

UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-Q

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

For the Quarterly Period Ended June 30, 2019
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	Trading Symbol(s)	Name of each exchange on which registered
Common Shares, par value CHF 24.15 per share	CB	New York Stock Exchange

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 whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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

Non-accelerated filer

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 Exchange Act).

Yes

No

The number of registrant's Common Shares (CHF 24.15 par value) outstanding as of July 17, 2019 was 455,749,479 .

**CHUBB LIMITED
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PART I FINANCIAL INFORMATION**ITEM 1. Financial Statements****CONSOLIDATED BALANCE SHEETS (Unaudited)**

Chubb Limited and Subsidiaries

	June 30 2019	December 31 2018
(in millions of U.S. dollars, except share and per share data)		
Assets		
Investments		
Fixed maturities available for sale, at fair value (amortized cost – \$80,119 and \$79,323) (includes hybrid financial instruments of \$6 and \$9)	\$ 82,410	\$ 78,470
Fixed maturities held to maturity, at amortized cost (fair value – \$13,177 and \$13,259)	12,838	13,435
Equity securities, at fair value and cost	715	770
Short-term investments, at fair value and amortized cost	3,808	3,016
Other investments, at fair value and cost	5,968	5,277
Total investments	105,739	100,968
Cash	1,270	1,247
Restricted cash	98	93
Securities lending collateral	1,727	1,926
Accrued investment income	850	883
Insurance and reinsurance balances receivable	10,935	10,075
Reinsurance recoverable on losses and loss expenses	15,445	15,993
Reinsurance recoverable on policy benefits	201	202
Deferred policy acquisition costs	5,113	4,922
Value of business acquired	280	295
Goodwill	15,300	15,271
Other intangible assets	6,266	6,143
Prepaid reinsurance premiums	2,765	2,544
Investments in partially-owned insurance companies	1,050	678
Other assets	7,477	6,531
Total assets	\$ 174,516	\$ 167,771
Liabilities		
Unpaid losses and loss expenses	\$ 63,205	\$ 62,960
Unearned premiums	16,403	15,532
Future policy benefits	5,568	5,506
Insurance and reinsurance balances payable	6,371	6,437
Securities lending payable	1,727	1,926
Accounts payable, accrued expenses, and other liabilities	11,639	10,472
Deferred tax liabilities	697	304
Repurchase agreements	1,416	1,418
Short-term debt	9	509
Long-term debt	13,371	12,087
Trust preferred securities	308	308
Total liabilities	120,714	117,459
Commitments and contingencies		
Shareholders' equity		
Common Shares (CHF 24.15 par value; 479,783,864 shares issued; 456,077,819 and 459,203,378 shares outstanding)	11,121	11,121
Common Shares in treasury (23,706,045 and 20,580,486 shares)	(3,093)	(2,618)
Additional paid-in capital	11,757	12,557
Retained earnings	33,878	31,700
Accumulated other comprehensive income (loss) (AOCI)	139	(2,448)
Total shareholders' equity	53,802	50,312
Total liabilities and shareholders' equity	\$ 174,516	\$ 167,771

See accompanying notes to the consolidated financial statements

CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME (Unaudited)

Chubb Limited and Subsidiaries

	Three Months Ended		Six Months Ended	
	June 30		June 30	
(in millions of U.S. dollars, except per share data)	2019	2018	2019	2018
Revenues				
Net premiums written	\$ 8,343	\$ 8,015	\$ 15,656	\$ 15,119
Increase in unearned premiums	(452)	(351)	(628)	(428)
Net premiums earned	7,891	7,664	15,028	14,691
Net investment income	859	828	1,695	1,634
Net realized gains (losses):				
Other-than-temporary impairment (OTTI) losses gross	(14)	(4)	(27)	(5)
Portion of OTTI losses recognized in other comprehensive income (OCI)	1	—	1	—
Net OTTI losses recognized in income	(13)	(4)	(26)	(5)
Net realized gains (losses) excluding OTTI losses	(210)	22	(294)	21
Total net realized gains (losses) (includes \$12, \$(81), \$(32) and \$(104) reclassified from AOCI)	(223)	18	(320)	16
Total revenues	8,527	8,510	16,403	16,341
Expenses				
Losses and loss expenses	4,715	4,487	8,813	8,589
Policy benefits	161	150	357	301
Policy acquisition costs	1,544	1,464	3,008	2,928
Administrative expenses	758	747	1,468	1,439
Interest expense	140	167	280	324
Other (income) expense	(230)	(115)	(269)	(162)
Amortization of purchased intangibles	77	85	153	170
Chubb integration expenses	4	13	7	23
Total expenses	7,169	6,998	13,817	13,612
Income before income tax	1,358	1,512	2,586	2,729
Income tax expense (benefit) (includes \$4, \$(12), \$(2) and \$(15) on reclassified unrealized gains and losses)	208	218	396	353
Net income	\$ 1,150	\$ 1,294	\$ 2,190	\$ 2,376
Other comprehensive income (loss)				
Unrealized appreciation (depreciation)	\$ 1,252	\$ (578)	\$ 3,097	\$ (1,812)
Reclassification adjustment for net realized (gains) losses included in net income	(12)	81	32	104
	1,240	(497)	3,129	(1,708)
Change in:				
Cumulative foreign currency translation adjustment	(97)	(574)	50	(177)
Postretirement benefit liability adjustment	(18)	(17)	(45)	(40)
Other comprehensive income (loss), before income tax	1,125	(1,088)	3,134	(1,925)
Income tax (expense) benefit related to OCI items	(216)	71	(547)	279
Other comprehensive income (loss)	909	(1,017)	2,587	(1,646)
Comprehensive income	\$ 2,059	\$ 277	\$ 4,777	\$ 730
Earnings per share				
Basic earnings per share	\$ 2.52	\$ 2.78	\$ 4.78	\$ 5.10
Diluted earnings per share	\$ 2.50	\$ 2.76	\$ 4.75	\$ 5.07

See accompanying notes to the consolidated financial statements

CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY (Unaudited)

Chubb Limited and Subsidiaries

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Common Shares				
Balance – beginning and end of period	\$ 11,121	\$ 11,121	\$ 11,121	\$ 11,121
Common Shares in treasury				
Balance – beginning of period	(2,775)	(1,727)	(2,618)	(1,944)
Common Shares repurchased	(376)	(324)	(743)	(324)
Net shares redeemed under employee share-based compensation plans	58	11	268	228
Balance – end of period	(3,093)	(2,040)	(3,093)	(2,040)
Additional paid-in capital				
Balance – beginning of period	12,051	13,430	12,557	13,978
Net shares redeemed under employee share-based compensation plans	1	1	(190)	(261)
Exercise of stock options	(14)	(3)	(48)	(19)
Share-based compensation expense	63	61	117	123
Funding of dividends declared to Retained earnings	(344)	(339)	(679)	(671)
Balance – end of period	11,757	13,150	11,757	13,150
Retained earnings				
Balance – beginning of period	32,728	28,966	31,700	27,474
Cumulative effect of adoption of accounting guidance (refer to Note 1)	—	—	(12)	410
Balance – beginning of period, as adjusted	32,728	28,966	31,688	27,884
Net income	1,150	1,294	2,190	2,376
Funding of dividends declared from Additional paid-in capital	344	339	679	671
Dividends declared on Common Shares	(344)	(339)	(679)	(671)
Balance – end of period	33,878	30,260	33,878	30,260
Accumulated other comprehensive income (loss)				
Net unrealized appreciation on investments				
Balance – beginning of period	1,014	45	(545)	1,450
Cumulative effect of adoption of accounting guidance	—	—	—	(417)
Balance – beginning of period, as adjusted	1,014	45	(545)	1,033
Change in period, before reclassification from AOCI, net of income tax benefit (expense) of \$(225), \$74, \$(549) and \$300	1,027	(504)	2,548	(1,512)
Amounts reclassified from AOCI, net of income tax benefit (expense) of \$4, \$(12), \$(2) and \$(15)	(8)	69	30	89
Change in period, net of income tax benefit (expense) of \$(221), \$62, \$(551) and \$285	1,019	(435)	2,578	(1,423)
Balance – end of period	2,033	(390)	2,033	(390)
Cumulative foreign currency translation adjustment				
Balance – beginning of period	(1,836)	(809)	(1,976)	(1,187)
Change in period, net of income tax benefit (expense) of \$2, \$4, \$(5) and \$(15)	(95)	(570)	45	(192)
Balance – end of period	(1,931)	(1,379)	(1,931)	(1,379)
Postretirement benefit liability adjustment				
Balance – beginning of period	52	261	73	280
Change in period, net of income tax benefit of \$3, \$5, \$9 and \$9	(15)	(12)	(36)	(31)
Balance – end of period	37	249	37	249
Accumulated other comprehensive income (loss)	139	(1,520)	139	(1,520)
Total shareholders' equity	\$ 53,802	\$ 50,971	\$ 53,802	\$ 50,971

See accompanying notes to the consolidated financial statements

CONSOLIDATED STATEMENTS OF CASH FLOWS (Unaudited)

Chubb Limited and Subsidiaries

	Six Months Ended June 30	
(in millions of U.S. dollars)	2019	2018
Cash flows from operating activities		
Net income	\$ 2,190	\$ 2,376
Adjustments to reconcile net income to net cash flows from operating activities		
Net realized (gains) losses	320	(16)
Amortization of premiums/discounts on fixed maturities	209	311
Amortization of purchased intangibles	153	170
Deferred income taxes	(133)	(71)
Unpaid losses and loss expenses	240	(267)
Unearned premiums	808	635
Future policy benefits	101	144
Insurance and reinsurance balances payable	(94)	675
Accounts payable, accrued expenses, and other liabilities	(357)	(489)
Income taxes payable	16	224
Insurance and reinsurance balances receivable	(843)	(1,129)
Reinsurance recoverable	565	178
Deferred policy acquisition costs	(194)	(213)
Other	(273)	(331)
Net cash flows from operating activities	2,708	2,197
Cash flows from investing activities		
Purchases of fixed maturities available for sale	(12,566)	(12,297)
Purchases of fixed maturities held to maturity	(73)	(337)
Purchases of equity securities	(147)	(85)
Sales of fixed maturities available for sale	7,832	6,858
Sales of to be announced mortgage-backed securities	6	—
Sales of equity securities	266	83
Maturities and redemptions of fixed maturities available for sale	3,963	3,920
Maturities and redemptions of fixed maturities held to maturity	598	732
Net change in short-term investments	(763)	401
Net derivative instruments settlements	(536)	5
Private equity contributions	(920)	(813)
Private equity distributions	780	413
Other	(727)	(140)
Net cash flows used for investing activities	(2,287)	(1,260)
Cash flows from financing activities		
Dividends paid on Common Shares	(671)	(661)
Common Shares repurchased	(741)	(347)
Proceeds from issuance of long-term debt	1,289	2,171
Repayment of long-term debt	(500)	(1,900)
Proceeds from issuance of repurchase agreements	1,984	1,014
Repayment of repurchase agreements	(1,986)	(1,009)
Proceeds from share-based compensation plans	95	60
Policyholder contract deposits	237	192
Policyholder contract withdrawals	(138)	(169)
Net cash flows used for financing activities	(431)	(649)
Effect of foreign currency rate changes on cash and restricted cash	38	(38)
Net increase in cash and restricted cash	28	250
Cash and restricted cash – beginning of period	1,340	851

Cash and restricted cash – end of period	\$	1,368	\$	1,101
Supplemental cash flow information				
Taxes paid	\$	522	\$	223
Interest paid	\$	286	\$	332

See accompanying notes to the consolidated financial statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

Chubb Limited and Subsidiaries

1 . General**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. Chubb operates 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 10 for additional information.

The interim unaudited 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 results of operations and cash flows for any interim period are not necessarily indicative of the results for the full year. These consolidated financial statements should be read in conjunction with the consolidated financial statements and related notes included in our 2018 Form 10-K.

b) 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.

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:

(in millions of U.S. dollars)	June 30 2019	December 31 2018
Cash	\$ 1,270	\$ 1,247
Restricted cash	98	93
Total cash and restricted cash shown in the Consolidated statements of cash flows	\$ 1,368	\$ 1,340

c) Goodwill

During the six months ended June 30, 2019, Goodwill increased \$29 million, primarily reflecting the impact of foreign exchange.

d) Accounting guidance adopted in 2019***Premium Amortization on Purchased Callable Debt Securities***

Effective January 1, 2019, we adopted new accounting guidance on "Premium Amortization on Purchased Callable Debt Securities" for bonds held at a premium on a modified retrospective basis. The guidance requires the premium to be amortized to the earliest call date. As a result, we recorded a cumulative effect adjustment to decrease beginning retained earnings by \$12 million after-tax (\$15 million pre-tax). Securities held at a discount did not require an accounting change.

Lease Accounting

Effective for the quarter ended March 31, 2019, we adopted new lease accounting guidance and elected to utilize a modified retrospective approach which allowed us to initially apply the new lease standard at the adoption date and recognize a cumulative effect adjustment to the opening balance of retained earnings for 2019, with no adjustment to prior periods presented. The cumulative effect adjustment to the opening balance of retained earnings was zero. Our leases consist principally of real estate operating leases that are amortized on a straight-line basis over the term of the lease. The adoption of the updated guidance resulted in recognizing a right-of-use asset, which was recorded within Other assets, and a lease liability, which was recorded within Accounts payable, accrued expenses, and other liabilities on the Consolidated balance sheet as well as de-recognizing the liability for deferred rent that was required under the previous guidance. The adoption of the new guidance did not have a material effect on our results of operations, financial condition or liquidity. Refer to Note 6 h) for additional information on leases.

Refer to the 2018 Form 10-K for information on accounting guidance not yet adopted.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

2 . Investments
a) Fixed maturities

June 30, 2019 (in millions of U.S. dollars)	Amortized Cost	Gross Unrealized Appreciation	Gross Unrealized Depreciation	Fair Value	OTTI Recognized in AOCI
<i>Available for sale</i>					
U.S. Treasury and agency	\$ 3,545	\$ 97	\$ (2)	\$ 3,640	\$ —
Foreign	21,777	942	(71)	22,648	—
Corporate securities	28,940	891	(97)	29,734	(6)
Mortgage-backed securities	17,597	398	(29)	17,966	(1)
States, municipalities, and political subdivisions	8,260	176	(14)	8,422	—
	\$ 80,119	\$ 2,504	\$ (213)	\$ 82,410	\$ (7)
<i>Held to maturity</i>					
U.S. Treasury and agency	\$ 1,167	\$ 27	\$ (1)	\$ 1,193	\$ —
Foreign	1,465	59	(1)	1,523	—
Corporate securities	2,457	79	(9)	2,527	—
Mortgage-backed securities	2,442	60	—	2,502	—
States, municipalities, and political subdivisions	5,307	127	(2)	5,432	—
	\$ 12,838	\$ 352	\$ (13)	\$ 13,177	\$ —

December 31, 2018 (in millions of U.S. dollars)	Amortized Cost	Gross Unrealized Appreciation	Gross Unrealized Depreciation	Fair Value	OTTI Recognized in AOCI
<i>Available for sale</i>					
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)
<i>Held to maturity</i>					
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	\$ —

As discussed in Note 2 b), 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 three and six months ended June 30, 2019 , \$7 million and \$16 million , respectively, of net unrealized appreciation related to such securities are included in OCI. For the three and six months ended June 30, 2018, nil and \$4 million ,

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

respectively, of net unrealized depreciation related to such securities are included in OCI. At June 30, 2019 and December 31, 2018, AOCI included cumulative net unrealized appreciation of \$3 million and \$1 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 (TBAs) held (refer to Note 6 b) (iv)) and are included in the category, "Mortgage-backed securities". Approximately 82 percent and 81 percent of the total mortgage-backed securities at June 30, 2019 and December 31, 2018, 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:

(in millions of U.S. dollars)	June 30 2019		December 31 2018	
	Amortized Cost	Fair Value	Amortized Cost	Fair Value
<i>Available for sale</i>				
Due in 1 year or less	\$ 3,613	\$ 3,630	\$ 3,569	\$ 3,568
Due after 1 year through 5 years	26,776	27,281	27,134	27,005
Due after 5 years through 10 years	22,957	23,711	24,095	23,543
Due after 10 years	9,176	9,822	8,767	8,814
	62,522	64,444	63,565	62,930
Mortgage-backed securities	17,597	17,966	15,758	15,540
	\$ 80,119	\$ 82,410	\$ 79,323	\$ 78,470
<i>Held to maturity</i>				
Due in 1 year or less	\$ 545	\$ 548	\$ 536	\$ 537
Due after 1 year through 5 years	3,267	3,315	3,122	3,106
Due after 5 years through 10 years	4,082	4,192	4,468	4,407
Due after 10 years	2,502	2,620	2,785	2,723
	10,396	10,675	10,911	10,773
Mortgage-backed securities	2,442	2,502	2,524	2,486
	\$ 12,838	\$ 13,177	\$ 13,435	\$ 13,259

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) 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

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

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.

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.

For the three and six months ended June 30, 2019, credit losses recognized in Net income for corporate securities were \$8 million and \$14 million, respectively. For both the three and six months ended June 30, 2018, credit losses recognized in Net income for corporate securities were \$1 million.

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.

For the three and six months ended June 30, 2019 and 2018, there were no credit losses recognized in Net income for mortgage-backed securities.

The following table presents the components of Net realized gains (losses):

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Fixed maturities:				
OTTI on fixed maturities, gross	\$ (14)	\$ (4)	\$ (27)	\$ (5)
OTTI on fixed maturities recognized in OCI (pre-tax)	1	—	1	—
OTTI on fixed maturities, net	(13)	(4)	(26)	(5)
Gross realized gains excluding OTTI	56	99	83	165
Gross realized losses excluding OTTI	(31)	(176)	(89)	(264)
Total fixed maturities	12	(81)	(32)	(104)
Equity securities	5	(2)	63	(13)
Other investments	30	(11)	(14)	18
Foreign exchange gains (losses)	(11)	140	2	63
Investment and embedded derivative instruments	(181)	24	(311)	41
Fair value adjustments on insurance derivative	(65)	41	49	79
S&P futures	(20)	(44)	(83)	(22)
Other derivative instruments	7	8	6	10
Other	—	(57)	—	(56)
Net realized gains (losses) (pre-tax)	\$ (223)	\$ 18	\$ (320)	\$ 16

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Other net realized gains (losses) for the three and six months ended June 30, 2018 included a \$36 million loss from the extinguishment of debt related to the redemption of the \$1.0 billion 6.375 percent unsecured junior subordinated capital securities and a \$22 million loss related to lease impairments.

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)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Balance of credit losses related to securities still held – beginning of period	\$ 32	\$ 15	\$ 34	\$ 22
Additions where no OTTI was previously recorded	5	1	11	1
Additions where an OTTI was previously recorded	3	—	3	—
Reductions for securities sold during the period	(10)	—	(18)	(7)
Balance of credit losses related to securities still held – end of period	\$ 30	\$ 16	\$ 30	\$ 16

c) Equity securities and Other investments

The following table presents realized gains and losses from equity securities and other investments, including both sales of securities and unrealized gains and losses from changes in fair value:

(in millions of U.S. dollars)	Three Months Ended					
	June 30					
	2019			2018		
	Equity Securities	Other Investments	Total	Equity Securities	Other Investments	Total
Net gains (losses) recognized during the period	\$ 5	\$ 30	\$ 35	\$ (2)	\$ (11)	\$ (13)
Less: Net gains (losses) recognized from sales of securities	32	—	32	5	—	5
Unrealized gains (losses) recognized for securities still held at reporting date	\$ (27)	\$ 30	\$ 3	\$ (7)	\$ (11)	\$ (18)

(in millions of U.S. dollars)	Six Months Ended					
	June 30					
	2019			2018		
	Equity Securities	Other Investments	Total	Equity Securities	Other Investments	Total
Net gains (losses) recognized during the period	\$ 63	\$ (14)	\$ 49	\$ (13)	\$ 18	\$ 5
Less: Net gains (losses) recognized from sales of securities	33	(2)	31	15	—	15
Unrealized gains (losses) recognized for securities still held at reporting date	\$ 30	\$ (12)	\$ 18	\$ (28)	\$ 18	\$ (10)

d) Gross unrealized loss

At June 30, 2019, there were 5,202 fixed maturities out of a total of 30,289 fixed maturities in an unrealized loss position. The largest single unrealized loss in the fixed maturities was \$3 million. Fixed maturities in an unrealized loss position at June 30, 2019, 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.

