

**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 March 31, 2019

Or

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

Commission file number: 001-16209



ARCH CAPITAL GROUP LTD.

(Exact name of registrant as specified in its charter)

Bermuda

(State or other jurisdiction of incorporation or organization)

Not applicable

(I.R.S. Employer Identification No.)

Waterloo House, Ground Floor

100 Pitts Bay Road, Pembroke HM 08, Bermuda

(Address of principal executive offices)

(441) 278-9250

(Registrant's telephone number, including area code)

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, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated Filer ☒ Accelerated Filer ☐ Non-accelerated Filer ☐ Smaller reporting company ☐ Emerging growth company ☐

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

Indicate by check mark whether the Registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

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

Title of each class	Trading Symbol (s)	Name of each exchange on which registered
Common shares, \$0.0011 par value per share	ACGL	NASDAQ Stock Market
Depository shares, each representing a 1/100 th interest in a 5.25% Series E preferred share	ACGLP	NASDAQ Stock Market
Depository shares, each representing a 1/100 th interest in a 5.45% Series F preferred share	ACGLO	NASDAQ Stock Market

As of May 1, 2019, there were 403,803,412 common shares, \$0.0011 par value per share, of the registrant outstanding.

ARCH CAPITAL GROUP LTD.**INDEX TO FORM 10-Q**

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PART I. FINANCIAL INFORMATION

Cautionary Note Regarding Forward-Looking Statements

The Private Securities Litigation Reform Act of 1995 (“PSLRA”) provides a “safe harbor” for forward-looking statements. This report or any other written or oral statements made by or on behalf of us may include forward-looking statements, which reflect our current views with respect to future events and financial performance. All statements other than statements of historical fact included in or incorporated by reference in this report are forward-looking statements. Forward-looking statements, for purposes of the PSLRA or otherwise, can generally be identified by the use of forward-looking terminology such as “may,” “will,” “expect,” “intend,” “estimate,” “anticipate,” “believe” or “continue” and similar statements of a future or forward-looking nature or their negative or variations or similar terminology.

Forward-looking statements involve our current assessment of risks and uncertainties. Actual events and results may differ materially from those expressed or implied in these statements. Important factors that could cause actual events or results to differ materially from those indicated in such statements are discussed below and elsewhere in this report and in our periodic reports filed with the Securities and Exchange Commission (the “SEC”), and include:

- our ability to successfully implement our business strategy during “soft” as well as “hard” markets;
- acceptance of our business strategy, security and financial condition by rating agencies and regulators, as well as by brokers and our insureds and reinsureds;
- the integration of any businesses we have acquired or may acquire into our existing operations;
- our ability to maintain or improve our ratings, which may be affected by our ability to raise additional equity or debt financings, by ratings agencies’ existing or new policies and practices, as well as other factors described herein;
- general economic and market conditions (including inflation, interest rates, unemployment, housing prices, foreign currency exchange rates, prevailing credit terms and the depth and duration of a recession) and conditions specific to the reinsurance and insurance markets (including the length and magnitude of the current “soft” market) in which we operate;
- competition, including increased competition, on the basis of pricing, capacity (including alternative sources of capital), coverage terms, or other factors;
- developments in the world’s financial and capital markets and our access to such markets;
- our ability to successfully enhance, integrate and maintain operating procedures (including information technology) to effectively support our current and new business;
- the loss of key personnel;
- accuracy of those estimates and judgments utilized in the preparation of our financial statements, including those related to revenue recognition, insurance and other reserves, reinsurance recoverables, investment valuations, intangible assets, bad debts, income taxes, contingencies and litigation, and any determination to use the deposit method of accounting, which for a relatively new insurance and reinsurance company, like our company, are even more difficult to make than those made in a mature company since relatively limited historical information has been reported to us through March 31, 2019 ;
- greater than expected loss ratios on business written by us and adverse development on claim and/or claim expense liabilities related to business written by our insurance and reinsurance subsidiaries;
- severity and/or frequency of losses;
- claims for natural or man-made catastrophic events or severe economic events in our insurance, reinsurance and mortgage businesses could cause large losses and substantial volatility in our results of operations;
- the effect of climate change on the Company’s business;
- acts of terrorism, political unrest and other hostilities or other unforecasted and unpredictable events;
- availability to us of reinsurance to manage our gross and net exposures and the cost of such reinsurance;
- the failure of reinsurers, managing general agents, third party administrators or others to meet their obligations to us;
- the timing of loss payments being faster or the receipt of reinsurance recoverables being slower than anticipated by us;

- our investment performance, including legislative or regulatory developments that may adversely affect the fair value of our investments;
- changes in general economic conditions, including new or continued sovereign debt concerns in Eurozone countries or downgrades of U.S. securities by credit rating agencies, which could affect our business, financial condition and results of operations;
- the volatility of our shareholders' equity from foreign currency fluctuations, which could increase due to us not matching portions of our projected liabilities in foreign currencies with investments in the same currencies;
- changes in accounting principles or policies or in our application of such accounting principles or policies;
- changes in the political environment of certain countries in which we operate or underwrite business;
- a disruption caused by cyber-attacks or other technology breaches or failures on us or our business partners and service providers, which could negatively impact our business and/or expose us to litigation;
- statutory or regulatory developments, including as to tax matters and insurance and other regulatory matters such as the adoption of proposed legislation that would affect Bermuda-headquartered companies and/or Bermuda-based insurers or reinsurers and/or changes in regulations or tax laws applicable to us, our subsidiaries, brokers or customers, including the Tax Cuts and Jobs Act of 2017; and
- the other matters set forth under Item 1A "Risk Factors", Item 7 "Management's Discussion and Analysis of Financial Condition and Results of Operations" and other sections of our Annual Report on Form 10-K for the year ended December 31, 2018, as well as the other factors set forth in our other documents on file with the SEC, and management's response to any of the aforementioned factors.

All subsequent written and oral forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by these cautionary statements. The foregoing review of important factors should not be construed as exhaustive and should be read in conjunction with other cautionary statements that are included herein or elsewhere. We undertake no obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise.

ITEM 1. CONSOLIDATED FINANCIAL STATEMENTS

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Arch Capital Group Ltd.:

Results of Review of Financial Statements

We have reviewed the accompanying consolidated balance sheet of Arch Capital Group Ltd. and its subsidiaries (the “Company”) as of March 31, 2019, the related consolidated statements of income, comprehensive income, changes in shareholders’ equity and cash flows for the three-month periods ended March 31, 2019 and 2018, including the related notes (collectively referred to as the “interim financial statements”). Based on our reviews, we are not aware of any material modifications that should be made to the accompanying interim financial statements for them to be in conformity with accounting principles generally accepted in the United States of America.

We have previously audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheet of the Company as of December 31, 2018, and the related consolidated statements of income, comprehensive income, changes in shareholders’ equity, and cash flows for the year then ended (not presented herein), and in our report dated February 28, 2019, we expressed an unqualified opinion on those consolidated financial statements. In our opinion, the information set forth in the accompanying consolidated balance sheet as of December 31, 2018, is fairly stated, in all material respects, in relation to the consolidated balance sheet from which it has been derived.

Basis for Review Results

These interim financial statements are the responsibility of the Company’s management. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB. We conducted our review in accordance with the standards of the PCAOB. A review of interim financial information consists principally of applying analytical procedures and making inquiries of persons responsible for financial and accounting matters. It is substantially less in scope than an audit conducted in accordance with the standards of the PCAOB, the objective of which is the expression of an opinion regarding the financial statements taken as a whole. Accordingly, we do not express such an opinion.

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
New York, NY
May 7, 2019

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(U.S. dollars in thousands, except share data)

	(Unaudited) March 31, 2019	December 31, 2018
Assets		
Investments:		
Fixed maturities available for sale, at fair value (amortized cost: \$15,063,594 and \$14,829,902)	\$ 15,177,312	\$ 14,699,010
Short-term investments available for sale, at fair value (amortized cost: \$705,954 and \$956,238)	706,214	955,880
Collateral received under securities lending, at fair value (amortized cost: \$415,048 and \$274,125)	415,056	274,133
Equity securities, at fair value	495,895	338,899
Investments accounted for using the fair value option	3,969,623	3,983,571
Investments accounted for using the equity method	1,563,779	1,493,791
Total investments	22,327,879	21,745,284
Cash	633,100	646,556
Accrued investment income	112,935	114,641
Securities pledged under securities lending, at fair value (amortized cost: \$400,948 and \$266,786)	404,262	268,395
Premiums receivable	1,584,682	1,299,150
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	3,099,823	2,919,372
Contractholder receivables	2,087,720	2,079,111
Ceded unearned premiums	1,099,581	975,469
Deferred acquisition costs	597,526	569,574
Receivable for securities sold	334,982	36,246
Goodwill and intangible assets	659,215	634,920
Other assets	1,035,332	929,611
Total assets	\$ 33,977,037	\$ 32,218,329
Liabilities		
Reserve for losses and loss adjustment expenses	\$ 12,010,041	\$ 11,853,297
Unearned premiums	4,036,119	3,753,636
Reinsurance balances payable	453,058	393,107
Contractholder payables	2,087,720	2,079,111
Collateral held for insured obligations	232,411	236,630
Senior notes	1,733,694	1,733,528
Revolving credit agreement borrowings	488,612	455,682
Securities lending payable	415,048	274,125
Payable for securities purchased	376,332	90,034
Other liabilities	984,942	911,500
Total liabilities	22,817,977	21,780,650
Commitments and Contingencies		
Redeemable noncontrolling interests	206,383	206,292
Shareholders' Equity		
Non-cumulative preferred shares	780,000	780,000
Common shares (\$0.0011 par, shares issued: 572,238,363 and 570,737,283)	636	634
Additional paid-in capital	1,819,605	1,793,781
Retained earnings	9,864,424	9,426,299
Accumulated other comprehensive income (loss), net of deferred income tax	38,323	(178,720)
Common shares held in treasury, at cost (shares: 168,499,599 and 168,282,449)	(2,388,392)	(2,382,167)
Total shareholders' equity available to Arch	10,114,596	9,439,827
Non-redeemable noncontrolling interests	838,081	791,560
Total shareholders' equity	10,952,677	10,231,387

Total liabilities, noncontrolling interests and shareholders' equity

\$	33,977,037	\$	32,218,329
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See Notes to Consolidated Financial Statements

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF INCOME
(U.S. dollars in thousands, except share data)

	(Unaudited)	
	Three Months Ended	
	March 31,	
	2019	2018
Revenues		
Net premiums written	\$ 1,525,259	\$ 1,412,544
Change in unearned premiums	(156,393)	(177,645)
Net premiums earned	1,368,866	1,234,899
Net investment income	156,949	126,724
Net realized gains (losses)	141,565	(110,998)
Other-than-temporary impairment losses	(1,309)	(162)
Less investment impairments recognized in other comprehensive income, before taxes	—	—
Net impairment losses recognized in earnings	(1,309)	(162)
Other underwriting income	8,825	5,349
Equity in net income of investment funds accounted for using the equity method	46,867	28,069
Other income	1,083	74
Total revenues	1,722,846	1,283,955
Expenses		
Losses and loss adjustment expenses	718,532	636,860
Acquisition expenses	197,848	191,376
Other operating expenses	201,163	175,015
Corporate expenses	17,962	15,312
Amortization of intangible assets	20,417	26,736
Interest expense	29,065	30,636
Net foreign exchange (gains) losses	(3,525)	19,721
Total expenses	1,181,462	1,095,656
Income before income taxes	541,384	188,299
Income tax expense	(45,886)	(21,915)
Net income	\$ 495,498	\$ 166,384
Net (income) loss attributable to noncontrolling interests	(46,970)	(15,961)
Net income available to Arch	448,528	150,423
Preferred dividends	(10,403)	(10,437)
Loss on redemption of preferred shares	—	(2,710)
Net income available to Arch common shareholders	\$ 438,125	\$ 137,276
Net income per common share and common share equivalent		
Basic	\$ 1.09	\$ 0.34
Diluted	\$ 1.07	\$ 0.33
Weighted average common shares and common share equivalents outstanding		
Basic	400,184,404	407,539,728
Diluted	408,971,029	417,893,802

See Notes to Consolidated Financial Statements

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(U.S. dollars in thousands)

	(Unaudited)	
	Three Months Ended	
	March 31,	
	2019	2018
Comprehensive Income		
Net income	\$ 495,498	\$ 166,384
Other comprehensive income (loss), net of deferred income tax		
Unrealized appreciation (decline) in value of available-for-sale investments:		
Unrealized holding gains (losses) arising during period	225,887	(166,677)
Reclassification of net realized (gains) losses, net of income taxes, included in net income (loss)	(10,221)	62,461
Foreign currency translation adjustments	5,516	1,282
Comprehensive income	716,680	63,450
Net (income) loss attributable to noncontrolling interests	(46,970)	(15,961)
Other comprehensive (income) loss attributable to noncontrolling interests	(4,139)	673
Comprehensive income available to Arch	\$ 665,571	\$ 48,162

See Notes to Consolidated Financial Statements

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
(U.S. dollars in thousands)

	(Unaudited)	
	Three Months Ended	
	March 31,	
	2019	2018
Non-cumulative preferred shares		
Balance at beginning of period	\$ 780,000	\$ 872,555
Preferred shares redeemed	—	(92,555)
Balance at end of period	780,000	780,000
Convertible non-voting common equivalent preferred shares		
Balance at beginning of period	—	489,627
Preferred shares converted to common shares	—	(489,627)
Balance at end of period	—	—
Common shares		
Balance at beginning of period	634	611
Common shares issued, net	2	19
Balance at end of period	636	630
Additional paid-in capital		
Balance at beginning of period	1,793,781	1,230,617
Preferred shares converted to common shares	—	489,608
Other changes	25,824	17,753
Balance at end of period	1,819,605	1,737,978
Retained earnings		
Balance at beginning of period	9,426,299	8,562,889
Cumulative effect of an accounting change	—	149,794
Balance at beginning of period, as adjusted	9,426,299	8,712,683
Net income	495,498	166,384
Net (income) loss attributable to noncontrolling interests	(46,970)	(15,961)
Preferred share dividends	(10,403)	(10,437)
Loss on redemption of preferred shares	—	(2,710)
Balance at end of period	9,864,424	8,849,959
Accumulated other comprehensive income (loss), net of deferred income tax		
Balance at beginning of period	(178,720)	118,044
Unrealized appreciation (decline) in value of available-for-sale investments, net of deferred income tax:		
Balance at beginning of period	(114,178)	157,400
Cumulative effect of an accounting change	—	(149,794)
Balance at beginning of period, as adjusted	(114,178)	7,606
Unrealized holding gains (losses) during period, net of reclassification adjustment	215,666	(104,216)
Unrealized holding gains (losses) during period attributable to noncontrolling interests	(4,286)	372
Balance at end of period	97,202	(96,238)
Foreign currency translation adjustments, net of deferred income tax:		
Balance at beginning of period	(64,542)	(39,356)
Foreign currency translation adjustments	5,516	1,282
Foreign currency translation adjustments attributable to noncontrolling interests	147	303
Balance at end of period	(58,879)	(37,771)
Balance at end of period	38,323	(134,009)
Common shares held in treasury, at cost		
Balance at beginning of period	(2,382,167)	(2,077,741)
Shares repurchased for treasury	(6,225)	(6,445)

Balance at end of period	(2,388,392)	(2,084,186)
Total shareholders' equity available to Arch	10,114,596	9,150,372
Non-redeemable noncontrolling interests	838,081	854,112
Total shareholders' equity	\$ 10,952,677	\$ 10,004,484

See Notes to Consolidated Financial Statements

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(U.S. dollars in thousands)

	(Unaudited)	
	Three Months Ended	
	March 31,	
	2019	2018
Operating Activities		
Net income	\$ 495,498	\$ 166,384
Adjustments to reconcile net income to net cash provided by operating activities:		
Net realized (gains) losses	(145,400)	101,995
Net impairment losses recognized in earnings	1,309	162
Equity in net income or loss of investment funds accounted for using the equity method and other income or loss	(29,752)	(19,383)
Amortization of intangible assets	20,417	26,736
Share-based compensation	25,891	14,664
Changes in:		
Reserve for losses and loss adjustment expenses, net of unpaid losses and loss adjustment expenses recoverable	(6,005)	86,319
Unearned premiums, net of ceded unearned premiums	156,393	177,645
Premiums receivable	(285,137)	(233,772)
Deferred acquisition costs	(23,168)	(30,347)
Reinsurance balances payable	62,605	53,634
Other items, net	(37,253)	56,143
Net cash provided by operating activities	235,398	400,180
Investing Activities		
Purchases of fixed maturity investments	(7,444,470)	(9,681,267)
Purchases of equity securities	(203,810)	(377,000)
Purchases of other investments	(324,593)	(522,454)
Proceeds from sales of fixed maturity investments	7,076,590	8,679,147
Proceeds from sales of equity securities	95,017	291,311
Proceeds from sales, redemptions and maturities of other investments	216,483	436,566
Proceeds from redemptions and maturities of fixed maturity investments	100,424	287,031
Net settlements of derivative instruments	29,737	36,070
Net sales of short-term investments	292,601	595,318
Change in cash collateral related to securities lending	(29,618)	161,567
Purchases of fixed assets	(9,423)	(4,240)
Other	(93,731)	40,037
Net cash used for investing activities	(294,793)	(57,914)
Financing Activities		
Redemption of preferred shares	—	(92,555)
Purchases of common shares under share repurchase program	(2,871)	(3,299)
Proceeds from common shares issued, net	(1,901)	(2,779)
Proceeds from borrowings	59,000	39,585
Repayments of borrowings	(26,038)	(101,000)
Change in cash collateral related to securities lending	29,618	(161,567)
Dividends paid to redeemable noncontrolling interests	(4,497)	(4,497)
Other	(1,389)	(2,356)
Preferred dividends paid	(10,403)	(10,437)
Net cash provided by (used for) financing activities	41,519	(338,905)
Effects of exchange rate changes on foreign currency cash and restricted cash	3,449	1,611
Increase (decrease) in cash and restricted cash	(14,427)	4,972
Cash and restricted cash, beginning of year	724,643	727,284
Cash and restricted cash, end of period	\$ 710,216	\$ 732,256

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

1. Basis of Presentation and Recent Accounting Pronouncements

Basis of Presentation

Arch Capital Group Ltd. (“Arch Capital”) is a Bermuda public limited liability company which provides insurance, reinsurance and mortgage insurance on a worldwide basis through its wholly-owned subsidiaries. As used herein, the “Company” means Arch Capital and its subsidiaries. The Company’s consolidated financial statements include the results of Watford Holdings Ltd. and its wholly owned subsidiaries. See [note 11](#).

On January 1, 2019, the Company’s U.K. insurance operations entered into a transaction with The Ardonagh Group to acquire renewal rights for a U.K. commercial lines book of business, consisting of commercial property, casualty, motor, professional liability, personal accident and travel business.

The interim consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America (“GAAP”). All significant intercompany transactions and balances have been eliminated in consolidation. The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ materially from those estimates and assumptions. In the opinion of management, the accompanying unaudited interim consolidated financial statements reflect all adjustments (consisting of normally recurring accruals) necessary for a fair statement of results on an interim basis. The results of any interim period are not necessarily indicative of the results for a full year or any future periods.

Certain information and footnote disclosures normally included in financial statements prepared in accordance with GAAP have been condensed or omitted; however, management believes that the disclosures are adequate to make the information presented not misleading. This report should be read in conjunction with the Company’s Annual Report on Form 10-K for the year ended December 31, 2018 (“2018 Form 10-K”), including the Company’s audited consolidated financial statements and related notes.

The Company has reclassified the presentation of certain prior year information to conform to the current presentation. Such reclassifications had no effect on the Company’s net income, comprehensive income, shareholders’ equity or cash flows. Tabular amounts are in U.S. Dollars in thousands, except share amounts, unless otherwise noted.

Recent Accounting Pronouncements

Recently Issued Accounting Standards Adopted

The Company adopted ASU 2016-02, “Leases (Topic 842)”, which provides a new comprehensive model for lease accounting. Topic 842 requires a lessee to recognize a liability to make lease payments (the lease liability) and a right-of-use asset representing its right to use the underlying asset for the lease term. The Company adopted the modified retrospective approach of this standard, that resulted in the recognition of a right-of-use asset of \$147.9 million as part of other assets and a lease liability of \$163.6 million as part of other liabilities in the consolidated balance sheet as of January 1, 2019. The Company de-recognizing the liability for deferred rent that was required under the previous guidance.

In addition, the Company adopted ASU 2018-11, “Leases: Targeted Improvements (Topic 842),” which provides an additional (optional) transition method to adopt the new lease standard. The Company adopted the alternative transition method and elected to utilize a cumulative-effect adjustment to the opening balance of the retained earnings for the year of adoption. As such, the Company’s reporting for the comparative periods prior to the adoption continue to be presented in the financial statements in accordance with previous lease accounting guidance. The Company also adopted the practical expedients as a package which allows the Company to not reassess (1) whether any expired or existing contracts are or contain leases (2) the lease classification for any expired or existing leases (3) initial direct costs for any existing leases and (4) to account for the lease and non lease components as a single lease component. In addition to electing the practical expedients as a package, the Company elected to include hindsight to determine the lease term of existing leases, and made an accounting policy election to not apply the recognition requirements to short-term leases (lease term of less than twelve months). The cumulative effect adjustment to the opening balance of retained earnings was zero. The adoption of the updated guidance did not have a material effect on the Company’s results of operations or liquidity.

The Company adopted ASU 2018-07 “Improvements to Nonemployee Share-Based Payment Accounting,” which was issued in June 2018 to simplify the accounting for share-based payments granted to nonemployees for goods and services. Under this ASU, most of the guidance on such payments to nonemployees would be aligned with the requirements for share-based payments granted to employees. The ASU is effective for reporting periods beginning after December 15, 2018. This guidance and the adoption of this provision did not have a material effect on the Company’s financial position, results of operations or cash flows.

ASU 2018-02 “Income Statement-Reporting Comprehensive Income (Topic 220) - Reclassification of Certain Tax Effects

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

from Accumulated Other Comprehensive Income,” was issued in February 2018 to allow the reclassification of the stranded tax effects in accumulated other comprehensive income (“AOCI”) resulting from the Tax Cuts and Jobs Act of 2017 (“Tax Cuts Act”). Current guidance requires the effect of a change in tax laws or rates on deferred tax balances to be reported in income from continuing operations in the accounting period that includes the period of enactment, even if the related income tax effects were originally charged or credited directly to AOCI. The amount of the reclassification would include the effect of the change in the U.S. federal corporate income tax rate on the gross deferred tax amounts and related valuation allowances, if any, at the date of the enactment of the Tax Cuts Act related to items in AOCI. The updated guidance is effective for reporting periods beginning after December 15, 2018 and is to be applied retrospectively to each period in which the effect of the Tax Cuts Act related to items remaining in AOCI are recognized or at the beginning of the period of adoption. The adoption of this ASU did not have a material effect on the Company’s results of operations, financial position or liquidity.

