013

(1) Represents Common Shares that will be issued to the director upon his or her termination from the Board. These Common Shares relate to stock units granted as director's compensation prior to 2008 and associated dividend reinvestment accruals.

For Ms. Burke and Mr. Cash include deferred stock units and market value units granted prior to the merger that will settle following separation from service. The market value units includes dividend reinvestment accruals. For Mr. Zimmerman, it includes deferred stock units granted prior to the merger that will settle following separation from service.

(2) Represents Common Shares with respect to which the individual has the power to vote (but not to dispose of).

(3) Mr. Atieh shares with other persons the power to vote and/or dispose of 341 of the Common Shares listed at December 31, 2018 and 2017.

(4) Mr. Mullin retired from the Board upon the expiration of his term at the May 2018 annual general meeting.

(5) Includes 2,775 shares held by Mr. Scully's daughter, of which Mr. Scully disclaims beneficial ownership.

b) Group Executives

The following table presents information, at December 31, 2018 and 2017, with respect to the beneficial ownership of Common Shares by each of the following Group Executives. Unless otherwise indicated, the named individual has sole voting and investment power over the Common Shares listed in the Common Shares Beneficially Owned column.

Name of Beneficial Owner	Year	Common Shares Beneficially Owned	Common Shares Subject to Options [1]	Weighted Average Option Exercise Price in CHF	Option Exercise Years	Restricted Common Stock [2]
Evan G. Greenberg [3] [4]	**2018**	**1,049,537**	**941,594**	**85.46**	**4.25**	**172,442**
	2017	1,042,235	1,019,269	74.28	4.25	175,877
Philip V. Bancroft [5]	**2018**	**207,900**	**82,377**	**108.73**	**6.21**	**37,466**
	2017	249,516	64,311	103.58	6.69	42,243
John W. Keogh [6]	**2018**	**126,395**	**183,149**	**104.20**	**5.85**	**79,576**
	2017	107,941	151,847	99.60	6.39	80,485
Joseph Wayland	**2018**	**22,500**	**46,805**	**117.40**	**6.93**	**29,530**
	2017	16,030	33,841	113.45	7.49	28,997
Total	**2018**	**1,406,332**	**1,253,925**			**319,014**
	2017	1,415,722	1,269,268			327,602

(1) Represents Common Shares that the individual has the right to acquire within 60 days of December 31, 2018 and 2017, through option exercises, both vested and unvested.

(2) Represents Common Shares with respect to which the individual has the power to vote (but not to dispose of).

(3) Mr. Greenberg shares with other persons the power to vote and/or dispose of 97,528 and 115,298 of the Common Shares listed at December 31, 2018 and 2017, respectively.

(4) Mr. Greenberg pledged 240,000 Common Shares in connection with a margin account at December 31, 2018 and 2017.

(5) Mr. Bancroft pledged 41,000 Common Shares in connection with a margin account at December 31, 2018 and 2017.

(6) Mr. Keogh shares with other persons the power to vote and/or dispose of 2,702 of the Common Shares listed at December 31, 2018.

6. Shareholders' equity

The following table presents issued, authorized, and conditional share capital, at December 31, 2018 and 2017. Treasury shares held by Chubb which are issued, but not outstanding totaled 21,902 shares at both December 31, 2018 and 2017. In addition to the treasury shares held by Chubb, at December 31, 2018 and 2017, subsidiaries of Chubb held 20,558,584 treasury shares at a cost of CHF 2.5 billion ($2.6 billion) and 15,928,783 treasury shares at a cost of CHF 1.9 billion ($1.9 billion), respectively.

	Year ended December 31	
	2018	2017
Issued share capital	**479,783,864**	479,783,864
Authorized share capital for general purposes	**200,000,000**	200,000,000
Conditional share capital for bonds and similar debt instruments	**33,000,000**	33,000,000
Conditional share capital for employee benefit plans	**25,410,929**	25,410,929

a) Shares authorized and issued
All Common Shares are authorized under Swiss Corporate law. At December 31, 2018 and 2017, Chubb's share capital consisted of 479,783,864 Common Shares, with a par value of CHF 24.15 per share for both periods. The Board has shareholder-approved authority as set forth in the Articles of Association to increase for general purposes Chubb's share capital from time to time until May 17, 2020, by the issuance of up to 200,000,000 fully paid up Common Shares with a par value equal to the par value of Chubb's Common Shares as set forth in the Articles of Association at the time of any such issuance.

b) Conditional share capital
(i) Conditional share capital for bonds and similar debt instruments
At both December 31, 2018 and 2017, the share capital of Chubb was authorized to be increased through the issuance of a maximum of 33,000,000 fully paid up shares each with a par value of CHF 24.15 per share through the exercise of conversion and/or option or warrant rights granted in connection with bonds, notes, or similar instruments, issued or to be issued by Chubb, including convertible debt instruments.

(ii) Conditional share capital for employee benefit plans
At both December 31, 2018 and 2017, the share capital of Chubb was authorized to be increased through the issuance of a maximum of 25,410,929 fully paid up shares each with a par value of CHF 24.15 per share in connection with the exercise of option rights granted to any employee of Chubb or a subsidiary, and any consultant, director, or other person providing services to Chubb or a subsidiary.

c) Capital contribution reserves
At our May 2017 annual general meeting, our shareholders approved an annual dividend for the following year of up to $2.84 per share, which was paid in four quarterly installments of $0.71 per share at dates determined by the Board of Directors (Board) after the annual general meeting by way of a distribution from capital contribution reserves, transferred to free reserves for payment.