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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:

June 30, 2019 (in millions of U.S. dollars)	0 – 12 Months		Over 12 Months		Total
	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss	Gross Unrealized Loss
U.S. Treasury and agency	\$ 41	\$ —	\$ 836	\$ (3)	\$ (3)
Foreign	946	(14)	2,042	(58)	(72)
Corporate securities	2,617	(49)	1,834	(57)	(106)
Mortgage-backed securities	289	(1)	2,779	(28)	(29)
States, municipalities, and political subdivisions	61	—	1,467	(16)	(16)
Total fixed maturities	\$ 3,954	\$ (64)	\$ 8,958	\$ (162)	\$ (226)

December 31, 2018 (in millions of U.S. dollars)	0 – 12 Months		Over 12 Months		Total
	Fair Value	Gross Unrealized Loss	Fair Value	Gross Unrealized Loss	Gross Unrealized Loss
U.S. Treasury and agency	\$ 523	\$ (4)	\$ 2,859	\$ (50)	\$ (54)
Foreign	6,764	(208)	5,349	(159)	(367)
Corporate securities	16,538	(599)	4,873	(255)	(854)
Mortgage-backed securities	6,103	(98)	6,913	(229)	(327)
States, municipalities, and political subdivisions	5,024	(44)	7,768	(124)	(168)
Total fixed maturities	\$ 34,952	\$ (953)	\$ 27,762	\$ (817)	\$ (1,770)

e) Investments in partially-owned insurance companies

On May 31, 2019, we completed the purchase of an additional ownership in Huatai Insurance Group Company Limited ("Huatai Group") of approximately 6.2 percent for \$329 million. We increased our aggregate ownership interest in Huatai Group to approximately 26.2 percent. We continue to apply the equity method of accounting to our investment in Huatai Group by recording our share of net income or loss in Other (income) expense in the Consolidated statements of operations. With our increased ownership interest, Huatai Group becomes the first domestic Chinese financial services holding company to convert to a Sino-foreign equity joint venture.

f) 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 June 30, 2019 and December 31, 2018 are investments, primarily fixed maturities, totaling \$22.2 billion and \$21.0 billion, respectively, and cash of \$98 million and \$93 million, respectively.

The following table presents the components of restricted assets:

(in millions of U.S. dollars)	June 30 2019	December 31 2018
Trust funds	\$ 14,517	\$ 13,988
Deposits with U.S. regulatory authorities	2,920	2,405
Deposits with non-U.S. regulatory authorities	2,861	2,531
Assets pledged under repurchase agreements	1,470	1,468
Other pledged assets	519	692
Total	\$ 22,287	\$ 21,084

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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

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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 plans 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.

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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.

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.

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. For the three and six months ended June 30, 2019 and 2018, no material technical refinements were made to the model. For detailed information on our lapse and annuitization rate assumptions, refer to Note 3 to the Consolidated Financial Statements of our 2018 Form 10-K.

Financial instruments measured at fair value on a recurring basis, by valuation hierarchy

June 30, 2019

(in millions of U.S. dollars)

	Level 1	Level 2	Level 3	Total
Assets:				
<i>Fixed maturities available for sale</i>				
U.S. Treasury and agency	\$ 2,934	\$ 706	\$ —	\$ 3,640
Foreign	—	22,277	371	22,648
Corporate securities	—	28,375	1,359	29,734
Mortgage-backed securities	—	17,890	76	17,966
States, municipalities, and political subdivisions	—	8,422	—	8,422
	2,934	77,670	1,806	82,410
Equity securities	659	—	56	715
Short-term investments	2,360	1,444	4	3,808
Other investments ⁽¹⁾	414	353	11	778
Securities lending collateral	—	1,727	—	1,727
Investment derivative instruments	15	—	—	15
Other derivative instruments	15	—	—	15
Separate account assets	3,109	137	—	3,246
Total assets measured at fair value ⁽¹⁾	\$ 9,506	\$ 81,331	\$ 1,877	\$ 92,714
Liabilities:				
Investment derivative instruments	\$ 60	\$ 104	\$ —	\$ 164
Other derivative instruments	10	—	—	10
GLB ⁽²⁾	—	—	403	403
Total liabilities measured at fair value	\$ 70	\$ 104	\$ 403	\$ 577

(1) Excluded from the table above are partially-owned investments, investment funds, and limited partnerships of \$ 4,860 million and other investments of \$ 89 million at June 30, 2019 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.

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December 31, 2018

(in millions of U.S. dollars)

	Level 1		Level 2		Level 3		Total
Assets:							
<i>Fixed maturities available for sale</i>							
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.

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:

(in millions of U.S. dollars)	Expected Liquidation Period of Underlying Assets	June 30 2019		December 31 2018	
		Fair Value	Maximum Future Funding Commitments	Fair Value	Maximum Future Funding Commitments
Financial	2 to 10 Years	\$ 575	\$ 375	\$ 596	\$ 193
Real Assets	2 to 11 Years	776	542	704	362
Distressed	2 to 7 Years	267	93	296	105
Private Credit	3 to 8 Years	116	269	147	310
Traditional	2 to 14 Years	2,741	2,257	2,362	2,735
Vintage	1 to 2 Years	122	39	56	—
Investment funds	Not Applicable	263	—	83	—
		\$ 4,860	\$ 3,575	\$ 4,244	\$ 3,705

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.

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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	funds where the initial fund term has 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		Valuation Technique	Significant Unobservable Inputs	Ranges
	June 30, 2019	December 31, 2018			
GLB ⁽¹⁾	\$ 403	\$ 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.

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Chubb Limited and Subsidiaries

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):

Three Months Ended	Available-for-Sale Debt Securities							Assets	Liabilities
	Foreign	Corporate securities	MBS	Equity securities	Short-term investments	Other investments	GLB ⁽¹⁾		
June 30, 2019 (in millions of U.S. dollars)									
Balance – beginning of period	\$ 360	\$ 1,342	\$ 78	\$ 55	\$ —	\$ 11	\$ 338		
Transfers into Level 3	—	10	—	—	—	—	—		
Transfers out of Level 3	—	—	—	—	—	—	—		
Change in Net Unrealized Gains (Losses) included in OCI, including foreign exchange	—	1	—	1	—	—	—		
Net Realized Gains/Losses	—	(1)	—	(1)	—	—	65		
Purchases	43	121	—	5	4	—	—		
Sales	(14)	(36)	(1)	(4)	—	—	—		
Settlements	(18)	(78)	(1)	—	—	—	—		
Balance – end of period	\$ 371	\$ 1,359	\$ 76	\$ 56	\$ 4	\$ 11	\$ 403		
Net Realized Gains/Losses Attributable to Changes in Fair Value at the Balance Sheet Date	\$ —	\$ (1)	\$ —	\$ (1)	\$ —	\$ —	\$ 65		

(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 \$815 million at June 30, 2019, and \$741 million at March 31, 2019, which includes a fair value derivative adjustment of \$403 million and \$338 million, respectively.

Three Months Ended	Available-for-Sale Debt Securities							Assets	Liabilities
	Foreign	Corporate securities ⁽¹⁾	MBS	Equity securities	Short-term investments	Other investments	Other derivative instruments	GLB ⁽²⁾	
June 30, 2018 (in millions of U.S. dollars)									
Balance – beginning of period	\$ 176	\$ 1,073	\$ 83	\$ 64	\$ 12	\$ 270	\$ 2	\$ 167	
Transfers into Level 3	—	6	—	—	—	—	—	—	
Transfers out of Level 3	—	—	—	—	—	—	—	—	
Change in Net Unrealized Gains (Losses) included in OCI, including foreign exchange	(7)	(9)	—	—	—	—	—	—	
Net Realized Gains/Losses	—	2	—	(3)	—	1	—	(42)	
Purchases	95	217	—	3	1	16	—	—	
Sales	(11)	(45)	—	(5)	—	—	—	—	
Settlements	(1)	(63)	(1)	—	(1)	(23)	—	—	
Balance – end of period	\$ 252	\$ 1,181	\$ 82	\$ 59	\$ 12	\$ 264	\$ 2	\$ 125	
Net Realized Gains/Losses Attributable to Changes in Fair Value at the Balance Sheet Date	\$ —	\$ —	\$ —	\$ (3)	\$ —	\$ 1	\$ —	\$ (42)	

(1) 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 \$497 million at June 30, 2018, and \$529 million at March 31, 2018, which includes a fair value derivative adjustment of \$125 million and \$167 million, respectively.

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	Assets						Liabilities
Six Months Ended	Available-for-Sale Debt Securities						
June 30, 2019	Foreign	Corporate securities	MBS	Equity securities	Short-term investments	Other investments	GLB ⁽¹⁾
(in millions of U.S. dollars)							
Balance – beginning of period	\$ 345	\$ 1,299	\$ 61	\$ 57	\$ 1	\$ 11	\$ 452
Transfers into Level 3	3	15	—	—	—	—	—
Transfers out of Level 3	(15)	—	—	—	—	—	—
Change in Net Unrealized Gains (Losses) included in OCI, including foreign exchange	6	5	—	2	—	—	—
Net Realized Gains/Losses	(1)	—	—	(3)	—	—	(49)
Purchases	96	249	18	14	4	—	—
Sales	(19)	(73)	(1)	(14)	—	—	—
Settlements	(44)	(136)	(2)	—	(1)	—	—
Balance – end of period	\$ 371	\$ 1,359	\$ 76	\$ 56	\$ 4	\$ 11	\$ 403
Net Realized Gains/Losses Attributable to Changes in Fair Value at the Balance Sheet Date	\$ —	\$ (1)	\$ —	\$ (2)	\$ —	\$ —	\$ (49)

(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 \$815 million at June 30, 2019, and \$861 million at December 31, 2018, which includes a fair value derivative adjustment of \$403 million and \$452 million, respectively.

	Assets						Liabilities	
Six Months Ended	Available-for-Sale Debt Securities							
June 30, 2018	Foreign	Corporate securities ⁽¹⁾	MBS	Equity securities	Short-term investments	Other investments	Other derivative instruments	GLB ⁽²⁾
(in millions of U.S. dollars)								
Balance – beginning of period	\$ 93	\$ 1,037	\$ 78	\$ 44	\$ —	\$ 263	\$ 2	\$ 204
Transfers into Level 3	7	6	1	—	5	—	—	—
Transfers out of Level 3	—	(10)	—	—	—	—	—	—
Change in Net Unrealized Gains (Losses) included in OCI, including foreign exchange	2	(12)	—	1	—	2	—	—
Net Realized Gains/Losses	—	2	—	(1)	—	1	—	(79)
Purchases	182	356	4	20	9	30	—	—
Sales	(30)	(96)	—	(5)	—	—	—	—
Settlements	(2)	(102)	(1)	—	(2)	(32)	—	—
Balance – end of period	\$ 252	\$ 1,181	\$ 82	\$ 59	\$ 12	\$ 264	\$ 2	\$ 125
Net Realized Gains/Losses Attributable to Changes in Fair Value at the Balance Sheet Date	\$ —	\$ —	\$ —	\$ (1)	\$ —	\$ 1	\$ —	\$ (79)

(1) 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 \$497 million at June 30, 2018, and \$550 million at December 31, 2017, which includes a fair value derivative adjustment of \$125 million and \$204 million, respectively.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

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.

Refer to the 2018 Form 10-K for information on the fair value methods and assumptions for investments in partially-owned insurance companies, short-term and long-term debt, repurchase agreements, and trust-preferred securities.

The following tables present fair value, by valuation hierarchy, and carrying value of the financial instruments not measured at fair value:

June 30, 2019 (in millions of U.S. dollars)	Fair Value				Carrying Value
	Level 1	Level 2	Level 3	Total	
Assets:					
<i>Fixed maturities held to maturity</i>					
U.S. Treasury and agency	\$ 1,138	\$ 55	\$ —	\$ 1,193	\$ 1,167
Foreign	—	1,523	—	1,523	1,465
Corporate securities	—	2,494	33	2,527	2,457
Mortgage-backed securities	—	2,502	—	2,502	2,442
States, municipalities, and political subdivisions	—	5,432	—	5,432	5,307
Total assets	\$ 1,138	\$ 12,006	\$ 33	\$ 13,177	\$ 12,838
Liabilities:					
Repurchase agreements	\$ —	\$ 1,416	\$ —	\$ 1,416	\$ 1,416
Short-term debt	—	9	—	9	9
Long-term debt	—	14,541	—	14,541	13,371
Trust preferred securities	—	439	—	439	308
Total liabilities	\$ —	\$ 16,405	\$ —	\$ 16,405	\$ 15,104

December 31, 2018 (in millions of U.S. dollars)	Fair Value				Carrying Value
	Level 1	Level 2	Level 3	Total	
Assets:					
<i>Fixed maturities held to maturity</i>					
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

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

4 . Unpaid losses and loss expenses

The following table presents a reconciliation of beginning and ending Unpaid losses and loss expenses:

(in millions of U.S. dollars)	Six Months Ended June 30	
	2019	2018
Gross unpaid losses and loss expenses – beginning of period	\$ 62,960	\$ 63,179
Reinsurance recoverable on unpaid losses - beginning of period ⁽¹⁾	(14,689)	(14,014)
Net unpaid losses and loss expenses – beginning of period	48,271	49,165
Net losses and loss expenses incurred in respect of losses occurring in:		
Current year	9,224	9,026
Prior years ⁽²⁾	(411)	(437)
Total	8,813	8,589
Net losses and loss expenses paid in respect of losses occurring in:		
Current year	2,288	2,346
Prior years	5,823	6,269
Total	8,111	8,615
Foreign currency revaluation and other	(1)	(96)
Net unpaid losses and loss expenses – end of period	48,972	49,043
Reinsurance recoverable on unpaid losses ⁽¹⁾	14,233	13,735
Gross unpaid losses and loss expenses – end of period	\$ 63,205	\$ 62,778

(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 \$19 million and \$37 million for the six months ended June 30, 2019 and 2018, respectively.

Gross and net unpaid losses and loss expenses increased \$245 million and \$701 million, respectively, for the six months ended June 30, 2019, reflecting an increase in the underlying reserves, partially offset by favorable prior period development.

Prior Period Development

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. 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.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

The following table summarizes (favorable) and adverse PPD by segment.

(in millions of U.S. dollars)	Three Months Ended June 30			Six Months Ended June 30		
	Long-tail	Short-tail	Total	Long-tail	Short-tail	Total
2019						
North America Commercial P&C Insurance	\$ (206)	\$ 21	\$ (185)	\$ (271)	\$ (45)	\$ (316)
North America Personal P&C Insurance	—	(16)	(16)	—	(26)	(26)
North America Agricultural Insurance	—	—	—	—	(61)	(61)
Overseas General Insurance	—	(20)	(20)	—	(24)	(24)
Global Reinsurance	(33)	33	—	(34)	26	(8)
Corporate	33	—	33	43	—	43
Total	\$ (206)	\$ 18	\$ (188)	\$ (262)	\$ (130)	\$ (392)
2018						
North America Commercial P&C Insurance	\$ (104)	\$ (51)	\$ (155)	\$ (96)	\$ (160)	\$ (256)
North America Personal P&C Insurance	—	7	7	—	1	1
North America Agricultural Insurance	—	—	—	—	(76)	(76)
Overseas General Insurance	(2)	(70)	(72)	(2)	(92)	(94)
Global Reinsurance	(30)	14	(16)	(30)	—	(30)
Corporate	45	—	45	55	—	55
Total	\$ (91)	\$ (100)	\$ (191)	\$ (73)	\$ (327)	\$ (400)

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
2019

For the three months ended June 30, 2019, net favorable PPD was \$185 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 \$206 million in long-tail business, primarily from:
 - Net favorable development of \$163 million in our workers' compensation lines. This included favorable development of \$61 million related to our annual assessment of multi-claimant events including industrial accidents, in the 2018 accident year. 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. This development in accident year 2018 was partially offset by some higher than expected activity from other claims and from involuntary pools. The remaining overall favorable development was mainly in accident years 2014 and prior, driven by lower than expected loss experience and related updates to loss development factors;
 - Net favorable development of \$50 million in our general liability portfolios, mainly driven by lower than expected paid and reported loss experience in accident years 2015 and prior, partly offset by adverse developments in more recent accident years; and
 - Net adverse development of \$25 million in automobile liability, driven by adverse paid and reported loss experience mainly in accident years 2014 through 2018.
- Net adverse development of \$21 million in short-tail business, which was the result of several adverse movements, in lines such as automobile physical damage and involuntary pools, none of which were significant individually or in the aggregate, mainly impacting accident year 2018.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

For the six months ended June 30, 2019, net favorable PPD was \$316 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 \$271 million in long-tail business, primarily from:
 - Net favorable development of \$200 million in our workers' compensation lines, mainly due to the same factors experienced for the three months ended June 30, 2019, as described above;
 - Net favorable development of \$54 million in professional liability (errors & omissions and cyber), mainly in the 2015 and prior accident years where case activity was less than expected, partially offset by adverse development in the 2016 accident year, which was driven by several large adverse claim developments;
 - Net favorable development of \$31 million in commercial excess and umbrella portfolios, driven by the 2013 and prior accident years, where case emergence was less than expected and greater weight was given to experience-based methods; this was partially offset by higher than expected claim activity in the 2015, 2016, and 2018 accident years which led to reserve strengthening in those years; and
 - Net adverse development of \$31 million in automobile liability, mainly due to the same factors experienced for the three months ended June 30, 2019, as described above.
- Net favorable development of \$45 million in short-tail business, primarily from favorable development of \$49 million in surety business, mainly in the 2017 accident year, driven by lower than expected reported loss activity.

2018

For the three months ended June 30, 2018 , net favorable PPD was \$155 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 \$104 million in long-tail business, primarily from:
 - Net favorable development of \$118 million in our 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 remaining favorable development is mainly in accident years 2011 and prior, and was principally due to lower than expected loss experience; and
 - Net adverse development of \$14 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 \$51 million in short-tail business, primarily from:
 - Net favorable development of \$40 million in our commercial property and marine businesses due to favorable claim development on the 2017 natural catastrophes.

For the six months ended June 30, 2018, net favorable PPD was \$256 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 \$96 million in long-tail business, primarily from:
 - Net favorable development of \$138 million in our workers' compensation lines mainly due to the same factors experienced for the three months ended June 30, 2018, as described above;
 - Net favorable development of \$29 million in our commercial excess and umbrella portfolios, driven by the 2012 and prior accident years where the cumulative emergence over time has been less than expected overall and an increase in weighting towards experience-based methods, partly offset by several large settlements; additionally there was adverse claim activity in the 2014 and 2015 accident years which led to reserve strengthening in those years;

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

- Net favorable development of \$3 million on several lines of business due to favorable claim development on the 2017 natural catastrophes; and
- Net adverse development of \$74 million, mainly in our automobile liability, commercial-multi peril (CMP) liability, products and general liability lines, due to the same factors experienced for the three months ended June 30, 2018, as described above.
- Net favorable development of \$160 million in short-tail business, primarily from:
 - Net favorable development of \$115 million in our commercial property and marine businesses due to favorable claim development on the 2017 natural catastrophes; and
 - Net favorable development of \$45 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.

North America Personal P&C Insurance

2019

For the three months ended June 30, 2019, net favorable PPD was \$16 million, which was the net result of several underlying favorable and adverse movements predominantly in the automobile and recreational marine lines.

For the six months ended June 30, 2019, net favorable PPD was \$26 million due to the same factors experienced for the three months ended June 30, 2019 as described above and favorable claim development on homeowners and valuables lines in the 2017 and 2018 accident years. In total, there was favorable claim development of \$134 million on the 2017 and 2018 natural catastrophes, offset by net adverse development of \$108 million mainly from elevated non-catastrophe activity in homeowners and valuables in the 2018 accident year.

2018

For the three and six months ended June 30, 2018, net adverse PPD was \$7 million and \$1 million, respectively, which were the net results of some modest net adverse and favorable movements by class and accident year, including favorable development of \$5 million and \$11 million, respectively, on the 2017 natural catastrophes.

North America Agricultural Insurance

There was no PPD in both the three months ended June 30, 2019 and 2018.

For the six months ended June 30, 2019 and 2018, net favorable PPD was \$61 million and \$76 million, respectively. Actual claim development relates to our Multiple Peril Crop Insurance (MPCI) business and was favorable due to better than expected crop yield results in certain states at the prior year-end period (i.e., 2019 results based on crop yield results at year-end 2018).

Overseas General Insurance

2019

For the three and six months ended June 30, 2019, net favorable PPD was \$20 million and \$24 million, respectively, principally driven by favorable development of \$27 million and \$31 million, respectively, in accident and health business, mainly due to favorable loss development in Continental Europe and Latin America in accident years 2015 through 2018.

2018

For the three months ended June 30, 2018, net favorable PPD was \$72 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 \$2 million in long-tail business.
- Net favorable development of \$70 million in short-tail business, primarily from:
 - Net favorable development of \$40 million in property and marine (excluding technical lines), primarily in accident years 2014 through 2016, driven mainly by favorable loss emergence across all regions, including favorable claim-specific loss settlements; and

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

- Net favorable development of \$30 million , including \$17 million in personal business and \$16 million in A&H business.

For the six months ended June 30, 2018, net favorable PPD was \$94 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 \$2 million in long-tail business.
- Net favorable development of \$92 million in short-tail business, due primarily to the same factors experienced for the three months ended June 30, 2018 as described above, and due to \$12 million of favorable claim development on the 2017 natural catastrophes.

**Global Reinsurance
2019**

For the three months ended June 30, 2019 , net PPD was nil , which was the net result of several underlying favorable and adverse movements, and was driven by the following principal changes:

- Net favorable development of \$33 million in long-tail business, primarily from our casualty and automobile lines, primarily impacting treaty years 2013 and prior, principally resulting from lower than expected loss emergence.
- Net adverse development of \$33 million in short-tail business, which included \$32 million of adverse development primarily on 2017 and 2018 natural catastrophe events.

For the six months ended June 30, 2019, net favorable PPD was \$8 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 \$34 million in long-tail business, primarily from our casualty and automobile lines, due to the same factors experienced for the three months ended June 30, 2019, as described above.
- Net adverse development of \$26 million in short-tail business, which included \$37 million of adverse development primarily on 2017 and 2018 natural catastrophe events.