Recently Issued Accounting Standards Not Yet Adopted

For information regarding additional accounting standards that the Company has not yet adopted, see note 3(q), “Significant Accounting Policies—Recent Accounting Pronouncements,” of the notes to consolidated financial statements in the Company’s 2018 Form 10-K.

2. Share Transactions

Share-Based Compensation

Annual long-term incentive awards have historically been made in the second quarter of each year. However, beginning in 2019, the awards were made in the first quarter.

During the 2019 first quarter, the Company granted 1,182,264 stock options, 672,768 performance share awards (“PSAs”) and units (“PSUs”) and 1,099,125 restricted shares and units to certain employees. The stock options were valued at the grant date using the Black-Scholes option pricing model. The weighted average grant-date fair value of the stock options, PSAs/PSUs and restricted shares and units granted during the 2019 first quarter were approximately \$7.90, \$35.83 and \$32.64 per share, respectively. Such values are being amortized over the respective substantive vesting period.

During the 2018 second quarter, the Company made a stock grant of 2,199,656 stock options, 705,345 PSAs/PSUs and 1,264,931 restricted shares and units to certain employees and directors. The stock options were valued at the grant date using the Black-Scholes option pricing model. The weighted average grant-date fair value of the stock options, PSAs/PSUs and

restricted shares and units granted during the 2018 second quarter were approximately \$7.43, \$24.65 and \$26.56 per share, respectively. Such values are being amortized over the respective substantive vesting period.

Share Repurchases

The board of directors of Arch Capital has authorized the investment in Arch Capital’s common shares through a share repurchase program. Since the inception of the share repurchase program, Arch Capital has repurchased 386.3 million common shares for an aggregate purchase price of \$3.97 billion. For the three months ended March 31, 2019, Arch Capital repurchased 0.1 million shares under the share repurchase program with an aggregate purchase price of \$2.9 million. Arch Capital repurchased 0.1 million shares under the share repurchase program with an aggregate purchase price of \$3.3 million during the three months ended March 31, 2018. At March 31, 2019, \$160.9 million of share repurchases were available under the program, which may be effected from time to time in open market or privately negotiated transactions through December 31, 2019. The timing and amount of the repurchase transactions under this program will depend on a variety of factors, including market conditions and corporate and regulatory considerations.

Conversion of Convertible Non-Voting Common Equivalent Preferred Shares

In March 2018, Arch Capital completed an underwritten public secondary offering of 17.0 million common shares (split adjusted) by American International Group, Inc. (“AIG”) following transfer of 0.6 million Series D convertible non-voting common equivalent preferred shares (“Series D Preferred Shares”). Proceeds from the sale of common shares pursuant to the public offering were received by AIG. At March 31, 2019, no Series D Preferred Shares were outstanding.

Series C Preferred Shares

On January 2, 2018, Arch Capital redeemed all outstanding 6.75% Series C non-cumulative preferred shares. The preferred shares were redeemed at a redemption price equal to \$25 per share, plus all declared and unpaid dividends to (but excluding) the redemption date. In accordance with GAAP, following the redemption, original issuance costs related to such shares were removed from additional paid-in capital and recorded as a “loss on redemption of preferred shares.” Such adjustment had no impact on total shareholders’ equity or cash flows.

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3. Earnings Per Common Share

The following table sets forth the computation of basic and diluted earnings per common share:

	Three Months Ended	
	March 31,	
	2019	2018
Numerator:		
Net income	\$ 495,498	\$ 166,384
Amounts attributable to noncontrolling interests	(46,970)	(15,961)
Net income available to Arch	448,528	150,423
Preferred dividends	(10,403)	(10,437)
Loss on redemption of preferred shares	—	(2,710)
Net income available to Arch common shareholders	\$ 438,125	\$ 137,276
Denominator:		
Weighted average common shares outstanding	400,184,404	394,110,789
Series D preferred shares (1)	—	13,428,939
Weighted average common shares and common share equivalents outstanding — basic	400,184,404	407,539,728
Effect of dilutive common share equivalents:		
Nonvested restricted shares	1,807,488	2,159,577
Stock options (2)	6,979,137	8,194,497
Weighted average common shares and common share equivalents outstanding — diluted	408,971,029	417,893,802
Earnings per common share:		
Basic	\$ 1.09	\$ 0.34
Diluted	\$ 1.07	\$ 0.33

(1) Such shares are convertible non-voting common equivalent preferred shares issued in connection with the UGC acquisition. See [note 2](#).

(2) Certain stock options were not included in the computation of diluted earnings per share where the exercise price of the stock options exceeded the average market price and would have been anti-dilutive or where, when applying the treasury stock method to in-the-money options, the sum of the proceeds, including unrecognized compensation, exceeded the average market price and would have been anti-dilutive. For the 2019 first quarter and 2018 first quarter, the number of stock options excluded were 5,577,724 and 3,168,786, respectively.

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4. Segment Information

The Company classifies its businesses into three underwriting segments — insurance, reinsurance and mortgage — and two other operating segments — ‘other’ and corporate (non-underwriting). The Company determined its reportable segments using the management approach described in accounting guidance regarding disclosures about segments of an enterprise and related information. The accounting policies of the segments are the same as those used for the preparation of the Company’s consolidated financial statements. Intersegment business is allocated to the segment accountable for the underwriting results.

The Company’s insurance, reinsurance and mortgage segments each have managers who are responsible for the overall profitability of their respective segments and who are directly accountable to the Company’s chief operating decision makers, the President and Chief Executive Officer of Arch Capital, and the Chief Financial Officer of Arch Capital. The chief operating decision makers do not assess performance, measure return on equity or make resource allocation decisions on a line of business basis. Management measures segment performance for its three underwriting segments based on underwriting income or loss. The Company does not manage its assets by underwriting segment, with the exception of goodwill and intangible assets, and, accordingly, investment income is not allocated to each underwriting segment.

The insurance segment consists of the Company’s insurance underwriting units which offer specialty product lines on a worldwide basis. Product lines include: construction and national accounts; excess and surplus casualty; lenders products; professional lines; programs; property, energy, marine and aviation; travel, accident and health; and other (consisting of alternative markets, excess workers' compensation and surety business).

The reinsurance segment consists of the Company’s reinsurance underwriting units which offer specialty product lines on a worldwide basis. Product lines include: casualty; marine and aviation; other specialty; property catastrophe; property excluding property catastrophe (losses on a single risk, both excess of loss and pro rata); and other (consisting of life reinsurance, casualty clash and other).

The mortgage segment includes the Company’s U.S. and international mortgage insurance and reinsurance operations as well as government sponsored enterprise (“GSE”) credit-risk sharing transactions. Arch Mortgage Insurance Company and United Guaranty Residential Insurance Company (combined “Arch MI U.S.”) are approved as eligible mortgage insurers by Federal National Mortgage Association (“Fannie Mae”) and Federal Home Loan Mortgage Corporation (“Freddie Mac”), each a GSE.

The corporate (non-underwriting) segment results include net investment income, other income (loss), corporate expenses, transaction costs and other, interest expense, items related to the Company’s non-cumulative preferred shares, net realized gains or losses, net impairment losses included in earnings, equity in net income or loss of investment funds accounted for using the equity method, net foreign exchange gains or losses and income taxes. Such amounts exclude the results of the ‘other’ segment.

The ‘other’ segment includes the results of Watford Holdings Ltd. Watford Holdings Ltd. is the parent of Watford Re Ltd., a multi-line Bermuda reinsurance company (together with Watford Holdings Ltd., “Watford Re”) (see [note 11](#)). Watford Re has its own management and board of directors that is responsible for the overall profitability of the ‘other’ segment. For the ‘other’ segment, performance is measured based on net income or loss.

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The following tables summarize the Company's underwriting income or loss by segment, together with a reconciliation of underwriting income or loss to net income available to Arch common shareholders:

	Three Months Ended					
	March 31, 2019					
	Insurance	Reinsurance	Mortgage	Sub-Total	Other	Total
Gross premiums written (1)	\$ 941,954	\$ 682,855	\$ 356,050	\$ 1,980,453	\$ 186,689	\$ 2,077,879
Premiums ceded	(320,622)	(231,567)	(48,798)	(600,581)	(41,302)	(552,620)
Net premiums written	621,332	451,288	307,252	1,379,872	145,387	1,525,259
Change in unearned premiums	(67,827)	(104,923)	15,650	(157,100)	707	(156,393)
Net premiums earned	553,505	346,365	322,902	1,222,772	146,094	1,368,866
Other underwriting income (loss)	—	4,377	3,856	8,233	592	8,825
Losses and loss adjustment expenses	(356,723)	(239,810)	(11,149)	(607,682)	(110,850)	(718,532)
Acquisition expenses	(82,824)	(54,326)	(31,672)	(168,822)	(29,026)	(197,848)
Other operating expenses	(113,396)	(35,704)	(39,875)	(188,975)	(12,188)	(201,163)
Underwriting income (loss)	\$ 562	\$ 20,902	\$ 244,062	265,526	(5,378)	260,148
Net investment income				121,249	35,700	156,949
Net realized gains (losses)				112,433	29,132	141,565
Net impairment losses recognized in earnings				(1,309)	—	(1,309)
Equity in net income (loss) of investment funds accounted for using the equity method				46,867	—	46,867
Other income (loss)				1,083	—	1,083
Corporate expenses (2)				(16,772)	—	(16,772)
Transaction costs and other (2)				(1,190)	—	(1,190)
Amortization of intangible assets				(20,417)	—	(20,417)
Interest expense				(23,482)	(5,583)	(29,065)
Net foreign exchange gains (losses)				5,175	(1,650)	3,525
Income before income taxes				489,163	52,221	541,384
Income tax expense				(45,886)	—	(45,886)
Net income				443,277	52,221	495,498
Dividends attributable to redeemable noncontrolling interests				—	(4,588)	(4,588)
Amounts attributable to nonredeemable noncontrolling interests				—	(42,382)	(42,382)
Net income available to Arch				443,277	5,251	448,528
Preferred dividends				(10,403)	—	(10,403)
Net income available to Arch common shareholders	\$			\$ 432,874	\$ 5,251	\$ 438,125
Underwriting Ratios						
Loss ratio	64.4%	69.2%	3.5%	49.7%	75.9%	52.5%
Acquisition expense ratio	15.0%	15.7%	9.8%	13.8%	19.9%	14.5%
Other operating expense ratio	20.5%	10.3%	12.3%	15.5%	8.3%	14.7%
Combined ratio	99.9%	95.2%	25.6%	79.0%	104.1%	81.7%
Goodwill and intangible assets	\$ 156,735	\$ —	\$ 494,830	\$ 651,565	\$ 7,650	\$ 659,215

- (1) Certain amounts included in the gross premiums written of each segment are related to intersegment transactions. Accordingly, the sum of gross premiums written for each segment does not agree to the total gross premiums written as shown in the table above due to the elimination of intersegment transactions in the total.
- (2) Certain expenses have been excluded from 'corporate expenses' and reflected in 'transaction costs and other.'

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Three Months Ended March 31, 2018						
	Insurance	Reinsurance	Mortgage	Sub-Total	Other	Total
Gross premiums written (1)	\$ 823,378	\$ 577,483	\$ 321,178	\$ 1,721,605	\$ 213,870	\$ 1,838,214
Premiums ceded	(247,180)	(195,730)	(46,137)	(488,613)	(34,318)	(425,670)
Net premiums written	576,198	381,753	275,041	1,232,992	179,552	1,412,544
Change in unearned premiums	(37,461)	(102,581)	5,201	(134,841)	(42,804)	(177,645)
Net premiums earned	538,737	279,172	280,242	1,098,151	136,748	1,234,899
Other underwriting income (loss)	—	1,232	3,416	4,648	701	5,349
Losses and loss adjustment expenses	(353,730)	(141,675)	(43,466)	(538,871)	(97,989)	(636,860)
Acquisition expenses	(85,169)	(48,319)	(26,567)	(160,055)	(31,321)	(191,376)
Other operating expenses	(91,974)	(35,571)	(38,771)	(166,316)	(8,699)	(175,015)
Underwriting income (loss)	\$ 7,864	\$ 54,839	\$ 174,854	237,557	(560)	236,997
Net investment income				100,243	26,481	126,724
Net realized gains (losses)				(111,859)	861	(110,998)
Net impairment losses recognized in earnings				(162)	—	(162)
Equity in net income (loss) of investment funds accounted for using the equity method				28,069	—	28,069
Other income (loss)				74	—	74
Corporate expenses (2)				(14,482)	—	(14,482)
Transaction costs and other (2)				(830)	—	(830)
Amortization of intangible assets				(26,736)	—	(26,736)
Interest expense				(25,907)	(4,729)	(30,636)
Net foreign exchange gains (losses)				(15,039)	(4,682)	(19,721)
Income before income taxes				170,928	17,371	188,299
Income tax expense				(21,912)	(3)	(21,915)
Net income				149,016	17,368	166,384
Dividends attributable to redeemable noncontrolling interests				—	(4,585)	(4,585)
Amounts attributable to nonredeemable noncontrolling interests				—	(11,376)	(11,376)
Net income available to Arch				149,016	1,407	150,423
Preferred dividends				(10,437)	—	(10,437)
Loss on redemption of preferred shares				(2,710)	—	(2,710)
Net income available to Arch common shareholders				\$ 135,869	\$ 1,407	\$ 137,276
Underwriting Ratios						
Loss ratio	65.7%	50.7%	15.5%	49.1%	71.7%	51.6%
Acquisition expense ratio	15.8%	17.3%	9.5%	14.6%	22.9%	15.5%
Other operating expense ratio	17.1%	12.7%	13.8%	15.1%	6.4%	14.2%
Combined ratio	98.6%	80.7%	38.8%	78.8%	101.0%	81.3%
Goodwill and intangible assets	\$ 21,664	\$ —	\$ 596,690	\$ 618,354	\$ 7,650	\$ 626,004

- (1) Certain amounts included in the gross premiums written of each segment are related to intersegment transactions. Accordingly, the sum of gross premiums written for each segment does not agree to the total gross premiums written as shown in the table above due to the elimination of intersegment transactions in the total.
- (2) Certain expenses have been excluded from ‘corporate expenses’ and reflected in ‘transaction costs and other.’

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5. Reserve for Losses and Loss Adjustment Expenses

The following table represents an analysis of losses and loss adjustment expenses and a reconciliation of the beginning and ending reserve for losses and loss adjustment expenses:

	Three Months Ended	
	March 31,	
	2019	2018
Reserve for losses and loss adjustment expenses at beginning of period	\$ 11,853,297	\$ 11,383,792
Unpaid losses and loss adjustment expenses recoverable	2,814,291	2,464,910
Net reserve for losses and loss adjustment expenses at beginning of period	9,039,006	8,918,882
Net incurred losses and loss adjustment expenses relating to losses occurring in:		
Current year	757,964	687,885
Prior years	(39,432)	(51,025)
Total net incurred losses and loss adjustment expenses	718,532	636,860
Retroactive reinsurance transaction (1)	(225,500)	—
Net foreign exchange (gains) losses	(504)	44,014
Net paid losses and loss adjustment expenses relating to losses occurring in:		
Current year	(64,340)	(36,000)
Prior years	(427,312)	(514,541)
Total net paid losses and loss adjustment expenses	(491,652)	(550,541)
Net reserve for losses and loss adjustment expenses at end of period	9,039,882	9,049,215
Unpaid losses and loss adjustment expenses recoverable	2,970,159	2,446,990
Reserve for losses and loss adjustment expenses at end of period	\$ 12,010,041	\$ 11,496,205

(1) During the 2019 first quarter, a subsidiary of the Company entered into a retroactive reinsurance transaction with a third party reinsurer to reinsure liabilities associated with certain U.S. insurance exposures.

Development on Prior Year Loss Reserves

2019 First Quarter

During the 2019 first quarter, the Company recorded net favorable development on prior year loss reserves of \$39.4 million, which consisted of \$4.4 million of favorable development from the insurance segment, \$36.6 million from the mortgage segment and \$0.1 million from the 'other' segment, partially offset by \$1.7 million of adverse development from the reinsurance segment.

The insurance segment's net favorable development of \$4.4 million, or 0.8 loss ratio points, for the 2019 first quarter consisted of \$9.7 million of net favorable development in short-tailed lines, \$6.9 million of net adverse development in medium-tailed lines and \$1.6 million of net favorable development in long-tailed lines. Net favorable development in short-tailed lines primarily resulted from property (including special risk other than marine) reserves from the 2017 accident year (i.e., the year in which a loss occurred). Net adverse development in medium-tailed lines primarily resulted from \$7.7 million of adverse development on program business and \$6.0 million of adverse development on contract binding

business. Such amounts were partially offset by \$6.8 million of net favorable development in other medium-tailed lines, including professional liability and surety business, across most accident years.

The reinsurance segment's net adverse development of \$1.7 million, or 0.5 loss ratio points, for the 2019 first quarter consisted of \$6.2 million of net adverse development from short-tailed lines, partially offset by \$4.5 million of net favorable development from long-tailed and medium-tailed lines. Net adverse development in short-tailed lines included \$13.8 million from property catastrophe and property other than property catastrophe reserves, primarily due to an increase in reserves on Typhoon Jebi of \$16.0 million, or 4.6 points, based on receipt of updated information from cedents and additional updated industry data. Such amounts were partially offset by net favorable development of \$9.6 million from other specialty reserves, primarily from the 2016 and 2018 underwriting years (i.e., all premiums and losses attributable to contracts having an inception or renewal date within the given twelve-month period). Favorable development in long-tailed and medium-tailed lines reflected reductions in casualty and marine reserves from most underwriting years.

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The mortgage segment's net favorable development was \$36.6 million , or 11.3 loss ratio points, for the 2019 first quarter . The 2019 first quarter development was primarily driven by continued favorable claim rates on first lien business and subrogation recoveries on second lien business at Arch MI U.S.

2018 First Quarter

During the 2018 first quarter , the Company recorded net favorable development on prior year loss reserves of \$51.0 million , which consisted of \$36.5 million from the reinsurance segment, \$2.1 million from the insurance segment, \$13.0 million from the mortgage segment and adverse development of \$0.6 million from the 'other' segment.

The insurance segment's net favorable development of \$2.1 million , or 0.4 loss ratio points, for the 2018 first quarter consisted of \$8.7 million of net favorable development in short-tailed lines and \$3.0 million of net favorable development in long-tailed lines, partially offset by \$9.6 million of net adverse development in medium-tailed lines. Net favorable development in short-tailed lines primarily resulted from property (including special risk other than marine) reserves from the 2017 accident year (*i.e.*, the year in which a loss occurred) while net favorable development in long-tailed lines primarily resulted from reductions in casualty reserves of \$3.9 million , primarily from the 2012 to 2014 accident years. Net adverse development in medium-tailed lines reflected \$10.2 million of adverse development in program business, primarily driven by a few inactive programs that were non-renewed in 2015 and early in 2016.

The reinsurance segment's net favorable development of \$36.5 million , or 13.1 loss ratio points, for the 2018 first quarter consisted of \$28.9 million from short-tailed lines and \$7.6 million from long-tailed and medium-tailed lines. Favorable development in short-tailed lines included \$21.1 million from property catastrophe and property other than property catastrophe reserves, across most underwriting years (*i.e.*, all premiums and losses attributable to contracts having an inception or renewal date within the given twelve-month period), reflecting lower levels of reported and paid claims activity than previously anticipated which led to decreases in certain loss ratio selections during the period. Favorable development in long-tailed and medium-tailed lines reflected reductions in marine reserves of \$6.2 million , primarily from the 2011 accident year, and in casualty reserves of \$1.1 million based on varying levels of reported and paid claims activity, primarily from the 2002 to 2009 underwriting years.

The mortgage segment's net favorable development was \$13.0 million , or 4.6 loss ratio points, for the 2018 first quarter . The 2018 first quarter development was primarily driven by continued lower than expected claim rates on first lien business and subrogation recoveries on second lien business at Arch MI U.S.

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6. Investment Information

At March 31, 2019, total investable assets of \$22.88 billion included \$20.06 billion held by the Company and \$2.82 billion attributable to Watford Re.

Available For Sale Investments

The following table summarizes the fair value and cost or amortized cost of the Company's securities classified as available for sale:

	Estimated Fair Value	Gross Unrealized Gains	Gross Unrealized Losses	Cost or Amortized Cost	OTTI Unrealized Losses (2)
March 31, 2019					
Fixed maturities (1):					
Corporate bonds	\$ 5,816,885	\$ 81,520	\$ (31,276)	\$ 5,766,641	\$ (69)
Mortgage backed securities	499,962	5,825	(1,576)	495,713	(6)
Municipal bonds	715,893	14,725	(1,773)	702,941	—
Commercial mortgage backed securities	610,754	7,336	(1,854)	605,272	—
U.S. government and government agencies	4,579,711	40,584	(4,127)	4,543,254	—
Non-U.S. government securities	1,797,484	33,435	(34,093)	1,798,142	—
Asset backed securities	1,545,355	15,115	(6,809)	1,537,049	—
Total	15,566,044	198,540	(81,508)	15,449,012	(75)
Short-term investments	706,214	352	(92)	705,954	—
Total	\$ 16,272,258	\$ 198,892	\$ (81,600)	\$ 16,154,966	\$ (75)
December 31, 2018					
Fixed maturities (1):					
Corporate bonds	\$ 5,537,548	\$ 14,476	\$ (105,428)	\$ 5,628,500	\$ (69)
Mortgage backed securities	541,193	3,991	(3,216)	540,418	(6)
Municipal bonds	1,013,395	5,380	(11,891)	1,019,906	—
Commercial mortgage backed securities	729,442	2,650	(10,751)	737,543	—
U.S. government and government agencies	3,758,698	27,189	(8,474)	3,739,983	—
Non-U.S. government securities	1,771,338	14,477	(50,948)	1,807,809	—
Asset backed securities	1,600,896	8,060	(14,798)	1,607,634	—
Total	14,952,510	76,223	(205,506)	15,081,793	(75)
Short-term investments	955,880	36	(394)	956,238	—
Total	\$ 15,908,390	\$ 76,259	\$ (205,900)	\$ 16,038,031	\$ (75)

- (1) In securities lending transactions, the Company receives collateral in excess of the fair value of the fixed maturities pledged. For purposes of this table, the Company has excluded the collateral received under securities lending, at fair value and included the securities pledged under securities lending, at fair value. See "—Securities Lending Agreements."
- (2) Represents the total other-than-temporary impairments ("OTTI") recognized in accumulated other comprehensive income ("AOCI"). It does not include the change in fair value subsequent to the impairment measurement date. At March 31, 2019 and December 31, 2018, the net unrealized loss related to securities for which a non-credit OTTI was recognized in AOCI was nil.