At our May 2018 annual general meeting, our shareholders approved an annual dividend for the following year of up to $2.92 per share, expected to be paid in four quarterly installments of $0.73 per share after the annual general meeting by way of distribution from capital contribution reserves, transferred to free reserves for payment. The Board will determine the record and payment dates at which the annual dividend may be paid until the date of the 2019 annual general meeting, and is authorized to abstain from distributing a dividend at its discretion. The first three quarterly installments of $0.73 per share have been distributed by the Board as expected.

The following table presents dividend distributions per Common Share in Swiss francs (CHF) and U.S. dollars (USD) for the years ended December 31, 2018 and 2017:

	2018		2017	
	CHF	**USD**	CHF	USD
Dividends - distributed from Capital contribution reserves	**2.84**	**$ 2.90**	2.76	$ 2.82
Total dividend distributions per common share	**2.84**	**$ 2.90**	2.76	$ 2.82

d) Treasury Shares - Reserve for Treasury shares
Treasury shares held by Chubb are carried at the lower of cost or market. Treasury shares held by Chubb totaled 21,902 at a cost of CHF 1.6 million for both years ended December 31, 2018 and 2017. Treasury shares held by Chubb subsidiaries are carried at the lower of cost or market. The following table presents a roll-forward of treasury shares held by Chubb subsidiaries for the years ended December 31, 2018 and 2017:

	2018		2017	
(cost in millions of Swiss francs)	**Number of Shares**	**Cost**	Number of Shares	Cost
Balance – beginning of year	**15,928,783**	**1,871**	13,793,246	1,391
Repurchase of shares	**7,719,035**	**999**	5,866,612	817
Additions related to share-based compensation plans	**1,121,923**	**146**	1,289,422	173
Redeemed under share-based compensation plans	**(4,211,157)**	**(478)**	(5,020,497)	(510)
Balance – end of year	**20,558,584**	**2,538**	15,928,783	1,871

Decreases in treasury shares held by Chubb and its subsidiaries are principally due to issuances of shares upon the exercise of employee stock options, grants of restricted stock, and purchases under the Employee Stock Purchase Plan (ESPP). Increases in treasury shares are due to open market repurchases of shares and the surrender of shares to satisfy tax withholding obligations in connection with the vesting of restricted stock and the forfeiture of unvested restricted stock.

e) Movements in Statutory Retained earnings

	Year ended December 31	
(in millions of Swiss francs)	**2018**	2017
Balance – beginning of year	**9,344**	9,284
Attribution to reserve for treasury shares	**(665)**	(480)
Profit for the year	**280**	540
Balance – end of year	**8,959**	9,344

f) Chubb securities repurchase authorization
From time to time, Chubb repurchases shares as part of our capital management program and to partially offset potential dilution from the exercise of stock options and the granting of restricted stock under share-based compensation plans. Our Board of Directors has authorized share repurchase programs as follows:

- $1.0 billion of Chubb Common Shares from November 17, 2016 through December 31, 2017
- $1.0 billion of Chubb Common Shares from January 1, 2018 through December 31, 2018
- $1.5 billion of Chubb Common Shares from December 1, 2018 through December 31, 2019

Share repurchases may be in the open market, in privately negotiated transactions, block trades, accelerated repurchases and/or through option or other forward transactions.

The following table presents repurchases of Chubb's Common Shares conducted in a series of open market transactions under the Board authorizations:

	Year ended December 31	
(in millions of Swiss francs)	**2018**	2017
Number of shares repurchased	**7,719,035**	5,866,612
Cost of shares repurchased	**999**	817

g) General restrictions
Holders of Common Shares are entitled to receive dividends as proposed by the Board and approved by the shareholders. Holders of Common Shares are allowed one vote per share provided that, if the controlled shares of any shareholder constitute ten percent or more of the outstanding Common Shares of Chubb, only a fraction of the vote will be allowed so as not to exceed ten percent. Entry of acquirers of Common Shares as shareholders with voting rights in the share register may be refused if it

would confer voting rights with respect to ten percent or more of the registered share capital recorded in the commercial register.

7. Significant shareholders

The following table presents information regarding each person, including corporate groups, known to Chubb to own beneficially or of record more than five percent of Chubb's outstanding Common Shares at December 31, 2018 and December 31, 2017.

	2018		2017	
Name of Beneficial Owner	**Number of Shares Beneficially Owned**	**Percent of Class**	Number of Shares Beneficially Owned	Percent of Class
Vanguard Group, Inc.	**38,234,960**	**8.29%**	36,217,268	7.80%
Wellington Management Group, LLP	**31,405,197**	**6.82%**	28,209,206	6.08%
BlackRock, Inc.	**31,252,910**	**6.80%**	30,206,383	6.50%
FMR LLC	*	*	26,140,134	5.63%

* Represented less than five percent

8. Other disclosures required by Swiss law

a) Expenses
Total personnel expenses amounted to CHF 8.8 million and CHF 10.0 million for the years ended December 31, 2018 and 2017, respectively. The number of full-time positions on an annual average was no more than 50 for years ended December 31, 2018 and 2017.