2018

For the three months ended June 30, 2018, net favorable PPD was \$16 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 \$30 million in long-tail business, primarily from \$32 million favorable development in our casualty and professional liability lines, primarily impacting treaty years 2013 and prior, principally resulting from lower than expected loss emergence.
- Net adverse development of \$14 million in short-tail business, which included \$9 million of adverse claim development on the 2017 natural catastrophes.

For the six months ended June 30, 2018, net favorable PPD was \$30 million , which was the net result of several underlying favorable and adverse movements, primarily from long-tail business lines discussed above, and in short-tail business due to \$1 million of net favorable claim development on the 2017 natural catastrophes.

**Corporate
2019**

For the three and six months ended June 30, 2019, net adverse development was \$33 million and \$43 million , respectively, from the non A&E run-off casualty exposures, including workers' compensation, driven by increased claim costs and net adverse settlements on a limited number of claims. The net adverse development also included charges relating to unallocated loss adjustment expenses due to run-off operating expenses of \$9 million and \$19 million , respectively.

2018

For the three and six months ended June 30, 2018, net adverse development was \$45 million and \$55 million , respectively, from the non A&E run-off casualty exposures, driven by recent net adverse settlements on a limited number of claims and reinsurance collection activity. The net adverse development also included charges relating to unallocated loss adjustment expenses due to run-off operating expenses of \$10 million and \$20 million , respectively.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

5 . Debt

On June 18, 2019, Chubb INA Holdings Inc. (Chubb INA) issued €575 million (\$650 million based on the foreign exchange rate at the date of issuance) of 0.875 percent Euro denominated senior notes due June 2027 and €575 million (\$650 million based on the foreign exchange rate at the date of issuance) of 1.4 percent Euro denominated senior notes due June 2031. 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 0.20 percent for the senior notes due 2027 and 0.25 percent for the senior notes due 2031). 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.

Chubb INA's \$500 million of 5.9 percent senior notes due June 2019 were paid upon maturity.

6 . 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.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

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:

(in millions of U.S. dollars)	Consolidated Balance Sheet Location	June 30, 2019			December 31, 2018		
		Derivative Asset	Fair Value Derivative (Liability)	Notional Value/ Payment Provision	Derivative Asset	Fair Value Derivative (Liability)	Notional Value/ Payment Provision
<i>Investment and embedded derivative instruments:</i>							
Foreign currency forward contracts	OA / (AP)	\$ 12	\$ (49)	\$ 2,752	\$ 15	\$ (19)	\$ 2,185
Cross-currency swaps	OA / (AP)	—	—	—	—	—	45
Interest rate swaps	OA / (AP)	—	(104)	2,000	—	(115)	5,250
Options/Futures contracts on notes, bonds, and equities	OA / (AP)	3	(11)	829	13	(19)	1,046
Convertible securities ⁽¹⁾	FM AFS / ES	6	—	9	9	—	11
TBAs	FM AFS	—	—	—	6	—	6
		\$ 21	\$ (164)	\$ 5,590	\$ 43	\$ (153)	\$ 8,543
<i>Other derivative instruments:</i>							
Futures contracts on equities ⁽²⁾	OA / (AP)	\$ —	\$ (10)	\$ 560	\$ 23	\$ —	\$ 507
Other	OA / (AP)	15	—	207	2	—	74
		\$ 15	\$ (10)	\$ 767	\$ 25	\$ —	\$ 581
GLB ⁽³⁾	(AP) / (FPB)	\$ —	\$ (815)	\$ 1,537	\$ —	\$ (861)	\$ 1,750

(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. 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 June 30, 2019 and December 31, 2018, derivative liabilities of \$140 million and \$95 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.

The following table presents net realized gains (losses) related to derivative instrument activity in the Consolidated statements of operations:

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
<i>Investment and embedded derivative instruments:</i>				
Foreign currency forward contracts	\$ (22)	\$ 3	\$ (37)	\$ 7
Interest rate swaps	(135)	—	(215)	—
All other futures contracts, options, and equities	(25)	21	(61)	34
Convertible securities ⁽¹⁾	1	—	2	—
Total investment and embedded derivative instruments	\$ (181)	\$ 24	\$ (311)	\$ 41
<i>GLB and other derivative instruments:</i>				
GLB ⁽²⁾	\$ (65)	\$ 41	\$ 49	\$ 79
Futures contracts on equities ⁽³⁾	(20)	(44)	(83)	(22)
Other	7	8	6	10
Total GLB and other derivative instruments	\$ (78)	\$ 5	\$ (28)	\$ 67
	\$ (259)	\$ 29	\$ (339)	\$ 108

(1) Includes embedded derivatives.

(2) Excludes foreign exchange gains (losses) related to GLB.

(3) Related to GMDB and GLB blocks of business.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

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

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

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	
	June 30	December 31
	2019	2018
(in millions of U.S. dollars)	Overnight and Continuous	
<i>Collateral held under securities lending agreements:</i>		
Cash	\$ 583	\$ 756
U.S. Treasury and agency	117	64
Foreign	700	795
Corporate securities	50	15
Mortgage-backed securities	51	45
Equity securities	226	251
	\$ 1,727	\$ 1,926
Gross amount of recognized liability for securities lending payable	\$ 1,727	\$ 1,926

At June 30, 2019 and December 31, 2018, our repurchase agreement obligations of \$1,416 million and \$1,418 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.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

The following table presents the carrying value of collateral pledged under repurchase agreements by investment category and remaining contractual maturity of the underlying agreements:

(in millions of U.S. dollars)	June 30, 2019			Remaining contractual maturity		
	Up to 30 Days	Greater than 90 Days	Total	December 31, 2018		
				30-90 Days	Greater than 90 Days	Total
<i>Collateral pledged under repurchase agreements:</i>						
Cash	\$ 5	\$ —	\$ 5	\$ —	\$ —	\$ —
U.S. Treasury and agency	4	106	110	—	259	259
Mortgage-backed securities	406	949	1,355	496	713	1,209
	\$ 415	\$ 1,055	\$ 1,470	\$ 496	\$ 972	\$ 1,468
Gross amount of recognized liabilities for repurchase agreements			\$ 1,416			\$ 1,418
Difference ⁽¹⁾			\$ 54			\$ 50

(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.

d) Fixed maturities

At June 30, 2019, we have commitments to purchase fixed income securities of \$904 million over the next several years.

e) Other investments

At June 30, 2019, included in Other investments in the Consolidated balance sheets are investments in limited partnerships and partially-owned investment companies with a carrying value of \$4.6 billion. In connection with these investments, we have commitments that may require funding of up to \$3.6 billion over the next several years.

f) Income Taxes

At June 30, 2019, \$14 million of unrecognized tax benefits remain outstanding. 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 lapses of statutes of limitations. With few exceptions, Chubb is no longer subject to income tax examinations for years before 2010.

g) 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.

h) Leases

At June 30, 2019, the right-of-use asset was \$601 million recorded within Other assets, and the lease liability was \$642 million, which was recorded within Accounts payable, accrued expenses, and other liabilities on the Consolidated balance

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

sheet. These leases consist principally of real estate operating leases that are amortized on a straight-line basis over the term of the lease.

7. Shareholders' equity

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 consolidated financial statements. Under Swiss corporate law, dividends, including distributions through a reduction in par value (par value reduction) or from legal reserves, must be stated in Swiss francs though dividend payments are made by Chubb in U.S. dollars. At June 30, 2019, our Common Shares had a par value of CHF 24.15 per share.

At our May 2018 and 2017 annual general meetings, our shareholders approved an annual dividend for the following year of up to \$2.92 per share and \$2.84 per share, respectively, which were paid in four quarterly installments of \$0.73 per share and \$0.71 per share, respectively, at dates determined by the Board of Directors (Board) after the annual general meetings by way of a distribution from capital contribution reserves, transferred to free reserves for payment.

At our May 2019 annual general meeting, our shareholders approved an annual dividend for the following year of up to \$3.00 per share, expected to be paid in four quarterly installments of \$0.75 per share after the 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 2020 annual general meeting, and is authorized to abstain from distributing a dividend at its discretion.

The following table presents dividend distributions per Common Share in Swiss francs (CHF) and U.S. dollars (USD):

	Three Months Ended				Six Months Ended			
	June 30				June 30			
	2019		2018		2019		2018	
	CHF	USD	CHF	USD	CHF	USD	CHF	USD
Total dividend distributions per common share	0.75	\$ 0.75	0.73	\$ 0.73	1.47	\$ 1.48	1.39	\$ 1.44

Common Shares in treasury are used principally for issuance upon the exercise of employee stock options, grants of restricted stock, and purchases under the Employee Stock Purchase Plan (ESPP). At June 30, 2019, 23,706,045 Common Shares remain in treasury after net shares redeemed under employee share-based compensation plans.

Chubb Limited securities repurchase authorization

In December 2017, the Board authorized a share repurchase program of \$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.

The following table presents repurchases of Chubb's Common Shares conducted in a series of open market transactions under the Board authorizations:

(in millions of U.S. dollars, except share data)	Three Months Ended June 30		Six Months Ended June 30		July 1, 2019 through July 30, 2019
	2019	2018	2019	2018	
Number of shares repurchased	2,584,466	2,443,855	5,338,220	2,443,855	730,417
Cost of shares repurchased	\$ 376	\$ 324	\$ 743	\$ 324	\$ 110
Repurchase authorization remaining at end of period	\$ 736	\$ 676	\$ 736	\$ 676	\$ 626

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

8 . Share-based compensation

The Chubb Limited 2016 Long-Term Incentive Plan (the 2016 LTIP) permits grants of both incentive and non-qualified stock options principally 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 typically vest in equal annual installments over the respective vesting period, which is also the requisite service period. On February 28, 2019 , Chubb granted 2,073,712 stock options with a weighted-average grant date fair value of \$18.79 each. The fair value of the options issued is estimated on the grant date using the Black-Scholes option pricing model.

The 2016 LTIP also permits grants of service-based restricted stock and restricted stock units as well as performance-based restricted stock awards. Chubb generally grants service-based restricted stock and restricted stock units with a 4 -year vesting period, based on a graded vesting schedule. Beginning in 2017, the performance-based restricted stock awards granted comprise target awards and premium awards that cliff vest at the end of a 3 -year performance period based on both tangible book value (shareholders' equity less goodwill and intangible assets, net of tax) per share growth and P&C combined ratio compared to a defined group of peer companies. Premium awards are subject to an additional vesting provision based on total shareholder return compared to our peer group. The restricted stock is granted at market close price on the grant date. On February 28, 2019 , Chubb granted 1,078,247 service-based restricted stock awards, 357,463 service-based restricted stock units, and 212,059 performance-based stock awards to employees and officers with a grant date fair value of \$133.90 each. Each restricted stock unit represents our obligation to deliver to the holder one Common Share upon vesting.

9 . Postretirement benefits

The components of net pension and other postretirement benefit costs (benefits) reflected in Net income in the Consolidated statements of operations were as follows:

	Pension Benefit Plans				Other Postretirement Benefit Plans	
	2019		2018		2019	2018
	U.S. Plans	Non-U.S. Plans	U.S. Plans	Non-U.S. Plans		
Three Months Ended June 30 (in millions of U.S. dollars)						
Service cost	\$ 13	\$ 2	\$ 15	\$ 3	\$ —	\$ —
Non-service cost:						
Interest cost	29	7	27	7	1	1
Expected return on plan assets	(48)	(11)	(53)	(13)	(1)	(1)
Amortization of net actuarial loss	—	1	—	—	—	—
Amortization of prior service cost	—	—	—	—	(20)	(22)
Curtailments	—	—	—	—	—	(1)
Settlements	—	—	1	—	—	—
Total non-service (benefit) cost	(19)	(3)	(25)	(6)	(20)	(23)
Net periodic (benefit) cost	\$ (6)	\$ (1)	\$ (10)	\$ (3)	\$ (20)	\$ (23)

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

Six Months Ended June 30 (in millions of U.S. dollars)	Pension Benefit Plans				Other Postretirement Benefit Plans	
	2019		2018		2019	2018
	U.S. Plans	Non-U.S. Plans	U.S. Plans	Non-U.S. Plans		
Service cost	\$ 25	\$ 5	\$ 29	\$ 6	\$ —	\$ —
Non-service cost:						
Interest cost	59	14	53	14	2	2
Expected return on plan assets	(95)	(22)	(106)	(26)	(2)	(2)
Amortization of net actuarial loss	—	1	—	—	—	—
Amortization of prior service cost	—	—	—	—	(40)	(43)
Curtailments	—	—	—	—	—	(1)
Settlements	—	—	1	—	—	—
Total non-service (benefit) cost	(36)	(7)	(52)	(12)	(40)	(44)
Net periodic (benefit) cost	\$ (11)	\$ (2)	\$ (23)	\$ (6)	\$ (40)	\$ (44)

The service and non-service cost components of net periodic (benefit) cost reflected in the Consolidated statements of operations were as follows:

Three Months Ended June 30 (in millions of U.S. dollars)	Pension Benefit Plans		Other Postretirement Benefit Plans	
	2019	2018	2019	2018
Service Cost:				
Losses and loss expenses	\$ 1	\$ 1	\$ —	\$ —
Administrative expenses	14	17	—	—
Total service cost	15	18	—	—
Non-service Cost:				
Losses and loss expenses	(2)	(2)	(2)	(3)
Administrative expenses	(20)	(29)	(18)	(20)
Total non-service (benefit) cost	(22)	(31)	(20)	(23)
Net periodic (benefit) cost	\$ (7)	\$ (13)	\$ (20)	\$ (23)

Six Months Ended June 30 (in millions of U.S. dollars)	Pension Benefit Plans		Other Postretirement Benefit Plans	
	2019	2018	2019	2018
Service Cost:				
Losses and loss expenses	\$ 3	\$ 3	\$ —	\$ —
Administrative expenses	27	32	—	—
Total service cost	30	35	—	—
Non-service Cost:				
Losses and loss expenses	(4)	(5)	(4)	(4)
Administrative expenses	(39)	(59)	(36)	(40)
Total non-service (benefit) cost	(43)	(64)	(40)	(44)
Net periodic (benefit) cost	\$ (13)	\$ (29)	\$ (40)	\$ (44)

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

10 . 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.

Corporate results primarily include income and expenses not attributable to reportable segments and loss and loss expenses of asbestos and environmental (A&E) liabilities and certain other non-A&E run-off exposures.

For segment reporting purposes, certain items are presented in a different manner below than in the consolidated financial statements. Management uses underwriting income (loss) as the main measures of segment performance. Chubb calculates underwriting income (loss) by subtracting Losses and loss expenses, Policy benefits, Policy acquisition costs, and Administrative expenses from Net premiums earned. To calculate Segment income (loss), include Net investment income (loss), 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 (loss). For example, for the three months ended June 30, 2019, underwriting income in our North America Agricultural Insurance segment was \$38 million . This amount includes \$7 million of realized gains 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 three months ended June 30, 2019, Life Insurance underwriting income of \$87 million includes Net investment income of \$97 million and losses from fair value changes in separate account assets of \$3 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 Three Months Ended June 30, 2019 (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	\$ 3,534	\$ 1,309	\$ 466	\$ 2,258	\$ 197	\$ 579	\$ —	\$ 8,343
Net premiums earned	3,390	1,168	378	2,225	159	571	—	7,891
Losses and loss expenses	2,214	747	316	1,125	90	189	34	4,715
Policy benefits	—	—	—	—	—	161	—	161
Policy acquisition costs	459	237	27	629	42	150	—	1,544
Administrative expenses	259	71	4	265	7	78	74	758
Underwriting income (loss)	458	113	31	206	20	(7)	(108)	713
Net investment income (loss)	521	64	4	151	55	97	(33)	859
Other (income) expense	2	1	1	3	(15)	(7)	(215)	(230)
Amortization expense of purchased intangibles	—	3	7	12	—	1	54	77
Segment income	\$ 977	\$ 173	\$ 27	\$ 342	\$ 90	\$ 96	\$ 20	\$ 1,725
Net realized gains (losses) including OTTI							(223)	(223)
Interest expense							140	140
Chubb integration expenses							4	4
Income tax expense							208	208
Net income (loss)							\$ (555)	\$ 1,150

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

For the Three Months Ended June 30, 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	\$ 3,331	\$ 1,335	\$ 388	\$ 2,199	\$ 197	\$ 565	\$ —	\$ 8,015
Net premiums earned	3,277	1,156	351	2,161	167	552	—	7,664
Losses and loss expenses	2,084	728	289	1,071	83	184	48	4,487
Policy benefits	—	—	—	—	—	150	—	150
Policy acquisition costs	448	228	26	584	40	138	—	1,464
Administrative expenses	253	68	1	266	9	80	70	747
Underwriting income (loss)	492	132	35	240	35	—	(118)	816
Net investment income (loss)	510	59	6	155	65	85	(52)	828
Other (income) expense	(13)	1	1	(12)	(6)	8	(94)	(115)
Amortization expense of purchased intangibles	—	3	7	11	—	—	64	85
Segment income (loss)	\$ 1,015	\$ 187	\$ 33	\$ 396	\$ 106	\$ 77	\$ (140)	\$ 1,674
Net realized gains (losses) including OTTI							18	18
Interest expense							167	167
Chubb integration expenses							13	13
Income tax expense							218	218
Net income (loss)							\$ (520)	\$ 1,294

For the Six Months Ended June 30, 2019 (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	\$ 6,485	\$ 2,365	\$ 596	\$ 4,653	\$ 399	\$ 1,158	\$ —	\$ 15,656
Net premiums earned	6,475	2,322	433	4,339	327	1,132	—	15,028
Losses and loss expenses	4,187	1,504	289	2,231	166	391	45	8,813
Policy benefits	—	—	—	—	—	357	—	357
Policy acquisition costs	918	468	34	1,225	85	278	—	3,008
Administrative expenses	499	139	5	514	17	157	137	1,468
Underwriting income (loss)	871	211	105	369	59	(51)	(182)	1,382
Net investment income (loss)	1,031	128	14	295	111	186	(70)	1,695
Other (income) expense	(3)	1	1	7	(24)	(47)	(204)	(269)
Amortization expense of purchased intangibles	—	6	14	23	—	1	109	153
Segment income (loss)	\$ 1,905	\$ 332	\$ 104	\$ 634	\$ 194	\$ 181	\$ (157)	\$ 3,193
Net realized gains (losses) including OTTI							(320)	(320)
Interest expense							280	280
Chubb integration expenses							7	7
Income tax expense							396	396
Net income (loss)							\$ (1,160)	\$ 2,190

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

For the Six Months Ended June 30, 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	\$ 6,143	\$ 2,383	\$ 496	\$ 4,583	\$ 390	\$ 1,124	\$ —	\$ 15,119
Net premiums earned	6,306	2,296	394	4,268	335	1,092	—	14,691
Losses and loss expenses	3,992	1,614	236	2,149	150	389	59	8,589
Policy benefits	—	—	—	—	—	301	—	301
Policy acquisition costs	920	465	25	1,172	80	266	—	2,928
Administrative expenses	484	133	(2)	505	19	158	142	1,439
Underwriting income (loss)	910	84	135	442	86	(22)	(201)	1,434
Net investment income (loss)	1,013	118	13	306	129	168	(113)	1,634
Other (income) expense	(19)	1	1	(5)	(13)	4	(131)	(162)
Amortization expense of purchased intangibles	—	6	14	21	—	1	128	170
Segment income (loss)	\$ 1,942	\$ 195	\$ 133	\$ 732	\$ 228	\$ 141	\$ (311)	\$ 3,060
Net realized gains (losses) including OTTI							16	16
Interest expense							324	324
Chubb integration expenses							23	23
Income tax expense							353	353
Net income (loss)							\$ (995)	\$ 2,376

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.