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The following table summarizes, for all available for sale securities in an unrealized loss position, the fair value and gross unrealized loss by length of time the security has been in a continual unrealized loss position:

	Less than 12 Months		12 Months or More		Total	
	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses
March 31, 2019						
Fixed maturities (1):						
Corporate bonds	\$ 450,609	\$ (14,755)	\$ 1,376,117	\$ (16,521)	\$ 1,826,726	\$ (31,276)
Mortgage backed securities	41,253	(272)	106,136	(1,304)	147,389	(1,576)
Municipal bonds	12,604	(36)	177,113	(1,737)	189,717	(1,773)
Commercial mortgage backed securities	69,792	(347)	91,338	(1,507)	161,130	(1,854)
U.S. government and government agencies	696,039	(656)	378,351	(3,471)	1,074,390	(4,127)
Non-U.S. government securities	1,062,659	(31,117)	257,300	(2,976)	1,319,959	(34,093)
Asset backed securities	324,034	(4,143)	299,844	(2,666)	623,878	(6,809)
Total	2,656,990	(51,326)	2,686,199	(30,182)	5,343,189	(81,508)
Short-term investments	67,807	(92)	—	—	67,807	(92)
Total	\$ 2,724,797	\$ (51,418)	\$ 2,686,199	\$ (30,182)	\$ 5,410,996	\$ (81,600)

December 31, 2018						
Fixed maturities (1):						
Corporate bonds	\$ 2,983,195	\$ (68,910)	\$ 1,234,865	\$ (36,518)	\$ 4,218,060	\$ (105,428)
Mortgage backed securities	84,296	(695)	109,009	(2,521)	193,305	(3,216)
Municipal bonds	233,081	(2,074)	408,155	(9,817)	641,236	(11,891)
Commercial mortgage backed securities	223,341	(2,831)	193,956	(7,920)	417,297	(10,751)
U.S. government and government agencies	635,049	(1,354)	391,102	(7,120)	1,026,151	(8,474)
Non-U.S. government securities	1,028,340	(35,524)	389,671	(15,424)	1,418,011	(50,948)
Asset backed securities	533,592	(8,832)	368,095	(5,966)	901,687	(14,798)
Total	5,720,894	(120,220)	3,094,853	(85,286)	8,815,747	(205,506)
Short-term investments	122,878	(394)	—	—	122,878	(394)
Total	\$ 5,843,772	\$ (120,614)	\$ 3,094,853	\$ (85,286)	\$ 8,938,625	\$ (205,900)

(1) In securities lending transactions, the Company receives collateral in excess of the fair value of the fixed maturities pledged. For purposes of this table, the Company has excluded the collateral received under securities lending, at fair value and included the securities pledged under securities lending, at fair value. See “—Securities Lending Agreements.”

At March 31, 2019, on a lot level basis, approximately 2,940 security lots out of a total of approximately 9,250 security lots were in an unrealized loss position and the largest single unrealized loss from a single lot in the Company’s fixed maturity portfolio was \$2.5 million. At December 31, 2018, on a lot level basis, approximately 5,870 security lots out of a total of approximately 8,450 security lots were in an unrealized loss position and the largest single unrealized loss from a single lot in the Company’s fixed maturity portfolio was \$2.6 million.

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The contractual maturities of the Company's fixed maturities are shown in the following table. Expected maturities, which are management's best estimates, will differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without call or prepayment penalties.

Maturity	March 31, 2019		December 31, 2018	
	Estimated Fair Value	Amortized Cost	Estimated Fair Value	Amortized Cost
Due in one year or less	\$ 436,875	\$ 438,023	\$ 276,682	\$ 279,135
Due after one year through five years	9,359,874	9,315,567	8,666,297	8,738,944
Due after five years through 10 years	2,939,707	2,884,260	2,919,232	2,951,582
Due after 10 years	173,517	173,128	218,768	226,537
	12,909,973	12,810,978	12,080,979	12,196,198
Mortgage backed securities	499,962	495,713	541,193	540,418
Commercial mortgage backed securities	610,754	605,272	729,442	737,543
Asset backed securities	1,545,355	1,537,049	1,600,896	1,607,634
Total (1)	\$ 15,566,044	\$ 15,449,012	\$ 14,952,510	\$ 15,081,793

(1) In securities lending transactions, the Company receives collateral in excess of the fair value of the securities pledged. For purposes of this table, the Company has excluded the collateral received under securities lending, at fair value and included the securities pledged under securities lending, at fair value. See "—Securities Lending Agreements."

Securities Lending Agreements

The Company enters into securities lending agreements with financial institutions to enhance investment income whereby it loans certain of its securities to third parties, primarily major brokerage firms, for short periods of time through a lending agent. The Company maintains legal control over the securities it lends, retains the earnings and cash flows associated with the loaned securities and receives a fee from the borrower for the temporary use of the securities. An indemnification agreement with the lending agent protects the Company in the event a borrower becomes insolvent or fails to return any of the securities on loan from the Company.

The Company receives collateral in the form of cash or securities. Cash collateral primarily consists of short term investments. At March 31, 2019, the fair value of the cash collateral received on securities lending was \$48.6 million and the fair value of security collateral received was \$366.4 million. At December 31, 2018, the fair value of the cash collateral received on securities lending was \$19.0 million, and the fair value of security collateral received was \$255.1 million.

The Company's securities lending transactions were accounted for as secured borrowings with significant investment categories as follows:

	Remaining Contractual Maturity of the Agreements				
	Overnight and Continuous	Less than 30 Days	30-90 Days	90 Days or More	Total
March 31, 2019					
U.S. government and government agencies	\$ 339,404	\$ 7,424	\$ 48,903	\$ —	\$ 395,731
Corporate bonds	3,625	—	—	—	3,625
Equity securities	15,692	—	—	—	15,692
Total	\$ 358,721	\$ 7,424	\$ 48,903	\$ —	\$ 415,048
Gross amount of recognized liabilities for securities lending in offsetting disclosure in note 8					\$ —
Amounts related to securities lending not included in offsetting disclosure in note 8					\$ 415,048
December 31, 2018					
U.S. government and government agencies	\$ 219,276	\$ —	\$ 32,583	\$ —	\$ 251,859
Corporate bonds	7,129	—	—	—	7,129
Equity securities	15,137	—	—	—	15,137
Total	\$ 241,542	\$ —	\$ 32,583	\$ —	\$ 274,125
Gross amount of recognized liabilities for securities lending in offsetting disclosure in note 8					\$ —
Amounts related to securities lending not included in offsetting disclosure in note 8					\$ 274,125

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Equity Securities, at Fair Value

At March 31, 2019, the Company held \$495.9 million of equity securities, at fair value, compared to \$338.9 million at December 31, 2018. Such holdings include publicly traded common stocks in the natural resources, energy, consumer staples and other sectors.

Other Investments

The following table summarizes the Company's other investments which are included in investments accounted for using the fair value option, by strategy:

	March 31, 2019	December 31, 2018
Term loan investments (par value: \$1,375,936 and \$1,369,216)	\$ 1,297,025	\$ 1,282,287
Lending	545,569	524,112
Credit related funds	225,876	202,123
Energy	126,612	117,509
Investment grade fixed income	97,676	101,902
Infrastructure	54,421	45,371
Private equity	24,501	24,383
Real estate	15,930	14,252
Total	\$ 2,387,610	\$ 2,311,939

Investments Accounted For Using the Equity Method

The following table summarizes the Company's investments accounted for using the equity method, by strategy:

	March 31, 2019	December 31, 2018
Credit related funds	\$ 438,208	\$ 429,402
Equities	350,315	375,273
Real estate	248,739	232,647
Lending	192,346	125,041
Private equity	111,454	114,019
Infrastructure	126,706	113,748
Energy	96,011	103,661
Total	\$ 1,563,779	\$ 1,493,791

Certain of the Company's other investments are in investment funds for which the Company has the option to redeem at agreed upon values as described in each investment fund's subscription agreement. Depending on the terms of the various subscription agreements, investments in investment funds may be redeemed daily, monthly, quarterly or on other terms. Two common redemption restrictions which may impact the Company's ability to redeem these investment funds are gates and lockups. A gate is a suspension of redemptions which may be implemented by the general partner or investment manager of the fund in order to defer, in whole or in part, the redemption request in the event the aggregate amount of redemption requests exceeds a predetermined percentage of the investment fund's net assets which may otherwise hinder the general

partner or investment manager's ability to liquidate holdings in an orderly fashion in order to generate the cash necessary to fund extraordinarily large redemption payouts. A lockup period is the initial amount of time an investor is contractually required to hold the security before having the ability to redeem. If the investment funds are eligible to be redeemed, the time to redeem such fund can take weeks or months following the notification.

Fair Value Option

The following table summarizes the Company's assets which are accounted for using the fair value option:

	March 31, 2019	December 31, 2018
Fixed maturities	\$ 1,192,486	\$ 1,245,562
Other investments	2,387,610	2,311,939
Short-term investments	282,139	322,177
Equity securities	107,388	103,893
Investments accounted for using the fair value option	\$ 3,969,623	\$ 3,983,571

Limited Partnership Interests

In the normal course of its activities, the Company invests in limited partnerships as part of its overall investment strategy. Such amounts are included in 'investments accounted for using the equity method' and 'investments accounted for using the fair value option.' The Company has determined that it is not required to consolidate these investments because it is not the primary beneficiary of the funds. The Company's maximum exposure to loss with respect to these investments is limited to the investment carrying amounts reported in the Company's consolidated balance sheet and any unfunded commitment.

The following table summarizes investments in limited partnership interests where the Company has a variable interest by balance sheet line item:

	March 31, 2019	December 31, 2018
Investments accounted for using the equity method (1)	1,563,779	1,493,791
Investments accounted for using the fair value option (2)	178,572	162,398
Total	\$ 1,742,351	\$ 1,656,189

(1) Aggregate unfunded commitments were \$1.34 billion at March 31, 2019, compared to \$1.22 billion at December 31, 2018.

(2) Aggregate unfunded commitments were \$177.0 million at March 31, 2019, compared to \$117.5 million at December 31, 2018.

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Net Investment Income

The components of net investment income were derived from the following sources:

	March 31,	
	2019	2018
Three Months Ended		
Fixed maturities	\$ 129,799	\$ 107,887
Term loans	24,616	19,764
Equity securities	2,988	2,568
Short-term investments	4,179	4,860
Other (1)	21,196	17,610
Gross investment income	182,778	152,689
Investment expenses	(25,829)	(25,965)
Net investment income	\$ 156,949	\$ 126,724

(1) Includes income distributions from investment funds and other items.

Net Realized Gains (Losses)

Net realized gains (losses) were as follows, excluding net impairment losses recognized in earnings:

	March 31,	
	2019	2018
Three Months Ended		
Available for sale securities:		
Gross gains on investment sales	\$ 43,365	\$ 14,965
Gross losses on investment sales	(31,656)	(82,551)
Change in fair value of assets and liabilities accounted for using the fair value option:		
Fixed maturities	31,148	(17,551)
Other investments	18,195	(6,374)
Equity securities	4,266	6,668
Short-term investments	720	(151)
Equity securities, at fair value:		
Net realized gains (losses) on sales during the period	10,930	(5,368)
Net unrealized gains (losses) on equity securities still held at reporting date	37,136	(7,583)
Derivative instruments (1)	35,871	(3,963)
Other (2)	(8,410)	(9,090)
Net realized gains (losses)	\$ 141,565	\$ (110,998)

- (1) See [note 8](#) for information on the Company's derivative instruments.
(2) Includes the re-measurement of contingent consideration liability amounts.

Equity in Net Income (Loss) of Investment Funds Accounted for Using the Equity Method

The Company recorded \$46.9 million of equity in net income related to investment funds accounted for using the equity method in the 2019 first quarter, compared to \$28.1 million for the 2018 first quarter. In applying the equity method, investments are initially recorded at cost and are subsequently adjusted based on the Company's proportionate share of the net income or loss of the funds (which include changes in the market value of the underlying securities in the funds). Such

investments are generally recorded on a one to three month lag based on the availability of reports from the investment funds.

Net Impairment Losses Recognized in Earnings

The Company performs quarterly reviews of its available for sale investments in order to determine whether declines in fair value below the amortized cost basis were considered other-than-temporary in accordance with applicable guidance.

The following table details the net impairment losses recognized in earnings by asset class:

	March 31,	
	2019	2018
Three Months Ended		
Fixed maturities:		
Mortgage backed securities	\$ (531)	\$ (42)
Corporate bonds	(565)	(120)
Asset backed securities	(213)	—
Total	(1,309)	(162)
Net impairment losses recognized in earnings	\$ (1,309)	\$ (162)

Net impairment losses recognized in earnings in the 2019 first quarter reflected foreign currency impacts and other impairments on corporate bonds and other securities.

The Company believes that the \$0.1 million of OTTI included in accumulated other comprehensive income at March 31, 2019 on the securities which were considered by the Company to be impaired was due to market and sector-related factors (*i.e.*, not credit losses). At March 31, 2019, the Company did not intend to sell these securities, or any other securities which were in an unrealized loss position, and determined that it is more likely than not that the Company will not be required to sell such securities before recovery of their cost basis.

The following table provides a roll forward of the amount related to credit losses recognized in earnings for which a portion of an OTTI was recognized in accumulated other comprehensive income:

	March 31,	
	2019	2018
Three Months Ended		
Balance at start of period	\$ 637	\$ 767
Credit loss impairments recognized on securities not previously impaired	—	—
Credit loss impairments recognized on securities previously impaired	—	—
Reductions for increases in cash flows expected to be collected that are recognized over the remaining life of the security	—	—
Reductions for securities sold during the period	(291)	—
Balance at end of period	\$ 346	\$ 767

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Restricted Assets

The Company is required to maintain assets on deposit, which primarily consist of fixed maturities, with various regulatory authorities to support its operations. The Company's subsidiaries maintain assets in trust accounts as collateral for transactions with affiliated companies and also have investments in segregated portfolios primarily to provide collateral or guarantees for letters of credit to third parties. See note 16, "Commitments and Contingencies," of the notes to consolidated financial statements in the Company's 2018 Form 10-K. The following table details the value of the Company's restricted assets:

	March 31, 2019	December 31, 2018
Assets used for collateral or guarantees:		
Affiliated transactions	\$ 4,796,096	\$ 4,623,483
Third party agreements	2,403,392	2,181,682
Deposits with U.S. regulatory authorities	780,916	689,114
Deposits with non-U.S. regulatory authorities	59,680	59,624
Total restricted assets	\$ 8,040,084	\$ 7,553,903

Reconciliation of Cash and Restricted Cash

The following table details reconciliation of cash and restricted cash within the Consolidated Balance Sheets:

	March 31, 2019	December 31, 2018
Cash	\$ 633,100	\$ 646,556
Restricted cash (included in 'other assets')	\$ 77,116	\$ 78,087
Cash and restricted cash	\$ 710,216	\$ 724,643

7. Fair Value

Accounting guidance regarding fair value measurements addresses how companies should measure fair value when they are required to use a fair value measure for recognition or disclosure purposes under GAAP and provides a common definition of fair value to be used throughout GAAP. It defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly fashion between market participants at the measurement date. In addition, it establishes a three-level valuation hierarchy for the disclosure of fair value measurements. The valuation hierarchy is based upon the transparency of inputs to the valuation of an asset or liability as of the measurement date. The level in the hierarchy within which a given fair value measurement falls is determined based on the lowest level input that is significant to the measurement (Level 1 being the highest priority and Level 3 being the lowest priority).

The levels in the hierarchy are defined as follows:

- Level 1: Inputs to the valuation methodology are observable inputs that reflect quoted prices (unadjusted) for *identical* assets or liabilities in *active markets*
- Level 2: Inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument
- Level 3: Inputs to the valuation methodology are unobservable and significant to the fair value measurement

Following is a description of the valuation methodologies used for securities measured at fair value, as well as the general classification of such securities pursuant to the valuation hierarchy. The Company reviews its securities measured at fair value and discusses the proper classification of such investments with investment advisers and others.

The Company determines the existence of an active market based on its judgment as to whether transactions for the financial instrument occur in such market with sufficient frequency and volume to provide reliable pricing information. The independent pricing sources obtain market quotations and actual transaction prices for securities that have quoted prices in active markets. The Company uses quoted values and other data provided by nationally recognized independent pricing sources as inputs into its process for determining fair values of its fixed maturity investments. To validate the techniques or models used by pricing sources, the Company's review process includes, but is not limited to: (i) quantitative analysis (e.g., comparing the quarterly return for each managed portfolio to its target benchmark, with significant differences identified and investigated); (ii) a review of the average number of prices obtained in the pricing process and the range of resulting fair values; (iii) initial and ongoing evaluation of methodologies used by outside parties to calculate fair value; (iv) a comparison of the fair value estimates to the Company's knowledge of the current market; (v) a comparison of the pricing services' fair values to other pricing services' fair values for the same investments; and (vi) periodic back-testing, which includes randomly selecting purchased or sold securities and comparing the executed prices to the fair value estimates from the pricing service. A price source hierarchy was maintained in order to determine which price source would be used (*i.e.*, a price obtained from a pricing service with more seniority in the hierarchy will be used over a less senior one in all cases). The hierarchy prioritizes pricing services based on availability and reliability and assigns the highest priority to index providers. Based on the above review, the Company will challenge any prices for a security or portfolio which are considered not to be

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representative of fair value. The Company did not adjust any of the prices obtained from the independent pricing sources at March 31, 2019.

In certain circumstances, when fair values are unavailable from these independent pricing sources, quotes are obtained directly from broker-dealers who are active in the corresponding markets. Such quotes are subject to the validation procedures noted above. Of the \$20.88 billion of financial assets and liabilities measured at fair value at March 31, 2019, approximately \$221.0 million, or 1.1%, were priced using non-binding broker-dealer quotes. Of the \$20.41 billion of financial assets and liabilities measured at fair value at December 31, 2018, approximately \$217.9 million, or 1.1%, were priced using non-binding broker-dealer quotes.

Fixed maturities

The Company uses the market approach valuation technique to estimate the fair value of its fixed maturity securities, when possible. The market approach includes obtaining prices from independent pricing services, such as index providers and pricing vendors, as well as to a lesser extent quotes from broker-dealers. The independent pricing sources obtain market quotations and actual transaction prices for securities that have quoted prices in active markets. Each source has its own proprietary method for determining the fair value of securities that are not actively traded. In general, these methods involve the use of “matrix pricing” in which the independent pricing source uses observable market inputs including, but not limited to, investment yields, credit risks and spreads, benchmarking of like securities, broker-dealer quotes, reported trades and sector groupings to determine a reasonable fair value.

The following describes the significant inputs generally used to determine the fair value of the Company’s fixed maturity securities by asset class:

- U.S. government and government agencies — valuations provided by independent pricing services, with all prices provided through index providers and pricing vendors. The Company determined that all U.S. Treasuries would be classified as Level 1 securities due to observed levels of trading activity, the high number of strongly correlated pricing quotes received on U.S. Treasuries and other factors. The fair values of U.S. government agency securities are generally determined using the spread above the risk-free yield curve. As the yields for the risk-free yield curve and the spreads for these securities are observable market inputs, the fair values of U.S. government agency securities are classified within Level 2.
- Corporate bonds — valuations provided by independent pricing services, substantially all through index providers and pricing vendors with a small amount through broker-dealers. The fair values of these securities are generally determined using the spread above the risk-free yield curve. These spreads are generally obtained from the new issue market, secondary

trading and from broker-dealers who trade in the relevant security market. As the significant inputs used in the pricing process for corporate bonds are observable market inputs, the fair value of these securities are classified within Level 2. A small number of securities are included in Level 3 due to a low level of transparency on the inputs used in the pricing process.

- Mortgage-backed securities — valuations provided by independent pricing services, substantially all through pricing vendors and index providers with a small amount through broker-dealers. The fair values of these securities are generally determined through the use of pricing models (including Option Adjusted Spread) which use spreads to determine the expected average life of the securities. These spreads are generally obtained from the new issue market, secondary trading and from broker-dealers who trade in the relevant security market. The pricing services also review prepayment speeds and other indicators, when applicable. As the significant inputs used in the pricing process for mortgage-backed securities are observable market inputs, the fair value of these securities are classified within Level 2. A small number of securities are included in Level 3 due to a low level of transparency on the inputs used in the pricing process.

- Municipal bonds — valuations provided by independent pricing services, with all prices provided through index providers and pricing vendors. The fair values of these securities are generally determined using spreads obtained from broker-dealers who trade in the relevant security market, trade prices and the new issue market. As the significant inputs used in the pricing process for municipal bonds are observable market inputs, the fair value of these securities are classified within Level 2.

- Commercial mortgage-backed securities — valuations provided by independent pricing services, substantially all through index providers and pricing vendors with a small amount through broker-dealers. The fair values of these securities are generally determined through the use of pricing models which use spreads to determine the appropriate average life of the securities. These spreads are generally obtained from the new issue market, secondary trading and from broker-dealers who trade in the relevant security market. The pricing services also review prepayment speeds and other indicators, when applicable. As the significant inputs used in the pricing process for commercial mortgage-backed securities are observable market inputs, the fair value of these securities are classified within Level 2.

- Non-U.S. government securities — valuations provided by independent pricing services, with all prices provided through index providers and pricing vendors. The fair values of these securities are generally based on international indices or valuation models which include daily observed yield curves, cross-currency basis index spreads and country credit spreads. As the significant inputs used in the pricing process for non-

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U.S. government securities are observable market inputs, the fair value of these securities are classified within Level 2.

- Asset-backed securities — valuations provided by independent pricing services, substantially all through index providers and pricing vendors with a small amount through broker-dealers. The fair values of these securities are generally determined through the use of pricing models (including Option Adjusted Spread) which use spreads to determine the appropriate average life of the securities. These spreads are generally obtained from the new issue market, secondary trading and from broker-dealers who trade in the relevant security market. The pricing services also review prepayment speeds and other indicators, when applicable. As the significant inputs used in the pricing process for asset-backed securities are observable market inputs, the fair value of these securities are classified within Level 2.

Equity securities

The Company determined that exchange-traded equity securities would be included in Level 1 as their fair values are based on quoted market prices in active markets. Other equity securities are included in Level 2 of the valuation hierarchy.

Other investments

The Company determined that exchange-traded investments in mutual funds would be included in Level 1 as their fair values are based on quoted market prices in active markets. Other investments also include term loan investments for which fair values are estimated by using quoted prices of term loan investments with similar characteristics, pricing models or matrix pricing. Such investments are generally classified within Level 2. The fair values for certain of the Company's other investments are determined using net asset values as advised by external fund managers. The net asset value is based on the fund manager's valuation of the underlying holdings in accordance with the fund's governing documents. In accordance with applicable accounting guidance, certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not

been classified in the fair value hierarchy. A small number of securities are included in Level 3 due to the lack of an available independent price source for such securities.

Derivative instruments

The Company's futures contracts, foreign currency forward contracts, interest rate swaps and other derivatives trade in the over-the-counter derivative market. The Company uses the market approach valuation technique to estimate the fair value for these derivatives based on significant observable market inputs from third party pricing vendors, non-binding broker-dealer quotes and/or recent trading activity. As the significant inputs used in the pricing process for these derivative instruments are observable market inputs, the fair value of these securities are classified within Level 2.

Short-term investments

The Company determined that certain of its short-term investments held in highly liquid money market-type funds, Treasury bills and commercial paper would be included in Level 1 as their fair values are based on quoted market prices in active markets. The fair values of other short-term investments are generally determined using the spread above the risk-free yield curve and are classified within Level 2.