Total amortization expense related to tangible property amounted to CHF 0.6 million and CHF 0.7 million for the years ended December 31, 2018 and 2017, respectively.

b) Fees paid to auditors
Fees paid to auditors by Chubb Limited totaled CHF 4.2 million and CHF 3.2 million for the years ended December 31, 2018 and 2017, respectively. An allocation of audit fees for professional services rendered in connection with the integrated audit of our consolidated financial statements and internal controls over financial reporting and audit fees for the standalone Swiss statutory financial statements totaled CHF 3.9 million and CHF 2.8 million for the years ended December 31, 2018 and 2017, respectively. Tax fees totaled CHF 0.3 million and CHF 0.4 million for the years ended December 31, 2018 and 2017, respectively.

c) Loans to subsidiaries
The following table presents information regarding loans to subsidiaries at December 31, 2018 and 2017. Loans to subsidiaries decreased CHF 2.1 billion ($2.2 billion) due to a principal repayment in 2018. For additional information regarding loans to subsidiaries, refer to Note 19 to the Consolidated Financial Statements.

(in millions of Swiss francs)	**2018**	2017
Loans to Chubb Group Holdings, Inc.	**7,217**	9,303
Total loans to subsidiaries	**7,217**	9,303

d) Receivables from subsidiaries

The following table presents information regarding receivables from subsidiaries at December 31, 2018 and 2017.

(in millions of Swiss francs)	2018	2017
Receivables from Chubb Group Holdings, Inc.	**127**	8
Receivables from Chubb Group Management and Holdings, Ltd.	**1**	2
Total receivables from subsidiaries	**128**	10

e) Payable to subsidiaries

The following table presents information regarding payables to subsidiaries at December 31, 2018 and 2017, respectively.

(in millions of Swiss francs)	2018	2017
Payable to Chubb Group Holdings, Inc.	**343**	289
Payable to INA Holdings, Inc.	**457**	144
Payable to Chubb Group Management and Holdings, Ltd.	**137**	92
Payable to Chubb Insurance (Switzerland) Ltd.	**12**	7
Total payable to subsidiaries	**949**	532

Proposed appropriation of available earnings

Our Board of Directors proposes to the Annual General Meeting that the Company's disposable profit (including the net income and the other items as shown below) be carried forward. The following table shows the appropriation of available earnings as proposed by the Board of Directors for the year ended December 31, 2018.

(in millions of Swiss francs)	**2018**	2017
Balance brought forward	**9,344**	9,284
Profit for the year	**280**	540
Attribution to reserve for treasury shares	**(665)**	(480)
Balance carried forward	**8,959**	9,344

In order to pay dividends, our Board of Directors proposes that an aggregate amount equal to CHF 2.1 billion be released from the capital contribution reserves account in 2019 and allocated to a segregated reserve for dividends account (the "Dividend Reserve"). The Board proposes to distribute a dividend to the shareholders up to an aggregate amount totaling $3.00 per Common Share from, and limited at a maximum to the amount of, the Dividend Reserve in one or more installments, in such amounts and on such record and payment dates as determined by the Board in its discretion. If the Board deems it advisable for the Company, the Board shall be authorized to abstain (in whole or in part) from distributing a dividend in its discretion. The authorization of the Board to distribute the installments from the Dividend Reserve will expire on the date of the 2020 annual general meeting, on which date any balance remaining in the Dividend Reserve will be automatically reallocated to the capital contribution reserves account.

If the Annual General Meeting approves this proposal, our Board currently intends to distribute the dividend in four equal installments of $0.75 each, on record dates at about the end of June, September, December and March, respectively, with payment dates about 21 days thereafter.

At December 31, 2018, 479,783,864 of the Company's Common Shares were eligible for dividends.

At the 2018 annual general meeting, the Company’s shareholders approved an aggregate annual dividend by way of a distribution from Capital contribution reserves, transferred to free reserves at the time of payment in 2018 totaling $2.92 per Common Share. The annual dividend was payable in four installments, each denominated in CHF but adjusted appropriately so that the U.S. dollar value of the installment remained at $0.73. The installments were subject to a dividend cap expressed in CHF which was not reached for 2018.

REPORT OF THE STATUTORY AUDITOR TO THE GENERAL MEETING OF CHUBB LIMITED, ZURICH ON THE (SWISS STATUTORY) FINANCIAL STATEMENTS

Report on the audit of the financial statements

Opinion

We have audited the financial statements of Chubb Limited, which comprise the balance sheet as at December 31, 2018, income statement and notes for the year then ended, including a summary of significant accounting policies (pages S-2 to S-13).

In our opinion, the accompanying financial statements as at December 31, 2018 comply with Swiss law and the company's articles of association.

Basis for opinion

We conducted our audit in accordance with Swiss law and Swiss Auditing Standards. Our responsibilities under those provisions and standards are further described in the "Auditor's responsibilities for the audit of the financial statements" section of our report.