11 . Earnings per share

(in millions of U.S. dollars, except share and per share data)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Numerator:				
Net income	\$ 1,150	\$ 1,294	\$ 2,190	\$ 2,376
Denominator:				
Denominator for basic earnings per share:				
Weighted-average shares outstanding	457,224,455	465,276,597	458,010,447	465,488,724
Denominator for diluted earnings per share:				
Share-based compensation plans	2,945,237	3,103,727	2,863,109	3,489,013
Weighted-average shares outstanding and assumed conversions	460,169,692	468,380,324	460,873,556	468,977,737
Basic earnings per share	\$ 2.52	\$ 2.78	\$ 4.78	\$ 5.10
Diluted earnings per share	\$ 2.50	\$ 2.76	\$ 4.75	\$ 5.07
Potential anti-dilutive share conversions	2,660,925	3,814,491	5,037,959	3,305,735

Excluded from weighted-average shares outstanding and assumed conversions is the impact of securities that would have been anti-dilutive during the respective periods.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

12 . Information provided in connection with outstanding debt of subsidiaries

The following tables present condensed consolidating financial information at June 30, 2019 and December 31, 2018 , and for the three and six months ended June 30, 2019 and 2018 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 June 30, 2019

(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	\$ —	\$ 235	\$ 105,504	\$ —	\$ 105,739
Cash ⁽¹⁾	1	1	1,625	(357)	1,270
Restricted cash	—	—	98	—	98
Insurance and reinsurance balances receivable	—	—	12,735	(1,800)	10,935
Reinsurance recoverable on losses and loss expenses	—	—	25,297	(9,852)	15,445
Reinsurance recoverable on policy benefits	—	—	297	(96)	201
Value of business acquired	—	—	280	—	280
Goodwill and other intangible assets	—	—	21,566	—	21,566
Investments in subsidiaries	47,983	51,972	—	(99,955)	—
Due from subsidiaries and affiliates, net	6,289	—	(61)	(6,228)	—
Other assets	5	449	20,266	(1,738)	18,982
Total assets	\$ 54,278	\$ 52,657	\$ 187,607	\$ (120,026)	\$ 174,516
Liabilities					
Unpaid losses and loss expenses	\$ —	\$ —	\$ 72,693	\$ (9,488)	\$ 63,205
Unearned premiums	—	—	17,624	(1,221)	16,403
Future policy benefits	—	—	5,664	(96)	5,568
Due to subsidiaries and affiliates, net	—	6,228	—	(6,228)	—
Affiliated notional cash pooling programs ⁽¹⁾	177	180	—	(357)	—
Repurchase agreements	—	—	1,416	—	1,416
Short-term debt	—	—	9	—	9
Long-term debt	—	13,370	1	—	13,371
Trust preferred securities	—	308	—	—	308
Other liabilities	299	1,774	21,042	(2,681)	20,434
Total liabilities	476	21,860	118,449	(20,071)	120,714
Total shareholders' equity	53,802	30,797	69,158	(99,955)	53,802
Total liabilities and shareholders' equity	\$ 54,278	\$ 52,657	\$ 187,607	\$ (120,026)	\$ 174,516

(1) Chubb maintains two notional multicurrency cash pools (Pools) with a third-party bank. Various Chubb entities participate in one or the other of the Pools, pursuant to which credit and debit balances in individual Chubb accounts are translated daily into a single currency and pooled on a notional basis. Individual Chubb entities are permitted to overdraw on their individual accounts provided the overall Pool balances do not fall below zero. At June 30, 2019 , the cash balance of one or more entities was negative; however, the overall Pool balances were positive.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

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. Various Chubb entities participate in one or the other of the Pools, pursuant to which credit and debit balances in individual Chubb accounts are translated daily into a single currency and pooled on a notional basis. Individual Chubb entities are permitted to overdraw on their individual accounts provided the overall Pool balances do not fall below zero. At December 31, 2018, the cash balance of one or more entities was negative; however, the overall Pool balances were positive.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

Condensed Consolidating Statements of Operations and Comprehensive Income

For the Three Months Ended June 30, 2019

(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	\$ —	\$ —	\$ 8,343	\$ —	\$ 8,343
Net premiums earned	—	—	7,891	—	7,891
Net investment income	1	(6)	864	—	859
Equity in earnings of subsidiaries	1,104	762	—	(1,866)	—
Net realized gains (losses) including OTTI	4	(21)	(206)	—	(223)
Losses and loss expenses	—	—	4,715	—	4,715
Policy benefits	—	—	161	—	161
Policy acquisition costs and administrative expenses	22	(5)	2,285	—	2,302
Interest (income) expense	(62)	180	22	—	140
Other (income) expense	(6)	1	(225)	—	(230)
Amortization of purchased intangibles	—	—	77	—	77
Chubb integration expenses	—	—	4	—	4
Income tax expense (benefit)	5	(45)	248	—	208
Net income	\$ 1,150	\$ 604	\$ 1,262	\$ (1,866)	\$ 1,150
Comprehensive income	\$ 2,059	\$ 1,397	\$ 2,181	\$ (3,578)	\$ 2,059

Condensed Consolidating Statements of Operations and Comprehensive Income

For the Three Months Ended June 30, 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	\$ —	\$ —	\$ 8,015	\$ —	\$ 8,015
Net premiums earned	—	—	7,664	—	7,664
Net investment income	1	5	822	—	828
Equity in earnings of subsidiaries	1,241	454	—	(1,695)	—
Net realized gains (losses) including OTTI	2	73	(57)	—	18
Losses and loss expenses	—	—	4,487	—	4,487
Policy benefits	—	—	150	—	150
Policy acquisition costs and administrative expenses	23	19	2,169	—	2,211
Interest (income) expense	(76)	204	39	—	167
Other (income) expense	(4)	8	(119)	—	(115)
Amortization of purchased intangibles	—	—	85	—	85
Chubb integration expenses	2	—	11	—	13
Income tax expense (benefit)	5	(36)	249	—	218
Net income	\$ 1,294	\$ 337	\$ 1,358	\$ (1,695)	\$ 1,294
Comprehensive income (loss)	\$ 277	\$ (462)	\$ 352	\$ 110	\$ 277

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

Condensed Consolidating Statements of Operations and Comprehensive Income

For the Six Months Ended June 30, 2019	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
(in millions of U.S. dollars)					
Net premiums written	\$ —	\$ —	\$ 15,656	\$ —	\$ 15,656
Net premiums earned	—	—	15,028	—	15,028
Net investment income	2	(10)	1,703	—	1,695
Equity in earnings of subsidiaries	2,094	1,521	—	(3,615)	—
Net realized gains (losses) including OTTI	5	(34)	(291)	—	(320)
Losses and loss expenses	—	—	8,813	—	8,813
Policy benefits	—	—	357	—	357
Policy acquisition costs and administrative expenses	42	(20)	4,454	—	4,476
Interest (income) expense	(128)	365	43	—	280
Other (income) expense	(12)	4	(261)	—	(269)
Amortization of purchased intangibles	—	—	153	—	153
Chubb integration expenses	—	2	5	—	7
Income tax expense (benefit)	9	(87)	474	—	396
Net income	\$ 2,190	\$ 1,213	\$ 2,402	\$ (3,615)	\$ 2,190
Comprehensive income	\$ 4,777	\$ 3,338	\$ 4,969	\$ (8,307)	\$ 4,777

Condensed Consolidating Statements of Operations and Comprehensive Income

For the Six Months Ended June 30, 2018	Chubb Limited (Parent Guarantor)	Chubb INA Holdings Inc. (Subsidiary Issuer)	Other Chubb Limited Subsidiaries	Consolidating Adjustments and Eliminations	Chubb Limited Consolidated
(in millions of U.S. dollars)					
Net premiums written	\$ —	\$ —	\$ 15,119	\$ —	\$ 15,119
Net premiums earned	—	—	14,691	—	14,691
Net investment income	3	9	1,622	—	1,634
Equity in earnings of subsidiaries	2,263	1,339	—	(3,602)	—
Net realized gains (losses) including OTTI	—	49	(33)	—	16
Losses and loss expenses	—	—	8,589	—	8,589
Policy benefits	—	—	301	—	301
Policy acquisition costs and administrative expenses	41	41	4,285	—	4,367
Interest (income) expense	(156)	413	67	—	324
Other (income) expense	(9)	16	(169)	—	(162)
Amortization of purchased intangibles	—	—	170	—	170
Chubb integration expenses	4	1	18	—	23
Income tax expense (benefit)	10	(95)	438	—	353
Net income	\$ 2,376	\$ 1,021	\$ 2,581	\$ (3,602)	\$ 2,376
Comprehensive income (loss)	\$ 730	\$ (246)	\$ 966	\$ (720)	\$ 730

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

Condensed Consolidating Statement of Cash Flows

Six Months Ended June 30, 2019

(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	\$ 323	\$ 1,302	\$ 2,943	\$ (1,860)	\$ 2,708
Cash flows from investing activities					
Purchases of fixed maturities available for sale	—	(5)	(12,561)	—	(12,566)
Purchases of fixed maturities held to maturity	—	—	(73)	—	(73)
Purchases of equity securities	—	—	(147)	—	(147)
Sales of fixed maturities available for sale	—	—	7,838	—	7,838
Sales of equity securities	—	—	266	—	266
Maturities and redemptions of fixed maturities available for sale	—	16	3,947	—	3,963
Maturities and redemptions of fixed maturities held to maturity	—	—	598	—	598
Net change in short-term investments	—	(11)	(752)	—	(763)
Net derivative instruments settlements	—	(35)	(501)	—	(536)
Private equity contributions	—	—	(920)	—	(920)
Private equity distributions	—	—	780	—	780
Capital contribution	(600)	(110)	—	710	—
Other	—	(12)	(715)	—	(727)
Net cash flows used for investing activities	(600)	(157)	(2,240)	710	(2,287)
Cash flows from financing activities					
Dividends paid on Common Shares	(671)	—	—	—	(671)
Common Shares repurchased	—	—	(741)	—	(741)
Proceeds from issuance of long-term debt	—	1,289	—	—	1,289
Repayment of long-term debt	—	(500)	—	—	(500)
Proceeds from issuance of repurchase agreements	—	—	1,984	—	1,984
Repayment of repurchase agreements	—	—	(1,986)	—	(1,986)
Proceeds from share-based compensation plans	—	—	95	—	95
Dividend to parent company	—	—	(1,860)	1,860	—
Advances (to) from affiliates	801	(1,498)	697	—	—
Capital contribution	—	—	710	(710)	—
Net proceeds from (payments to) affiliated notional cash pooling programs ⁽¹⁾	142	(437)	—	295	—
Policyholder contract deposits	—	—	237	—	237
Policyholder contract withdrawals	—	—	(138)	—	(138)
Net cash flows from (used for) financing activities	272	(1,146)	(1,002)	1,445	(431)
Effect of foreign currency rate changes on cash and restricted cash	5	—	33	—	38
Net increase (decrease) in cash and restricted cash	—	(1)	(266)	295	28
Cash and restricted cash – beginning of period ⁽¹⁾	1	2	1,989	(652)	1,340
Cash and restricted cash – end of period ⁽¹⁾	\$ 1	\$ 1	\$ 1,723	\$ (357)	\$ 1,368

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS – continued (Unaudited)

Chubb Limited and Subsidiaries

Condensed Consolidating Statement of Cash Flows

Six Months Ended June 30, 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	\$ 43	\$ 3,042	\$ 2,187	\$ (3,075)	\$ 2,197
Cash flows from investing activities					
Purchases of fixed maturities available for sale	—	(22)	(12,275)	—	(12,297)
Purchases of fixed maturities held to maturity	—	—	(337)	—	(337)
Purchases of equity securities	—	—	(85)	—	(85)
Sales of fixed maturities available for sale	—	—	6,858	—	6,858
Sales of equity securities	—	—	83	—	83
Maturities and redemptions of fixed maturities available for sale	—	14	3,906	—	3,920
Maturities and redemptions of fixed maturities held to maturity	—	—	732	—	732
Net change in short-term investments	—	6	395	—	401
Net derivative instruments settlements	—	(8)	13	—	5
Private equity contributions	—	—	(813)	—	(813)
Private equity distributions	—	—	413	—	413
Capital contribution	(750)	(3,500)	—	4,250	—
Other	—	(7)	(133)	—	(140)
Net cash flows used for investing activities	(750)	(3,517)	(1,243)	4,250	(1,260)
Cash flows from financing activities					
Dividends paid on Common Shares	(661)	—	—	—	(661)
Common Shares repurchased	—	—	(347)	—	(347)
Proceeds from issuance of long-term debt	—	2,171	—	—	2,171
Repayment of long-term debt	—	(1,900)	—	—	(1,900)
Proceeds from issuance of repurchase agreements	—	—	1,014	—	1,014
Repayment of repurchase agreements	—	—	(1,009)	—	(1,009)
Proceeds from share-based compensation plans	—	—	60	—	60
Dividend to parent company	—	—	(3,075)	3,075	—
Advances (to) from affiliates	963	(518)	(445)	—	—
Capital contribution	—	—	4,250	(4,250)	—
Net proceeds from affiliated notional cash pooling programs ⁽¹⁾	403	722	—	(1,125)	—
Policyholder contract deposits	—	—	192	—	192
Policyholder contract withdrawals	—	—	(169)	—	(169)
Net cash flows from (used for) financing activities	705	475	471	(2,300)	(649)
Effect of foreign currency rate changes on cash and restricted cash					
Net increase (decrease) in cash and restricted cash	(2)	—	1,377	(1,125)	250
Cash and restricted cash – beginning of period ⁽¹⁾	3	1	962	(115)	851
Cash and restricted cash – end of period ⁽¹⁾	\$ 1	\$ 1	\$ 2,339	\$ (1,240)	\$ 1,101

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ITEM 2. 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 three and six months ended June 30, 2019 .

All comparisons in this discussion are to the corresponding prior year period 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.

Our results of operations and cash flows for any interim period are not necessarily indicative of our results for the full year. This discussion should be read in conjunction with our consolidated financial statements and related notes and our Management's Discussion and Analysis of Financial Condition and Results of Operations included in our Annual Report on Form 10-K for the year ended December 31, 2018 (2018 Form 10-K).

Other Information

We routinely post important information for investors on our website (investors.chubb.com). We use this website as a means of disclosing material, non-public information and for complying with our disclosure obligations under Securities and Exchange Commission (SEC) Regulation FD (Fair Disclosure). Accordingly, investors should monitor the Investor Information portion of our website, in addition to following our press releases, SEC filings, 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.

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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 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

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 June 30, 2019, we had total assets of \$175 billion and shareholders' equity of \$54 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 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 in our 2018 Form 10-K.

Financial Highlights for the Three Months Ended June 30, 2019

- Net income was \$1,150 million compared with \$1,294 million in the prior year period.
- Total company and P&C net premiums written were \$8.3 billion and \$7.8 billion, respectively, up 4.1 percent and 4.2 percent, respectively, or 5.9 percent and 6.0 percent, respectively, on a constant-dollar basis.
- Combined ratio was 90.2 percent. P&C combined ratio was 90.1 percent compared with 88.4 percent in the prior year period. P&C current accident year combined ratio excluding catastrophe losses was 88.9 percent compared with 88.1 percent in the prior year period.
- Total pre-tax and after-tax catastrophe losses were \$275 million (3.8 percentage points of the combined ratio) and \$221 million, respectively, compared with \$211 million (3.0 percentage points of the combined ratio) and \$173 million, respectively, in the prior year period.
- Total pre-tax and after-tax favorable prior period development were \$188 million (2.6 percentage points of the combined ratio) and \$152 million, respectively, compared with \$191 million (2.7 percentage points of the combined ratio) and \$158 million, respectively, in the prior year period.
- Operating cash flow was \$1,386 million compared with \$1,646 million in the prior year period. Refer to the Liquidity section for additional information on our cash flows.
- Net investment income was \$859 million compared with \$828 million in the prior year period.
- Share repurchases totaled \$376 million, or approximately 2.6 million shares, during the quarter, and \$743 million, or approximately 5.3 million shares, through June 30, 2019.

Consolidated Operating Results – Three and Six Months Ended June 30, 2019 and 2018

(in millions of U.S. dollars, except for percentages)	Three Months Ended			Six Months Ended		
	June 30		% Change	June 30		% Change
	2019	2018	Q-19 vs. Q-18	2019	2018	YTD-19 vs. YTD-18
Net premiums written ⁽¹⁾	\$ 8,343	\$ 8,015	4.1 %	\$ 15,656	\$ 15,119	3.5 %
Net premiums earned ⁽¹⁾	7,891	7,664	3.0 %	15,028	14,691	2.3 %
Net investment income	859	828	3.8 %	1,695	1,634	3.8 %
Net realized gains (losses)	(223)	18	NM	(320)	16	NM
Total revenues	8,527	8,510	0.2 %	16,403	16,341	0.4 %
Losses and loss expenses	4,715	4,487	5.1 %	8,813	8,589	2.6 %
Policy benefits	161	150	7.5 %	357	301	18.7 %
Policy acquisition costs	1,544	1,464	5.5 %	3,008	2,928	2.7 %
Administrative expenses	758	747	1.5 %	1,468	1,439	2.0 %
Interest expense	140	167	(16.4)%	280	324	(13.7)%
Other (income) expense	(230)	(115)	100.8 %	(269)	(162)	66.1 %
Amortization of purchased intangibles	77	85	(9.5)%	153	170	(9.9)%
Chubb integration expenses	4	13	(66.0)%	7	23	(67.5)%
Total expenses	7,169	6,998	2.5 %	13,817	13,612	1.5 %
Income before income tax	1,358	1,512	(10.3)%	2,586	2,729	(5.2)%
Income tax expense	208	218	(4.7)%	396	353	12.2 %
Net income	\$ 1,150	\$ 1,294	(11.1)%	\$ 2,190	\$ 2,376	(7.8)%

NM – not meaningful

(1) On a constant-dollar basis for the three and six months ended June 30, 2019, net premiums written increased \$467 million, or 5.9 percent, and \$820 million, or 5.5 percent, respectively, and net premiums earned increased \$369 million, or 4.9 percent, and \$620 million, or 4.3 percent, respectively. Amounts are calculated by translating prior period results using the same local currency exchange rates as the comparable current period.

Net Premiums Written

Net premiums written reflect the premiums we retain after purchasing reinsurance protection. For the three and six months ended June 30, 2019 consolidated net premiums written increased \$328 million and \$537 million, or \$467 million (5.9 percent), and \$820 million (5.5 percent), respectively, on a constant-dollar basis, reflecting growth across most segments.

- Net premiums written in our North America Commercial P&C Insurance segment increased \$203 million, or 6.0 percent, and increased \$342 million, or 5.6 percent, for the three and six months ended June 30, 2019, respectively, reflecting positive rate increases and new business written across most retail lines, including in property, primary and excess casualty, global casualty, package and A&H, growth in our wholesale and high excess Bermuda lines, and continued growth in our small commercial businesses.
- Net premiums written in our North America Personal P&C Insurance segment decreased \$26 million, or 2.0 percent, and \$18 million, or 0.7 percent, for the three and six months ended June 30, 2019, respectively, as the prior year benefited from changes we made to harmonize registration between our legacy registration systems. In addition, there were higher cessions in the current year related to the homeowners quota share reinsurance treaty effective October 1, 2018, which were partially offset by strong retention and rate increases, predominantly in all lines. Excluding the impact of these items, our growth in net premiums written was 2.4 percent for both the three and six months ended June 30, 2019.
- Net premiums written in our North America Agricultural Insurance segment increased \$78 million, or 20.1 percent, and \$100 million, or 20.1 percent, for the three and six months ended June 30, 2019, respectively, primarily due to an increase in MPC1 premium reflecting the timing of premium registrations in the current year versus the prior year, the non-renewal of a quota-share treaty effective with the current crop year, and an increase in current year production.
- Net premiums written in our Overseas General Insurance segment for the three and six months ended June 30, 2019 increased \$59 million and \$70 million, or \$177 million (8.5 percent) and \$313 million (7.2 percent), respectively, on a constant-dollar basis, reflecting growth across most regions and lines of business. P&C lines growth was principally due to

new business in small commercial property and general casualty lines, middle market, and excess and surplus lines. Personal lines growth was driven by new business. Accident and health (A&H) lines growth was principally in Asia and Latin America driven by new business.

- Net premiums written in our Global Reinsurance segment remained flat, or increased \$3 million (1.3 percent) on a constant-dollar basis, for the three months ended June 30, 2019 as new business written in marine and property catastrophe lines was offset by reduced renewal retention primarily in the motor line, which was reflective of competitive market conditions, and higher ceded retrocessions principally in property catastrophe and marine lines. For the six months ended June 30, 2019 , net premiums written increased \$9 million , or \$15 million (3.8 percent) on a constant-dollar basis, primarily due to new business written in marine and property lines, and the timing of a homeowners treaty, which was previously written mainly in the third quarter of 2018. This increase was partially offset by reduced renewal retention and higher ceded retrocessions.
- Net premiums written in our Life Insurance segment increased \$14 million and \$34 million , or \$23 million (4.3 percent) and \$52 million (4.7 percent) on a constant-dollar basis, for the three and six months ended June 30, 2019, respectively, primarily reflecting growth in our North American Combined Insurance supplemental A&H program and Asian and Latin American international life operations, partially offset by our life reinsurance business, which continues to decline as no new life reinsurance business is currently being written.

Net Premiums Written By Line of Business

(in millions of U.S. dollars, except for percentages)	Three Months Ended					Six Months Ended				
	June 30					June 30				
	2019	2018	% Change Q-19 vs. Q-18	C\$ ⁽¹⁾ 2018	C\$ ⁽¹⁾ % Change Q-19 vs. Q-18	2019	2018	% Change YTD-19 vs. YTD-18	C\$ ⁽¹⁾ 2018	C\$ ⁽¹⁾ % Change YTD-19 vs. YTD-18
Commercial casualty	\$ 1,472	\$ 1,402	5.0 %	\$ 1,386	6.3 %	\$ 2,672	\$ 2,503	6.7 %	\$ 2,473	8.1 %
Workers' compensation	482	454	6.2 %	454	6.2 %	1,075	1,076	(0.1)%	1,076	(0.1)%
Professional liability	909	889	2.2 %	873	4.0 %	1,695	1,662	2.0 %	1,634	3.7 %
Surety	156	161	(3.0)%	157	(0.6)%	308	322	(4.2)%	313	(1.6)%
Commercial multiple peril ⁽²⁾	254	243	4.6 %	243	4.6 %	473	443	6.6 %	443	6.6 %
Property and other short-tail lines	1,186	1,072	10.5 %	1,046	13.4 %	2,343	2,159	8.5 %	2,104	11.4 %
Total Commercial P&C ⁽³⁾	4,459	4,221	5.6 %	4,159	7.2 %	8,566	8,165	4.9 %	8,043	6.5 %
Agriculture	466	388	20.1 %	388	20.1 %	596	496	20.1 %	496	20.1 %
Personal automobile	473	456	3.8 %	450	5.1 %	894	854	4.8 %	841	6.4 %
Personal homeowners	968	982	(1.4)%	977	(0.9)%	1,711	1,720	(0.5)%	1,712	(0.1)%
Personal other	383	389	(1.5)%	372	3.0 %	751	776	(3.2)%	744	1.0 %
Total Personal lines	1,824	1,827	(0.2)%	1,799	1.4 %	3,356	3,350	0.2 %	3,297	1.8 %
Total Property and Casualty lines	6,749	6,436	4.9 %	6,346	6.4 %	12,518	12,011	4.2 %	11,836	5.8 %
Global A&H lines ⁽⁴⁾	1,130	1,116	1.3 %	1,077	4.9 %	2,203	2,188	0.7 %	2,099	5.0 %
Reinsurance lines	197	197	0.2 %	194	1.3 %	399	390	2.3 %	384	3.8 %
Life	267	266	0.2 %	259	3.1 %	536	530	0.9 %	517	3.6 %
Total consolidated	\$ 8,343	\$ 8,015	4.1 %	\$ 7,876	5.9 %	\$ 15,656	\$ 15,119	3.5 %	\$ 14,836	5.5 %

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

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

(3) The three months ended June 30, 2018 included a reclassification of \$44 million from Commercial casualty to Property and other short-tail lines (\$40 million) and Workers' compensation (\$4 million) to better align the reporting with current year. The six months ended June 30, 2018 included a reclassification of \$88 million from Commercial casualty and \$1 million from Commercial multiple peril to Property and other short-tail lines (\$87 million) and Workers' compensation (\$2 million) to better align the reporting with current year. 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 Global A&H lines above.