Contingent consideration liabilities

Contingent consideration liabilities (included in 'other liabilities' in the consolidated balance sheets) include amounts related to the acquisition of CMG Mortgage Insurance Company and its affiliated mortgage insurance companies and other acquisitions. Such amounts are remeasured at fair value at each balance sheet date with changes in fair value recognized in 'net realized gains (losses).' To determine the fair value of contingent consideration liabilities, the Company estimates future payments using an income approach based on modeled inputs which include a weighted average cost of capital. The Company determined that contingent consideration liabilities would be included within Level 3.

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The following table presents the Company's financial assets and liabilities measured at fair value by level at March 31, 2019 :

	Estimated Fair Value	Estimated Fair Value Measurements Using:		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<u>Assets measured at fair value (1):</u>				
Available for sale securities:				
Fixed maturities:				
Corporate bonds	\$ 5,816,885	\$ —	\$ 5,809,318	\$ 7,567
Mortgage backed securities	499,962	—	499,660	302
Municipal bonds	715,893	—	715,893	—
Commercial mortgage backed securities	610,754	—	610,754	—
U.S. government and government agencies	4,579,711	4,439,888	139,823	—
Non-U.S. government securities	1,797,484	—	1,797,484	—
Asset backed securities	1,545,355	—	1,545,355	—
Total	15,566,044	4,439,888	11,118,287	7,869
Short-term investments	706,214	682,778	23,436	—
Equity securities, at fair value	511,425	433,317	78,108	—
Derivative instruments (4)	13,966	—	13,966	—
Fair value option:				
Corporate bonds	786,476	—	784,243	2,233
Non-U.S. government bonds	82,982	—	82,982	—
Mortgage backed securities	16,328	—	16,328	—
Municipal bonds	6,587	—	6,587	—
Commercial mortgage backed securities	—	—	—	—
Asset backed securities	190,448	—	190,448	—
U.S. government and government agencies	109,665	109,557	108	—
Short-term investments	282,139	272,904	9,235	—
Equity securities	107,388	51,113	56,275	—
Other investments	1,286,645	46,661	1,177,655	62,329
Other investments measured at net asset value (2)	1,100,965			
Total	3,969,623	480,235	2,323,861	64,562
Total assets measured at fair value	\$ 20,767,272	\$ 6,036,218	\$ 13,557,658	\$ 72,431
<u>Liabilities measured at fair value:</u>				
Contingent consideration liabilities	\$ (68,121)	\$ —	\$ —	\$ (68,121)
Securities sold but not yet purchased (3)	(28,737)	—	(28,737)	—
Derivative instruments (4)	(11,547)	—	(11,547)	—
Total liabilities measured at fair value	\$ (108,405)	\$ —	\$ (40,284)	\$ (68,121)

- (1) In securities lending transactions, the Company receives collateral in excess of the fair value of the securities pledged. For purposes of this table, the Company has excluded the collateral received under securities lending, at fair value and included the securities pledged under securities lending, at fair value. See [note 6](#), "—Securities Lending Agreements."
- (2) In accordance with applicable accounting guidance, certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented in the consolidated balance sheets.
- (3) Represents the Company's obligations to deliver securities that it did not own at the time of sale. Such amounts are included in "other liabilities" on the Company's consolidated balance sheets.
- (4) See [note 8](#).

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The following table presents the Company's financial assets and liabilities measured at fair value by level at December 31, 2018 :

	Estimated Fair Value	Estimated Fair Value Measurements Using:		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<u>Assets measured at fair value (1):</u>				
Available for sale securities:				
Fixed maturities:				
Corporate bonds	\$ 5,537,548	\$ —	\$ 5,529,407	\$ 8,141
Mortgage backed securities	541,193	—	540,884	309
Municipal bonds	1,013,395	—	1,013,395	—
Commercial mortgage backed securities	729,442	—	729,438	4
U.S. government and government agencies	3,758,698	3,657,181	101,517	—
Non-U.S. government securities	1,771,338	—	1,771,338	—
Asset backed securities	1,600,896	—	1,600,896	—
Total	14,952,510	3,657,181	11,286,875	8,454
Equity securities	353,794	321,927	31,867	—
Short-term investments	955,880	875,881	79,999	—
Derivative instruments (4)	73,893	—	73,893	—
Fair value option:				
Corporate bonds	852,585	—	846,827	5,758
Non-U.S. government bonds	79,066	—	79,066	—
Mortgage backed securities	16,731	—	16,731	—
Municipal bonds	7,144	—	7,144	—
Commercial mortgage backed securities	—	—	—	—
Asset backed securities	178,790	—	178,790	—
U.S. government and government agencies	111,246	111,138	108	—
Short-term investments	322,177	278,579	43,598	—
Equity securities	103,893	48,827	55,066	—
Other investments	1,254,220	39,107	1,152,408	62,705
Other investments measured at net asset value (2)	1,057,719			
Total	3,983,571	477,651	2,379,738	68,463
Total assets measured at fair value	\$ 20,319,648	\$ 5,332,640	\$ 13,852,372	\$ 76,917
<u>Liabilities measured at fair value:</u>				
Contingent consideration liabilities	\$ (66,665)	\$ —	\$ —	\$ (66,665)
Securities sold but not yet purchased (3)	(7,790)	—	(7,790)	—
Derivative instruments (4)	(20,664)	—	(20,664)	—
Total liabilities measured at fair value	\$ (95,119)	\$ —	\$ (28,454)	\$ (66,665)

- (1) In securities lending transactions, the Company receives collateral in excess of the fair value of the securities pledged. For purposes of this table, the Company has excluded the collateral received under securities lending, at fair value and included the securities pledged under securities lending, at fair value. See [note 6](#), “—Securities Lending Agreements.”
- (2) In accordance with applicable accounting guidance, certain investments that are measured at fair value using the net asset value per share (or its equivalent) practical expedient have not been classified in the fair value hierarchy. The fair value amounts presented in this table are intended to permit reconciliation of the fair value hierarchy to the amounts presented in the consolidated balance sheets.
- (3) Represents the Company's obligations to deliver securities that it did not own at the time of sale. Such amounts are included in “other liabilities” on the Company's consolidated balance sheets.
- (4) See [note 8](#).

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The following table presents a reconciliation of the beginning and ending balances for all financial assets and liabilities measured at fair value on a recurring basis using Level 3 inputs:

	Assets					Liabilities
	Available For Sale		Fair Value Option			Contingent Consideration Liabilities
	Structured Securities (1)	Corporate Bonds	Corporate Bonds	Other Investments	Total	
Three Months Ended March 31, 2019						
Balance at beginning of period	\$ 313	\$ 8,141	\$ 5,758	\$ 62,705	\$ 76,917	\$ (66,665)
Total gains or (losses) (realized/unrealized)						
Included in earnings (2)	1,757	—	(290)	298	1,765	(908)
Included in other comprehensive income	4	(118)	—	—	(114)	—
Purchases, issuances, sales and settlements						
Purchases	—	—	—	—	—	—
Issuances	—	—	—	—	—	(548)
Sales	(1,757)	—	(3,235)	(74)	(5,066)	—
Settlements	(15)	(456)	—	(600)	(1,071)	—
Transfers in and/or out of Level 3	—	—	—	—	—	—
Balance at end of period	<u>\$ 302</u>	<u>\$ 7,567</u>	<u>\$ 2,233</u>	<u>\$ 62,329</u>	<u>\$ 72,431</u>	<u>\$ (68,121)</u>
Three Months Ended March 31, 2018						
Balance at beginning of period	\$ 5,927	\$ 9,460	\$ 12,217	\$ 59,167	\$ 86,771	\$ (60,996)
Total gains or (losses) (realized/unrealized)						
Included in earnings (2)	1	—	12	17	30	(1,453)
Included in other comprehensive income	(4)	148	(87)	(732)	(675)	—
Purchases, issuances, sales and settlements						
Purchases	—	—	—	—	—	—
Issuances	—	—	—	—	—	—
Sales	—	—	—	—	—	—
Settlements	(511)	(456)	(270)	—	(1,237)	—
Transfers in and/or out of Level 3	—	—	—	—	—	—
Balance at end of period	<u>\$ 5,413</u>	<u>\$ 9,152</u>	<u>\$ 11,872</u>	<u>\$ 58,452</u>	<u>\$ 84,889</u>	<u>\$ (62,449)</u>

(1) Includes asset backed securities, mortgage backed securities and commercial mortgage backed securities.

(2) Gains or losses were included in net realized gains (losses).

Financial Instruments Disclosed, But Not Carried, At Fair Value

The Company uses various financial instruments in the normal course of its business. The carrying values of cash, accrued investment income, receivable for securities sold, certain other assets, payable for securities purchased and certain other liabilities approximated their fair values at March 31, 2019, due to their respective short maturities. As these financial instruments are not actively traded, their respective fair values are classified within Level 2.

At March 31, 2019, the Company's senior notes were carried at their cost, net of debt issuance costs, of \$1.73 billion and had a fair value of \$1.98 billion. At December 31, 2018, Company's senior notes were carried at their cost, net of debt issuance costs, of \$1.73 billion and had a fair value of \$1.88 billion. The fair values of the senior notes were obtained from a third party pricing service and are based on observable market inputs. As such, the fair values of the senior notes are classified within Level 2.

8. Derivative Instruments

The Company's investment strategy allows for the use of derivative instruments. The Company's derivative instruments are recorded on its consolidated balance sheets at fair value. The Company utilizes exchange traded U.S. Treasury note, Eurodollar and other futures contracts and commodity futures to manage portfolio duration or replicate investment positions in its portfolios and the Company routinely utilizes foreign currency forward contracts, currency options, index futures contracts and other derivatives as part of its total return objective. In addition, certain of the Company's investments are managed in portfolios which incorporate the use of foreign currency forward contracts which are intended to provide an economic hedge against foreign currency movements.

In addition, the Company purchases to-be-announced mortgage backed securities ("TBAs") as part of its investment strategy. TBAs represent commitments to purchase a future issuance of agency mortgage backed securities. For the period between

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purchase of a TBA and issuance of the underlying security, the Company's position is accounted for as a derivative. The Company purchases TBAs in both long and short positions to enhance investment performance and as part of its overall investment strategy.

The following table summarizes information on the fair values and notional values of the Company's derivative instruments:

	Estimated Fair Value		
	Asset Derivatives	Liability Derivatives	Notional Value (1)
<u>March 31, 2019</u>			
Futures contracts (2)	\$ 1,238	\$ (1,302)	\$ 3,650,464
Foreign currency forward contracts (2)	405	(3,825)	1,228,530
TBAs (3)	15,456	—	14,846
Other (2)	12,323	(6,420)	2,504,873
Total	<u>\$ 29,422</u>	<u>\$ (11,547)</u>	
<u>December 31, 2018</u>			
Futures contracts (2)	\$ 51,800	\$ (2,115)	\$ 3,153,518
Foreign currency forward contracts (2)	8,147	(7,796)	1,008,907
TBAs (3)	8,292	—	8,132
Other (2)	13,946	(10,753)	2,213,981
Total	<u>\$ 82,185</u>	<u>\$ (20,664)</u>	

- (1) Represents the absolute notional value of all outstanding contracts, consisting of long and short positions.
- (2) The fair value of asset derivatives are included in 'other assets' and the fair value of liability derivatives are included in 'other liabilities.'
- (3) The fair value of TBAs are included in 'fixed maturities available for sale, at fair value.'

The Company did not hold any derivatives which were designated as hedging instruments at March 31, 2019 or December 31, 2018.

The Company's derivative instruments can be traded under master netting agreements, which establish terms that apply to all derivative transactions with a counterparty. In the event of a bankruptcy or other stipulated event of default, such agreements provide that the non-defaulting party may elect to terminate all outstanding derivative transactions, in which case all individual derivative positions (loss or gain) with a counterparty are closed out and netted and replaced with a single amount, usually referred to as the termination amount, which is expressed in a single currency. The resulting single net amount, where positive, is payable to the party "in-the-money" regardless of whether or not it is the defaulting party, unless the parties have agreed that only the non-defaulting party is entitled to receive a termination payment where the net amount is positive and is in its favor. Contractual close-out netting reduces derivatives credit exposure from gross to net exposure. The remaining derivatives included in the table above were not subject to a master netting agreement.

At March 31, 2019, asset derivatives and liability derivatives of \$27.9 million and \$14.5 million, respectively, were subject to a master netting agreement, compared to \$80.4 million and \$18.9 million, respectively, at December 31, 2018. The remaining derivatives included in the preceding table were not subject to a master netting agreement.

Realized and unrealized contract gains and losses on the Company's derivative instruments are reflected in 'net realized gains (losses)' in the consolidated statements of income, as summarized in the following table:

Derivatives not designated as hedging instruments:	March 31,	
	2019	2018
Three Months Ended		
Net realized gains (losses):		
Futures contracts	\$ 27,336	\$ 5,030
Foreign currency forward contracts	(13,709)	(5,924)
TBAs	190	(97)
Other	22,054	(2,972)
Total	<u>\$ 35,871</u>	<u>\$ (3,963)</u>

9. Commitments and Contingencies

Investment Commitments

The Company's investment commitments, which are primarily related to agreements entered into by the Company to invest in funds and separately managed accounts when called upon, were approximately \$1.83 billion at March 31, 2019, compared to \$1.77 billion at December 31, 2018.

Interest Paid

Interest paid on the Company's senior notes and other borrowings were \$6.2 million for the three months ended March 31, 2019, compared to \$7.9 million for the 2018 period.

10. Leases

In the ordinary course of business, the Company renews and enters into new leases for office property and equipment. At the lease inception date, the Company determines whether a contract contains a lease and its classification as a finance or operating lease. Primarily all of the Company's leases are classified as operating leases. The Company's operating leases have remaining lease terms of up to 12 years, some of which include options to extend the lease term. The Company considers these options when determining the lease term and measuring its lease liability and right-of-use asset.

Short-term operating leases with an initial term of twelve months or less were excluded on the Company's consolidated

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balance sheet and represent an inconsequential amount of operating lease expense.

As most leases do not provide an implicit rate, the Company uses its incremental borrowing rate based on the information available at the lease commencement date in determining the present value of lease payments.

The Company's lease agreements do not contain any material residual value guarantees or material restrictive covenants.

For the three months ended March 31, 2019, the Company recognized approximately \$7.6 million in operating lease costs.

Additional information regarding the Company's operating leases is as follows:

	March 31, 2019
Other information on operating leases	
Cash payments included in the measurement of lease liabilities reported in operating cash flows	\$ 6,900
Right-of-use assets obtained in exchange for new lease liabilities	\$ —
Right-of-use assets (a)	\$ 140,741
Operating lease liability (b)	\$ 157,729
Weighted average discount rate	3.9%
Weighted average remaining lease term	7.2 years

(a) Included in 'other assets' on our consolidated balance sheet

(b) Included in 'other liabilities' on our consolidated balance sheet

The following table presents the contractual maturities of the Company's operating lease liabilities:

Years Ending December 31,	
Remainder of 2019	\$ 22,457
2020	29,796
2021	28,632
2022	25,349
2023	20,901
Thereafter	53,902
Total undiscounted lease liability	\$ 181,037
Less: present value adjustment	(23,308)
Operating lease liability	\$ 157,729

At December 31, 2018, the future minimum rental commitments, exclusive of escalation clauses and maintenance costs and net of rental income, for all of the Company's operating leases are as follows:

2019	\$ 31,088
2020	30,491
2021	29,351
2022	26,068
2023	21,408
2024 and thereafter	54,745
Total	\$ 193,151

11. Variable Interest Entities and Noncontrolling Interests

Watford Holdings Ltd.

In March 2014, the Company invested \$100.0 million and acquired 2,500,000 common shares, approximately 11% of Watford Holdings Ltd.'s common equity, and a warrant to purchase up to 975,503 additional common shares. The warrants expire on March 31, 2020. The exercise price of the warrants is determined on the date of exercise based on certain targeted returns for existing common shareholders. Watford Holdings Ltd.'s common shares are listed on the Nasdaq Select Global Market under the ticker symbol "WTRE".

Watford Re is considered a VIE and the Company concluded that it is the primary beneficiary of Watford Re. As such, the results of Watford Re are included in the Company's consolidated financial statements.

The Company does not guarantee or provide credit support for Watford Re, and the Company's financial exposure to Watford Re is limited to its investment in Watford Re's common and preferred shares and counterparty credit risk (mitigated by collateral) arising from reinsurance transactions.

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The following table provides the carrying amount and balance sheet caption in which the assets and liabilities of Watford Re are reported:

	March 31, 2019	December 31, 2018
Assets		
Investments accounted for using the fair value option	\$ 2,215,322	\$ 2,312,003
Fixed maturities available for sale, at fair value	549,834	393,351
Equity securities, at fair value	65,009	32,206
Cash	56,301	63,529
Accrued investment income	17,346	19,461
Premiums receivable	252,850	227,301
Reinsurance recoverable on unpaid and paid losses and LAE	102,818	86,445
Ceded unearned premiums	72,960	61,587
Deferred acquisition costs	80,664	80,858
Receivable for securities sold	62,566	24,507
Goodwill and intangible assets	7,650	7,650
Other assets	69,547	63,959
Total assets of consolidated VIE	\$ 3,552,867	\$ 3,372,857
Liabilities		
Reserves for losses and loss adjustment expenses	\$ 1,104,532	\$ 1,032,760
Unearned premiums	401,838	390,114
Reinsurance balances payable	27,039	21,034
Revolving credit agreement borrowings	488,612	455,682
Payable for securities purchased	95,577	60,142
Other liabilities (1)	272,295	302,524
Total liabilities of consolidated VIE	\$ 2,389,893	\$ 2,262,256
Redeemable noncontrolling interests	\$ 221,083	\$ 220,992

(1) Includes certain borrowings related to investing activities.

For the three months ended March 31, 2019, Watford Re generated \$70.3 million of cash provided by operating activities, \$105.9 million of cash used for investing activities and \$28.1 million of cash provided by financing activities, compared to \$30.2 million of cash provided by operating activities, \$35.4 million of cash used for investing activities and \$66.2 million of cash used for financing activities for the three months ended March 31, 2018.

Non-redeemable noncontrolling interests

The Company accounts for the portion of Watford Re's common equity attributable to third party investors in the shareholders' equity section of its consolidated balance sheets. The noncontrolling ownership in Watford Re's common shares was approximately 89% at March 31, 2019. The portion of Watford Re's income or loss attributable to third party investors is recorded in the consolidated statements of income in 'net (income) loss attributable to noncontrolling interests.'

The following table sets forth activity in the non-redeemable noncontrolling interests:

	March 31, 2019	2018
Three Months Ended		
Balance, beginning of period	\$ 791,560	\$ 843,411
Amounts attributable to noncontrolling interests	42,382	11,376
Other comprehensive income attributable to noncontrolling interests	4,139	(675)
Balance, end of period	\$ 838,081	\$ 854,112

Redeemable noncontrolling interests

The Company accounts for redeemable noncontrolling interests in the mezzanine section of its consolidated balance sheets in accordance with applicable accounting guidance. Such redeemable noncontrolling interests relate to the 9,065,200 cumulative redeemable preference shares ("Watford Preference Shares") issued in late March 2014 with a par value of \$0.01 per share and a liquidation preference of \$25.00 per share. The Watford Preference Shares were issued at a discounted amount of \$24.50 per share. Preferred dividends, including the accretion of the discount and issuance costs, are included in 'net (income) loss attributable to noncontrolling interests' in the Company's consolidated statements of income.

The following table sets forth activity in the redeemable non-controlling interests:

	March 31, 2019	2018
Three Months Ended		
Balance, beginning of period	\$ 206,292	\$ 205,922
Accretion of preference share issuance costs	91	91
Balance, end of period	\$ 206,383	\$ 206,013

The portion of Watford Re's income or loss attributable to third party investors, recorded in the Company's consolidated statements of income in 'net (income) loss attributable to noncontrolling interests,' are summarized in the table below:

	March 31, 2019	2018
Three Months Ended		
Amounts attributable to non-redeemable noncontrolling interests	\$ (42,382)	\$ (11,376)
Dividends attributable to redeemable noncontrolling interests	(4,588)	(4,585)
Net (income) loss attributable to noncontrolling interests	\$ (46,970)	\$ (15,961)

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Bellemeade Re

The Company has entered into various aggregate excess of loss mortgage reinsurance agreements with various special purpose reinsurance companies domiciled in Bermuda (the “Bellemeade Agreements”). At the time the Bellemeade Agreements were entered into, the applicability of the accounting guidance that addresses VIEs was evaluated. As a result of the evaluation of the Bellemeade Agreements, the Company concluded that these entities are VIEs. However, given that the ceding insurers do not have the unilateral power to direct those activities that are significant to their economic performance, the Company does not consolidate such entities in its consolidated financial statements.

The following table presents the total assets of the Bellemeade entities, as well as the Company’s maximum exposure to loss associated with these VIEs, calculated as the maximum historical observable spread between the one month LIBOR, the basis for the contractual payments to bond holders, and short term invested trust asset yields.

Bellemeade Entities (Issue Date)	Total VIE Assets	Maximum Exposure to Loss		
		On-Balance Sheet (Asset) Liability	Off-Balance Sheet	Total
Mar 31, 2019				
Bellemeade 2015-1 Ltd. (Jul-15)	\$ 34,176	\$ (76)	\$ 163	\$ 87
Bellemeade 2017-1 Ltd. (Oct-17)	296,773	721	8,088	8,809
Bellemeade 2018-1 Ltd. (Apr-18)	374,460	(858)	10,035	9,177
Bellemeade 2018-2 Ltd. (Aug-18)	625,523	(2,318)	9,688	7,370
Bellemeade 2018-3 Ltd. (Oct-18)	506,110	(430)	8,975	8,545
Bellemeade 2019-1 Ltd. (Mar-19)	341,790	—	5,397	5,397
Total	\$ 2,178,832	\$ (2,961)	\$ 42,346	\$ 39,385
Dec 31, 2018				
Bellemeade 2015-1 Ltd. (Jul-15)	\$ 43,246	\$ 112	\$ 498	\$ 610
Bellemeade 2017-1 Ltd. (Oct-17)	304,373	165	1,312	1,477
Bellemeade 2018-1 Ltd. (Apr-18)	374,460	132	3,539	3,671
Bellemeade 2018-2 Ltd. (Aug-18)	653,278	874	4,005	4,879
Bellemeade 2018-3 Ltd. (Oct-18)	506,110	469	1,836	2,305
Total	\$ 1,881,467	\$ 1,752	\$ 11,190	\$ 12,942

See [note 16](#).