We are independent of the entity in accordance with the provisions of Swiss law and the requirements of the Swiss audit profession and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Report on key audit matters based on the circular 1/2015 of the Federal Audit Oversight Authority

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Key audit matter	How our audit addressed the key audit matter
Investments in subsidiaries	
As set out in the balance sheet and at footnote 4, the Company owns five direct subsidiaries as at December 31, 2018 with a total book value of CHF 30.4 billion, representing 81% of the Company's total assets. We focused on this area due to the size of the investments in subsidiaries relative to the total assets, and the fact that there is judgment involved in assessing whether the carrying values of the investments in subsidiaries were impaired. The Swiss accounting law generally requires an individual impairment test at the entity or unit of account level.	• We tested the design and operating effectiveness of the Company's control over the valuation of investments in subsidiaries. • We reviewed the Company's impairment analyses performed for the five direct subsidiaries. The assessment of potential impairment indicators included as a first step the comparison of the recorded Swiss statutory carrying value with the net asset value of each subsidiary. In case the net asset value was smaller than the carrying value, a secondary, more judgmental, step was followed using additional valuation techniques, such as a value-in-use assessment, to assess whether there was any potential need for impairment. • Where a value-in-use metric was used, we challenged management as to whether the input data and assumptions to their model were reliable and reasonable. The most important parameters were underwriting income, investment income and operating expenses. We concluded that the carrying value of the Company's investments in subsidiaries is in line with its accounting policy and the valuation requirements of the Swiss Code of Obligations.

Responsibilities of the Board of Directors for the financial statements
The Board of Directors is responsible for the preparation of the financial statements in accordance with the provisions of Swiss law and the company's articles of association, and for such internal control as the Board of Directors determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board of Directors is responsible for assessing the entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Board of Directors either intends to liquidate the entity or to cease operations, or has no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements
Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Swiss law and Swiss Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Swiss law and Swiss Auditing Standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made.
- Conclude on the appropriateness of the Board of Directors' use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the entity to cease to continue as a going concern.

We communicate with the Board of Directors or its relevant committee regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide the Board of Directors or its relevant committee with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with the Board of Directors or its relevant committee, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

Report on other legal and regulatory requirements

In accordance with article 728a paragraph 1 item 3 CO and Swiss Auditing Standard 890, we confirm that an internal control system exists which has been designed for the preparation of financial statements according to the instructions of the Board of Directors.

We further confirm that the proposed appropriation of available earnings complies with Swiss law and the company's articles of association. We recommend that the financial statements submitted to you be approved.

PricewaterhouseCoopers AG

/s/ Ray Kunz	/s/ Nicolas Juillerat
Ray Kunz	Nicholas Juillerat
Audit expert Auditor in charge	Audit expert

Zurich, February 27, 2019

CHUBB LIMITED

SWISS STATUTORY COMPENSATION REPORT

December 31, 2018

A. General

Under the Swiss ordinance against excessive compensation in stock exchange listed companies (the "Ordinance") and our Articles of Association, we are required to prepare a separate Swiss Statutory Compensation Report each year that contains specific items in a presentation format determined by these regulations.

Our Executive Management (as defined under Swiss law) is appointed by our Board and for each of 2018 and 2017 consisted of Evan G. Greenberg, Chairman, President and Chief Executive Officer; Philip V. Bancroft, Chief Financial Officer; John W. Keogh, Executive Vice Chairman and Chief Operating Officer; and Joseph F. Wayland, General Counsel and Secretary.

For more detailed information about compensation for our Board of Directors and Executive Management, please review our Proxy Statement. You may access this report on the Investor Information section of our website at http://investors.chubb.com/investor-relations/shareholder-resources/shareholder-meeting-materials/default.aspx or by contacting Investor Relations by telephone, email or mail at:

Telephone:	+1 (212) 827-4400
Email:	investorrelations@chubb.com
Mail:	Investor Relations, Chubb Limited, 1133 Avenue of the Americas, 41st Floor, New York, New York 10036

References in this report to "we," "our" or "Chubb" are to Chubb Limited.

B. Compensation of the Board of Directors and Executive Management

Basis of Presentation

The following information sets forth the compensation for the years ended December 31, 2018 and 2017, of the members of the Board and Executive Management for all of the functions that they have performed for Chubb. Compensation of the Board is paid by Chubb. Compensation of Executive Management is paid by Chubb and the Chubb group entities where they are employed. Compensation is paid as a combination of both U.S. dollars, our functional reporting currency, with translation of certain amounts to whole Swiss francs. Where presented, 2018 and 2017 Swiss franc compensation figures have been translated at the average exchange rates. Swiss franc-equivalent total compensation of the Board and Executive Management is included in Tables 1 and 2 below. The average exchange rate we used for U.S. dollars into Swiss francs was 0.97804 in 2018 and 0.98461 in 2017.

This report is established in accordance with the provisions of the Ordinance.

Compensation of the Board of Directors

Our directors receive compensation in accordance with our Outside Directors Compensation Parameters. No changes were made to our Outside Directors Compensation Parameters in 2018. The Board had previously approved changes to the Outside Directors Compensation Parameters effective as of May 2017 based on, among other things, a comparison of our compensation structure to that of our competitors and other insurance and similarly-sized companies. The compensation of the Board for the financial year 2017 set forth in Table 1 is therefore composed of compensation under the prior parameters from January 1 to the date of our 2017 annual general meeting and compensation under the revised parameters from such date and thereafter. Director compensation had not been increased for several years prior to the 2017 changes, and director compensation for cash and equity retainers, as well as certain Committee chair retainers, were below the median of competitors and other insurance and similarly-sized companies. The following modifications were made in 2017:

- increase in the cash retainer from $100,000 to $120,000;
- increase in the equity retainer from $160,000 to $170,000;
- increase in the Audit Committee Chair retainer from $25,000 to $35.000;
- increase in the Compensation Committee Chair retainer from $20,000 to $25,000;
- increase in the Risk & Finance Committee Chair retainer from $15,000 to $20,000; and
- increase in the Nominating & Governance Committee Chair retainer from $12,000 to $20,000.