The increase in net premiums written for the three and six months ended June 30, 2019, reflects growth across most lines of business from positive rate increases and new business. The increase in commercial casualty and professional liability business was due to new business in North America, Europe, and Asia. Growth in workers' compensation was adversely impacted by competitive market conditions. Surety decreased due to declines in Europe, partially offset by new business written in North America. Commercial multiple peril increased due to new business. Property and other short-tail lines increased due to growth in North America major accounts and internationally due to new business. Our personal lines declined reflecting the system harmonization benefit in the prior year and higher cessions in the current year related to the North America homeowners quota share reinsurance treaty effective October 1, 2018. This decline was substantially offset by new business written and growth in personal automobile lines. Global A&H lines increased due to growth in our North American Combined Insurance supplemental A&H program along with new business in Asia and Latin America. For additional information on net premiums written, refer to the segment results discussions.

Net Premiums Earned

Net premiums earned for short-duration contracts, typically P&C contracts, generally reflect the portion of net premiums written that was 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. For the three and six months ended June 30, 2019, net premiums earned increased \$227 million and \$337 million, respectively, reflecting the growth in net premiums written described above, including the impact of premiums that were fully earned when written (e.g., large structured transactions and audit and retrospective premium adjustments). The North America Commercial P&C Insurance segment included \$226 million in the current year and \$206 million in the prior year of net premiums written related to large structured transactions that were fully earned when written. On a constant-dollar basis, for the three and six months ended June 30, 2019, net premiums earned increased \$369 million (4.9 percent) and \$620 million (4.3 percent), respectively.

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.

	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Loss and loss expense ratio	61.7%	60.4%	60.6%	60.2%
Policy acquisition cost ratio	19.1%	18.6%	19.6%	19.6%
Administrative expense ratio	9.3%	9.4%	9.4%	9.4%
P&C Combined ratio	90.1%	88.4%	89.6%	89.2%

The loss and loss expense ratio increased 1.3 percentage points for the three months ended June 30, 2019, due to higher catastrophe losses and earned price changes modestly below loss trends in our North America operations. The loss and loss expense ratio increased 0.4 percentage points for the six months ended June 30, 2019, due to earned price changes modestly below loss trends as discussed in the quarter, partially offset by lower catastrophe losses. Written price changes exceeded loss trends for the three and six months ended June 30, 2019.

Policy acquisition costs consist of commissions, premium taxes, and certain underwriting costs directly related to the successful acquisition of new or renewal insurance contracts. Our policy acquisition cost ratio increased 0.5 percentage points for the three months ended June 30, 2019 primarily due to a shift in the mix of business towards products and regions that have a higher acquisition cost ratio and a favorable supplemental commission adjustment that benefited the prior year. The policy acquisition cost ratio remained flat for the six months ended June 30, 2019.

Our administrative expense ratio remained flat for the three and six months ended June 30, 2019.

Catastrophe Losses and Prior Period Development

Catastrophe losses exclude reinstatement premiums which 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. Prior period development is net of related adjustments which 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. Refer to the Non-GAAP Reconciliation section for further information on reinstatement premiums on catastrophe losses and adjustments to prior period development.

(in millions of U.S dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Catastrophe losses	\$ 275	\$ 211	\$ 525	\$ 591
Favorable prior period development	\$ 188	\$ 191	\$ 392	\$ 400

Catastrophe losses through June 30, 2019 and 2018 were primarily from the following events:

- 2019 : Severe weather-related events in the U.S., including winter-related storms, and storms in Australia.
- 2018 : Severe weather-related events in the U.S., including California mudslides and Northeast winter storms, and in Asia Pacific and Europe.

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.

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. Refer to the Prior Period Development section in Note 4 to the Consolidated Financial Statements for additional information.

Pre-tax net favorable prior period development for the three months ended June 30, 2019 was \$188 million, including adverse development of \$48 million related to the 2017 and 2018 catastrophe events and \$25 million of adverse development related to our run-off non-A&E casualty exposures. The remaining net favorable development of \$261 million comprises approximately 90 percent long-tail lines, including workers' compensation lines and from accident years 2015 and prior, and approximately 10 percent short-tail lines.

Pre-tax net favorable prior period development for the six months ended June 30, 2019 was \$392 million, including \$61 million favorable development related to the 2018 crop year loss estimates, \$76 million favorable development related to the 2017 and 2018 catastrophe events, adverse development of \$122 million principally in homeowners due to elevated non-catastrophe activity, and adverse development of \$25 million of related to our run-off non-A&E casualty exposures. The remaining net favorable development of \$402 million comprises approximately 70 percent long-tail lines, including workers' compensation lines and from accident years 2015 and prior, and approximately 30 percent short-tail lines.

Pre-tax favorable prior period development for the three months ended June 30, 2018 was \$191 million, including \$236 million of favorable development, of which \$136 million was long-tail lines, principally from the 2014 and prior accident years, \$64 million was short-tail lines, and \$36 million was related to the 2017 catastrophe events. The favorable development was offset by \$45 million of adverse development related to our run-off non-A&E casualty exposures.

Pre-tax favorable prior period development for the six months ended June 30, 2018 was \$400 million, including \$455 million of favorable development, of which \$125 million was long-tail lines, principally from the 2014 and prior accident years, \$188 million was short-tail lines, principally related to our Crop insurance business, and \$142 million was related to the 2017 catastrophe events. The favorable development was offset by \$55 million of adverse development related to our run-off non-A&E casualty exposures.

Current Accident Year (CAY) Loss Ratio excluding CATs and CAY P&C Combined Ratio excluding CATs

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.

	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Loss and loss expense ratio	61.7 %	60.4 %	60.6 %	60.2 %
Catastrophe losses	(3.8)%	(3.0)%	(3.8)%	(4.3)%
Prior period development	2.6 %	2.6 %	2.8 %	3.0 %
CAY loss ratio excluding catastrophe losses	60.5 %	60.0 %	59.6 %	58.9 %

The CAY loss ratio excluding CATs increased 0.5 percentage points and 0.7 percentage points for the three and six months ended June 30, 2019, respectively, primarily due to earned price changes modestly below loss trends in our North America operations. Written price changes exceeded loss trends for the three and six months ended June 30, 2019.

CAY P&C Combined Ratio excluding Catastrophe Losses

	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
CAY Loss and loss expense ratio ex CATs	60.5%	60.0%	59.6%	58.9%
CAY Policy acquisition cost ratio ex CATs	19.1%	18.7%	19.6%	19.5%
CAY Administrative expense ratio ex CATs	9.3%	9.4%	9.5%	9.4%
CAY P&C combined ratio ex CATs	88.9%	88.1%	88.7%	87.8%

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 Insurance segment operating results section for further discussion.

For the three months ended June 30, 2019 and 2018, Policy benefits were \$161 million and \$150 million, respectively, which included separate account gains of \$3 million and \$10 million, respectively, related to separate account liabilities.

For the six months ended June 30, 2019 and 2018, Policy benefits were \$357 million and \$301 million, respectively, which included separate account losses of \$27 million and gains of \$4 million, respectively, related to separate account liabilities.

Refer to the respective sections 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 – Three and Six Months Ended June 30, 2019 and 2018

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 in our 2018 Form 10-K.

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 and certain other non-A&E run-off exposures.

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 (large corporate accounts and wholesale business), and the North America Commercial Insurance division (principally middle market and small commercial accounts).

	Three Months Ended			Six Months Ended		
	June 30		% Change	June 30		% Change
(in millions of U.S. dollars, except for percentages)	2019	2018	Q-19 vs. Q-18	2019	2018	YTD-19 vs. YTD-18
Net premiums written	\$ 3,534	\$ 3,331	6.0%	\$ 6,485	\$ 6,143	5.6%
Net premiums earned	3,390	3,277	3.4%	6,475	6,306	2.7%
Losses and loss expenses	2,214	2,084	6.2%	4,187	3,992	4.9%
Policy acquisition costs	459	448	2.7%	918	920	(0.2)%
Administrative expenses	259	253	2.0%	499	484	3.0%
Underwriting income	458	492	(7.0)%	871	910	(4.3)%
Net investment income	521	510	2.4%	1,031	1,013	1.8%
Other (income) expense	2	(13)	NM	(3)	(19)	(84.4)%
Segment income	\$ 977	\$ 1,015	(3.7)%	\$ 1,905	\$ 1,942	(1.9)%
Loss and loss expense ratio	65.3%	63.6%	1.7 pts	64.7%	63.3%	1.4 pts
Policy acquisition cost ratio	13.6%	13.7%	(0.1) pts	14.1%	14.6%	(0.5) pts
Administrative expense ratio	7.6%	7.7%	(0.1) pts	7.7%	7.7%	—
Combined ratio	86.5%	85.0%	1.5 pts	86.5%	85.6%	0.9 pts

NM – not meaningful

Premiums

Net premiums written increased \$203 million , or 6.0 percent , and \$342 million , or 5.6 percent , for the three and six months ended June 30, 2019 , respectively, reflecting positive rate increases and new business written across most retail lines, including in property, primary and excess casualty, global casualty, package and A&H, growth in our wholesale and high excess Bermuda lines, and continued growth in our small commercial businesses.

Net premiums earned increased \$113 million , or 3.4 percent , and \$169 million , or 2.7 percent , for the three and six months ended June 30, 2019 , respectively, due to the growth in net premiums written described above. The net premiums written in global casualty included \$226 million in the current year and \$206 million in the prior year of net premiums written related to large structured transactions that were fully earned when written. The table below shows the impact of these structured deals, as well as other transactions that are fully earned when written (e.g., audit and retrospective premium adjustments).

	Three Months Ended		Six Months Ended	
	June 30		June 30	
(in millions of U.S. dollars)	2019	2018	2019	2018
Premiums written and earned in the same period	\$ 290	\$ 288	\$ 347	\$ 342

Combined Ratio

The loss and loss expense ratio increased 1.7 percentage points and 1.4 percentage points for the three and six months ended June 30, 2019 , respectively, primarily due to higher catastrophe losses and earned price changes modestly below loss trends, partially offset by higher favorable prior period development. Written price changes exceeded loss trends for the three and six months ended June 30, 2019.

The policy acquisition cost ratio remained relatively flat for the three months ended June 30, 2019. The policy acquisition cost ratio decreased 0.5 percentage points for the six months ended June 30, 2019 , primarily due to a change in mix of business towards lower acquisition cost ratio lines and increased cessions under certain reinsurance agreements that resulted in higher ceded acquisition costs benefit than in prior year.

The administrative expense ratio remained relatively flat for the three and six months ended June 30, 2019 .

Catastrophe Losses and Prior Period Development

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Catastrophe losses	\$ 137	\$ 73	\$ 231	\$ 151
Favorable prior period development	\$ 185	\$ 155	\$ 316	\$ 256

Catastrophe losses through June 30, 2019 and 2018 were primarily from the following events:

- 2019 : Winter-related storms and other severe weather-related events in the U.S.
- 2018 : Severe weather-related events in the U.S.

Refer to the prior period development discussion in Footnote 4 to the Consolidated Financial Statements for additional information.

CAY Loss Ratio excluding Catastrophe Losses

	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Loss and loss expense ratio	65.3 %	63.6 %	64.7 %	63.3 %
Catastrophe losses	(4.0)%	(2.2)%	(3.6)%	(2.4)%
Prior period development	5.4 %	4.6 %	4.8 %	4.1 %
CAY loss ratio excluding catastrophe losses	66.7 %	66.0 %	65.9 %	65.0 %

The CAY loss ratio excluding catastrophe losses increased 0.7 percentage points and 0.9 percentage points for the three and six months ended June 30, 2019 , respectively, primarily due to earned price changes modestly below loss trends. Written price changes exceeded loss trends for the three and six months ended June 30, 2019.

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.

	Three Months Ended			Six Months Ended		
	June 30		% Change	June 30		% Change
(in millions of U.S. dollars, except for percentages)	2019	2018	Q-19 vs. Q-18	2019	2018	YTD-19 vs. YTD-18
Net premiums written	\$ 1,309	\$ 1,335	(2.0)%	\$ 2,365	\$ 2,383	(0.7)%
Net premiums earned	1,168	1,156	1.1%	2,322	2,296	1.2%
Losses and loss expenses	747	728	2.6%	1,504	1,614	(6.8)%
Policy acquisition costs	237	228	3.8%	468	465	0.7%
Administrative expenses	71	68	5.2%	139	133	4.9%
Underwriting income	113	132	(14.5)%	211	84	151.0%
Net investment income	64	59	7.2%	128	118	8.0%
Other (income) expense	1	1	—	1	1	—
Amortization of purchased intangibles	3	3	—	6	6	—
Segment income	\$ 173	\$ 187	(7.7)%	\$ 332	\$ 195	70.5%
Loss and loss expense ratio	64.0%	63.0%	1.0 pt	64.7%	70.3%	(5.6) pts
Policy acquisition cost ratio	20.2%	19.7%	0.5 pts	20.2%	20.2%	—
Administrative expense ratio	6.1%	5.9%	0.2 pts	6.0%	5.8%	0.2 pts
Combined ratio	90.3%	88.6%	1.7 pts	90.9%	96.3%	(5.4) pts

Premiums

Net premiums written decreased \$26 million , or 2.0 percent , and \$18 million , or 0.7 percent , for the three and six months ended June 30, 2019 , respectively, as the prior year benefited from changes we made to harmonize registration between our legacy registration systems. In addition, there were higher cessions in the current year related to the homeowners quota share reinsurance treaty effective October 1, 2018, which were partially offset by strong retention and rate increases, predominantly in all lines. Excluding the impact of these items, our growth in net premiums written was 2.4 percent for both the three and six months ended June 30, 2019.

Net premiums earned increased \$12 million , or 1.1 percent , and \$26 million , or 1.2 percent , for the three and six months ended June 30, 2019 , respectively, reflecting the earning in of premiums written in prior periods which more than offset the factors described above.

Combined Ratio

The loss and loss expense ratio increased 1.0 percentage point for the three months ended June 30, 2019, primarily due to an increase in the underlying loss ratio, reflecting a re-evaluation of non-catastrophe loss activity and higher catastrophe losses, partially offset by higher favorable prior period development. The loss and loss expense ratio decreased 5.6 percentage points for the six months ended June 30, 2019 , primarily due to lower catastrophe losses and higher favorable prior period development, partially offset by an increase in the underlying loss ratio, reflecting a re-evaluation of non-catastrophe loss activity.

The policy acquisition cost ratio increased 0.5 percentage points for the three months ended June 30, 2019 , primarily due to a favorable supplemental commission adjustment that benefited the prior year. In 2019, a similar favorable supplemental commission adjustment was recorded in the first quarter. Therefore, on a year-to-date basis, the policy acquisition cost ratio remained flat for the six months ended June 30, 2019.

The administrative expense ratio increased 0.2 percentage points for both the three and six months ended June 30, 2019 primarily due to higher employee-related expenses, including merit-based salary and inflationary increases.

Catastrophe losses and Prior Period Development

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Catastrophe losses	\$ 117	\$ 101	\$ 246	\$ 385
Favorable (unfavorable) prior period development	\$ 16	\$ (7)	\$ 26	\$ (1)

Catastrophe losses through June 30, 2019 and 2018 were primarily from the following events:

- 2019 : Winter-related storms and other severe weather-related events in the U.S.
- 2018 : California mudslides and Northeast winter storms.

Refer to the prior period development discussion in Footnote 4 to the Consolidated Financial Statements for additional information.

CAY Loss Ratio excluding Catastrophe Losses

	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Loss and loss expense ratio	64.0 %	63.0 %	64.7 %	70.3 %
Catastrophe losses	(10.1)%	(8.7)%	(10.6)%	(16.8)%
Prior period development	1.4 %	(0.6)%	1.1 %	—
CAY loss ratio excluding catastrophe losses	55.3 %	53.7 %	55.2 %	53.5 %

The CAY loss ratio excluding catastrophe losses increased 1.6 percentage points and 1.7 percentage points for the three and six months ended June 30, 2019 , respectively, primarily due to an increase in the underlying loss ratio, reflecting a re-evaluation of non-catastrophe loss activity.

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.

	Three Months Ended			Six Months Ended		
	June 30		% Change	June 30		% Change
(in millions of U.S. dollars, except for percentages)	2019	2018	Q-19 vs. Q-18	2019	2018	YTD-19 vs. YTD-18
Net premiums written	\$ 466	\$ 388	20.1%	\$ 596	\$ 496	20.1%
Net premiums earned	378	351	7.7%	433	394	9.8%
Losses and loss expenses ⁽¹⁾	309	281	10.3%	283	226	25.4%
Policy acquisition costs	27	26	5.1%	34	25	37.2%
Administrative expenses	4	1	NM	5	(2)	NM
Underwriting income	38	43	(11.6)%	111	145	(23.6)%
Net investment income	4	6	(43.0)%	14	13	1.0%
Other (income) expense	1	1	—	1	1	—
Amortization of purchased intangibles	7	7	—	14	14	—
Segment income	\$ 34	\$ 41	(17.8)%	\$ 110	\$ 143	(23.3)%
Loss and loss expense ratio	81.9%	80.0%	1.9 pts	65.5%	57.4 %	8.1 pts
Policy acquisition cost ratio	7.3%	7.4%	(0.1) pts	7.9%	6.3 %	1.6 pts
Administrative expense ratio	0.9%	0.5%	0.4 pts	1.1%	(0.4)%	1.5 pts
Combined ratio	90.1%	87.9%	2.2 pts	74.5%	63.3 %	11.2 pts

NM – not meaningful

⁽¹⁾ Gains on crop derivatives were \$7 million and \$6 million for the three and six months ended June 30, 2019, respectively. Gains on crop derivatives were \$8 million and \$10 million for the three and six months ended June 30, 2018, respectively. These gains 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

Net premiums written increased \$78 million, or 20.1 percent, and \$100 million, or 20.1 percent, for the three and six months ended June 30, 2019, respectively, primarily due to an increase in MPCI premium reflecting the timing of premium registrations in the current year versus the prior year, the non-renewal of a quota-share treaty effective with the current crop year, and an increase in current year production.

Net premiums earned increased \$27 million, or 7.7 percent, and \$39 million, or 9.8 percent, for the three and six months ended June 30, 2019, respectively, reflecting the growth in net premiums written described above.

Combined Ratio

The loss and loss expense ratio increased 1.9 percentage points and 8.1 percentage points for the three and six months ended June 30, 2019, respectively, primarily due to a modest decrease in MPCI expected margin which increased our loss ratio. Additionally, for the six months ended June 30, 2019 the increase was also due to lower favorable prior period development.

The policy acquisition cost ratio remained relatively flat for the three months ended June 30, 2019. The policy acquisition cost ratio increased 1.6 percentage points for the six months ended June 30, 2019 primarily due to a reinsurance ceded commission adjustment in the prior year that benefited acquisition expenses.

The administrative expense ratio increased 0.4 percentage points and 1.5 percentage points for the three and six months ended June 30, 2019, respectively, primarily due to merit-based salary and inflationary increases. For the six months ended June 30, 2019, the increase was also due to a reduction in the current year Administrative and Operating (A&O) reimbursements on the MPCI business we recorded under the government program. The current year reimbursement was less than the prior year reimbursement.

Catastrophe Losses and Prior Period Development

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Catastrophe losses	\$ 2	\$ 2	\$ 4	\$ 3
Favorable prior period development	\$ —	\$ —	\$ 61	\$ 76

Catastrophe losses through June 30, 2019 and 2018 were primarily from our farm, ranch, and specialty P&C businesses.

Refer to the prior period development discussion in Footnote 4 to the Consolidated Financial Statements for additional information.