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12. Other Comprehensive Income (Loss)

The following tables present details about amounts reclassified from accumulated other comprehensive income and the tax effects allocated to each component of other comprehensive income (loss):

Details About AOCI Components	Consolidated Statement of Income Line Item That Includes Reclassification	Amounts Reclassified from AOCI	
		Three Months Ended	
		March 31,	
		2019	2018
Unrealized appreciation on available-for-sale investments			
	Net realized gains (losses)	\$ 11,709	\$ (67,586)
	Other-than-temporary impairment losses	(1,309)	(162)
	Total before tax	10,400	(67,748)
	Income tax (expense) benefit	(179)	5,287
	Net of tax	\$ 10,221	\$ (62,461)

	Before Tax Amount	Tax Expense (Benefit)	Net of Tax Amount
Three Months Ended March 31, 2019			
Unrealized appreciation (decline) in value of investments:			
Unrealized holding gains (losses) arising during period	\$ 254,990	\$ 29,103	\$ 225,887
Portion of other-than-temporary impairment losses recognized in other comprehensive income (loss)	—	—	—
Less reclassification of net realized gains (losses) included in net income	10,400	179	10,221
Foreign currency translation adjustments	5,644	128	5,516
Other comprehensive income (loss)	\$ 250,234	\$ 29,052	\$ 221,182

Three Months Ended March 31, 2018			
Unrealized appreciation (decline) in value of investments:			
Unrealized holding gains (losses) arising during period	\$ (189,943)	\$ (23,266)	\$ (166,677)
Portion of other-than-temporary impairment losses recognized in other comprehensive income (loss)	—	—	—
Less reclassification of net realized gains (losses) included in net income	(67,748)	(5,287)	(62,461)
Foreign currency translation adjustments	1,432	150	1,282
Other comprehensive income (loss)	\$ (120,763)	\$ (17,829)	\$ (102,934)

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13. Guarantor Financial Information

The following tables present condensed financial information for Arch Capital, Arch Capital Group (U.S.) Inc. (“Arch-U.S.”), a 100% owned subsidiary of Arch Capital, and Arch Capital’s other subsidiaries.

Condensed Consolidating Balance Sheet	March 31, 2019				
	Arch Capital (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other Arch Capital Subsidiaries	Consolidating Adjustments and Eliminations	Arch Capital Consolidated
Assets					
Total investments	\$ 40	\$ 464,872	\$ 21,877,667	\$ (14,700)	\$ 22,327,879
Cash	12,065	40,716	580,319	—	633,100
Investments in subsidiaries	10,403,671	4,249,796	—	(14,653,467)	—
Due from subsidiaries and affiliates	—	2	1,883,339	(1,883,341)	—
Premiums receivable	—	—	2,226,386	(641,704)	1,584,682
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	—	—	8,658,803	(5,558,980)	3,099,823
Contractholder receivables	—	—	2,087,720	—	2,087,720
Ceded unearned premiums	—	—	1,951,746	(852,165)	1,099,581
Deferred acquisition costs	—	—	669,145	(71,619)	597,526
Goodwill and intangible assets	—	—	659,215	—	659,215
Other assets	21,943	46,146	2,026,386	(206,964)	1,887,511
Total assets	\$ 10,437,719	\$ 4,801,532	\$ 42,620,726	\$ (23,882,940)	\$ 33,977,037
Liabilities					
Reserve for losses and loss adjustment expenses	\$ —	\$ —	\$ 17,335,960	\$ (5,325,919)	\$ 12,010,041
Unearned premiums	—	—	4,888,284	(852,165)	4,036,119
Reinsurance balances payable	—	—	1,094,762	(641,704)	453,058
Contractholder payables	—	—	2,087,720	—	2,087,720
Collateral held for insured obligations	—	—	232,411	—	232,411
Senior notes	297,175	494,749	941,770	—	1,733,694
Revolving credit agreement borrowings	—	—	488,612	—	488,612
Due to subsidiaries and affiliates	—	542,045	1,341,296	(1,883,341)	—
Other liabilities	25,948	34,073	2,227,945	(511,644)	1,776,322
Total liabilities	323,123	1,070,867	30,638,760	(9,214,773)	22,817,977
Redeemable noncontrolling interests	—	—	221,083	(14,700)	206,383
Shareholders’ Equity					
Total shareholders’ equity available to Arch	10,114,596	3,730,665	10,922,802	(14,653,467)	10,114,596
Non-redeemable noncontrolling interests	—	—	838,081	—	838,081
Total shareholders’ equity	10,114,596	3,730,665	11,760,883	(14,653,467)	10,952,677
Total liabilities, noncontrolling interests and shareholders’ equity	\$ 10,437,719	\$ 4,801,532	\$ 42,620,726	\$ (23,882,940)	\$ 33,977,037

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Condensed Consolidating Balance Sheet	December 31, 2018				
	Arch Capital (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other Arch Capital Subsidiaries	Consolidating Adjustments and Eliminations	Arch Capital Consolidated
Assets					
Total investments	\$ 104	\$ 452,674	\$ 21,307,206	\$ (14,700)	\$ 21,745,284
Cash	6,125	5,940	634,491	—	646,556
Investments in subsidiaries	9,735,256	3,999,243	—	(13,734,499)	—
Due from subsidiaries and affiliates	9	2	1,802,686	(1,802,697)	—
Premiums receivable	—	—	1,834,389	(535,239)	1,299,150
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	—	—	8,618,660	(5,699,288)	2,919,372
Contractholder receivables	—	—	2,079,111	—	2,079,111
Ceded unearned premiums	—	—	1,730,262	(754,793)	975,469
Deferred acquisition costs	—	—	618,535	(48,961)	569,574
Goodwill and intangible assets	—	—	634,920	—	634,920
Other assets	12,588	80,949	1,466,438	(211,082)	1,348,893
Total assets	\$ 9,754,082	\$ 4,538,808	\$ 40,726,698	\$ (22,801,259)	\$ 32,218,329
Liabilities					
Reserve for losses and loss adjustment expenses	\$ —	\$ —	\$ 17,345,142	\$ (5,491,845)	\$ 11,853,297
Unearned premiums	—	—	4,508,429	(754,793)	3,753,636
Reinsurance balances payable	—	—	928,346	(535,239)	393,107
Contractholder payables	—	—	2,079,111	—	2,079,111
Collateral held for insured obligations	—	—	236,630	—	236,630
Senior notes	297,150	494,723	941,655	—	1,733,528
Revolving credit agreement borrowings	—	—	455,682	—	455,682
Due to subsidiaries and affiliates	—	536,805	1,265,892	(1,802,697)	—
Other liabilities	17,105	26,270	1,699,768	(467,484)	1,275,659
Total liabilities	314,255	1,057,798	29,460,655	(9,052,058)	21,780,650
Redeemable noncontrolling interests	—	—	220,992	(14,700)	206,292
Shareholders' Equity					
Total shareholders' equity available to Arch	9,439,827	3,481,010	10,253,491	(13,734,501)	9,439,827
Non-redeemable noncontrolling interests	—	—	791,560	—	791,560
Total shareholders' equity	9,439,827	3,481,010	11,045,051	(13,734,501)	10,231,387
Total liabilities, noncontrolling interests and shareholders' equity	\$ 9,754,082	\$ 4,538,808	\$ 40,726,698	\$ (22,801,259)	\$ 32,218,329

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

Condensed Consolidating Statement of Income and Comprehensive Income	Three Months Ended March 31, 2019				
	Arch Capital (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other Arch Capital Subsidiaries	Consolidating Adjustments and Eliminations	Arch Capital Consolidated
Revenues					
Net premiums earned	\$ —	\$ —	\$ 1,368,866	\$ —	\$ 1,368,866
Net investment income	46	3,679	175,672	(22,448)	156,949
Net realized gains (losses)	—	8,518	138,053	(5,006)	141,565
Net impairment losses recognized in earnings	—	—	(1,309)	—	(1,309)
Other underwriting income	—	—	8,825	—	8,825
Equity in net income (loss) of investment funds accounted for using the equity method	—	—	46,867	—	46,867
Other income (loss)	(239)	—	1,322	—	1,083
Total revenues	(193)	12,197	1,738,296	(27,454)	1,722,846
Expenses					
Losses and loss adjustment expenses	—	—	718,532	—	718,532
Acquisition expenses	—	—	197,848	—	197,848
Other operating expenses	—	—	201,163	—	201,163
Corporate expenses	16,307	2,166	(511)	—	17,962
Amortization of intangible assets	—	—	20,417	—	20,417
Interest expense	5,538	11,951	33,706	(22,130)	29,065
Net foreign exchange (gains) losses	2	—	(123)	(3,404)	(3,525)
Total expenses	21,847	14,117	1,171,032	(25,534)	1,181,462
Income (loss) before income taxes	(22,040)	(1,920)	567,264	(1,920)	541,384
Income tax (expense) benefit	—	543	(46,429)	—	(45,886)
Income (loss) before equity in net income of subsidiaries	(22,040)	(1,377)	520,835	(1,920)	495,498
Equity in net income of subsidiaries	470,568	136,554	—	(607,122)	—
Net income	448,528	135,177	520,835	(609,042)	495,498
Net (income) loss attributable to noncontrolling interests	—	—	(47,289)	319	(46,970)
Net income available to Arch	448,528	135,177	473,546	(608,723)	448,528
Preferred dividends	(10,403)	—	—	—	(10,403)
Net income available to Arch common shareholders	\$ 438,125	\$ 135,177	\$ 473,546	\$ (608,723)	\$ 438,125
Comprehensive income available to Arch	\$ 665,571	\$ 238,156	\$ 688,540	\$ (926,696)	\$ 665,571

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

Condensed Consolidating Statement of Income and Comprehensive Income	Three Months Ended March 31, 2018				
	Arch Capital (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other Arch Capital Subsidiaries	Consolidating Adjustments and Eliminations	Arch Capital Consolidated
Revenues					
Net premiums earned	\$ —	\$ —	\$ 1,234,899	\$ —	\$ 1,234,899
Net investment income	20	258	148,767	(22,321)	126,724
Net realized gains (losses)	29	(7)	(111,020)	—	(110,998)
Net impairment losses recognized in earnings	—	—	(162)	—	(162)
Other underwriting income	—	—	5,349	—	5,349
Equity in net income (loss) of investment funds accounted for using the equity method	—	—	28,069	—	28,069
Other income (loss)	(78)	—	152	—	74
Total revenues	(29)	251	1,306,054	(22,321)	1,283,955
Expenses					
Losses and loss adjustment expenses	—	—	636,860	—	636,860
Acquisition expenses	—	—	191,376	—	191,376
Other operating expenses	—	—	175,015	—	175,015
Corporate expenses	16,169	289	(1,146)	—	15,312
Amortization of intangible assets	—	—	26,736	—	26,736
Interest expense	5,536	11,926	35,172	(21,998)	30,636
Net foreign exchange (gains) losses	29	—	16,436	3,256	19,721
Total expenses	21,734	12,215	1,080,449	(18,742)	1,095,656
Income (loss) before income taxes	(21,763)	(11,964)	225,605	(3,579)	188,299
Income tax (expense) benefit	—	2,951	(24,866)	—	(21,915)
Income (loss) before equity in net income of subsidiaries	(21,763)	(9,013)	200,739	(3,579)	166,384
Equity in net income of subsidiaries	172,186	86,420	—	(258,606)	—
Net income (loss)	150,423	77,407	200,739	(262,185)	166,384
Net (income) loss attributable to noncontrolling interests	—	—	(16,284)	323	(15,961)
Net income (loss) available to Arch	150,423	77,407	184,455	(261,862)	150,423
Preferred dividends	(10,437)	—	—	—	(10,437)
Loss on redemption of preferred shares	(2,710)	—	—	—	(2,710)
Net income (loss) available to Arch common shareholders	\$ 137,276	\$ 77,407	\$ 184,455	\$ (261,862)	\$ 137,276
Comprehensive income available to Arch	\$ 48,162	\$ 6,537	\$ 79,081	\$ (85,618)	\$ 48,162

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

Condensed Consolidating Statement of Cash Flows	Three Months Ended March 31, 2019				
	Arch Capital (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other Arch Capital Subsidiaries	Consolidating Adjustments and Eliminations	Arch Capital Consolidated
Operating Activities					
Net Cash Provided By (Used For) Operating Activities	\$ 23,171	\$ 37,324	\$ 234,706	\$ (59,803)	\$ 235,398
Investing Activities					
Purchases of fixed maturity investments	—	(38,678)	(7,405,792)	—	(7,444,470)
Purchases of equity securities	—	(56,062)	(219,992)	72,244	(203,810)
Purchases of other investments	—	(17,500)	(307,093)	—	(324,593)
Proceeds from the sales of fixed maturity investments	—	75,583	7,001,007	—	7,076,590
Proceeds from the sales of equity securities	—	—	167,261	(72,244)	95,017
Proceeds from the sales, redemptions and maturities of other investments	—	—	216,483	—	216,483
Proceeds from redemptions and maturities of fixed maturity investments	—	—	100,424	—	100,424
Net settlements of derivative instruments	—	—	29,737	—	29,737
Net (purchases) sales of short-term investments	63	34,109	258,429	—	292,601
Change in cash collateral related to securities lending	—	—	(29,618)	—	(29,618)
Contributions to subsidiaries	(2,121)	—	(53,906)	56,027	—
Issuance of intercompany loans	—	—	(43,647)	43,647	—
Purchases of fixed assets	—	—	(9,423)	—	(9,423)
Other	—	—	(93,731)	—	(93,731)
Net Cash Provided By (Used For) Investing Activities	(2,058)	(2,548)	(389,861)	99,674	(294,793)
Financing Activities					
Purchases of common shares under share repurchase program	(2,871)	—	—	—	(2,871)
Proceeds from common shares issued, net	(1,901)	—	56,027	(56,027)	(1,901)
Proceeds from intercompany borrowings	—	—	43,647	(43,647)	—
Proceeds from borrowings	—	—	59,000	—	59,000
Repayments of borrowings	—	—	(26,038)	—	(26,038)
Change in cash collateral related to securities lending	—	—	29,618	—	29,618
Dividends paid to redeemable noncontrolling interests	—	—	(4,816)	319	(4,497)
Dividends paid to parent (1)	—	—	(59,484)	59,484	—
Other	—	—	(1,389)	—	(1,389)
Preferred dividends paid	(10,403)	—	—	—	(10,403)
Net Cash Provided By (Used For) Financing Activities	(15,175)	—	96,565	(39,871)	41,519
Effects of exchange rates changes on foreign currency cash and restricted cash	—	—	3,449	—	3,449
Increase (decrease) in cash and restricted cash	5,938	34,776	(55,141)	—	(14,427)
Cash and restricted cash, beginning of year	6,159	5,940	712,544	—	724,643
Cash and restricted cash, end of period	\$ 12,097	\$ 40,716	\$ 657,403	\$ —	\$ 710,216

(1) Dividends received by parent are included in net cash provided by (used for) operating activities.

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

Condensed Consolidating Statement of Cash Flows	Three Months Ended March 31, 2018				
	Arch Capital (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other Arch Capital Subsidiaries	Consolidating Adjustments and Eliminations	Arch Capital Consolidated
Operating Activities					
Net Cash Provided By (Used For) Operating Activities	\$ 13,315	\$ 74,248	\$ 419,956	\$ (107,339)	\$ 400,180
Investing Activities					
Purchases of fixed maturity investments	—	(26,501)	(10,050,206)	395,440	(9,681,267)
Purchases of equity securities	—	—	(377,000)	—	(377,000)
Purchases of other investments	—	—	(522,454)	—	(522,454)
Proceeds from the sales of fixed maturity investments	—	16,997	9,057,590	(395,440)	8,679,147
Proceeds from the sales of equity securities	—	—	291,311	—	291,311
Proceeds from the sales, redemptions and maturities of other investments	—	—	436,566	—	436,566
Proceeds from redemptions and maturities of fixed maturity investments	—	—	287,031	—	287,031
Net settlements of derivative instruments	—	—	36,070	—	36,070
Net (purchases) sales of short-term investments	92,885	(15,547)	517,980	—	595,318
Change in cash collateral related to securities lending	—	—	161,567	—	161,567
Contributions to subsidiaries	—	—	(2,970)	2,970	—
Purchases of fixed assets	(13)	—	(4,227)	—	(4,240)
Other	—	—	40,037	—	40,037
Net Cash Provided By (Used For) Investing Activities	92,872	(25,051)	(128,705)	2,970	(57,914)
Financing Activities					
Redemption of preferred shares	(92,555)	—	—	—	(92,555)
Purchases of common shares under share repurchase program	(3,299)	—	—	—	(3,299)
Proceeds from common shares issued, net	(2,779)	—	2,970	(2,970)	(2,779)
Proceeds from borrowings	—	—	39,585	—	39,585
Repayments of borrowings	—	—	(101,000)	—	(101,000)
Change in cash collateral related to securities lending	—	—	(161,567)	—	(161,567)
Dividends paid to redeemable noncontrolling interests	—	—	(4,816)	319	(4,497)
Dividends paid to parent (1)	—	—	(107,020)	107,020	—
Other	—	—	(2,356)	—	(2,356)
Preferred dividends paid	(10,437)	—	—	—	(10,437)
Net Cash Provided By (Used For) Financing Activities	(109,070)	—	(334,204)	104,369	(338,905)
Effects of exchange rates changes on foreign currency cash and restricted cash	(4)	—	1,615	—	1,611
Increase (decrease) in cash and restricted cash	(2,887)	49,197	(41,338)	—	4,972
Cash and restricted cash, beginning of year	10,052	30,380	686,852	—	727,284
Cash and restricted cash, end of period	\$ 7,165	\$ 79,577	\$ 645,514	\$ —	\$ 732,256

(1) Dividends received by parent are included in net cash provided by (used for) operating activities.

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

14. Income Taxes

The Company's income tax provision on income before income taxes resulted in an expense of 8.5% for the three months ended March 31, 2019, compared to an expense of 11.6% for the 2018 period. The Company's effective tax rate, which is based upon the expected annual effective tax rate, may fluctuate from period to period based on the relative mix of income or loss reported by jurisdiction and the varying tax rates in each jurisdiction. For interim reporting purposes, the Company has calculated its annual effective tax rate for the full year of 2019 by treating excess tax benefits that arise from the accounting for stock based compensation as a discrete item. As such, this amount is not included when projecting the Company's full year annual effective tax rate but rather is accounted for at the U.S. Federal statutory rate of 21% after applying the projected full year annual effective tax rate to actual three months results before the discrete item. The impact of the discrete item resulted in a benefit of 0.5% for the three months ended March 31, 2019.

The Company had a net deferred tax liability of \$18.9 million at March 31, 2019, compared to a net deferred tax asset of \$22.5 million at December 31, 2018. The change is primarily a result of the appreciation of the Company's fixed maturities from December 31, 2018 to March 31, 2019. In addition, the Company recovered \$32.7 million and \$49.9 million of income taxes for the three months ended March 31, 2019 and 2018, respectively.

15. Legal Proceedings

The Company, in common with the insurance industry in general, is subject to litigation and arbitration in the normal course of its business. As of March 31, 2019, the Company was not a party to any litigation or arbitration which is expected by management to have a material adverse effect on the Company's results of operations and financial condition and liquidity.

16. Subsequent Event

In April 2019, the Company's first-lien U.S. mortgage insurance subsidiaries entered into an aggregate excess of loss reinsurance agreement with Bellemeade Re 2019-2 Ltd. ("Bellemeade 2019-2"), a special purpose reinsurance company domiciled in Bermuda. The Bellemeade 2019-2 agreement provides for up to \$621.0 million of aggregate excess of loss reinsurance coverage at inception in excess of \$221.8 million of aggregate losses for new delinquencies on a portfolio of in-force policies primarily issued in the second half of 2018. The coverage amount decreases over a ten -year period as the underlying covered mortgages amortize.

Bellemeade 2019-2 financed the coverage through the issuance of mortgage insurance-linked notes in an aggregate amount of

approximately \$621.0 million to unrelated investors (the "Notes"). The maturity date of the Notes is April 25, 2029. The Notes will be redeemed prior to maturity upon the occurrence of a mandatory termination event or if the ceding insurers trigger a termination of the reinsurance agreement following the occurrence of an optional termination event. All of the proceeds paid to Bellemeade 2019-2 from the sale of the Notes were deposited into a reinsurance trust as security for Bellemeade 2019-2's obligations. At all times, funds in the reinsurance trust account are required to be invested in high credit quality money market funds.

ITEM 2.MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following is a discussion and analysis of our financial condition and results of operations. This should be read in conjunction with our consolidated financial statements included in Item 1 of this report and also our Management’s Discussion and Analysis of Financial Condition and Results of Operations contained in our Annual Report on Form 10-K for the year ended December 31, 2018 (“2018 Form 10-K”). In addition, readers should review “Risk Factors” set forth in Item 1A of Part I of our 2018 Form 10-K. Tabular amounts are in U.S. Dollars in thousands, except share amounts, unless otherwise noted.

Arch Capital Group Ltd. (“Arch Capital” and, together with its subsidiaries, “we” or “us”) is a Bermuda public limited liability company with approximately \$11.85 billion in capital at March 31, 2019 and, through operations in Bermuda, the United States, Europe, Canada and Australia, writes insurance, reinsurance and mortgage insurance on a worldwide basis.

CURRENT OUTLOOK

Our objective is to achieve an average operating return on average equity of 15% or greater over the insurance cycle, which we believe to be an attractive return to our common shareholders given the risks we assume. We continue to look for opportunities to find acceptable books of business to underwrite without sacrificing underwriting discipline and continue to write a portion of our overall book in catastrophe-exposed business which has the potential to increase the volatility of our operating results.

The broad property casualty insurance market environment continues to be competitive, with modest upward rate movement in property and select casualty lines. We believe that the modest improvement in the property and casualty markets reflects broader economic growth, particularly in the U.S. However, the spread between rate changes and loss trend continues to be a key variable in assessing expected returns and, in specialty lines, is volatile by nature. Our underwriting teams continue to execute a disciplined strategy by emphasizing small and medium-sized accounts over large accounts, shrinking premiums in more commoditized lines such as general liability and directors and officers, and by utilizing reinsurance purchases to reduce volatility on large account, high capacity business. Writings in property catastrophe-exposed business continued to remain low in the 2019 first quarter.

Our mortgage segment continues to experience generally favorable market conditions. Although pricing remains competitive in the U.S., borrower credit quality and the general

economy remain strong. Our results continue to reflect our success in making high quality credit underwriting risk decisions and building customer relationships.

Arch remains committed to providing solutions across many offerings as the marketplace evolves, including the mortgage credit risk transfer programs initiated by government sponsored enterprises, or “GSEs,” in 2018. Such programs have continued to generate business. In addition, we completed two Bellemeade risk transfers in March and April, increasing our protection for mortgage tail risk.

FINANCIAL MEASURES

Management uses the following three key financial indicators in evaluating our performance and measuring the overall growth in value generated for Arch Capital’s common shareholders:

Book Value per Share

Book value per share represents total common shareholders’ equity available to Arch divided by the number of common shares outstanding. Management uses growth in book value per share as a key measure of the value generated for our common shareholders each period and believes that book value per share is the key driver of Arch Capital’s share price over time. Book value per share is impacted by, among other factors, our underwriting results, investment returns and share repurchase activity, which has an accretive or dilutive impact on book value per share depending on the purchase price.