Non-management directors received $290,000 (CHF 283,633) in 2018 for their service as directors. Chubb paid $170,000 (CHF 166,267) of this fee in the form of restricted stock awards, based on the fair value of Chubb's Common Shares as of the date of the award, with the remaining portion of the annual fee paid to non-management directors in cash quarterly.

The Lead Director received a retainer of $50,000 (CHF 48,902) in 2018. Committee chairs received Committee chair retainers as follows:

Audit Committee - $35,000 (CHF 34,232)
Compensation Committee - $25,000 (CHF 24,451)
Nominating & Governance Committee - $20,000 (CHF 19,561)
Risk & Finance Committee - $20,000 (CHF 19,561)

Directors are not paid fees for attending regular Board or committee meetings but, at the discretion of the Chairman of the Board and the Lead Director, Chubb may pay an additional $2,000 fee for each special meeting attended by telephone and $3,000 for each special meeting attended in person. Such fees were not paid in 2018.

Directors may elect to receive all of their compensation, other than compensation for special meetings, in the form of restricted stock awards. Restricted stock awards vest at the following year's annual general meeting.

Chubb’s Corporate Governance Guidelines specify director equity ownership requirements. Chubb awards independent directors restricted stock awards and mandates minimum equity ownership of $600,000 for outside directors (based on the stock price on the date of award). Each director has until the fifth anniversary of his or her initial election to the Board to achieve this minimum. The previously granted restricted stock awards (whether or not vested) will be counted toward achieving this minimum. Stock options will not be counted toward achieving this minimum.

Once a director has achieved the minimum equity ownership, this requirement will remain satisfied going forward as long as he or she retains the number of shares valued at the minimum amount based on the New York Stock Exchange closing price for Chubb’s Common Shares as of the date the minimum threshold is initially met. Any vested shares held by a director in excess of the minimum share equivalent specified above may be sold at the director's discretion after consultation with Chubb’s General Counsel.

No compensation was paid to former directors nor did any former director receive any benefits in kind or waivers of claims during the years ended December 31, 2018 and 2017. During the years ended December 31, 2018 and 2017, no current directors received benefits in kind or waivers of claims and no compensation had been paid to any related party of current or former directors, except as noted below with respect to our director charitable contributions program. Additionally, no related party of current or former directors received any benefits in kind or waivers of claims during 2018 or 2017. At each of December 31, 2018 and 2017, no current or former directors or any related party of current or former directors had outstanding loans or credits from Chubb.

Chubb has a matching contribution program for directors under which Chubb will match director charitable contributions to registered charities, churches, and other places of worship or schools up to a maximum of $20,000 per year. For Swiss law purposes, some of these matching contributions during the years ended December 31, 2018 and 2017 qualified as related party transactions under our Related Party Transactions Guidelines because our directors or members of their immediate family were directors or officers of the charity. Pursuant to this matching charitable contributions program, Chubb matched a total of $72,000 (CHF 70,419) in contributions to six organizations that fell under our Related Party Transactions Guidelines in 2018 and $47,000 (CHF 46,277) in contributions to five organizations that fell under our Related Party Transactions Guidelines in 2017.

The following table presents information concerning director compensation paid or, in the case of restricted stock awards, earned in the years ended December 31, 2018 and 2017. Although Evan G. Greenberg is Chairman of the Board, Mr. Greenberg received no compensation in respect of these duties. Details of Mr. Greenberg's compensation in his capacity as a member of Executive Management are included in Table 2 below.

Table 1 - audited

Name	Year	Board Function	Fees Earned or Paid	Stock Awards [1]	All Other [2]	Total in USD	Total in CHF
Michael G. Atieh	**2018**	**Member**	**$ 128,750**	**$ 170,000**	**$ 98,153**	**$ 396,903**	**CHF 388,189**
	2017	Member Chair - Audit	147,500	166,250	93,577	407,327	CHF 401,059
Sheila P. Burke	**2018**	**Member**	**120,000**	**170,000**	**29,246**	**319,246**	**312,237**
	2017	Member	115,000	166,250	27,882	309,132	304,375
James I. Cash	**2018**	**Member**	**120,000**	**170,000**	**9,280**	**299,280**	**292,709**
	2017	Member	115,000	166,250	8,846	290,096	285,632
Mary Cirillo	**2018**	**Member Chair - Nominating & Governance**	**—**	**310,000**	**40,870**	**350,870**	**343,166**
	2017	Member Chair - Nominating & Governance	—	295,750	38,962	334,712	329,562
Michael P. Connors	**2018**	**Member Chair - Compensation**	**145,000**	**170,000**	**—**	**315,000**	**308,084**
	2017	Member Chair - Compensation	138,750	166,250	—	305,000	300,307
John A. Edwardson	**2018**	**Member**	**—**	**290,000**	**—**	**290,000**	**283,633**
	2017	Member	—	278,750	—	278,750	274,461
Robert M. Hernandez	**2018**	**Lead Director**	**170,000**	**170,000**	**71,872**	**411,872**	**402,829**
	2017	Lead Director	165,000	166,250	68,558	399,808	393,656
Leo F. Mullin	**2018**	**Retired**	**30,000**	**63,750**	**16,019**	**109,769**	**107,359**
	2017	Member	115,000	166,250	15,272	296,522	291,959
Kimberly A. Ross	**2018**	**Member**	**90,000**	**215,000**	**—**	**305,000**	**298,303**
	2017	Member	—	278,750	—	278,750	274,461
Robert W. Scully	**2018**	**Member Chair - Audit**	**—**	**311,875**	**—**	**311,875**	**305,027**
	2017	Member	—	278,750	—	278,750	274,461
Eugene B. Shanks, Jr.	**2018**	**Member**	**120,000**	**170,000**	**—**	**290,000**	**283,633**
	2017	Member	115,000	166,250	—	281,250	276,922
Theodore E. Shasta	**2018**	**Member**	**120,000**	**170,000**	**—**	**290,000**	**283,633**
	2017	Member	115,000	166,250	—	281,250	276,922
David H. Sidwell	**2018**	**Member**	**120,000**	**170,000**	**—**	**290,000**	**283,633**
	2017	Member	115,000	166,250	—	281,250	276,922
Olivier Steimer	**2018**	**Member Chair - Risk & Finance**	**140,000**	**170,000**	**9,901**	**319,901**	**312,877**
	2017	Member Chair - Risk & Finance	133,750	166,250	9,439	309,439	304,678
James M. Zimmerman	**2018**	**Member**	**120,000**	**170,000**	**—**	**290,000**	**283,633**
	2017	Member	115,000	166,250	—	281,250	276,922
Total [3]	**2018**		**$ 1,423,750**	**$ 2,890,625**	**$ 275,341**	**$ 4,589,716**	**CHF 4,488,945**
	2017		$ 1,390,000	$ 2,960,750	$ 262,536	$ 4,613,286	CHF 4,542,299