There was no prior period development for the three months ended June 30, 2019 and 2018. For the six months ended June 30, 2019, net favorable prior period development was \$61 million which included \$90 million of favorable incurred losses and \$3 million of lower acquisition costs due to lower than expected MPCl losses for the 2018 crop year, partially offset by a \$32 million decrease in net premiums earned related to the MPCl profit and loss calculation formula. For the six months ended June 30, 2018, net favorable prior period development was \$76 million which included \$112 million of favorable incurred losses and \$4 million of lower acquisition costs due to lower than expected MPCl losses for the 2017 crop year, partially offset by a \$40 million decrease in net premiums earned related to the MPCl profit and loss calculation formula.

CAY Loss Ratio excluding Catastrophe Losses

	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Loss and loss expense ratio	81.9 %	80.0 %	65.5 %	57.4 %
Catastrophe losses	(0.5)%	(0.7)%	(0.9)%	(0.8)%
Prior period development	—	—	14.9 %	20.7 %
CAY loss ratio excluding catastrophe losses	81.4 %	79.3 %	79.5 %	77.3 %

The CAY loss ratio excluding catastrophe losses increased 2.1 percentage points and 2.2 percentage points for the three and six months ended June 30, 2019, respectively, primarily due to a modest decrease in MPCl expected margin which increased our loss ratio.

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.

	Three Months Ended			Six Months Ended		
	2019	2018	% Change	2019	2018	% Change
(in millions of U.S. dollars, except for percentages)						YTD-19 vs. YTD-18
Net premiums written ⁽¹⁾	\$ 2,258	\$ 2,199	2.7%	\$ 4,653	\$ 4,583	1.5%
Net premiums earned	2,225	2,161	3.0%	4,339	4,268	1.7%
Losses and loss expenses	1,125	1,071	5.1%	2,231	2,149	3.8%
Policy acquisition costs	629	584	7.6%	1,225	1,172	4.5%
Administrative expenses	265	266	0.1%	514	505	1.9%
Underwriting income ⁽²⁾	206	240	(14.2)%	369	442	(16.6)%
Net investment income	151	155	(2.7)%	295	306	(3.5)%
Other (income) expense	3	(12)	NM	7	(5)	NM
Amortization of purchased intangibles	12	11	13.8%	23	21	12.5%
Segment income	\$ 342	\$ 396	(13.7)%	\$ 634	\$ 732	(13.4)%
Loss and loss expense ratio	50.6%	49.6%	1.0 pt	51.4%	50.4%	1.0 pt
Policy acquisition cost ratio	28.3%	27.0%	1.3 pts	28.2%	27.4%	0.8 pts
Administrative expense ratio	11.9%	12.3%	(0.4) pts	11.9%	11.8%	0.1 pts
Combined ratio	90.8%	88.9%	1.9 pts	91.5%	89.6%	1.9 pts

NM – not meaningful

(1) On a constant-dollar basis, for the three and six months ended June 30, 2019, net premiums written increased \$177 million and \$313 million, or 8.5 percent and 7.2 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 three and six months ended June 30, 2019, underwriting income decreased \$15 million and \$36 million, or 6.7 percent and 8.9 percent, respectively. Amounts are calculated by translating prior period results using the same local currency rates as the comparable current period.

Premiums

For the three and six months ended June 30, 2019, net premiums written increased \$59 million and \$70 million, or \$177 million (8.5 percent) and \$313 million (7.2 percent), respectively, on a constant-dollar basis, reflecting growth across most regions and lines of business. P&C lines growth was principally due to new business in small commercial property and general casualty lines, middle market, and excess and surplus lines. Personal lines growth was driven by new business. Accident and health (A&H) lines growth was principally in Asia and Latin America driven by new business.

For the three and six months ended June 30, 2019, net premiums earned increased \$64 million and \$71 million, or \$187 million (9.2 percent) and \$313 million (7.8 percent), respectively, on a constant-dollar basis, reflecting the increase in net premiums written.

Net Premiums Written by Region

(in millions of U.S. dollars, except for percentages)	Three Months Ended June 30						% Change	
	2019	2019 % of Total	2018	2018 % of Total	C\$ (1) 2018	Q-19 vs. Q- 18	C\$ (1) Q-19 vs. Q-18	
Region								
Europe	\$ 810	36%	\$ 804	37%	\$ 757	0.8%	7.0%	
Latin America	573	25%	550	25%	517	4.2%	10.9%	
Asia	792	35%	764	35%	730	3.8%	8.6%	
Other ⁽²⁾	83	4%	81	3%	77	1.8%	6.5%	
Net premiums written	\$ 2,258	100%	\$ 2,199	100%	\$ 2,081	2.7%	8.5%	

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

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

(in millions of U.S. dollars, except for percentages)	Six Months Ended June 30						% Change	
	2019	2019 % of Total	2018	2018 % of Total	C\$ (1) 2018	YTD-19 vs. YTD-18	C\$ (1) YTD-19 vs. YTD-18	
Region								
Europe	\$ 1,916	41%	\$ 1,914	42%	\$ 1,819	0.1 %	5.4%	
Latin America	1,106	24%	1,078	24%	989	2.6 %	11.8%	
Asia	1,461	31%	1,421	31%	1,370	2.8 %	6.7%	
Other ⁽²⁾	170	4%	170	3%	162	(0.2)%	4.7%	
Net premiums written	\$ 4,653	100%	\$ 4,583	100%	\$ 4,340	1.5 %	7.2%	

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

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

Combined Ratio

The loss and loss expense ratio increased 1.0 percentage point for both the three and six months ended June 30, 2019 due to lower favorable prior period development, partially offset by lower catastrophe losses and a change in mix of business towards products and regions within personal lines that have a lower loss and loss expense ratio and a higher policy acquisition cost ratio.

The policy acquisition cost ratio increased 1.3 percentage points and 0.8 percentage points for the three and six months ended June 30, 2019 , respectively, due to a change in mix of business towards products and regions within personal lines that have a higher policy acquisition cost ratio and lower loss and loss expense ratio and due to higher deferrable underwriting costs resulting from the successful acquisition of business.

The administrative expense ratio decreased 0.4 percentage points for the three months ended June 30, 2019 , primarily driven by higher deferrable underwriting costs as noted above. For the six months ended June 30, 2019 , the administrative expense ratio remained relatively flat.

Catastrophe Losses and Prior Period Development

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Catastrophe losses	\$ 9	\$ 26	\$ 34	\$ 41
Favorable prior period development	\$ 20	\$ 72	\$ 24	\$ 94

Catastrophe losses through June 30, 2019 and 2018 were primarily from the following events:

- 2019 : Storms in Australia and other international weather-related events
- 2018 : Severe weather-related events in Asia Pacific and Europe

Refer to the prior period development discussion in Footnote 4 to the Consolidated Financial Statements for additional information.

CAY Loss Ratio excluding Catastrophe Losses

	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Loss and loss expense ratio	50.6 %	49.6 %	51.4 %	50.4 %
Catastrophe losses	(0.4)%	(1.2)%	(0.8)%	(1.0)%
Prior period development	0.9 %	3.3 %	0.6 %	2.2 %
CAY loss ratio excluding catastrophe losses	51.1 %	51.7 %	51.2 %	51.6 %

The CAY loss ratio excluding catastrophe losses decreased 0.6 percentage points and 0.4 percentage points for the three and six months ended June 30, 2019 , respectively, primarily due to a change in mix of business towards products and regions within personal lines that have a lower loss and loss expense ratio and a higher policy acquisition cost ratio.

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 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.

	Three Months Ended			Six Months Ended		
	June 30		% Change	June 30		% Change
(in millions of U.S. dollars, except for percentages)	2019	2018	Q-19 vs. Q-18	2019	2018	YTD-19 vs. YTD-18
Net premiums written	\$ 197	\$ 197	0.2%	\$ 399	\$ 390	2.3%
Net premiums earned	159	167	(5.0)%	327	335	(2.5)%
Losses and loss expenses	90	83	7.5%	166	150	10.4%
Policy acquisition costs	42	40	5.6%	85	80	6.6%
Administrative expenses	7	9	(18.8)%	17	19	(10.2)%
Underwriting income	20	35	(43.4)%	59	86	(31.6)%
Net investment income	55	65	(15.7)%	111	129	(13.5)%
Other (income) expense	(15)	(6)	142.6%	(24)	(13)	77.1%
Segment income	\$ 90	\$ 106	(15.3)%	\$ 194	\$ 228	(14.9)%
Loss and loss expense ratio	55.9%	49.4%	6.5 pts	50.6%	44.8%	5.8 pts
Policy acquisition cost ratio	26.9%	24.2%	2.7 pts	26.1%	23.9%	2.2 pts
Administrative expense ratio	4.9%	5.7%	(0.8) pts	5.4%	5.7%	(0.3) pts
Combined ratio	87.7%	79.3%	8.4 pts	82.1%	74.4%	7.7 pts

Premiums

For the three months ended June 30, 2019 , net premiums written remained flat, or increased \$3 million (1.3 percent) on a constant-dollar basis, as new business written in marine and property catastrophe lines was offset by reduced renewal retention primarily in the motor line, which was reflective of competitive market conditions, and higher ceded retrocessions principally in property catastrophe and marine lines. For the six months ended June 30, 2019 , net premiums written increased \$9 million , or \$15 million (3.8 percent), on a constant-dollar basis, primarily due to new business written in marine and property lines, and

the timing of a homeowners treaty, which was previously written mainly in the third quarter of 2018. This increase was partially offset by reduced renewal retention and higher ceded retrocessions.

Net premiums earned decreased \$8 million for both the three and six months ended June 30, 2019 . On a constant-dollar basis, net premiums earned decreased \$6 million (3.5 percent) and \$2 million (0.5 percent), for the three and six months ended June 30, 2019, respectively, reflecting reduced renewal retention and higher ceded retrocessions.

Combined Ratio

The loss and loss expense ratio increased 6.5 percentage points and 5.8 percentage points for the three and six months ended June 30, 2019, respectively, primarily due to less favorable prior period development, partially offset by lower loss ratios in structured property and motor lines. In addition, the increase for the six months ended June 30, 2019 was also driven by proportionally lower premiums earned from property catastrophe business, which has a relatively lower loss ratio.

The policy acquisition cost ratio increased 2.7 percentage points and 2.2 percentage points for the three and six months ended June 30, 2019 , respectively, primarily due to lower loss ratios in structured property and motor lines for treaties with adjustable commission features.

The administrative expense ratio decreased 0.8 percentage points and 0.3 percentage points for the three and six months ended June 30, 2019 , respectively, primarily due to a shift in the mix of business, partially offset by merit-based salary and inflationary increases.

Catastrophe Losses and Prior Period Development

(in millions of U.S dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Catastrophe losses	\$ 10	\$ 9	\$ 10	\$ 11
Favorable prior period development	\$ —	\$ 16	\$ 8	\$ 30

Catastrophe losses through June 30, 2019 were primarily from severe weather-related events in the U.S. Catastrophe losses through June 30, 2018 were primarily from severe weather-related events in the U.S. and Europe.

Refer to the prior period development discussion in Footnote 4 to the Consolidated Financial Statements for additional information.

CAY Loss Ratio excluding Catastrophe Losses

	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Loss and loss expense ratio	55.9 %	49.4 %	50.6 %	44.8 %
Catastrophe losses	(6.2)%	(5.4)%	(3.0)%	(3.3)%
Prior period development	—	9.0 %	2.5 %	8.9 %
CAY loss ratio excluding catastrophe losses	49.7 %	53.0 %	50.1 %	50.4 %

The CAY loss ratio excluding catastrophe losses decreased 3.3 percentage points for the three months ended June 30, 2019 due to lower loss ratios in structured property and motor lines. The CAY loss ratio excluding catastrophe losses decreased 0.3 percentage points for the six months ended June 30, 2019 as the decrease in the quarter was partially offset by proportionally lower premiums earned from property catastrophe business, which has a relatively lower loss ratio.

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.

(in millions of U.S. dollars, except for percentages)	Three Months Ended			Six Months Ended		
	June 30		% Change	June 30		% Change
	2019	2018	Q-19 vs. Q-18	2019	2018	YTD-19 vs. YTD-18
Net premiums written	\$ 579	\$ 565	2.5 %	\$ 1,158	\$ 1,124	3.0 %
Net premiums earned	571	552	3.4 %	1,132	1,092	3.6 %
Losses and loss expenses	189	184	2.5 %	391	389	0.4 %
Policy benefits ⁽¹⁾	161	150	7.5 %	357	301	18.7 %
(Gains) losses from fair value changes in separate account assets ⁽¹⁾	3	10	(70.4)%	(27)	4	NM
Policy acquisition costs	150	138	8.4 %	278	266	4.4 %
Administrative expenses	78	80	(0.9)%	157	158	(0.4)%
Net investment income	97	85	13.8 %	186	168	11.1 %
Life Insurance underwriting income	87	75	14.2 %	162	142	14.3 %
Other (income) expense ⁽¹⁾	(10)	(2)	NM	(20)	—	NM
Amortization of purchased intangibles	1	—	NM	1	1	—
Segment income	\$ 96	\$ 77	24.5 %	\$ 181	\$ 141	28.7 %

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

Net premiums written increased \$14 million and \$34 million, or \$23 million (4.3 percent) and \$52 million (4.7 percent) on a constant-dollar basis, for the three and six months ended June 30, 2019, respectively, primarily reflecting growth in our North American Combined Insurance supplemental A&H program and Asian and Latin American international life operations, partially offset by our life reinsurance business, which continues to decline as no new life reinsurance business is currently being written.

Deposits

The following table presents deposits collected on universal life and investment contracts:

(in millions of U.S. dollars, except for percentages)	Three Months Ended					Six Months Ended				
	June 30		% Change			June 30		% Change		
	2019	2018	C\$ ⁽¹⁾ 2018	Q-19 vs. Q-18	C\$ ⁽¹⁾ Q-19 vs. Q-18	2019	2018	C\$ ⁽¹⁾ 2018	Y-19 vs. Y-18	C\$ ⁽¹⁾ Y-19 vs. Y-18
Deposits collected on Universal life and investment contracts	\$ 369	\$ 392	\$ 377	(6.1)%	(2.4)%	\$ 690	\$ 771	\$ 743	(10.5)%	(7.2)%

(1) On a constant-dollar basis. Amounts are calculated by translating prior period results using the same local currency exchange 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 decreased for the three and six months ended June 30, 2019 primarily due to a decline in Taiwan driven by competitive market conditions, partially offset by growth in Hong Kong and Vietnam.

Life Insurance underwriting income and Segment income

Life Insurance underwriting income increased \$12 million and \$20 million for the three and six months ended June 30, 2019, respectively, principally reflecting growth as described above, and an increase in net investment income. Additionally, the increase in segment income was also due to our share of net income from Huatai Life, our partially-owned life insurance entity in China, of \$10 million and \$20 million for the three and six months ended June 30, 2019, respectively. For the six months ended June 30, 2019, our share of net income from our partially-owned life insurance entities included a one-time favorable adjustment of \$7 million related to a change in estimate.

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 and certain other non-A&E run-off exposures.

	Three Months Ended			Six Months Ended		
	June 30	% Change		June 30	% Change	
(in millions of U.S. dollars, except for percentages)	2019	2018	Q-19 vs. Q-18	2019	2018	YTD-19 vs. YTD-18
Losses and loss expenses	\$ 34	\$ 48	(28.6)%	\$ 45	\$ 59	(23.1)%
Administrative expenses	74	70	4.3 %	137	142	(3.9)%
Underwriting loss	108	118	(9.1)%	182	201	(9.8)%
Net investment income (loss)	(33)	(52)	(40.0)%	(70)	(113)	(38.9)%
Interest expense	140	167	(16.4)%	280	324	(13.7)%
Net realized gains (losses)	(230)	10	NM	(326)	6	NM
Other (income) expense	(215)	(94)	129.1 %	(204)	(131)	54.6 %
Amortization of purchased intangibles	54	64	(14.3)%	109	128	(14.4)%
Chubb integration expenses	4	13	(66.0)%	7	23	(67.5)%
Income tax expense	208	218	(4.7)%	396	353	12.2 %
Net loss	\$ (562)	\$ (528)	6.1 %	\$ (1,166)	\$ (1,005)	16.1 %

NM - not meaningful

Losses and loss expenses for the three and six months ended June 30, 2019 and 2018 were primarily from unfavorable prior period development related to non-A&E run-off casualty exposures, including workers' compensation, as well as unallocated loss adjustment expenses of the A&E claim operations.

Administrative expenses increased \$4 million for the three months ended June 30, 2019, primarily due to increased spending to support overall company growth. For the six months ended June 30, 2019, administrative expenses decreased \$5 million, primarily due to lower employee incentive compensation costs, partially offset by increased spending to support overall company growth.

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 the three and six months ended June 30, 2019 and 2018 principally consisted of small residual items related to the Chubb acquisition.

Refer to the respective sections 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.

For both the three and six months ended June 30, 2019, our effective income tax rate was 15.3 percent, compared to 14.4 percent and 12.9 percent, respectively, in the prior year periods. The effective income tax rates in the current year were higher compared to the prior year periods primarily due to a higher percentage of income generated in higher taxing jurisdictions, a higher percentage of realized losses generated in lower taxing jurisdictions and lower amounts of tax-exempt income.

In a referendum held on May 19, 2019, the Swiss people adopted the Federal Act on Tax Reform (Swiss tax reform). The majority of the measures associated with this reform will be effective on January 1, 2020. While we are still reviewing the impact, we do not expect these reforms to have a material impact on our financial condition or results of operations.

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 our results 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 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.

P&C combined ratio is the sum of the loss and loss expense ratio, acquisition cost ratio and the administrative expense ratio excluding the life business and including the realized gains and losses on the 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 impacts underwriting results. We view gains and losses on these derivatives as part of the results of our underwriting operations.

CAY P&C combined ratio excluding catastrophe losses (CATs) excludes CATs and prior period development (PPD) from the P&C combined ratio. 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 CATs, 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 adjustable 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.

For this disclosure purpose, the normalized level of CATs, or expected level of CATs, is not intended to represent a probability weighted expectation for the company but rather to represent management's view of what might be more typical for a given period, 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). The following table presents CATs above (below) expected level and the impact on the combined ratio:

	Three Months Ended		Six Months Ended	
	June 30		June 30	
(in millions of U.S. dollars, except for percentage points)	2019	2018	2019	2018
Actual level of CATs - pre-tax	\$ 275	\$ 211	\$ 525	\$ 591
Less: Expected level of CATs - pre-tax	241	225	447	430
CATs above (below) expected level - pre-tax	\$ 34	\$ (14)	\$ 78	\$ 161
Adverse (favorable) impact of CATs above (below) an expected level on combined ratio	0.5%	(0.2)%	0.6%	1.2%

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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:

Three Months Ended June 30, 2019 (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	\$	2,214	\$ 747	\$ 316	\$ 1,125	\$ 90	\$ 34	\$ 4,526
Realized (gains) losses on crop derivatives		—	—	(7)	—	—	—	(7)
Adjusted losses and loss expenses	A \$	2,214	\$ 747	\$ 309	\$ 1,125	\$ 90	\$ 34	\$ 4,519
Catastrophe losses		(137)	(117)	(2)	(9)	(10)	—	(275)
PPD and related adjustments								
PPD, net of related adjustments - favorable (unfavorable)		185	16	—	20	—	(33)	188
Net premiums earned adjustments on PPD - unfavorable (favorable)		(3)	—	—	—	—	—	(3)
Expense adjustments - unfavorable (favorable)		(2)	—	—	—	—	—	(2)
PPD - gross of related adjustments - favorable (unfavorable)		180	16	—	20	—	(33)	183
CAY loss and loss expense ex CATs	B \$	2,257	\$ 646	\$ 307	\$ 1,136	\$ 80	\$ 1	\$ 4,427
Policy acquisition costs and administrative expenses								
Policy acquisition costs and administrative expenses	C \$	718	\$ 308	\$ 31	\$ 894	\$ 49	\$ 74	\$ 2,074
Expense adjustments - favorable (unfavorable)		2	—	—	—	—	—	2
Policy acquisition costs and administrative expenses, adjusted	D \$	720	\$ 308	\$ 31	\$ 894	\$ 49	\$ 74	\$ 2,076
Denominator								
Net premiums earned	E \$	3,390	\$ 1,168	\$ 378	\$ 2,225	\$ 159		\$ 7,320
Net premiums earned adjustments on PPD - unfavorable (favorable)		(3)	—	—	—	—		(3)
Net premiums earned excluding adjustments	F \$	3,387	\$ 1,168	\$ 378	\$ 2,225	\$ 159		\$ 7,317
P&C Combined ratio								
Loss and loss expense ratio	A/E	65.3%	64.0%	81.9%	50.6%	55.9%		61.7 %
Policy acquisition cost and administrative expense ratio	C/E	21.2%	26.3%	8.2%	40.2%	31.8%		28.4 %
P&C Combined ratio		86.5%	90.3%	90.1%	90.8%	87.7%		90.1 %
CAY P&C Combined ratio ex CATs								
Loss and loss expense ratio, adjusted	B/F	66.7%	55.3%	81.4%	51.1%	49.7%		60.5 %
Policy acquisition cost and administrative expense ratio, adjusted	D/F	21.2%	26.4%	8.2%	40.1%	32.0%		28.4 %
CAY P&C Combined ratio ex CATs		87.9%	81.7%	89.6%	91.2%	81.7%		88.9 %
Combined ratio								
Combined ratio								90.2 %
Add: impact of gains and losses on crop derivatives								(0.1)%
P&C Combined ratio								90.1 %

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.