Book value per share was \$23.12 at March 31, 2019, compared to \$21.52 at December 31, 2018 and \$20.41 at March 31, 2018. The 7.4% increase for the 2019 first quarter reflected strong underwriting results and the impact of a decrease in interest rates on our fixed income securities while the 13.3% increase over the trailing twelve months reflected strong underwriting results and the impact of higher interest rates.

Operating Return on Average Common Equity

Operating return on average common equity (“Operating ROAE”) represents annualized after-tax operating income available to Arch common shareholders divided by the average of beginning and ending common shareholders’ equity available to Arch during the period. After-tax operating income available to Arch common shareholders, a non-GAAP financial measure as defined in Regulation G, represents net income available to Arch common shareholders, excluding net realized gains or losses, net impairment losses recognized in earnings,

equity in net income or loss of investment funds accounted for using the equity method, net foreign exchange gains or losses, transaction costs and other, loss on redemption of preferred shares and income taxes. Management uses Operating ROAE as a key measure of the return generated to common shareholders. See “Comment on Non-GAAP Financial Measures.”

Our Operating ROAE was 12.3% for the 2019 first quarter, compared to 11.3% for the 2018 first quarter. The 2019 and 2018 returns reflected favorable mortgage insurance underwriting performance, strong investment returns and a low level of catastrophic activity.

Total Return on Investments

Total return on investments includes investment income, equity in net income or loss of investment funds accounted for using the equity method, net realized gains and losses and the change in unrealized gains and losses generated by Arch’s investment portfolio. Total return is calculated on a pre-tax basis and before investment expenses, excludes amounts reflected in the ‘other’ segment, and reflects the effect of financial market conditions along with foreign currency fluctuations. In addition, total return incorporates the timing of investment returns during the periods. The following table summarizes our total return compared to the benchmark return against which we measured our portfolio during the periods. See “Comment on Non-GAAP Financial Measures.”

	Arch Portfolio	Benchmark Return
Pre-tax total return (before investment expenses):		
2019 First Quarter	2.70 %	2.82 %
2018 First Quarter	(0.32)%	(0.68)%

Excluding the effects of foreign exchange, total return was 2.67% for the 2019 first quarter. Total return for the 2019 first quarter reflected the impact of a decline in interest rates, which increased the total return on our investment grade fixed income portfolio, aided by favorable returns on equities.

The benchmark return index is a customized combination of indices intended to approximate a target portfolio by asset mix and average credit quality while also matching the approximate estimated duration and currency mix of our insurance and reinsurance liabilities. Although the estimated duration and average credit quality of this index will move as the duration and rating of its constituent securities change, generally we do not adjust the composition of the benchmark return index except to incorporate changes to the mix of liability currencies and durations noted above. The benchmark return index should not be interpreted as expressing a preference for or aversion to any particular sector or sector weight. The index is intended solely to provide, unlike many master indices that change based on the size of their constituent indices, a relatively stable basket

of investable indices. At March 31, 2019, the benchmark return index had an average credit quality of “Aa3” by Moody’s Investors Service (“Moody’s”), and an estimated duration of 3.06 years.

The benchmark return index included weightings to the following indices:

	%
ICE BoAML 1-10 Year AAA - A U.S. Corporate Index	21.00%
ICE BoAML 1-5 Year U.S. Treasury Index	15.00
ICE BoAML 3-5 Year Fixed Rate Asset Backed Securities Index	7.00
ICE BoAML 1-10 Year U.S. Municipal Securities Index	5.00
Bloomberg Barclays CMBS Invest Grade Aaa Total Return Index	5.00
MSCI ACWI Net Total Return USD Index	5.00
Hedge Fund Research HFRX Fixed Income Credit Index	5.00
Hedge Fund Research HFRX Equal Weighted Strategies	5.00
ICE BoAML 1-10 Year BBB U.S. Corporate Index	4.00
ICE BoAML German Government 1-10 Year Index	4.00
ICE BoAML U.S. Mortgage Backed Securities Index	4.00
ICE BoAML 0-3 Month U.S. Treasury Bill Index	4.00
ICE BoAML 1-5 Year U.K. Gilt Index	3.50
ICE BoAML 5-10 Year U.S. Treasury Index	3.00
ICE BoAML 1-5 Year Australian Governments Index	3.00
ICE BoAML U.S. High Yield Constrained Index	2.50
S&P Leveraged Loan Total Return Index	2.50
ICE BoAML 1-5 Year Canada Government Index	1.00
ICE BoAML 20+ Year Canada Government Index	0.50
Total	100.00%

COMMENT ON NON-GAAP FINANCIAL MEASURES

Throughout this filing, we present our operations in the way we believe will be the most meaningful and useful to investors, analysts, rating agencies and others who use our financial information in evaluating the performance of our company. This presentation includes the use of after-tax operating income available to Arch common shareholders, which is defined as net income available to Arch common shareholders, excluding net realized gains or losses, net impairment losses recognized in earnings, equity in net income or loss of investment funds accounted for using the equity method, net foreign exchange gains or losses, transaction costs and other, loss on redemption of preferred shares and income taxes, and the use of annualized operating return on average common equity. The presentation of after-tax operating income available to Arch common shareholders and annualized operating return on average common equity are non-GAAP financial measures as defined in Regulation G. The reconciliation of such measures to net income available to Arch common shareholders and annualized return on average common equity (the most directly comparable

GAAP financial measures) in accordance with Regulation G is included under “Results of Operations” below.

We believe that net realized gains or losses, net impairment losses recognized in earnings, equity in net income or loss of investment funds accounted for using the equity method, net foreign exchange gains or losses, transaction costs and other and loss on redemption of preferred shares in any particular period are not indicative of the performance of, or trends in, our business. Although net realized gains or losses, net impairment losses recognized in earnings, equity in net income or loss of investment funds accounted for using the equity method and net foreign exchange gains or losses are an integral part of our operations, the decision to realize investment gains or losses, the recognition of the change in the carrying value of investments accounted for using the fair value option in net realized gains or losses, the recognition of net impairment losses, the recognition of equity in net income or loss of investment funds accounted for using the equity method and the recognition of foreign exchange gains or losses are independent of the insurance underwriting process and result, in large part, from general economic and financial market conditions. Furthermore, certain users of our financial information believe that, for many companies, the timing of the realization of investment gains or losses is largely opportunistic. In addition, net impairment losses recognized in earnings on our investments represent other-than-temporary declines in expected recovery values on securities without actual realization. The use of the equity method on certain of our investments in certain funds that invest in fixed maturity securities is driven by the ownership structure of such funds (either limited partnerships or limited liability companies). In applying the equity method, these investments are initially recorded at cost and are subsequently adjusted based on our proportionate share of the net income or loss of the funds (which include changes in the market value of the underlying securities in the funds). This method of accounting is different from the way we account for our other fixed maturity securities and the timing of the recognition of equity in net income or loss of investment funds accounted for using the equity method may differ from gains or losses in the future upon sale or maturity of such investments. Transaction costs and other include advisory, financing, legal, severance, incentive compensation and other transaction costs related to the acquisition of United Guaranty Corporation, a North Carolina corporation (“UGC”) which closed at the end of 2016. We believe that transaction costs and other, due to their non-recurring nature, are not indicative of the performance of, or trends in, our business performance. The loss on redemption of preferred shares related to the redemption of our Series C preferred shares in January 2018 and had no impact on shareholders' equity or cash flows. Due to these reasons, we exclude net realized gains or losses, net impairment losses recognized in earnings, equity in net income or loss of investment funds accounted for using the equity method, net foreign exchange gains or losses, transaction costs and other and loss on redemption of preferred shares from

the calculation of after-tax operating income available to Arch common shareholders.

We believe that showing net income available to Arch common shareholders exclusive of the items referred to above reflects the underlying fundamentals of our business since we evaluate the performance of and manage our business to produce an underwriting profit. In addition to presenting net income available to Arch common shareholders, we believe that this presentation enables investors and other users of our financial information to analyze our performance in a manner similar to how management analyzes performance. We also believe that this measure follows industry practice and, therefore, allows the users of financial information to compare our performance with our industry peer group. We believe that the equity analysts and certain rating agencies which follow us and the insurance industry as a whole generally exclude these items from their analyses for the same reasons.

Our segment information includes the presentation of consolidated underwriting income or loss and a subtotal of underwriting income or loss before the contribution from the ‘other’ segment. Such measures represent the pre-tax profitability of our underwriting operations and include net premiums earned plus other underwriting income, less losses and loss adjustment expenses, acquisition expenses and other operating expenses. Other operating expenses include those operating expenses that are incremental and/or directly attributable to our individual underwriting operations. Underwriting income or loss does not incorporate items included in our corporate (non-underwriting) segment. While these measures are presented in [note 4, “Segment Information,”](#) of the notes accompanying our consolidated financial statements, they are considered non-GAAP financial measures when presented elsewhere on a consolidated basis. The reconciliations of underwriting income or loss to income before income taxes (the most directly comparable GAAP financial measure) on a consolidated basis and a subtotal before the contribution from the ‘other’ segment, in accordance with Regulation G, is shown in [note 4, “Segment Information,”](#) to our consolidated financial statements.

We measure segment performance for our three underwriting segments based on underwriting income or loss. We do not manage our assets by underwriting segment, with the exception of goodwill and intangibles and, accordingly, investment income and other non-underwriting related items are not allocated to each underwriting segment. For the ‘other’ segment, performance is measured based on net income or loss.

Along with consolidated underwriting income, we provide a subtotal of underwriting income or loss before the contribution from the ‘other’ segment. Pursuant to generally accepted accounting principles, Watford Re is considered a variable interest entity and we concluded that we are the primary beneficiary of Watford Re. As such, we consolidate the results

of Watford Re in our consolidated financial statements, although we only own approximately 11% of Watford Re's common equity. Watford Re has its own management and board of directors that is responsible for its overall profitability. In addition, we do not guarantee or provide credit support for Watford Re. Since Watford Re is an independent company, the assets of Watford Re can be used only to settle obligations of Watford Re and Watford Re is solely responsible for its own liabilities and commitments. Our financial exposure to Watford Re is limited to our investment in Watford Re's common and preferred shares and counterparty credit risk (mitigated by collateral) arising from the reinsurance transactions. We believe that presenting certain information excluding the 'other' segment enables investors and other users of our financial information to analyze our performance in a manner similar to how our management analyzes performance.

Our presentation of segment information includes the use of a current year loss ratio which excludes favorable or adverse development in prior year loss reserves. This ratio is a non-GAAP financial measure as defined in Regulation G. The reconciliation of such measure to the loss ratio (the most directly comparable GAAP financial measure) in accordance with Regulation G is shown on the individual segment pages. Management utilizes the current year loss ratio in its analysis of the underwriting performance of each of our underwriting segments.

Total return on investments includes investment income, equity in net income or loss of investment funds accounted for using the equity method, net realized gains and losses and the change in unrealized gains and losses generated by Arch's investment portfolio. Total return is calculated on a pre-tax basis and before investment expenses, excludes amounts reflected in the 'other' segment, and reflects the effect of financial market conditions along with foreign currency fluctuations. In addition, total return incorporates the timing of investment returns during the periods. There is no directly comparable GAAP financial measure for total return. Management uses total return on investments as a key measure of the return generated to Arch common shareholders on the capital held in the business, and compares the return generated by our investment portfolio against benchmark returns which we measured our portfolio against during the periods.

RESULTS OF OPERATIONS

The following table summarizes our consolidated financial data, including a reconciliation of net income or loss available to Arch common shareholders to after-tax operating income or loss available to Arch common shareholders. Each line item reflects the impact of our approximate 11% ownership of Watford Re's common equity.

	Three Months Ended	
	March 31,	
	2019	2018
Net income available to Arch common shareholders	\$ 438,125	\$ 137,276
Net realized (gains) losses	(115,644)	111,764
Net impairment losses recognized in earnings	1,309	162
Equity in net (income) loss of investment funds accounted for using the equity method	(46,867)	(28,069)
Net foreign exchange (gains) losses	(4,994)	15,556
Transaction costs and other	1,190	830
Loss on redemption of preferred shares	—	2,710
Income tax expense (benefit) (1)	2,778	(5,086)
After-tax operating income available to Arch common shareholders	\$ 275,897	\$ 235,143
Beginning common shareholders' equity	\$ 8,659,827	\$ 8,324,047
Ending common shareholders' equity	9,334,596	8,370,372
Average common shareholders' equity	\$ 8,997,212	\$ 8,347,210
Annualized return on average common equity %	19.5	6.6
Annualized operating return on average common equity %	12.3	11.3

- (1) Income tax on net realized gains or losses, net impairment losses recognized in earnings, equity in net income or loss of investment funds accounted for using the equity method, net foreign exchange gains or losses, transaction costs and other and loss on redemption of preferred shares reflects the relative mix reported by jurisdiction and the varying tax rates in each jurisdiction.

Segment Information

We classify our businesses into three underwriting segments — insurance, reinsurance and mortgage — and two other operating segments — corporate (non-underwriting) and 'other.' Our insurance, reinsurance and mortgage segments each have managers who are responsible for the overall profitability of their respective segments and who are directly accountable to our chief operating decision makers, the President and Chief Executive Officer of Arch Capital and the Chief Financial Officer of Arch Capital. The chief operating decision makers do not assess performance, measure return on equity or make resource allocation decisions on a line of business basis. Management measures segment performance for our three underwriting segments based on underwriting income or loss. We do not manage our assets by underwriting segment, with the exception of goodwill and intangible assets, and, accordingly, investment income is not allocated to each underwriting segment.

We determined our reportable segments using the management approach described in accounting guidance regarding disclosures about segments of an enterprise and related information. The accounting policies of the segments are the same as those used for the preparation of our consolidated financial statements. Intersegment business is allocated to the segment accountable for the underwriting results.

Insurance Segment

The following tables set forth our insurance segment's underwriting results:

	Three Months Ended March 31,		
	2019	2018	% Change
Gross premiums written	\$ 941,954	\$ 823,378	14.4
Premiums ceded	(320,622)	(247,180)	
Net premiums written	621,332	576,198	7.8
Change in unearned premiums	(67,827)	(37,461)	
Net premiums earned	553,505	538,737	2.7
Losses and loss adjustment expenses	(356,723)	(353,730)	
Acquisition expenses	(82,824)	(85,169)	
Other operating expenses	(113,396)	(91,974)	
Underwriting income	\$ 562	\$ 7,864	(92.9)
Underwriting Ratios			% Point Change
Loss ratio	64.4%	65.7%	(1.3)
Acquisition expense ratio	15.0%	15.8%	(0.8)
Other operating expense ratio	20.5%	17.1%	3.4
Combined ratio	99.9%	98.6%	1.3

The insurance segment consists of our insurance underwriting units which offer specialty product lines on a worldwide basis. Product lines include:

- *Construction and national accounts:* primary and excess casualty coverages to middle and large accounts in the construction industry and a wide range of products for middle and large national accounts, specializing in loss sensitive primary casualty insurance programs (including large deductible, self-insured retention and retrospectively rated programs).
- *Excess and surplus casualty:* primary and excess casualty insurance coverages, including middle market energy business, and contract binding, which primarily provides casualty coverage through a network of appointed agents to small and medium risks.
- *Lenders products:* collateral protection, debt cancellation and service contract reimbursement products to banks, credit unions, automotive dealerships and original equipment manufacturers and other specialty programs that pertain to automotive lending and leasing.
- *Professional lines:* directors' and officers' liability, errors and omissions liability, employment practices liability,

fiduciary liability, crime, professional indemnity and other financial related coverages for corporate, private equity, venture capital, real estate investment trust, limited partnership, financial institution and not-for-profit clients of all sizes and medical professional and general liability insurance coverages for the healthcare industry. The business is predominately written on a claims-made basis.

- *Programs:* primarily package policies, underwriting workers' compensation and umbrella liability business in support of desirable package programs, targeting program managers with unique expertise and niche products offering general liability, commercial automobile, inland marine and property business with minimal catastrophe exposure.
- *Property, energy, marine and aviation:* primary and excess general property insurance coverages, including catastrophe-exposed property coverage, for commercial clients. Coverages for marine include hull, war, specie and liability. Aviation and stand alone terrorism are also offered.
- *Travel, accident and health:* specialty travel and accident and related insurance products for individual, group travelers, travel agents and suppliers, as well as accident and health, which provides accident, disability and medical plan insurance coverages for employer groups, medical plan members, students and other participant groups.
- *Other:* includes alternative market risks (including captive insurance programs), excess workers' compensation and employer's liability insurance coverages for qualified self-insured groups, associations and trusts, and contract and commercial surety coverages, including contract bonds (payment and performance bonds) primarily for medium and large contractors and commercial surety bonds for Fortune 1,000 companies and smaller transaction business programs.

Premiums Written .

The following tables set forth our insurance segment's net premiums written by major line of business:

	Three Months Ended March 31,			
	2019		2018	
	Amount	%	Amount	%
Professional lines	\$ 129,234	20.8	\$ 119,789	20.8
Programs	101,172	16.3	96,556	16.8
Construction and national accounts	95,355	15.3	98,428	17.1
Travel, accident and health	88,104	14.2	80,524	14.0
Property, energy, marine and aviation	70,486	11.3	52,127	9.0
Excess and surplus casualty	45,165	7.3	41,922	7.3
Lenders products	22,415	3.6	21,984	3.8
Other	69,401	11.2	64,868	11.3
Total	\$ 621,332	100.0	\$ 576,198	100.0

Gross premiums written by the insurance segment in the 2019 first quarter were 14.4% higher than in the 2018 first quarter, while net premiums written were 7.8% higher. The increase in net premiums written primarily reflects the acquisition of renewal rights of a U.K. commercial lines book of business on January 1, 2019, along with the growth in most lines of business. The percentage increase in gross premiums written is higher than the increase in net premiums written due to a single large national account, for which the premium written in the quarter was substantially ceded.

Net Premiums Earned .

The following tables set forth our insurance segment's net premiums earned by major line of business:

	Three Months Ended March 31,			
	2019		2018	
	Amount	%	Amount	%
Professional lines	\$ 114,791	20.7	\$ 116,018	21.5
Programs	97,486	17.6	95,011	17.6
Construction and national accounts	75,931	13.7	77,212	14.3
Travel, accident and health	71,575	12.9	66,835	12.4
Property, energy, marine and aviation	59,638	10.8	48,603	9.0
Excess and surplus casualty	42,369	7.7	46,544	8.6
Lenders products	23,232	4.2	22,816	4.2
Other	68,483	12.4	65,698	12.2
Total	\$ 553,505	100.0	\$ 538,737	100.0

Net premiums written are primarily earned on a pro rata basis over the terms of the policies for all products, usually 12 months. Net premiums earned reflect changes in net premiums written over the previous five quarters. Net premiums earned in the

2019 first quarter were 2.7% higher than in the 2018 first quarter.

Losses and Loss Adjustment Expenses .

The table below shows the components of the insurance segment's loss ratio:

	Three Months Ended March 31,	
	2019	2018
Current year	65.2 %	66.1 %
Prior period reserve development	(0.8)%	(0.4)%
Loss ratio	64.4 %	65.7 %

Current Year Loss Ratio .

The insurance segment's current year loss ratio in the 2019 first quarter was 0.9 points lower than in the 2018 first quarter and reflected minimal current year catastrophic activity, consistent with the 2018 first quarter.

Prior Period Reserve Development .

The insurance segment's net favorable development was \$4.4 million, or 0.8 points, for the 2019 first quarter, compared to \$2.1 million, or 0.4 points, for the 2018 first quarter. See [note 5, "Reserve for Losses and Loss Adjustment Expenses,"](#) to our consolidated financial statements for information about the insurance segment's prior year reserve development.

Underwriting Expenses .

The insurance segment's underwriting expense ratio was 35.5% in the 2019 first quarter, compared to 32.9% in the 2018 first quarter. The increase in the underwriting expense ratio reflected a previously announced change in the timing of our incentive compensation practices, with a large portion of the expense associated with the share based compensation grants reflected in the 2019 first quarter. In prior periods, share based compensation grants occurred in the second quarter. On the U.K. acquisition noted above, only a small portion of net premiums written were earned in the 2019 first quarter while the Company incurred a full quarter of expenses. This resulted in a higher expense ratio in the period, which is expected to moderate as the business matures. The Company did not acquire any loss reserves or unearned premiums as part of the transaction.

Reinsurance Segment

The following tables set forth our reinsurance segment's underwriting results:

	Three Months Ended March 31,		
	2019	2018	% Change
Gross premiums written	\$ 682,855	\$ 577,483	18.2
Premiums ceded	(231,567)	(195,730)	
Net premiums written	451,288	381,753	18.2
Change in unearned premiums	(104,923)	(102,581)	
Net premiums earned	346,365	279,172	24.1
Other underwriting income	4,377	1,232	
Losses and loss adjustment expenses	(239,810)	(141,675)	
Acquisition expenses	(54,326)	(48,319)	
Other operating expenses	(35,704)	(35,571)	
Underwriting income	\$ 20,902	\$ 54,839	(61.9)
			% Point Change
Underwriting Ratios			
Loss ratio	69.2%	50.7%	18.5
Acquisition expense ratio	15.7%	17.3%	(1.6)
Other operating expense ratio	10.3%	12.7%	(2.4)
Combined ratio	95.2%	80.7%	14.5

The reinsurance segment consists of our reinsurance underwriting units which offer specialty product lines on a worldwide basis. Product lines include:

- *Casualty*: provides coverage to ceding company clients on third party liability and workers' compensation exposures from ceding company clients, primarily on a treaty basis. Exposures include, among others, executive assurance, professional liability, workers' compensation, excess and umbrella liability, excess motor and healthcare business.
- *Marine and aviation*: provides coverage for energy, hull, cargo, specie, liability and transit, and aviation business, including airline and general aviation risks. Business written may also include space business, which includes coverages for satellite assembly, launch and operation for commercial space programs.
- *Other specialty*: provides coverage to ceding company clients for proportional motor and other lines, including surety, accident and health, workers' compensation catastrophe, agriculture, trade credit and political risk.
- *Property catastrophe*: provides protection for most catastrophic losses that are covered in the underlying policies written by reinsureds, including hurricane, earthquake, flood, tornado, hail and fire, and coverage for other perils on a case-by-case basis. Property catastrophe reinsurance provides coverage on an excess of loss basis when aggregate losses and loss adjustment expense from a single occurrence or aggregation of losses from a covered peril exceed the retention specified in the contract.

- *Property excluding property catastrophe*: provides coverage for both personal lines and commercial property exposures and principally covers buildings, structures, equipment and contents. The primary perils in this business include fire, explosion, collapse, riot, vandalism, wind, tornado, flood and earthquake. Business is assumed on both a proportional and excess of loss basis. In addition, facultative business is written which focuses on individual commercial property risks on an excess of loss basis.

- *Other*: includes life reinsurance business on both a proportional and non-proportional basis, casualty clash business and, in limited instances, non-traditional business which is intended to provide insurers with risk management solutions that complement traditional reinsurance.

Premiums Written .