(1) The Stock Awards column reflects restricted stock awards earned during 2018 and 2017. These stock awards were granted in May 2018 and May 2017, respectively, at the annual general meetings and vest at the subsequent year's annual general meeting.

(2) The All Other column includes dividend equivalents on our deferred restricted stock units (which we stopped issuing in 2009) held by our longer-serving directors. We issue stock units equivalent in value to the dividend payments that those directors would have received if they held stock.
Ms. Burke and Mr. Cash received deferred Market Value Units from The Chubb Corporation prior to its acquisition by us in January 2016. Each unit has the equivalent value of one share of our common stock. These units are credited with market value units equivalent in value to the dividend payments they would have received if they held stock.

(3) Total director compensation in 2018 reflects one less director for a portion of the year compared to 2017 as a result of the retirement of Leo F. Mullin as of the date of the May 2018 annual general meeting of shareholders.

Compensation of Executive Management

The following table presents information concerning Executive Management's 2018 and 2017 compensation.

Table 2 - audited

Name and Principal Position	Year	Salary	Bonus	Stock Awards (1)	Option Awards (2)	All Other Compensation (3)	Total in USD	Total in CHF
Evan G. Greenberg Chairman, President and Chief Executive Officer, Chubb Limited (highest paid executive)	**2018**	**$ 1,400,000**	**$ 6,100,000**	**$ 9,225,174**	**$ 1,881,925**	**$ 1,246,474**	**$ 19,853,573**	**CHF 19,417,589**
	2017	1,400,000	5,500,000	8,849,881	2,761,129	1,183,046	19,694,056	CHF 19,391,024
All Other Executive Management	**2018**	**$ 2,523,193**	**$ 4,634,800**	**$ 6,425,985**	**$ 1,280,174**	**$ 1,229,301**	**$ 16,093,453**	**CHF 15,740,041**
	2017	2,432,212	4,362,000	5,930,968	1,850,407	1,246,688	15,822,275	CHF 15,578,817
Total	**2018**	**$ 3,923,193**	**$10,734,800**	**$ 15,651,159**	**$ 3,162,099**	**$ 2,475,775**	**$ 35,947,026**	**CHF 35,157,629**
	2017	$ 3,832,212	$ 9,862,000	$ 14,780,849	$ 4,611,536	$ 2,429,734	$ 35,516,331	CHF 34,969,841

(1) The Stock Awards column discloses the fair value of the restricted stock awards granted on February 28, 2019 for 2018 and February 22, 2018 for 2017, respectively. This column includes time-based and performance-based restricted stock awards. In comparison, the Summary Compensation Table in the Company's annual proxy statement (unaudited) discloses equity grants for a particular fiscal year based on the grants made during that fiscal year.

(2) The Option Awards column discloses the fair value of the stock options granted on February 28, 2019 for 2018 and February 22, 2018 for 2017. In comparison, the Summary Compensation Table in the Company's annual proxy statement (unaudited) discloses equity grants for a particular fiscal year based on the grants made during that fiscal year.

(3) All Other Compensation column includes perquisites and other personal benefits, consisting of the following:

For Mr. Greenberg, contributions to retirement plans of $828,000 (CHF 809,820) in 2018 and $960,000 (CHF 945,228) in 2017, personal use of corporate aircraft of $378,929 (CHF 370,609) in 2018 and $188,405 (CHF 185,506) in 2017, and miscellaneous other benefits of $39,545 (CHF 38,677) in 2018 and $34,641 (CHF 34,108) in 2017, including executive medical coverage and matching contributions made under our matching charitable contributions program. The Board required Mr. Greenberg to use corporate aircraft for all travel whenever practicable for security reasons.

For the other members of Executive Management, contributions to retirement plans, personal use of corporate aircraft and corporate apartment, and miscellaneous other benefits, including, as applicable, club memberships, financial planning, executive medical coverage, matching contributions made under our matching charitable contributions program, car allowance or car lease and car maintenance allowance.