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Three Months Ended June 30, 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	\$ 2,084	\$ 728	\$ 289	\$ 1,071	\$ 83	\$ 48	\$ 4,303
Realized (gains) losses on crop derivatives	—	—	(8)	—	—	—	(8)
Adjusted losses and loss expenses	A \$ 2,084	\$ 728	\$ 281	\$ 1,071	\$ 83	\$ 48	\$ 4,295
Catastrophe losses	(73)	(101)	(2)	(26)	(9)	—	(211)
PPD and related adjustments							
PPD, net of related adjustments - favorable (unfavorable)	155	(7)	—	72	16	(45)	191
Net premiums earned adjustments on PPD - unfavorable (favorable)	(11)	—	—	—	2	—	(9)
Expense adjustments - unfavorable (favorable)	—	—	—	—	(1)	—	(1)
PPD - gross of related adjustments - favorable (unfavorable)	144	(7)	—	72	17	(45)	181
CAY loss and loss expense ex CATs	B \$ 2,155	\$ 620	\$ 279	\$ 1,117	\$ 91	\$ 3	\$ 4,265
Policy acquisition costs and administrative expenses							
Policy acquisition costs and administrative expenses	C \$ 701	\$ 296	\$ 27	\$ 850	\$ 49	\$ 70	\$ 1,993
Expense adjustments - favorable (unfavorable)	—	—	—	—	1	—	1
Policy acquisition costs and administrative expenses, adjusted	D \$ 701	\$ 296	\$ 27	\$ 850	\$ 50	\$ 70	\$ 1,994
Denominator							
Net premiums earned	E \$ 3,277	\$ 1,156	\$ 351	\$ 2,161	\$ 167		\$ 7,112
Net premiums earned adjustments on PPD - unfavorable (favorable)	(11)	—	—	—	2		(9)
Net premiums earned excluding adjustments	F \$ 3,266	\$ 1,156	\$ 351	\$ 2,161	\$ 169		\$ 7,103
P&C Combined ratio							
Loss and loss expense ratio	A/E	63.6%	63.0%	80.0%	49.6%	49.4%	60.4 %
Policy acquisition cost and administrative expense ratio	C/E	21.4%	25.6%	7.9%	39.3%	29.9%	28.0 %
P&C Combined ratio		85.0%	88.6%	87.9%	88.9%	79.3%	88.4 %
CAY P&C Combined ratio ex CATs							
Loss and loss expense ratio, adjusted	B/F	66.0%	53.7%	79.3%	51.7%	53.0%	60.0 %
Policy acquisition cost and administrative expense ratio, adjusted	D/F	21.4%	25.6%	7.9%	39.3%	30.5%	28.1 %
CAY P&C Combined ratio ex CATs		87.4%	79.3%	87.2%	91.0%	83.5%	88.1 %
Combined ratio							
Combined ratio							88.5 %
Add: impact of gains and losses on crop derivatives							(0.1)%
P&C Combined ratio							88.4 %

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.

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Six Months Ended June 30, 2019 (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	\$ 4,187	\$ 1,504	\$ 289	\$ 2,231	\$ 166	\$ 45	\$ 8,422
Realized (gains) losses on crop derivatives	—	—	(6)	—	—	—	(6)
Adjusted losses and loss expenses	A \$ 4,187	\$ 1,504	\$ 283	\$ 2,231	\$ 166	\$ 45	\$ 8,416
Catastrophe losses	(231)	(246)	(4)	(34)	(10)	—	(525)
PPD and related adjustments							
PPD, net of related adjustments - favorable (unfavorable)	316	26	61	24	8	(43)	392
Net premiums earned adjustments on PPD - unfavorable (favorable)	(1)	—	32	—	—	—	31
Expense adjustments - unfavorable (favorable)	(6)	—	(3)	—	—	—	(9)
PPD reinstatement premiums - unfavorable (favorable)	—	(3)	—	—	—	—	(3)
PPD - gross of related adjustments - favorable (unfavorable)	309	23	90	24	8	(43)	411
CAY loss and loss expense ex CATs	B \$ 4,265	\$ 1,281	\$ 369	\$ 2,221	\$ 164	\$ 2	\$ 8,302
Policy acquisition costs and administrative expenses							
Policy acquisition costs and administrative expenses	C \$ 1,417	\$ 607	\$ 39	\$ 1,739	\$ 102	\$ 137	\$ 4,041
Expense adjustments - favorable (unfavorable)	6	—	3	—	—	—	9
Policy acquisition costs and administrative expenses, adjusted	D \$ 1,423	\$ 607	\$ 42	\$ 1,739	\$ 102	\$ 137	\$ 4,050
Denominator							
Net premiums earned	E \$ 6,475	\$ 2,322	\$ 433	\$ 4,339	\$ 327		\$ 13,896
Net premiums earned adjustments on PPD - unfavorable (favorable)	(1)	—	32	—	—		31
PPD reinstatement premiums - unfavorable (favorable)	—	(3)	—	—	—		(3)
Net premiums earned excluding adjustments	F \$ 6,474	\$ 2,319	\$ 465	\$ 4,339	\$ 327		\$ 13,924
P&C Combined ratio							
Losses and loss expense ratio	A/E	64.7%	64.7%	65.5%	51.4%	50.6%	60.6%
Policy acquisition cost and administrative expense ratio	C/E	21.8%	26.2%	9.0%	40.1%	31.5%	29.0%
P&C Combined ratio		86.5%	90.9%	74.5%	91.5%	82.1%	89.6%
CAY P&C Combined ratio ex CATs							
Loss and loss expense ratio, adjusted	B/F	65.9%	55.2%	79.5%	51.2%	50.1%	59.6%
Policy acquisition cost and administrative expense ratio, adjusted	D/F	21.9%	26.2%	9.0%	40.1%	31.5%	29.1%
CAY P&C Combined ratio ex CATs		87.8%	81.4%	88.5%	91.3%	81.6%	88.7%
Combined ratio							
Combined ratio							89.6%
Add: impact of gains and losses on crop derivatives							—
P&C Combined ratio							89.6%

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.

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Six Months Ended June 30, 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	\$ 3,992	\$ 1,614	\$ 236	\$ 2,149	\$ 150	\$ 59	\$ 8,200
Realized (gains) losses on crop derivatives	—	—	(10)	—	—	—	(10)
Adjusted losses and loss expenses	A \$ 3,992	\$ 1,614	\$ 226	\$ 2,149	\$ 150	\$ 59	\$ 8,190
Catastrophe losses	(151)	(385)	(3)	(41)	(11)	—	(591)
PPD and related adjustments							
PPD, net of related adjustments - favorable (unfavorable)	256	(1)	76	94	30	(55)	400
Net premiums earned adjustments on PPD - unfavorable (favorable)	(11)	—	40	—	3	—	32
Expense adjustments - unfavorable (favorable)	6	—	(4)	—	(1)	—	1
PPD reinstatement premiums - unfavorable (favorable)	4	—	—	—	—	—	4
PPD - gross of related adjustments - favorable (unfavorable)	255	(1)	112	94	32	(55)	437
CAY loss and loss expense ex CATs	B \$ 4,096	\$ 1,228	\$ 335	\$ 2,202	\$ 171	\$ 4	\$ 8,036
Policy acquisition costs and administrative expenses							
Policy acquisition costs and administrative expenses	C \$ 1,404	\$ 598	\$ 23	\$ 1,677	\$ 99	\$ 142	\$ 3,943
Expense adjustments - favorable (unfavorable)	(6)	—	4	—	1	—	(1)
Policy acquisition costs and administrative expenses, adjusted	D \$ 1,398	\$ 598	\$ 27	\$ 1,677	\$ 100	\$ 142	\$ 3,942
Denominator							
Net premiums earned	E \$ 6,306	\$ 2,296	\$ 394	\$ 4,268	\$ 335		\$ 13,599
Net premiums earned adjustments on PPD - unfavorable (favorable)	(11)	—	40	—	3		32
PPD reinstatement premiums - unfavorable (favorable)	4	—	—	—	—		4
Net premiums earned excluding adjustments	F \$ 6,299	\$ 2,296	\$ 434	\$ 4,268	\$ 338		\$ 13,635
P&C Combined ratio							
Losses and loss expense ratio	A/E	63.3%	70.3%	57.4%	50.4%	44.8%	60.2 %
Policy acquisition cost and administrative expense ratio	C/E	22.3%	26.0%	5.9%	39.2%	29.6%	29.0 %
P&C Combined ratio		85.6%	96.3%	63.3%	89.6%	74.4%	89.2 %
CAY P&C Combined ratio ex CATs							
Loss and loss expense ratio, adjusted	B/F	65.0%	53.5%	77.3%	51.6%	50.4%	58.9 %
Policy acquisition cost and administrative expense ratio, adjusted	D/F	22.2%	26.0%	6.2%	39.3%	29.9%	28.9 %
CAY P&C Combined ratio ex CATs		87.2%	79.5%	83.5%	90.9%	80.3%	87.8 %
Combined ratio							
Combined ratio							89.3 %
Add: impact of gains and losses on crop derivatives							(0.1)%
P&C Combined ratio							89.2 %

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.

Other Income and Expense

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Equity in net (income) loss of partially-owned entities	\$ (250)	\$ (117)	\$ (272)	\$ (176)
(Gains) losses from fair value changes in separate account assets ⁽¹⁾	3	10	(27)	4
Federal excise and capital taxes	6	4	12	7
Other	11	(12)	18	3
Other (income) expense	\$ (230)	\$ (115)	\$ (269)	\$ (162)

(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.

Amortization of purchased intangibles and Other amortization

Amortization expense related to purchased intangibles was \$77 million and \$153 million for the three and six months ended June 30, 2019, respectively, compared with \$85 million and \$170 million, respectively, in the prior year periods. The decrease in amortization expense of purchased intangibles reflects lower intangible amortization expense related to agency distribution relationships and renewal rights and no expense related to internally developed software, which was fully amortized in 2018, partially offset by a lower amortization benefit from the fair value adjustment on unpaid losses and loss expenses.

Amortization expense for the remainder of 2019 is expected to be \$156 million, or \$78 million each quarter.

The following table presents, as of June 30, 2019, the estimated pre-tax amortization expense (benefit) of purchased intangibles, at current foreign currency exchange rates, for the third and fourth quarters of 2019 and the next five years:

For the Years Ending December 31 (in millions of U.S. dollars)	Associated with the Chubb Corp Acquisition			Other intangible assets ⁽²⁾	Total Amortization of purchased intangibles
	Agency distribution relationships and renewal rights	Fair value adjustment on Unpaid losses and loss expenses	Total ⁽¹⁾		
Third quarter of 2019	\$ 70	\$ (15)	\$ 55	\$ 23	\$ 78
Fourth quarter of 2019	70	(15)	55	23	78
2020	239	(35)	204	88	292
2021	216	(20)	196	103	299
2022	196	(14)	182	98	280
2023	177	(7)	170	96	266
2024	160	(5)	155	89	244
Total	\$ 1,128	\$ (111)	\$ 1,017	\$ 520	\$ 1,537

(1) Recorded in Corporate.

(2) Recorded in applicable segment(s) that acquired the intangible assets.

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 June 30, 2019, the deferred tax liability associated with Other intangible assets (excluding the fair value adjustment on Unpaid losses and loss expense) was \$1,396 million.

The following table presents, as of June 30, 2019, the expected reduction of 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 third and fourth quarters of 2019 and 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	
Third quarter of 2019	\$	21
Fourth quarter of 2019		21
2020		73
2021		71
2022		66
2023		61
2024		56
Total	\$	369

Amortization of the fair value adjustment on acquired invested assets and assumed long-term debt

The following table presents at June 30, 2019, 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 third and fourth quarters of 2019 and for the next five years:

For the Years Ending December 31 (in millions of U.S. dollars)	Amortization (expense) benefit of the fair value adjustment on	
	Acquired invested assets ⁽¹⁾	Assumed long-term debt ⁽²⁾
Third quarter of 2019	\$ (40)	\$ 5
Fourth quarter of 2019	(38)	6
2020	(140)	21
2021	(108)	21
2022	(88)	21
2023	—	21
2024	—	21
Total	\$ (414)	\$ 116

(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 the estimated interest expense for the remainder of 2019 based on our existing debt obligations as well as fees based on our expected usage of certain facilities including letters of credit, collateral fees, and repurchase agreements.

Our estimated fixed interest expense, at current foreign currency exchange rates, is based on outstanding debt obligations during the period. We redeemed the \$500 million 5.9 percent senior note on June 15, 2019, therefore, no interest expense was included after the date of redemption.

We issued €575 million of 0.875 percent and €575 million of 1.4 percent Euro denominated senior notes on June 18, 2019 (\$650 million each based on the foreign exchange rate at the date of issuance). Interest expense is included after the date of issuance. Refer to Note 5 to the Consolidated Financial Statements for further information.

Our estimated variable interest expense is based on expected usage and interest rates and may fluctuate. These interest expenses include: fees on collateral, repurchase agreements, and credit facilities.

(in millions of U.S. dollars)	Estimated Interest Expense				
	First Quarter 2019	Second Quarter 2019	Third Quarter 2019	Fourth Quarter 2019	Full Year 2019
Fixed interest expense based on outstanding debt	\$ 124	\$ 123	\$ 120	\$ 121	\$ 488
Variable interest expense based on expected usage	21	22	23	22	88
Adjusted interest expense	\$ 145	\$ 145	\$ 143	\$ 143	\$ 576
Amortization of the fair value of debt related to the Chubb Corp acquisition	(5)	(5)	(5)	(6)	(21)
Total interest expense, including amortization of the fair value of debt	\$ 140	\$ 140	\$ 138	\$ 137	\$ 555

(in millions of U.S. dollars)	Actual Interest Expense				
	First Quarter 2018	Second Quarter 2018	Third Quarter 2018	Fourth Quarter 2018	Full Year 2018
Fixed interest expense based on outstanding debt	\$ 140	\$ 131	\$ 125	\$ 124	\$ 520
Variable interest expense	29	46	45	34	154
Adjusted interest expense	\$ 169	\$ 177	\$ 170	\$ 158	\$ 674
Amortization of the fair value of debt related to the Chubb Corp acquisition	(12)	(10)	(6)	(5)	(33)
Total interest expense, including amortization of the fair value of debt	\$ 157	\$ 167	\$ 164	\$ 153	\$ 641

Net Investment Income

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended	
	June 30		June 30	
	2019	2018	2019	2018
Fixed maturities ⁽¹⁾	\$ 851	\$ 778	\$ 1,671	\$ 1,550
Short-term investments	22	21	46	41
Other interest income ⁽²⁾	6	37	12	65
Equity securities	9	11	16	19
Other investments	15	24	37	43
Gross investment income	903	871	1,782	1,718
Investment expenses	(44)	(43)	(87)	(84)
Net investment income	\$ 859	\$ 828	\$ 1,695	\$ 1,634

⁽¹⁾ Includes amortization expense related to fair value adjustment on acquired invested assets related to the Chubb Corp acquisition

\$ (43) \$ (62) \$ (89) \$ (133)

⁽²⁾ Other interest income includes interest earned from operating cash held outside the investment portfolio and also cash held in our global multi-currency notional cash pooling programs. Other interest income fluctuates based on changing interest rates and cash balances.

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 3.8 percent for both the three and six months ended June 30, 2019, compared with the prior year periods. The increase was primarily due to higher average invested assets, partially offset by lower private equity distributions, a reduction in the usage of notional cash pooling programs, and unfavorable foreign exchange.

Investment income for private equities where we own less than three percent is included within Net investment income and is shown in "Other investments" in the table above. Investment income for private equities where we own more than three percent is included within Other income (expense) in the Consolidated statements of operations. The mark-to-market movement for private equities is included within either Other income (expense) or Net realized gains (losses) based on our percentage of ownership, which in total, was as follows:

(in millions of U.S. dollars)	Three Months Ended		Six Months Ended
	March 31	June 30	June 30
	2019	2019	2019
Total mark-to-market on private equity, pre-tax	\$ (47)	\$ 240	\$ 193

(in millions of U.S. dollars)	Three Months Ended				Year Ended
	March 31	June 30	September 30	December 31	December 31
	2018	2018	2018	2018	2018
Total mark-to-market on private equity, pre-tax	\$ 74	\$ 86	\$ 157	\$ (19)	\$ 298

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 b) to the Consolidated Financial Statements. Additionally, Net income is impacted through the reporting of changes in the fair

value of equity securities and private equity securities where we own less than three percent and 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 liability adjustment, are reported as separate components of Accumulated other comprehensive income (loss) in Shareholders' equity in the Consolidated balance sheets.

The following table presents our net realized and unrealized gains (losses):

(in millions of U.S. dollars)	Three Months Ended June 30, 2019			Three Months Ended June 30, 2018		
	Net Realized Gains (Losses)	Net Unrealized Gains (Losses)	Net Impact	Net Realized Gains (Losses)	Net Unrealized Gains (Losses)	Net Impact
Fixed maturities	\$ 12	\$ 1,240	\$ 1,252	\$ (81)	\$ (497)	\$ (578)
Fixed income and equity derivatives	(181)	—	(181)	24	—	24
Public equity	32	—	32	5	—	5
Mark-to-market on public equity	(27)	—	(27)	(7)	—	(7)
Private equity	—	—	—	—	—	—
Mark-to-market on private equity ⁽¹⁾	30	—	30	(11)	—	(11)
Total investment portfolio ⁽²⁾	(134)	1,240	1,106	(70)	(497)	(567)
Variable annuity reinsurance derivative transactions, net of applicable hedges	(85)	—	(85)	(3)	—	(3)
Other derivatives	7	—	7	8	—	8
Foreign exchange	(11)	(97)	(108)	140	(574)	(434)
Other	—	(18)	(18)	(57)	(17)	(74)
Net gains (losses), pre-tax	\$ (223)	\$ 1,125	\$ 902	\$ 18	\$ (1,088)	\$ (1,070)

(1) Represents mark-to-market movements for private equity investments where we own less than three percent.

(2) For the three months ended June 30, 2019 and 2018, other-than-temporary impairments in Net realized gains (losses) included \$13 million and \$4 million, respectively, for fixed maturities.

(in millions of U.S. dollars)	Six Months Ended June 30, 2019			Six Months Ended June 30, 2018		
	Net Realized Gains (Losses)	Net Unrealized Gains (Losses)	Net Impact	Net Realized Gains (Losses)	Net Unrealized Gains (Losses)	Net Impact
Fixed maturities	\$ (32)	\$ 3,129	\$ 3,097	\$ (104)	\$ (1,708)	\$ (1,812)
Fixed income and equity derivatives	(311)	—	(311)	41	—	41
Public equity	33	—	33	15	—	15
Mark-to-market on public equity	30	—	30	(28)	—	(28)
Private equity	(2)	—	(2)	—	—	—
Mark-to-market on private equity ⁽¹⁾	(12)	—	(12)	18	—	18
Total investment portfolio ⁽²⁾	(294)	3,129	2,835	(58)	(1,708)	(1,766)
Variable annuity reinsurance derivative transactions, net of applicable hedges	(34)	—	(34)	57	—	57
Other derivatives	6	—	6	10	—	10
Foreign exchange	2	50	52	63	(177)	(114)
Other	—	(45)	(45)	(56)	(40)	(96)
Net gains (losses), pre-tax	\$ (320)	\$ 3,134	\$ 2,814	\$ 16	\$ (1,925)	\$ (1,909)

(1) Represents mark-to-market movements for private equity investments where we own less than three percent.

(2) For the six months ended June 30, 2019 and 2018, other-than-temporary impairments in Net realized gains (losses) included \$26 million and \$5 million, respectively, for fixed maturities.

The variable annuity reinsurance derivative transactions consist of changes in the fair value of GLB liabilities and gain or losses on other derivative instruments we maintain that decrease in fair value when the S&P 500 index increases. For the three months ended June 30, 2019, the variable annuity reinsurance derivative transactions resulted in realized losses of \$85 million reflecting a net increase in the fair value of GLB liabilities of \$65 million and a net realized loss of \$20 million related to these other derivative instruments. The net increase in the fair value of GLB liabilities is due to lower interest rates, partially offset by higher global equity market levels. For the six months ended June 30, 2019, the variable annuity reinsurance derivative transactions resulted in realized losses of \$34 million, reflecting a net realized loss of \$83 million related to these other derivative instruments partially offset by a decrease in the fair value of GLB liabilities of \$49 million. The net decrease in the fair value of GLB liabilities is due to higher global equity market levels partially offset by lower interest rates.

The variable annuity reinsurance derivative transactions resulted in realized gains (losses) of \$(3) million and \$57 million for the three and six months ended June 30, 2018, respectively, reflecting a net decrease in the fair value of GLB liabilities of \$41 million and \$79 million, respectively. The decrease in the fair value of GLB liabilities was primarily due to rising interest rates and higher equity market levels. In addition, we maintain positions in derivative instruments that decrease when the S&P 500 index increases. There were realized losses of \$44 million and \$22 million for the three and six months ended June 30, 2018, respectively, related to these derivative instruments.

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 3.8 years and 3.7 years at June 30, 2019 and December 31, 2018, respectively. We estimate that a 100 basis point (bps) increase in interest rates would reduce the valuation of our fixed income portfolio by approximately \$3.8 billion at June 30, 2019.