The following tables set forth our reinsurance segment's net premiums written by major line of business:

	Three Months Ended March 31,			
	2019		2018	
	Amount	%	Amount	%
Other specialty	\$ 140,477	31.1	\$ 138,992	36.4
Casualty	168,484	37.3	130,176	34.1
Property excluding property catastrophe	102,740	22.8	85,170	22.3
Property catastrophe	3,383	0.7	7,632	2.0
Marine and aviation	15,958	3.5	10,012	2.6
Other	20,246	4.5	9,771	2.6
Total	\$ 451,288	100.0	\$ 381,753	100.0

Gross and net premiums written by the reinsurance segment in the 2019 first quarter were 18.2% higher than in the 2018 first quarter . The increase in net premiums written in the 2019 first quarter primarily reflected growth from selected new business opportunities in casualty and property excluding property catastrophe lines of business.

Net Premiums Earned .

The following tables set forth our reinsurance segment's net premiums earned by major line of business:

	Three Months Ended March 31,			
	2019		2018	
	Amount	%	Amount	%
Other specialty	\$ 121,521	35.1	\$ 103,717	37.2
Casualty	91,624	26.5	69,372	24.8
Property excluding property catastrophe	83,792	24.2	68,754	24.6
Property catastrophe	18,732	5.4	18,387	6.6
Marine and aviation	11,059	3.2	9,389	3.4
Other	19,637	5.7	9,553	3.4
Total	\$ 346,365	100.0	\$ 279,172	100.0

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Net premiums written, irrespective of the class of business, are generally earned on a pro rata basis over the terms of the underlying policies or reinsurance contracts. For the 2019 first quarter, net premiums earned were 24.1% higher than in the 2018 first quarter.

Other Underwriting Income

Other underwriting income for the 2019 first quarter was \$4.4 million, compared to \$1.2 million for the 2018 first quarter.

Losses and Loss Adjustment Expenses

The table below shows the components of the reinsurance segment's loss ratio:

	Three Months Ended March 31,	
	2019	2018
Current year	68.7%	63.8 %
Prior period reserve development	0.5%	(13.1)%
Loss ratio	69.2%	50.7 %

Current Year Loss Ratio

The reinsurance segment's current year loss ratio in the 2019 first quarter was 4.9 points higher than in the 2018 first quarter and reflected 2.3 points of current year catastrophic activity, compared to 0.4 points in the 2018 first quarter.

Prior Period Reserve Development

The reinsurance segment's net adverse development was \$1.7 million, or 0.5 points, for the 2019 first quarter, compared to \$36.5 million, or 13.1 points, of net favorable development for the 2018 first quarter. The estimated net adverse development in the 2019 first quarter included an increase in reserves on Typhoon Jebi of \$16.0 million, or 4.6 points, based on receipt of updated information from cedents and additional updated industry data. See [note 5, "Reserve for Losses and Loss Adjustment Expenses,"](#) to our consolidated financial statements for information about the reinsurance segment's prior year reserve development.

Underwriting Expenses

The underwriting expense ratio for the reinsurance segment was 26.0% in the 2019 first quarter, compared to 30.0% in the 2018 first quarter, reflecting growth in net premiums earned and changes in mix of business.

Mortgage Segment

Our mortgage operations include U.S. and international mortgage insurance and reinsurance operations as well as participation in GSE credit risk-sharing transactions. Our mortgage group includes direct mortgage insurance in the U.S. primarily through Arch Mortgage Insurance Company and

United Guaranty Residential Insurance Company (together, "Arch MI U.S."), mortgage reinsurance by Arch Reinsurance Ltd. ("Arch Re Bermuda") to mortgage insurers on both a proportional and non-proportional basis globally; direct mortgage insurance in Europe through Arch Insurance (EU) Designated Activity Company ("Arch MI Europe") and in Hong Kong through Arch MI Asia Limited ("Arch MI Asia"); and participation in various GSE credit risk-sharing products primarily through Arch Re Bermuda.

The following tables set forth our mortgage segment's underwriting results.

	Three Months Ended March 31,		
	2019	2018	% Change
Gross premiums written	\$ 356,050	\$ 321,178	10.9
Premiums ceded	(48,798)	(46,137)	
Net premiums written	307,252	275,041	11.7
Change in unearned premiums	15,650	5,201	
Net premiums earned	322,902	280,242	15.2
Other underwriting income	3,856	3,416	
Losses and loss adjustment expenses	(11,149)	(43,466)	
Acquisition expenses	(31,672)	(26,567)	
Other operating expenses	(39,875)	(38,771)	
Underwriting income	\$ 244,062	\$ 174,854	39.6
			% Point Change
Underwriting Ratios			
Loss ratio	3.5%	15.5%	(12.0)
Acquisition expense ratio	9.8%	9.5%	0.3
Other operating expense ratio	12.3%	13.8%	(1.5)
Combined ratio	25.6%	38.8%	(13.2)

Premiums Written

The following tables set forth our mortgage segment's net premiums written by underwriting location (i.e., where the business is underwritten):

	Three Months Ended March 31,			
	2019		2018	
	Amount	%	Amount	%
Underwriting location:				
United States	\$ 255,380	83.1	\$ 221,177	80.4
Other	51,872	16.9	53,864	19.6
Total	\$ 307,252	100.0	\$ 275,041	100.0

Gross premiums written by the mortgage segment in the 2019 first quarter were 10.9% higher than in the 2018 first quarter, while net premiums written were 11.7% higher. The growth in net premiums written primarily reflected an increase in monthly premiums business due to growth in U.S. insurance in force, partially offset by a lower level of U.S. single premium business, a decrease in Australian mortgage reinsurance business and higher ceded premiums related to Bellemeade transactions.

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The persistency rate, which represents the percentage of mortgage insurance in force at the beginning of a 12-month period that remains in force at the end of such period, of the Arch MI U.S. portfolio of mortgage loans was 81.3% at March 31, 2019, compared to 81.5% at December 31, 2018.

Arch MI U.S. generated \$11.2 billion of new insurance written (“NIW”) in the 2019 first quarter, consistent with the \$11.4 billion in the 2018 first quarter. NIW represents the original principal balance of all loans that received coverage during the period. Monthly premium policies contributed 91.6 % of NIW in the 2019 first quarter, compared to 91.4 % for the 2018 first quarter.

The following tables provide details on the NIW generated by Arch MI U.S.:

(U.S. Dollars in millions)

	Three Months Ended March 31,			
	2019		2018	
	Amount	%	Amount	%
Total new insurance written (NIW) (1)	\$ 11,207		\$ 11,373	
<u>Credit quality (FICO):</u>				
>=740	\$ 6,350	56.7	\$ 6,612	58.1
680-739	4,041	36.1	4,042	35.5
620-679	816	7.3	719	6.3
Total	\$ 11,207	100.0	\$ 11,373	100.0
<u>Loan-to-value (LTV):</u>				
95.01% and above	\$ 1,808	16.1	\$ 1,262	11.1
90.01% to 95.00%	4,975	44.4	5,136	45.2
85.01% to 90.00%	3,149	28.1	3,643	32.0
85.01% and below	1,275	11.4	1,332	11.7
Total	\$ 11,207	100.0	\$ 11,373	100.0
<u>Monthly vs. single:</u>				
Monthly	\$ 10,263	91.6	\$ 10,390	91.4
Single	944	8.4	983	8.6
Total	\$ 11,207	100.0	\$ 11,373	100.0
<u>Purchase vs. refinance:</u>				
Purchase	\$ 10,289	91.8	\$ 10,288	90.5
Refinance	918	8.2	1,085	9.5
Total	\$ 11,207	100.0	\$ 11,373	100.0

(1) Represents the original principal balance of all loans that received coverage during the period.

Net Premiums Earned.

The following tables set forth our mortgage segment’s net premiums earned by underwriting location:

	Three Months Ended March 31,			
	2019		2018	
	Amount	%	Amount	%
<u>Underwriting location:</u>				
United States	\$ 274,473	85.0	\$ 238,141	85.0
Other	48,429	15.0	42,101	15.0
Total	\$ 322,902	100.0	\$ 280,242	100.0

Net premiums earned for the 2019 first quarter were 15.2% higher than in the 2018 first quarter. The increase was primarily due to growth in insurance in force over the last twelve months.

Other Underwriting Income.

Other underwriting income, which is primarily related to older GSE credit risk-sharing transactions receiving derivative accounting treatment, was \$3.9 million for the 2019 first quarter, compared to \$3.4 million for the 2018 first quarter.

Losses and Loss Adjustment Expenses.

The table below shows the components of the mortgage segment’s loss ratio:

	Three Months Ended March 31,	
	2019	2018
Current year	14.8 %	20.1 %
Prior period reserve development	(11.3)%	(4.6)%
Loss ratio	3.5 %	15.5 %

Current Year Loss Ratio.

The mortgage segment’s current year loss ratio was 5.3 points lower in the 2019 first quarter than in the 2018 first quarter. The lower current year loss ratio for the 2019 first quarter reflects the current favorable macroeconomic environment.

Prior Period Reserve Development.

The mortgage segment’s net favorable development was \$36.6 million, or 11.3 points, for the 2019 first quarter, compared to \$13.0 million, or 4.6 points, for the 2018 first quarter. See [note 5, “Reserve for Losses and Loss Adjustment Expenses.”](#) to our consolidated financial statements for information about the mortgage segment’s prior year reserve development.

Underwriting Expenses.

The underwriting expense ratio for the mortgage segment was 22.1% in the 2019 first quarter, compared to 23.3% in the 2018 first quarter. The lower ratio in the 2019 first quarter primarily resulted from the higher level of net premiums earned.

Corporate (Non-Underwriting) Segment

The corporate (non-underwriting) segment results include net investment income, other income (loss), corporate expenses, transaction costs and other, amortization of intangible assets, interest expense, items related to our non-cumulative preferred shares, net realized gains or losses, net impairment losses included in earnings, equity in net income or loss of investment funds accounted for using the equity method, net foreign exchange gains or losses and income taxes. Such amounts exclude the results of the ‘other’ segment.

Net Investment Income.

The components of net investment income were derived from the following sources:

	Three Months Ended	
	March 31,	
	2019	2018
Fixed maturities	\$ 110,651	\$ 92,438
Equity securities	2,246	2,750
Short-term investments	4,298	3,949
Other (1)	22,944	19,229
Gross investment income	140,139	118,366
Investment expenses (2)	(18,890)	(18,123)
Net investment income	\$ 121,249	\$ 100,243

- (1) Amounts include dividends and other distributions on investment funds, term loan investments, funds held balances, cash balances and other items.
- (2) Investment expenses were approximately 0.38% of average invested assets for the 2019 first quarter, consistent with 0.38% for the 2018 first quarter.

The higher level of net investment income for the 2019 first quarter reflected an increase in the embedded book yield on fixed income securities, reflecting the reinvestment at higher available yields and the shift from municipal bonds to corporates over the last twelve months. The pre-tax investment income yield, calculated based on amortized cost and on an annualized basis, was 2.67% for the 2019 first quarter, compared to 2.13% for the 2018 first quarter.

Corporate Expenses.

Corporate expenses were \$16.8 million for the 2019 first quarter, compared to \$14.5 million for the 2018 first quarter. The increase in corporate expenses in the 2019 first quarter primarily reflected a previously announced change in the timing of our incentive compensation practices, with a large portion of the expense associated with the share based compensation grants reflected in the 2019 first quarter. In prior periods, share based compensation grants occurred in the second quarter.

Transaction Costs and Other.

Transaction costs and other were \$1.2 million for the 2019 first quarter, compared to \$0.8 million for the 2018 first quarter. Amounts in both periods primarily related to severance and related costs.

Amortization of Intangible Assets.

Amortization of intangible assets for the 2019 first quarter was \$20.4 million, compared to \$26.7 million for the 2018 first quarter. Expenses in both periods primarily related to the UGC acquisition, while the 2019 first quarter also included amortization related to the previously announced acquisitions of (i) renewal rights of a U.K. commercial lines book of business on January 1, 2019; and (ii) McNeil & Co. on December 6, 2018.

See the consolidated financial statements contained in our 2018 Form 10-K for disclosures on our amortization pattern.

Interest Expense.

Interest expense was \$23.5 million for the 2019 first quarter, compared to the \$25.9 million for the 2018 first quarter, reflecting the paydown of revolving credit agreement borrowings in the second half of 2018.

Loss on Redemption of Preferred Shares.

In January 2018, we redeemed all remaining 6.75% Series C preferred shares and, in accordance with GAAP, recorded a loss of \$2.7 million to remove original issuance costs related to the redeemed shares from additional paid-in capital. Such adjustment had no impact on total shareholders' equity or cash flows.

Net Realized Gains or Losses.

We recorded net realized gains of \$112.4 million for the 2019 first quarter, compared to net realized losses of \$111.9 million for the 2018 first quarter. Currently, our portfolio is actively managed to maximize total return within certain guidelines. The effect of financial market movements on the investment portfolio will directly impact net realized gains and losses as the portfolio is adjusted and rebalanced. Net realized gains or losses from the sale of fixed maturities primarily results from our decisions to reduce credit exposure, to change duration targets, to rebalance our portfolios or due to relative value determinations. Net realized gains or losses also include realized and unrealized contract gains and losses on our derivative instruments, changes in the fair value of assets accounted for using the fair value option and in the fair value of equities, along with re-measurement of contingent consideration liability amounts. See [note 6, "Investment Information—Net Realized Gains \(Losses\)."](#) to our consolidated financial statements for additional information.

Net Impairment Losses Recognized in Earnings.

We recorded \$1.3 million of impairment losses for the 2019 first quarter, compared to \$0.2 million for the 2018 first quarter. See [note 6, "Investment Information—Other-Than-Temporary Impairments."](#) to our consolidated financial statements for additional information.

Equity in Net Income (Loss) of Investment Funds Accounted for Using the Equity Method.

We recorded \$46.9 million of equity in net income related to investment funds accounted for using the equity method in the 2019 first quarter, compared to \$28.1 million of income for the 2018 first quarter. Investment funds accounted for using the equity method totaled \$1.56 billion at March 31, 2019, compared to \$1.49 billion at December 31, 2018. See [note 6, "Investment Information—Investments Accounted For Using](#)

[the Equity Method.](#)” to our consolidated financial statements for additional information.

Net Foreign Exchange Gains or Losses.

Net foreign exchange gains for the 2019 first quarter were \$5.2 million , compared to net foreign exchange losses for the 2018 first quarter of \$15.0 million . Amounts in both periods were primarily unrealized and resulted from the effects of revaluing our net insurance liabilities required to be settled in foreign currencies at each balance sheet date.

Income Tax Expense.

Our income tax provision on income before income taxes resulted in an expense of 9.4% for the 2019 first quarter , compared to 12.8% for the 2018 period. The effective tax rate for the 2019 first quarter included a discrete income tax benefit of \$1.8 million related to share based compensation. Our effective tax rate, which is based upon the expected annual effective tax rate, may fluctuate from period to period based on the relative mix of income or loss reported by jurisdiction and the varying tax rates in each jurisdiction.

Other Segment

The ‘other’ segment includes the results of Watford Re. Pursuant to generally accepted accounting principles, Watford Re is considered a variable interest entity and we concluded that we are the primary beneficiary of Watford Re. As such, we consolidate the results of Watford Re in our consolidated financial statements, although we only own approximately 11% of Watford Re’s common equity. See [note 11, “Variable Interest Entities and Noncontrolling Interests.”](#) and [note 4, “Segment Information.”](#) to our consolidated financial statements for additional information on Watford Re.

**CRITICAL ACCOUNTING POLICIES,
ESTIMATES AND RECENT ACCOUNTING PRONOUNCEMENTS**

Critical accounting policies, estimates and recent accounting pronouncements are discussed in Management’s Discussion and Analysis of Financial Condition and Results of Operations contained in our 2018 Form 10-K, updated where applicable in the notes accompanying our consolidated financial statements, including [note 1, “Basis of Presentation and Recent Accounting Pronouncements.”](#)

FINANCIAL CONDITION

Investable Assets

At March 31, 2019, total investable assets held by Arch were \$20.06 billion, excluding the \$2.82 billion included in the 'other' segment (i.e., attributable to Watford Re).

Investable Assets Held by Arch

The following table summarizes the fair value of the investable assets held by Arch:

Investable assets (1):	Estimated Fair Value	% of Total
March 31, 2019		
Fixed maturities (2)	\$ 15,382,680	76.7
Short-term investments (2)	731,643	3.6
Cash	576,799	2.9
Equity securities (2)	495,002	2.5
Other investments (2)	1,313,816	6.6
Investments accounted for using the equity method	1,563,779	7.8
Securities transactions entered into but not settled at the balance sheet date	(8,339)	0.0
Total investable assets held by Arch	\$ 20,055,380	100.0

Average effective duration (in years)	3.47
Average S&P/Moody's credit ratings (3)	AA/Aa2
Embedded book yield (4)	2.95%

December 31, 2018		
Fixed maturities (2)	\$ 14,881,902	76.1
Short-term investments (2)	995,926	5.1
Cash	583,027	3.0
Equity securities (2)	368,843	1.9
Other investments (2)	1,261,525	6.4
Investments accounted for using the equity method	1,493,791	7.6
Securities transactions entered into but not settled at the balance sheet date	(18,153)	(0.1)
Total investable assets held by Arch	\$ 19,566,861	100.0

Average effective duration (in years)	3.38
Average S&P/Moody's credit ratings (3)	AA/Aa2
Embedded book yield (4)	2.89%

- (1) In securities lending transactions, we receive collateral in excess of the fair value of the securities pledged. For purposes of this table, we have excluded the collateral received under securities lending, at fair value and included the securities pledged under securities lending, at fair value.
- (2) Includes investments carried at fair value under the fair value option.
- (3) Average credit ratings on our investment portfolio on securities with ratings by Standard & Poor's Rating Services ("S&P") and Moody's Investors Service ("Moody's").
- (4) Before investment expenses.

At March 31, 2019, approximately \$14.30 billion, or 71.3%, of total investable assets held by Arch were internally managed, compared to \$14.08 billion, or 72.0%, at December 31, 2018.

The following table summarizes our fixed maturities and fixed maturities pledged under securities lending agreements ("Fixed Maturities") by type:

	Estimated Fair Value	% of Total
March 31, 2019		
Corporate bonds	\$ 6,054,114	39.4
Mortgage backed securities	492,255	3.2
Municipal bonds	714,790	4.6
Commercial mortgage backed securities	610,754	4.0
U.S. government and government agencies	4,352,266	28.3
Non-U.S. government securities	1,740,110	11.3
Asset backed securities	1,418,391	9.2
Total	\$ 15,382,680	100.0

December 31, 2018		
Corporate bonds	\$ 5,735,526	38.5
Mortgage backed securities	535,763	3.6
Municipal bonds	1,012,308	6.8
Commercial mortgage backed securities	729,442	4.9
U.S. government and government agencies	3,601,269	24.2
Non-U.S. government securities	1,713,891	11.5
Asset backed securities	1,553,703	10.4
Total	\$ 14,881,902	100.0

The following table provides the credit quality distribution of our Fixed Maturities. For individual fixed maturities, S&P ratings are used. In the absence of an S&P rating, ratings from Moody's are used, followed by ratings from Fitch Ratings.

	Estimated Fair Value	% of Total
March 31, 2019		
U.S. government and gov't agencies (1)	\$ 4,895,315	31.8
AAA	3,096,530	20.1
AA	1,886,690	12.3
A	3,213,166	20.9
BBB	1,437,907	9.3
BB	363,887	2.4
B	231,544	1.5
Lower than B	60,577	0.4
Not rated	197,064	1.3
Total	\$ 15,382,680	100.0

December 31, 2018		
U.S. government and gov't agencies (1)	\$ 4,194,676	28.2
AAA	3,551,039	23.9
AA	2,129,336	14.3
A	3,069,656	20.6
BBB	1,251,205	8.4
BB	275,201	1.8
B	183,614	1.2
Lower than B	61,271	0.4
Not rated	165,904	1.1
Total	\$ 14,881,902	100.0

- (1) Includes U.S. government-sponsored agency residential mortgage-backed securities and agency commercial mortgage-backed securities.

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The following table provides information on the severity of the unrealized loss position as a percentage of amortized cost for all Fixed Maturities which were in an unrealized loss position:

Severity of gross unrealized losses:	Estimated Fair Value	Gross Unrealized Losses	% of Total Gross Unrealized Losses
March 31, 2019			
0-10%	\$ 5,296,513	\$ (73,911)	90.7
10-20%	44,878	(6,816)	8.4
20-30%	1,625	(499)	0.6
Greater than 30%	173	(282)	0.3
Total	\$ 5,343,189	\$ (81,508)	100.0
December 31, 2018			
0-10%	\$ 8,722,837	\$ (190,170)	92.5
10-20%	87,188	(13,012)	6.3
20-30%	3,359	(1,058)	0.5
Greater than 30%	2,363	(1,266)	0.6
Total	\$ 8,815,747	\$ (205,506)	100.0

The following table summarizes our top ten exposures to fixed income corporate issuers by fair value at March 31, 2019 , excluding guaranteed amounts and covered bonds:

	Estimated Fair Value	Credit Rating (1)
JPMorgan Chase & Co.	\$ 238,973	A-/A2
Bank of America Corporation	208,129	A-/A2
Wells Fargo & Company	195,423	A/A1
Citigroup Inc.	160,741	A/A1
Apple Inc.	160,052	AA+/Aa1
U.S. Bancorp	124,936	AA-/A1
BP P.L.C.	113,032	A-/A1
Morgan Stanley	112,792	BBB+/A3
Nestle S.A.	112,305	AA-/Aa2
Daimler AG	111,970	A/A2
Total	\$ 1,538,353	

(1) Average credit ratings as assigned by S&P and Moody's, respectively.

The following table provides information on our structured securities, which includes residential mortgage-backed securities ("RMBS"), commercial mortgage-backed securities ("CMBS") and asset-backed securities ("ABS"):

	Agencies	Investment Grade	Below Investment Grade	Total
Mar 31, 2019				
RMBS	\$ 435,123	\$ 21,797	\$ 35,335	\$ 492,255
CMBS	107,928	478,255	24,571	610,754
ABS	—	1,332,715	85,676	1,418,391
Total	\$ 543,051	\$ 1,832,767	\$ 145,582	\$ 2,521,400
Dec 31, 2018				
RMBS	\$ 488,862	\$ 15,410	\$ 31,491	\$ 535,763
CMBS	104,547	602,865	22,030	729,442
ABS	—	1,485,150	68,553	1,553,703
Total	\$ 593,409	\$ 2,103,425	\$ 122,074	\$ 2,818,908

At March 31, 2019 , our structured securities included \$38.4 million par value in sub-prime securities with a fair value of \$32.3 million and average credit quality ratings from S&P/Moody's of " CCC-/Caa3 ," compared to \$38.2 million par value with a fair value of \$31.7 million and average credit quality ratings of " CCC-/Caa3 " at December 31, 2018 .

At March 31, 2019 , our investment portfolio included \$495.0 million of equity securities, compared to \$368.8 million at December 31, 2018 . Our equity portfolio includes publicly traded common stocks in the natural resources, energy, consumer staples and other sectors.