Personal use of the corporate aircraft was limited to space available on normally scheduled management business flights.

Other personal benefits including housing allowances and cost of living allowance.

In 2018 and 2017, housing allowances were provided to Mr. Bancroft because Chubb requires him to maintain a second residence in addition to maintaining his own personal residence.

Contributions to retirement plans for 2018 and 2017 totaled $1.55 million (CHF 1.51 million) in 2018 and $1.72 million (CHF 1.69 million) in 2017, respectively. These consist of discretionary and non-discretionary employer contributions. The discretionary employer contributions for 2018 have been calculated and are expected to be paid in April 2019.

No former member of Executive Management or any related party of current or former Executive Management received non-market standard compensation from Chubb during each of the years ended December 31, 2018 and 2017. Additionally, no current or former member of Executive Management or any related party thereto received benefits in kind or waivers of claims during 2018 or 2017 other than as described in the footnotes to Table 2.

At each of December 31, 2018 and 2017, no current or former member of Executive Management or any related party of a current or former member of Executive Management had outstanding loans or credits from Chubb.

REPORT OF THE STATUTORY AUDITOR TO THE GENERAL MEETING OF CHUBB LIMITED, ZURICH ON THE (SWISS STATUTORY) COMPENSATION REPORT

Report of the statutory auditor on the compensation report

We have audited the accompanying compensation report of Chubb Limited for the year ended December 31, 2018. The audit was limited to the information according to articles 14-16 of the Ordinance against Excessive Compensation in Stock Exchange Listed Companies (Ordinance) contained in Table 1 and Table 2 of the compensation report.

Board of Directors' responsibility

The Board of Directors is responsible for the preparation and overall fair presentation of the compensation report in accordance with Swiss law and the Ordinance against Excessive Compensation in Stock Exchange Listed Companies (Ordinance). The Board of Directors is also responsible for designing the remuneration system and defining individual remuneration packages.

Auditor's responsibility

Our responsibility is to express an opinion on the accompanying compensation report. We conducted our audit in accordance with Swiss Auditing Standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the compensation report complies with Swiss law and articles 14-16 of the Ordinance.

An audit involves performing procedures to obtain audit evidence on the disclosures made in the compensation report with regard to compensation, loans and credits in accordance with articles 14-16 of the Ordinance. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatements in the compensation report, whether due to fraud or error. This audit also includes evaluating the reasonableness of the methods applied to value components of remuneration, as well as assessing the overall presentation of the compensation report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Opinion

In our opinion, the compensation report of Chubb Limited for the year ended December 31, 2018 complies with Swiss law and articles 14-16 of the Ordinance.

PricewaterhouseCoopers AG

/s/ Ray Kunz	/s/ Nicolas Juillerat
Ray Kunz	Nicolas Juillerat
Audit expert Auditor in charge	Audit expert

Zurich, March 20, 2019

Chubb Greenhouse Gas Reduction Programs

As an insurance company, Chubb's environmental footprint is relatively modest, but through our Corporate Greenhouse Gas Inventory Program and Corporate Environmental Strategy, we work to reduce it even further. Some of the primary objectives of our environmental strategy are to measure, record and reduce Chubb's corporate GHG emissions.

In 2007, Chubb joined the voluntary U.S. Environmental Protection Agency (EPA)-sponsored Climate Leaders program, through which the company was able to develop long-term, comprehensive climate change strategies, inventory its emissions and set a six-year GHG reduction goal of 8% per employee. While the EPA program was discontinued in September 2011, Chubb's Corporate GHG Inventory Program remains active using its methodology, which is based on the World Resources Institute and the World Business Council for Sustainable Development (WRI/WBCSD) GHG Protocol for data collection and analysis. In 2012, Chubb successfully met its first generation GHG reduction goal with a 27% reduction in emissions per employee since 2006. In order to continue Chubb's global commitment to reducing its environmental footprint, a new GHG reduction target was announced in September of 2014 to reduce emissions 10% per employee by 2020 from a 2012 base year. From 2015 to 2018, Chubb reduced its global absolute GHG emissions by 21%.

Chubb 2018 GHG Inventory Data

	2018
Global Absolute Emissions (CO_2-eq.)	**71,488**

The data above represent 26,048 metric tons of CO_2-eq. of Scope 1 emissions from fossil fuel combustion; 47,190 metric tons of CO_2-eq. of location-based Scope 2 emissions; and 45,440 metric tons of CO_2-eq. of market-based Scope 2 emissions from purchased electricity. Chubb's GHG emissions data are reviewed by a third-party on an annual basis. The company's most recent 2018 GHG inventory was reviewed by Bureau Veritas and the verification statement can be found on the following page.

In addition to tracking GHG emissions versus its goals, Chubb reports its GHG emissions data to the CDP, an organization that scores carbon emissions information from thousands of corporations on behalf of the global investment community. In 2018, Chubb's response to the questionnaire resulted in a score of B.

Chubb's Global GHG Management Plan concentrates primarily on reducing energy consumption at the facility level – specifically, in owned buildings and larger, long-term leased spaces. Projects have been implemented at a number of major offices including: Philadelphia, Pa.; Wilmington, Del.; Whitehouse Station, N.J.; Hamilton, Bermuda; Sydney, Australia; the Chubb Conference Center, Lafayette Hill, Pa.; London, U.K.; and Monterrey, Mexico. The projects include installation of new HVAC equipment, lighting upgrades and installation of a central building automation system (BAS) in order to improve operations within the building and reduce energy consumption.