The following table shows the fair value and cost/amortized cost of our invested assets:

(in millions of U.S. dollars)	June 30, 2019		December 31, 2018	
	Fair Value	Cost/ Amortized Cost	Fair Value	Cost/ Amortized Cost
Fixed maturities available for sale	\$ 82,410	\$ 80,119	\$ 78,470	\$ 79,323
Fixed maturities held to maturity	13,177	12,838	13,259	13,435
Short-term investments	3,808	3,808	3,016	3,016
	99,395	96,765	94,745	95,774
Equity securities	715	715	770	770
Other investments	5,968	5,968	5,277	5,277
Total investments	\$ 106,078	\$ 103,448	\$ 100,792	\$ 101,821

The fair value of our total investments increased \$5.3 billion during the six months ended June 30, 2019, primarily due to unrealized appreciation driven by declining interest rates, the investing of operating cash flows and the investing of net proceeds from the debt issuance. This increase was partially offset by the payment of dividends on our Common Shares and share repurchases.

The following tables present the market value of our fixed maturities and short-term investments at June 30, 2019 and December 31, 2018 . The first table lists investments according to type and second according to S&P credit rating:

(in millions of U.S. dollars, except for percentages)	June 30, 2019		December 31, 2018	
	Market Value	% of Total	Market Value	% of Total
Treasury	\$ 4,519	5%	\$ 4,799	5%
Agency	314	—	528	1%
Corporate and asset-backed	32,261	32%	29,091	31%
Mortgage-backed	20,468	21%	18,026	19%
Municipal	13,854	14%	16,327	17%
Non-U.S.	24,171	24%	22,958	24%
Short-term investments	3,808	4%	3,016	3%
Total	\$ 99,395	100%	\$ 94,745	100%
AAA	\$ 15,276	15%	\$ 14,571	15%
AA	37,211	38%	36,715	39%
A	18,476	19%	17,253	18%
BBB	12,682	13%	12,035	13%
BB	9,161	9%	8,363	9%
B	6,375	6%	5,596	6%
Other	214	—	212	—
Total	\$ 99,395	100%	\$ 94,745	100%

Corporate and asset-backed securities

The following table presents our 10 largest global exposures to corporate bonds by market value at June 30, 2019 :

(in millions of U.S. dollars)	Market Value
Wells Fargo & Co	\$ 616
JP Morgan Chase & Co	566
Bank of America Corp	549
Comcast Corp	453
HSBC Holdings Plc	372
Verizon Communications Inc	370
AT&T Inc	366
Citigroup Inc	332
Anheuser-Busch InBev NV	326
Morgan Stanley	318

Mortgage-backed securities

June 30, 2019 (in millions of U.S. dollars)	S&P Credit Rating					Market Value	Amortized Cost
	AAA	AA	A	BBB	BB and below	Total	Total
Agency residential mortgage-backed (RMBS)	\$ 187	\$ 16,610	\$ —	\$ —	\$ —	\$ 16,797	\$ 16,444
Non-agency RMBS	35	85	75	23	18	236	232
Commercial mortgage-backed	3,069	246	120	—	—	3,435	3,363
Total mortgage-backed securities	\$ 3,291	\$ 16,941	\$ 195	\$ 23	\$ 18	\$ 20,468	\$ 20,039

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 June 30, 2019 :

(in millions of U.S. dollars)	Market Value	Amortized Cost
United Kingdom	\$ 1,099	\$ 1,073
Republic of Korea	1,060	937
Canada	846	831
Federative Republic of Brazil	737	718
Province of Ontario	632	615
United Mexican States	587	582
Kingdom of Thailand	555	513
Province of Quebec	487	472
Commonwealth of Australia	348	302
Federal Republic of Germany	299	277
Other Non-U.S. Government Securities (1)	4,612	4,419
Total	\$ 11,262	\$ 10,739

(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 June 30, 2019 :

(in millions of U.S. dollars)	Market Value	Amortized Cost
United Kingdom	\$ 2,101	\$ 2,030
Canada	1,598	1,556
United States (1)	1,201	1,167
France	1,027	984
Australia	828	795
Netherlands	661	642
Japan	553	543
Germany	535	515
Switzerland	480	464
China	342	332
Other Non-U.S. Corporate Securities	3,583	3,475
Total	\$ 12,909	\$ 12,503

(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 June 30, 2019, our corporate fixed income investment portfolio included below-investment grade and non-rated securities which, in total, comprised approximately 14 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 \$171 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. Eleven 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.

Critical Accounting Estimates

As of June 30, 2019, there were no material changes to our critical accounting estimates. For a full discussion of our critical accounting estimates, refer to Item 7 in our 2018 Form 10-K.

Reinsurance recoverable on ceded reinsurance

(in millions of U.S. dollars)	June 30, 2019		December 31, 2018	
	Net Reinsurance Recoverable (1)	Provision for Uncollectible	Net Reinsurance Recoverable (1)	Provision for Uncollectible
Reinsurance recoverable on unpaid losses and loss expenses	\$ 14,233	\$ 248	\$ 14,689	\$ 251
Reinsurance recoverable on paid losses and loss expenses	1,212	76	1,304	72
Reinsurance recoverable on losses and loss expenses	\$ 15,445	\$ 324	\$ 15,993	\$ 323
Reinsurance recoverable on policy benefits	\$ 201	\$ 4	\$ 202	\$ 4

(1) Net of provision for uncollectible reinsurance.

The decrease in reinsurance recoverable on losses and loss expenses was primarily due to collections on catastrophe losses and collections related to favorable reinsurance settlements.

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.

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. 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.

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

(in millions of U.S. dollars)	Gross Losses	Reinsurance Recoverable ⁽¹⁾	Net Losses
Balance at December 31, 2018	\$ 62,960	\$ 14,689	\$ 48,271
Losses and loss expenses incurred	11,019	2,206	8,813
Losses and loss expenses paid	(10,778)	(2,667)	(8,111)
Foreign currency revaluation and other	4	5	(1)
Balance at June 30, 2019	\$ 63,205	\$ 14,233	\$ 48,972

(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).

Refer to Note 4 to the Consolidated Financial Statements for a discussion on the changes in the loss reserves.

Asbestos and Environmental (A&E)

There was no significant A&E reserve activity during the three and six months ended June 30, 2019. A&E reserves are included in Corporate. Refer to our 2018 Form 10-K for further information on our A&E exposures.

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 to the Consolidated Financial Statements for information on our fair value measurements.

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 June 30, 2019, for Worldwide, U.S. hurricane and California earthquake events, based on our in-force portfolio at April 1, 2019 and reflecting the April 1, 2019 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 \$2,684 million (or 5.0 percent of our total shareholders' equity at June 30, 2019).

(in millions of U.S. dollars, except for percentages)	Modeled Net Probable Maximum Loss (PML)					
	Worldwide ⁽¹⁾		U.S. Hurricane ⁽²⁾		California Earthquake ⁽³⁾	
	Annual Aggregate		Annual Aggregate		Single Occurrence	
	Chubb	% of Total Shareholders' Equity	Chubb	% of Total Shareholders' Equity	Chubb	% of Total Shareholders' Equity
1-in-10	\$ 1,863	3.5%	\$ 1,066	2.0%	\$ 129	0.2%
1-in-100	\$ 3,778	7.0%	\$ 2,684	5.0%	\$ 1,347	2.5%
1-in-250	\$ 6,151	11.4%	\$ 4,807	8.9%	\$ 1,533	2.8%

(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, 2019 through March 31, 2020, with modest enhancements 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, 2019 through March 31, 2020 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.

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 – \$1.2 billion	All natural perils and terrorism	(b)
United States (excluding Alaska and Hawaii)	\$1.2 billion – \$2.2 billion	All natural perils and terrorism	(c)
United States (excluding Alaska and Hawaii)	\$2.2 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 – \$1.175 billion	All natural perils and terrorism	(c)
Alaska, Hawaii, and Canada	\$1.175 billion – \$2.475 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.

(b) These coverages are partially placed with Reinsurers.

(c) These coverages are both part of the same Second layer within the Global Catastrophe Program and are fully placed with Reinsurers.

(d) These coverages are both part of the same Third layer within the Global Catastrophe Program and are fully placed with Reinsurers.

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 \$427 million layer in excess of \$2.0 billion retention through March 13, 2020.

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 MPCl 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 MPCl 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 2020 SRA covers the 2020 reinsurance year from July 1, 2019 through June 30, 2020). There were no significant changes in the terms and conditions from the 2019 SRA and therefore, the new SRA does not impact Chubb's outlook on the crop program relative to 2020.

We recognize net premiums written as soon as estimable on our MPCl 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 MPCl 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 MPCl 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 MPCl 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 MPCl 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 MPCl 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

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. 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. Should the need arise, we generally have access to capital markets and an available \$1.0 billion letter of credit/revolver facility. 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. At June 30, 2019, our LOC usage was \$423 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. Our existing credit facility has a remaining term expiring in October 2022 and requires that we maintain certain financial covenants, all of which we met at June 30, 2019. 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. Refer to "Credit Facilities" in our 2018 10-K for additional information.

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 the six months ended June 30, 2019, 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 \$200 million and \$75 million from its Bermuda subsidiaries during the six months ended June 30, 2019 and 2018, 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. The U.S. insurance subsidiaries of Chubb INA Holdings Inc. (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 CGM or Chubb INA during the six months ended June 30, 2019 and 2018. 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 \$1.7 billion and \$3.0 billion from its subsidiaries during the six months ended June 30, 2019 and 2018, respectively.

Cash Flows

Our sources of liquidity include cash from operations, routine sales of investments, and financing arrangements. The following is a discussion of our cash flows for the six months ended June 30, 2019 and 2018.

Operating cash flows were \$2.7 billion in the six months ended June 30, 2019, compared to \$2.2 billion in the prior year period. The increase was primarily due to higher underwriting cash flow, offset by higher taxes paid, principally due to timing of tax payments.

Cash used for investing was \$2.3 billion in the six months ended June 30, 2019, compared to \$1.3 billion in the prior year period. The current year included the purchase of an additional 6.2 percent ownership interest in Huatai Insurance Group Company Limited for \$329 million and the purchase of other intangible assets for \$243 million. Cash used for financing was \$431 million in the six months ended June 30, 2019, compared to \$649 million in the prior year period. The current year included \$741 million of share repurchases and \$671 million of dividends paid on Common Shares, partially offset by \$789 million of net proceeds from the issuance of long-term debt (net of repayments). The prior year included \$347 million of share repurchases and \$661 million of dividends paid on Common Shares, partially offset by \$271 million of net proceeds from the issuance of long-term debt (net of 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 funding alternative. At June 30, 2019, there were \$ 1.4 billion in repurchase agreements outstanding with various maturities over the next nine months.

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 ratios)	June 30 2019	December 31 2018
Short-term debt	\$ 9	\$ 509
Long-term debt	13,371	12,087
Total financial debt	13,380	12,596
Trust preferred securities	308	308
Total shareholders' equity	53,802	50,312
Total capitalization	\$ 67,490	\$ 63,216
Ratio of financial debt to total capitalization	19.8%	19.9%
Ratio of financial debt plus trust preferred securities to total capitalization	20.3%	20.4%

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.

Refer to Note 5 to the Consolidated Financial Statements for information about the debt issued and debt redeemed.

For the six months ended June 30, 2019, we repurchased \$743 million of Common Shares in a series of open market transactions under the Board of Directors (Board) share repurchase authorization. At June 30, 2019, there were 23,706,045 Common Shares in treasury with a weighted average cost of \$130.47 per share. For the period July 1 through July 30, 2019, we repurchased 730,417 Common Shares for a total of \$110 million in a series of open market transactions. At July 30, 2019, \$626 million in share repurchase authorization remained through December 31, 2019.

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.

Dividends

We have paid dividends each quarter since we became a public company in 1993. Under Swiss law, dividends must be stated in Swiss francs though dividend payments are made by Chubb in U.S. dollars. Refer to Note 7 to the Consolidated Financial Statements for a discussion of our dividend methodology.

At our May 2019 annual general meeting, our shareholders approved an annual dividend for the following year of up to \$3.00 per share, or CHF 3.00 per share, calculated using the USD/CHF exchange rate as published in the Wall Street Journal on May 16, 2019, expected to be paid in four quarterly installments of \$0.75 per share after the general meeting by way of a distribution from capital contribution reserves, transferred to free reserves for payment. The Board determines the record and payment dates at which the annual dividend may be paid until the date of the 2020 annual general meeting, and is authorized to abstain from distributing a dividend at its discretion. The annual dividend approved in May 2019 represented an \$0.08 per share increase (\$0.02 per quarter) over the prior year dividend.

The following table represents dividends paid per Common Share to shareholders of record on each of the following dates:

Shareholders of record as of:	Dividends paid as of:		
December 21, 2018	January 11, 2019	\$0.73 (CHF 0.73)	
March 22, 2019	April 12, 2019	\$0.73 (CHF 0.72)	
June 21, 2019	July 12, 2019	\$0.75 (CHF 0.75)	

ITEM 3. Quantitative and Qualitative Disclosures about Market Risk

Refer to Item 7A included in our 2018 Form 10-K.

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. We occasionally engage in hedging activity for planned cross border transactions. For an estimated impact of foreign currency movement on our net assets denominated in non-U.S. currencies, refer to Item 7A in our 2018 Form 10-K. This information will be updated and disclosed in interim filings if our net assets in non-U.S. currencies change materially from the December 31, 2018 balances disclosed in the 2018 Form 10-K.

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 June 30, 2019 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 June 30, 2019 .
- 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 June 30, 2019 market levels and only applicable to the equity and interest rate sensitivities table below.
- 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. This realized loss occurs primarily because the guarantees provided in the underlying contracts continue to become more valuable even when markets remain unchanged. 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 third quarter 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.

Sensitivities to equity and interest rate movements

(in millions of U.S. dollars)

Interest Rate Shock	Worldwide Equity Shock					
	+10%	Flat	-10%	-20%	-30%	-40%
+100 bps						
(Increase)/decrease in Gross FVL	\$ 324	\$ 198	\$ 46	\$ (131)	\$ (337)	\$ (567)
Increase/(decrease) in hedge value	(57)	—	57	114	171	228
Increase/(decrease) in net income	\$ 267	\$ 198	\$ 103	\$ (17)	\$ (166)	\$ (339)
Flat						
(Increase)/decrease in Gross FVL	\$ 150	\$ —	\$ (174)	\$ (375)	\$ (604)	\$ (852)
Increase/(decrease) in hedge value	(57)	—	57	114	171	228
Increase/(decrease) in net income	\$ 93	\$ —	\$ (117)	\$ (261)	\$ (433)	\$ (624)
-100 bps						
(Increase)/decrease in Gross FVL	\$ (68)	\$ (236)	\$ (429)	\$ (648)	\$ (888)	\$ (1,141)
Increase/(decrease) in hedge value	(57)	—	57	114	171	228
Increase/(decrease) in net income	\$ (125)	\$ (236)	\$ (372)	\$ (534)	\$ (717)	\$ (913)

Sensitivities to Other Economic Variables

(in millions of U.S. dollars)

	AA-rated Credit Spreads		Interest Rate Volatility		Equity Volatility	
	+100 bps	-100 bps	+2%	-2%	+2%	-2%
(Increase)/decrease in Gross FVL	\$ 68	\$ (76)	\$ —	\$ —	\$ (9)	\$ 9
Increase/(decrease) in net income	\$ 68	\$ (76)	\$ —	\$ —	\$ (9)	\$ 9

Sensitivities to Actuarial Assumptions

(in millions of U.S. dollars)

	Mortality			
	+20%	+10%	-10%	-20%
(Increase)/decrease in Gross FVL	\$ 18	\$ 9	\$ (9)	\$ (19)
Increase/(decrease) in net income	\$ 18	\$ 9	\$ (9)	\$ (19)

(in millions of U.S. dollars)

	Lapses			
	+50%	+25%	-25%	-50%
(Increase)/decrease in Gross FVL	\$ 91	\$ 48	\$ (52)	\$ (110)
Increase/(decrease) in net income	\$ 91	\$ 48	\$ (52)	\$ (110)

(in millions of U.S. dollars)

	Annuity			
	+50%	+25%	-25%	-50%
(Increase)/decrease in Gross FVL	\$ (493)	\$ (261)	\$ 295	\$ 524
Increase/(decrease) in net income	\$ (493)	\$ (261)	\$ 295	\$ 524

ITEM 4. 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 June 30, 2019. 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.

On January 14, 2016, Chubb completed the acquisition of The Chubb Corporation. For the three months ended June 30, 2019, 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 three months ended June 30, 2019 that have materially affected, or are reasonably likely to materially affect, Chubb's internal controls over financial reporting.

PART II OTHER INFORMATION**ITEM 1. Legal Proceedings**

The information required with respect to this item is included in Note 6 g) to the Consolidated Financial Statements which is hereby incorporated by reference.

ITEM 1A. Risk Factors

Refer to "Risk Factors" under Item 1A of Part I of our 2018 Form 10-K. There have been no material changes to the risk factors disclosed in Item 1A of Part I of our 2018 Form 10-K.

ITEM 2. Unregistered Sales of Equity Securities and Use of Proceeds and Issuer Repurchases of Equity Securities**Issuer's Repurchases of Equity Securities**

The following table provides information with respect to purchases by Chubb of its Common Shares during the three months ended June 30, 2019 :

Period	Total Number of Shares Purchased ⁽¹⁾	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plan ⁽²⁾	Approximate Dollar Value of Shares that May Yet be Purchased Under the Plan ⁽³⁾
April 1 through April 30	525,993	\$ 139.33	525,000	\$ 1.0 billion
May 1 through May 31	1,083,220	\$ 145.57	985,000	\$ 895 million
June 1 through June 30	1,075,337	\$ 148.79	1,074,466	\$ 736 million
Total	2,684,550	\$ 145.64	2,584,466	

(1) This column 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 repurchased in the three months ended June 30, 2019 as part of the publicly announced plan was \$376 million .

(3) Refer to Note 7 to the Consolidated Financial Statements for more information on the Chubb Limited securities repurchase authorization. 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. For the period July 1, 2019 through July 30, 2019, we repurchased 730,417 Common Shares for a total of \$110 million in a series of open market transactions. At July 30, 2019, \$626 million in share repurchase authorization remained through December 31, 2019.

ITEM 6. Exhibits

Exhibit Number	Exhibit Description	Incorporated by Reference			Filed Herewith
		Form	Original Number	Date Filed	
3.1	Articles of Association of the Company, as amended	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	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	Form of Officer's Certificate related to the 0.875% Senior Notes due 2027 and 1.400% Senior Notes due 2031	8-K	4.1	June 17, 2019	
4.4	Form of Global Note for the 0.875% Senior Notes due 2027	8-K	4.2	June 17, 2019	
4.5	Form of Global Note for the 1.400% Senior Notes due 2031	8-K	4.3	June 17, 2019	
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
101.1	The following financial information from Chubb Limited's Quarterly Report on Form 10-Q for the quarter ended June 30, 2019 formatted in Inline XBRL: (i) Consolidated Balance Sheets at June 30, 2019, and December 31, 2018; (ii) Consolidated Statements of Operations and Comprehensive Income for the three and six months ended June 30, 2019 and 2018; (iii) Consolidated Statements of Shareholders' Equity for the three and six months ended June 30, 2019 and 2018; (iv) Consolidated Statements of Cash Flows for the six months ended June 30, 2019 and 2018; and (v) Notes to Consolidated Financial Statements				X

SIGNATURES

Pursuant to the requirements 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
(Registrant)**

July 31, 2019

/s/ Evan G. Greenberg

Evan G. Greenberg
Chairman, President and Chief Executive Officer

July 31, 2019

/s/ Philip V. Bancroft

Philip V. Bancroft
Executive Vice President and Chief Financial Officer

CERTIFICATION PURSUANT TO
SECTION 302 OF
THE SARBANES-OXLEY ACT OF 2002

I, Evan G. Greenberg, certify that:

- 1) I have reviewed this quarterly report on Form 10-Q of Chubb Limited;
- 2) Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
- 3) Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
- 4) The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
- 5) The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's Board of Directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: July 31, 2019

/s/ Evan G. Greenberg

Evan G. Greenberg

Chairman, President and Chief Executive Officer

CERTIFICATION PURSUANT TO
SECTION 302 OF
THE SARBANES-OXLEY ACT OF 2002

I, Philip V. Bancroft, certify that:

- 1) I have reviewed this quarterly report on Form 10-Q of Chubb Limited;
- 2) Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
- 3) Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
- 4) The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
- 5) The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's Board of Directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: July 31, 2019

/s/ Philip V. Bancroft

Philip V. Bancroft

Executive Vice President and Chief Financial Officer

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

The undersigned officer of Chubb Limited (the Corporation) hereby certifies that the Corporation's Quarterly Report on Form 10-Q for the quarter ended June 30, 2019, fully complies with the applicable reporting requirements of Section 13(a) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a)) and that the information contained in the Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of the Corporation.

Date: July 31, 2019

/s/ Evan G. Greenberg

Evan G. Greenberg

Chairman, President and Chief Executive Officer

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

The undersigned officer of Chubb Limited (the Corporation) hereby certifies that the Corporation's Quarterly Report on Form 10-Q for the quarter ended June 30, 2019, fully complies with the applicable reporting requirements of Section 13(a) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a)) and that the information contained in the Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of the Corporation.

Date: July 31, 2019

/s/ Philip V. Bancroft

Philip V. Bancroft

Executive Vice President and Chief Financial Officer