In Chubb's office building in Philadelphia, the company has reduced energy consumption by over 20% since 2006 through the installation of new boilers and LED lighting, the use of variable speed drive HVAC equipment and installation of an exhaust energy recovery ventilator. Through these steps, the company earned LEED Silver certification in 2009 and was awarded LEED Gold certification in 2014. It was also awarded Energy Star Certification by the U.S. EPA in 2016.

In July 2011, the company's Bermuda office building was awarded LEED Gold certification – the first building in Bermuda to be awarded the designation – due in large part to a re-lamping of office lights, applying a floating temperature set point and installing motion sensors and timers on office equipment. These actions reduced electrical needs by approximately 500,000 kWh (358 metric tons CO_2e) per year. In 2014, the company engaged with the U.S. Green Building Council (USGBC) and the Bermuda facility became one of the first buildings using LEED Dynamic Plaque, a tool that continuously monitors and encourages improvement of overall building performance. The building was re-certified with LEED Gold using LEED Dynamic Plaque in 2019.

Information about Chubb's full range of environmental efforts, including insurance solutions to help customers manage their environmental and climate change risks, corporate initiatives to control our own ecological impact and philanthropic actions in support of environmental causes, can be found in the company's annual Environmental Report, which is available at https://www.chubb.com/environment.

VERIFICATION STATEMENT
GREENHOUSE GAS EMISSIONS

Bureau Veritas North America, Inc. (BVNA) was engaged to provide Limited Assurance and conduct an independent verification of the greenhouse gas (GHG) emissions and energy consumption reported by Chubb from January 1, 2018 to December 31, 2018. This Verification Statement applies to the related information included within the scope of work described below.

The determination of the GHG emissions is the sole responsibility of Chubb. BVNA was not involved in determining the GHG emissions. Our sole responsibility was to provide independent verification on the accuracy of the GHG emissions reported, and on the underlying systems and processes used to collect, analyze and review the information.

Boundaries of the reporting company GHG emissions covered by the verification:

- Operational Control
- Global

Emissions verified in Metric tonnes of CO_2-equivalent (tCO_2e):

- Scope 1 Emissions: **26,048**
- Scope 2 Emissions (Location-Based): **47,190**
- Scope 2 Emissions (Market-Based): **45,440**
- Scope 3 Emissions (Business Air & Rail Travel): **17,310**

Data and information supporting the Scope 1 & Scope 2 GHG emissions were historical in nature and in some cases estimated, based on historical data for similar properties in similar locations. Data and information supporting the Scope 3 GHG emissions assertion were in some cases estimated rather than historical in nature.

Period covered by GHG emissions verification:

- January 1, 2018 to December 31, 2018

Reporting Protocols against which verification was conducted:

- World Resources Institute (WRI)/World Business Council for Sustainable Development (WBCSD) Greenhouse Gas Protocol, Corporate Accounting and Reporting Standard **(Scope 1 & 2)**
- WRI/WBCSD Corporate Value Chain (Scope 3) Accounting and Reporting Standard **(Scope 3)**

GHG Verification Protocols used to conduct the verification:

- ISO 14064-3: Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions

Level of Assurance and Qualifications:

- Limited
- Materiality Threshold: ±5%

Verification Methodology:

- Interviews with relevant personnel of Chubb;
- Review of documentary evidence produced by Chubb;
- Review of Chubb data and information systems and methodology for collection, aggregation, analysis and review of information used to determine GHG emissions;
- Audit of samples of data used by Chubb to determine GHG emissions.

Assurance Opinion:

Based on the results of our verification process, BVNA provides Limited Assurance of the GHG emissions and energy assertion shown above, and found no evidence that the assertion:

- is not materially correct;
- is not a fair representation of the GHG emissions and energy data and information; and
- is not prepared in accordance with the WRI/WBCSD GHG Protocol Corporate Accounting and Reporting Standard.

It is our opinion that Chubb has established appropriate systems for the collection, aggregation and analysis of quantitative data for determination of GHG emissions for the stated period and boundaries.

Statement of independence, impartiality and competence

The Bureau Veritas Group is an independent professional services company that specializes in Quality, Health, Safety, Social and Environmental management with over 180 years history in providing independent assurance services.

No member of the verification team has a business relationship with Chubb, its Directors or Managers beyond that required of this assignment. We conducted this verification independently and to our knowledge there has been no conflict of interest.

BVNA has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day-to-day business activities.

The verification team has extensive experience in conducting assurance over environmental, social, ethical and health and safety information, systems and processes, has over 20 years combined experience in this field and an excellent understanding of BVNA standard methodology for the verification of greenhouse gas emissions data.

Attestation:

Trevor A. Donaghu, Lead Verifier

Program Manager, Sustainability and Climate Change Services

Bureau Veritas North America, Inc.

March 18, 2019

This verification statement, including the opinion expressed herein, is provided to Chubb and is solely for the benefit of Chubb in accordance with the terms of our agreement. We consent to the release of this statement by you to the CDP in order to satisfy the terms of CDP disclosure requirements but without accepting or assuming any responsibility or liability on our part to CDP or to any other party who may have access to this statement.

Bureau Veritas North America, Inc.

Health, Safety and Environmental Services

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