The following table summarizes our other investments:

	March 31, 2019	December 31, 2018
Lending	\$ 545,569	\$ 524,112
Term loan investments	\$ 274,787	\$ 281,486
Energy	126,612	117,509
Credit related funds	174,320	152,510
Investment grade fixed income	97,676	101,902
Infrastructure	54,421	45,371
Private equity	24,501	24,383
Real estate	15,930	14,252
Total	\$ 1,313,816	\$ 1,261,525

(1) Includes fund investments with strategies in mortgage servicing rights, transportation and infrastructure assets and other.

For details on our investments accounted for using the equity method, see [note 6, "Investment Information—Investments Accounted For Using the Equity Method."](#) to our consolidated financial statements.

Our investment strategy allows for the use of derivative instruments. We utilize various derivative instruments such as futures contracts to enhance investment performance, replicate

investment positions or manage market exposures and duration risk that would be allowed under our investment guidelines if implemented in other ways. See [note 8, “Derivative Instruments,”](#) to our consolidated financial statements for additional disclosures related to derivatives.

Accounting guidance regarding fair value measurements addresses how companies should measure fair value when they are required to use a fair value measure for recognition or disclosure purposes under GAAP and provides a common definition of fair value to be used throughout GAAP. See [note 7, “Fair Value,”](#) to our consolidated financial statements for a summary of our financial assets and liabilities measured at fair value, segregated by level in the fair value hierarchy.

Investable Assets in the ‘Other’ Segment

Investable assets in the ‘other’ segment are managed by Watford Re. The board of directors of Watford Re establishes its investment policies and guidelines. Watford Re’s investments are accounted for using the fair value option with changes in the carrying value of such investments recorded in net realized gains or losses.

The following table summarizes investable assets in the ‘other’ segment:

	March 31, 2019	December 31, 2018
Investments accounted for using the fair value option:		
Other investments	\$ 1,073,794	\$ 1,050,414
Fixed maturities	826,016	922,819
Short-term investments	256,710	282,131
Equity securities	58,801	56,638
Total	2,215,321	2,312,002
Fixed maturities available for sale, at fair value	549,834	393,351
Equity securities, at fair value	65,010	32,206
Cash	56,301	63,529
Securities sold but not yet purchased	(28,737)	(7,790)
Securities transactions entered into but not settled at the balance sheet date	(33,011)	(35,635)
Total investable assets included in ‘other’ segment	\$ 2,824,718	\$ 2,757,663

Reinsurance

The effects of reinsurance on written and earned premiums and losses and loss adjustment expenses (“LAE”) with unaffiliated reinsurers were as follows:

	Three Months Ended March 31,	
	2019	2018
Premiums written:		
Direct	\$ 1,363,506	\$ 1,200,362
Assumed	714,373	637,852
Ceded	(552,620)	(425,670)
Net	\$ 1,525,259	\$ 1,412,544
Premiums earned:		
Direct	\$ 1,266,063	\$ 1,147,676
Assumed	533,279	445,969
Ceded	(430,476)	(358,746)
Net	\$ 1,368,866	\$ 1,234,899
Losses and LAE:		
Direct	\$ 616,062	\$ 568,466
Assumed	338,400	220,310
Ceded	(235,930)	(151,916)
Net	\$ 718,532	\$ 636,860

Reinsurance Recoverables

The following table summarizes the Company’s reinsurance recoverables on paid and unpaid losses (not including ceded unearned premiums) at March 31, 2019 and December 31, 2018 :

	March 31, 2019	December 31, 2018
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	\$ 3,099,823	\$ 2,919,372
% due from carriers with A.M. Best rating of “A-” or better	59.9%	63.0%
% due from unrated fully collateralized reinsurers (1)	16.2%	12.9%
% due from all other carriers with no A.M. Best rating (2)	23.9%	24.1%
Largest balance due from any one carrier as % of total shareholders’ equity	2.3%	2.7%

- (1) Such amount is fully collateralized through reinsurance trusts.
- (2) Over 90% of such amount is collateralized through reinsurance trusts or letters of credit.

Growth in items not rated in the 2019 first quarter is due to recoverables from a third party reinsurer related to a retroactive reinsurance transaction to reinsure liabilities associated with certain U.S. insurance exposures. Such amounts are fully collateralized. See [note 5, “Reserve for Losses and Loss Adjustment Expenses,”](#) to our consolidated financial statements for additional information.

Bellemeade Re

The Company has entered into various aggregate excess of loss mortgage reinsurance agreements with various special purpose reinsurance companies domiciled in Bermuda (the “Bellemeade Agreements”). For the respective coverage periods, the Company will retain the first layer of the respective aggregate losses and the special purpose reinsurance companies will provide second layer coverage up to the outstanding coverage amount. The Company will then retain losses in excess of the outstanding coverage limit. The aggregate excess of loss reinsurance coverage decreases over a ten-year period as the underlying covered mortgages amortize.

The following table summarizes the respective coverages and retentions at March 31, 2019 :

	Initial Coverage at Issuance	Coverage at Mar. 31, 2019	First Layer Retention
Bellemeade 2015-1 Ltd. (1)	\$ 300,000	\$ 34,176	\$ 129,900
Bellemeade 2017-1 Ltd. (2)	368,100	296,773	165,700
Bellemeade 2018-1 Ltd. (3)	374,460	374,460	168,510
Bellemeade 2018-2 Ltd. (4)	653,278	625,523	352,258
Bellemeade 2018-3 Ltd. (5)	506,110	506,110	179,331
Bellemeade 2019-1 Ltd. (6)	341,790	341,790	208,046

- (1) Issued in July 2015, covering in-force policies issued between January 1, 2009 and March 31, 2013.
- (2) Issued in October 2017, covering in-force policies issued between January 1, 2017 and June 30, 2017.
- (3) Issued in April 2018, covering in-force policies issued between July 1, 2017 and December 31, 2017.
- (4) Issued in August 2018, covering in-force policies issued between April 1, 2013 and December 31, 2015.
- (5) Issued in October 2018, covering in-force policies issued between January 1, 2018 and June 30, 2018.
- (6) Issued in March 2019, covering in-force policies issued through 2015.

Reserves for Losses and Loss Adjustment Expenses

We establish reserves for losses and loss adjustment expenses (“Loss Reserves”) which represent estimates involving actuarial and statistical projections, at a given point in time, of our expectations of the ultimate settlement and administration costs of losses incurred. Estimating Loss Reserves is inherently difficult, which is exacerbated by the fact that we have relatively limited historical experience upon which to base such estimates. We utilize actuarial models as well as available historical insurance industry loss ratio experience and loss development patterns to assist in the establishment of Loss Reserves. Actual losses and loss adjustment expenses paid will deviate, perhaps substantially, from the reserve estimates reflected in our financial statements.

At March 31, 2019 and December 31, 2018 , our Loss Reserves, net of unpaid losses and loss adjustment expenses recoverable, by type and by operating segment were as follows:

	March 31, 2019	December 31, 2018
Insurance segment:		
Case reserves	\$ 1,431,754	\$ 1,489,644
IBNR reserves	3,216,327	3,266,796
Total net reserves	4,648,081	4,756,440
Reinsurance segment:		
Case reserves	1,077,680	1,082,917
Additional case reserves	205,026	191,002
IBNR reserves	1,644,973	1,578,907
Total net reserves	2,927,679	2,852,826
Mortgage segment:		
Case reserves	325,708	355,606
IBNR reserves	132,450	122,304
Total net reserves (1)	458,158	477,910
Other segment:		
Case reserves	407,437	364,052
Additional case reserves	12,543	36,512
IBNR reserves	585,984	551,266
Total net reserves	1,005,964	951,830
Total:		
Case reserves	3,242,579	3,292,219
Additional case reserves	217,569	227,514
IBNR reserves	5,579,734	5,519,273
Total net reserves	\$ 9,039,882	\$ 9,039,006

- (1) At March 31, 2019 , total net reserves include \$346.1 million from U.S. mortgage insurance business, of which 70.3% represents policy years 2009 and prior and the remainder from later policy years. At December 31, 2018 , total net reserves include \$375.8 million from U.S. mortgage insurance business, of which 73.4% represents policy years 2009 and prior and the remainder from later policy years.

At March 31, 2019 and December 31, 2018 , the insurance segment’s Loss Reserves by major line of business, net of unpaid losses and loss adjustment expenses recoverable, were as follows:

	March 31, 2019	December 31, 2018
Insurance segment:		
Professional lines (1)	\$ 1,253,362	\$ 1,247,914
Construction and national accounts	1,185,524	1,166,143
Excess and surplus casualty (2)	490,223	631,370
Programs	501,851	482,045
Property, energy, marine and aviation	351,684	388,710
Travel, accident and health	85,297	83,836
Lenders products	51,599	52,007
Other (3)	728,541	704,415
Total net reserves	\$ 4,648,081	\$ 4,756,440

- (1) Includes professional liability, executive assurance and healthcare business.
- (2) Includes casualty and contract binding business.
- (3) Includes alternative markets, excess workers’ compensation and surety business.

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At March 31, 2019 and December 31, 2018, the reinsurance segment's Loss Reserves by major line of business, net of unpaid losses and loss adjustment expenses recoverable, were as follows:

	March 31, 2019	December 31, 2018
Reinsurance segment:		
Casualty (1)	\$ 1,568,735	\$ 1,551,550
Other specialty (2)	621,725	582,420
Property excluding property catastrophe	434,926	422,612
Marine and aviation	128,617	130,683
Property catastrophe	95,261	90,635
Other (3)	78,415	74,926
Total net reserves	<u>\$ 2,927,679</u>	<u>\$ 2,852,826</u>

- (1) Includes executive assurance, professional liability, workers' compensation, excess motor, healthcare and other.
(2) Includes non-excess motor, surety, accident and health, workers' compensation catastrophe, agriculture, trade credit and other.
(3) Includes life, casualty clash and other.

Mortgage Operations Supplemental Information

The mortgage segment's insurance in force ("IIF") and risk in force ("RIF") were as follows at March 31, 2019 and December 31, 2018:

(U.S. Dollars in millions)

	March 31, 2019		December 31, 2018	
	Amount	%	Amount	%
Insurance In Force (IIF) (1):				
U.S. primary mortgage insurance	\$ 276,699	70.9	\$ 276,538	72.1
Mortgage reinsurance	26,487	6.8	25,975	6.8
Other (2)	87,190	22.3	81,147	21.2
Total	<u>\$ 390,376</u>	<u>100.0</u>	<u>\$ 383,660</u>	<u>100.0</u>
Risk In Force (RIF) (3):				
U.S. primary mortgage insurance	\$ 71,114	92.2	\$ 70,995	92.3
Mortgage reinsurance	2,204	2.9	2,217	2.9
Other (2)	3,772	4.9	3,728	4.8
Total	<u>\$ 77,090</u>	<u>100.0</u>	<u>\$ 76,940</u>	<u>100.0</u>

- (1) Represents the aggregate dollar amount of each insured mortgage loan's current principal balance.
(2) Includes GSE credit risk-sharing transactions and international insurance business.
(3) Represents the aggregate dollar amount of each insured mortgage loan's current principal balance multiplied by the insurance coverage percentage specified in the policy for insurance policies issued and after contract limits and/or loss ratio caps for credit risk-sharing or reinsurance transactions.

The insurance in force and risk in force for our U.S. primary mortgage insurance business by policy year were as follows at March 31, 2019:

(U.S. Dollars in millions)	IIF		RIF		Delinquency
	Amount	%	Amount	%	Rate (1)
Policy year:					
2009 and prior	\$ 20,142	7.3	\$ 4,640	6.5	8.70%
2010	582	0.2	157	0.2	2.65%
2011	2,278	0.8	634	0.9	1.60%
2012	8,569	3.1	2,379	3.3	0.75%
2013	15,926	5.8	4,433	6.2	0.87%
2014	17,376	6.3	4,733	6.7	1.01%
2015	32,221	11.6	8,477	11.9	0.71%
2016	50,121	18.1	12,900	18.1	0.77%
2017	52,837	19.1	13,458	18.9	0.60%
2018	65,496	23.7	16,507	23.2	0.25%
2019	11,151	4.0	2,796	3.9	0.02%
Total	<u>\$ 276,699</u>	<u>100.0</u>	<u>\$ 71,114</u>	<u>100.0</u>	<u>1.54%</u>

- (1) Represents the ending percentage of loans in default.

The insurance in force and risk in force for our U.S. primary mortgage insurance business by policy year were as follows at December 31, 2018:

(U.S. Dollars in millions)	IIF		RIF		Delinquency
	Amount	%	Amount	%	Rate (1)
Policy year:					
2009 and prior	\$ 21,210	7.7	\$ 4,900	6.9	8.90%
2010	646	0.2	175	0.2	2.62%
2011	2,530	0.9	701	1.0	1.57%
2012	9,650	3.5	2,664	3.8	0.78%
2013	16,823	6.1	4,676	6.6	0.89%
2014	18,274	6.6	4,947	7.0	0.97%
2015	33,781	12.2	8,849	12.5	0.69%
2016	52,324	18.9	13,407	18.9	0.77%
2017	54,287	19.6	13,793	19.4	0.55%
2018	67,013	24.2	16,883	23.8	0.15%
Total	<u>\$ 276,538</u>	<u>100.0</u>	<u>\$ 70,995</u>	<u>100.0</u>	<u>1.60%</u>

- (1) Represents the ending percentage of loans in default.

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The following tables provide supplemental disclosures on risk in force for our U.S. primary mortgage insurance business at March 31, 2019 and December 31, 2018 :

(U.S. Dollars in millions)

	March 31, 2019		December 31, 2018	
	Amount	%	Amount	%
Credit quality (FICO):				
>=740	\$ 41,053	57.7	\$ 41,066	57.8
680-739	24,122	33.9	23,954	33.7
620-679	5,476	7.7	5,485	7.7
<620	463	0.7	490	0.7
Total	\$ 71,114	100.0	\$ 70,995	100.0
Weighted average FICO score	743		743	

Loan-to-value (LTV):

95.01% and above	\$ 8,175	11.5	\$ 7,918	11.2
90.01% to 95.00%	39,500	55.5	39,370	55.5
85.01% to 90.00%	20,418	28.7	20,643	29.1
85.00% and below	3,021	4.2	3,064	4.3
Total	\$ 71,114	100.0	\$ 70,995	100.0
Weighted average LTV	93.1%		93.0%	

Total RIF, net of external reinsurance

\$ 55,957	\$ 55,755
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(U.S. Dollars in millions)

	March 31, 2019		December 31, 2018	
	Amount	%	Amount	%
Total RIF by State:				
Texas	\$ 5,488	7.7	\$ 5,491	7.7
California	4,574	6.4	4,505	6.3
Florida	3,601	5.1	3,541	5.0
Virginia	2,915	4.1	2,931	4.1
Georgia	2,565	3.6	2,573	3.6
Illinois	2,492	3.5	2,482	3.5
North Carolina	2,477	3.5	2,505	3.5
Washington	2,408	3.4	2,408	3.4
Maryland	2,404	3.4	2,407	3.4
Minnesota	2,404	3.4	2,400	3.4
Others	39,786	55.9	39,752	56.0
Total	\$ 71,114	100.0	\$ 70,995	100.0

The following table provides supplemental disclosures for our U.S. primary mortgage insurance business related to insured loans and loss metrics:

(U.S. Dollars in thousands, except policy, loan and claim count)

	Three Months Ended March 31,	
	2019	2018
Roll-forward of insured loans in default:		
Beginning delinquent number of loans	20,665	27,068
New notices	9,711	9,640
Cures	(9,706)	(11,592)
Paid claims	(843)	(1,054)
Ending delinquent number of loans (1)	19,827	24,062
Ending number of policies in force (1)	1,286,877	1,214,539
Delinquency rate (1)	1.54%	1.98%
Losses:		
Number of claims paid	843	1,054
Total paid claims	\$ 33,494	\$ 47,645
Average per claim	\$ 39.7	\$ 45.2
Severity (2)	98.9%	105.2%
Average reserve per default (in thousands)	\$ 16.6	\$ 18.3

(1) Includes first lien primary and pool policies.

(2) Represents total paid claims divided by RIF of loans for which claims were paid.

The risk-to-capital ratio, which represents total current (non-delinquent) risk in force, net of reinsurance, divided by total statutory capital, for Arch MI U.S. was approximately 12.2 to 1 at March 31, 2019 , compared to 13.0 to 1 at December 31, 2018 .

Shareholders' Equity and Book Value per Share

Total shareholders' equity available to Arch was \$10.11 billion at March 31, 2019 , compared to \$9.44 billion at December 31, 2018 . The increase reflected strong underwriting and investment returns.

The following table presents the calculation of book value per share:

	March 31, 2019		December 31, 2018	
Total shareholders' equity available to Arch	\$	10,114,596	\$	9,439,827
Less preferred shareholders' equity		780,000		780,000
Common shareholders' equity available to Arch	\$	9,334,596	\$	8,659,827
Common shares and common share equivalents outstanding, net of treasury shares (1)		403,738,764		402,454,834
Book value per share	\$	23.12	\$	21.52

(1) Excludes the effects of 20,482,427 and 20,076,593 stock options and 2,095,337 and 1,307,304 restricted stock units outstanding at March 31, 2019 and December 31, 2018 , respectively.

LIQUIDITY

This section does not include information specific to Watford Re. We do not guarantee or provide credit support for Watford Re, and our financial exposure to Watford Re is limited to our investment in Watford Re's common and preferred shares and counterparty credit risk (mitigated by collateral) arising from reinsurance transactions with Watford Re.

Liquidity is a measure of our ability to access sufficient cash flows to meet the short-term and long-term cash requirements of our business operations.

Arch Capital is a holding company whose assets primarily consist of the shares in its subsidiaries. Generally, Arch Capital depends on its available cash resources, liquid investments and dividends or other distributions from its subsidiaries to make payments, including the payment of debt service obligations and operating expenses it may incur and any dividends or liquidation amounts with respect to our preferred and common shares.

For the three months ended March 31, 2019, Arch Capital received dividends of \$39.7 million from Arch Re Bermuda, our Bermuda-based reinsurer and insurer, which can pay approximately \$2.58 billion to Arch Capital during the remainder of 2019 without providing an affidavit to the Bermuda Monetary Authority ("BMA").

We expect that our liquidity needs, including our anticipated (re)insurance obligations and operating and capital expenditure needs, for the next twelve months, at a minimum, will be met by funds generated from underwriting activities and investment income, as well as by our balance of cash, short-term investments, proceeds on the sale or maturity of our investments, and our credit facilities.

Cash Flows

The following table summarizes our cash flows from operating, investing and financing activities, excluding amounts related to the 'other' segment (i.e., Watford Re). See [note 11, "Variable Interest Entities and Noncontrolling Interests,"](#) for cash flows related to Watford Re.

	Three Months Ended	
	March 31,	
	2019	2018
Total cash provided by (used for):		
Operating activities	\$ 165,411	\$ 370,261
Investing activities	(188,853)	(22,475)
Financing activities	13,055	(272,994)
Effects of exchange rate changes on foreign currency cash	3,188	776
Increase (decrease) in cash and restricted cash	\$ (7,199)	\$ 75,568

- Cash provided by operating activities for the three months ended March 31, 2019 were lower than in the 2018 period, primarily due to the impact of a retroactive reinsurance transaction with a third party reinsurer.

- Cash used for investing activities for the three months ended March 31, 2019 was higher than in the 2018 period, reflecting a decrease in cash collateral received on securities lending.

- Cash provided by financing activities for the three months ended March 31, 2019 was higher than in the 2018 period, reflecting a decrease in cash collateral received on securities lending. In addition, the 2018 first quarter included the redemption of Series C preferred shares of \$92.6 million.

CAPITAL RESOURCES

This section does not include information specific to Watford Re. We do not guarantee or provide credit support for Watford Re, and our financial exposure to Watford Re is limited to our investment in Watford Re's common and preferred shares and counterparty credit risk (mitigated by collateral) arising from reinsurance transactions with Watford Re.

The following table provides an analysis of our capital structure:

(U.S. dollars in thousands, except share data)	Mar 31, 2019	Dec 31, 2018
Debt:		
Senior notes, due May 2034	\$ 300,000	\$ 300,000
Arch-U.S. senior notes, due Nov 2043 (1)	500,000	500,000
Arch Finance senior notes, due Dec 2026 (1)	500,000	500,000
Arch Finance senior notes, due Dec 2046 (1)	450,000	450,000
Deferred debt costs on senior notes	(16,306)	(16,472)
Revolving credit agreement borrowings due Oct 2021 (2)	—	—
Total	\$ 1,733,694	\$ 1,733,528
Shareholders' equity available to Arch:		
Series E non-cumulative preferred shares	\$ 450,000	\$ 450,000
Series F non-cumulative preferred shares	330,000	330,000
Common shareholders' equity	9,334,596	8,659,827
Total	\$ 10,114,596	\$ 9,439,827
Total capital available to Arch	\$ 11,848,290	\$ 11,173,355
Senior notes to total capital (%)	14.6	15.5
Revolving credit agreement borrowings to total capital (%)	—	—
Debt to total capital (%)	14.6	15.5
Preferred to total capital (%)	6.6	7.0
Debt and preferred to total capital (%)	21.2	22.5

(1) Fully and unconditionally guaranteed by Arch Capital.

(2) \$500 million unsecured facility for revolving loans and letters of credit.

Arch Capital and Arch-U.S. are each holding companies and, accordingly, they conduct substantially all of their operations through their operating subsidiaries. Arch Capital Finance LLC (“Arch Finance”) is a wholly owned subsidiary of Arch U.S. MI Holdings Inc. As a result, Arch Capital, Arch-U.S. and Arch Finance's cash flows and their ability to service their debt depends upon the earnings of their operating subsidiaries, or affiliates in the case of Arch Finance, and on their ability to distribute the earnings, loans or other payments from such subsidiaries or affiliates to Arch Capital, Arch-U.S. and Arch Finance, respectively.

In addition, Arch MI U.S. is required to maintain compliance with the GSEs requirements, known as the Private Mortgage Insurer Eligibility Requirements or “PMIERs.” The financial requirements require an eligible mortgage insurer's available assets, which generally include only the most liquid assets of an insurer, to meet or exceed “minimum required assets” as of each quarter end. Minimum required assets are calculated from PMIERs tables with several risk dimensions (including origination year, original loan-to-value and original credit score of performing loans, and the delinquency status of non-performing loans) and are subject to a minimum amount. Arch MI U.S. satisfied the PMIERs' financial requirements as of March 31, 2019 with an estimated PMIER sufficiency ratio of 146% , compared to 141% at December 31, 2018 .

Arch Capital, through its subsidiaries, provides financial support to certain of its insurance subsidiaries and affiliates, through certain reinsurance arrangements beneficial to the ratings of such subsidiaries. Historically, our insurance, reinsurance and mortgage insurance subsidiaries have entered into separate reinsurance arrangements with Arch Re Bermuda covering individual lines of business. The reinsurance agreements between our U.S.-based property casualty insurance and reinsurance subsidiaries and Arch Re Bermuda were canceled on a cutoff basis as of January 1, 2018. As a result, the level of subject business ceded to Arch Re Bermuda for the reported periods was substantially lower than in 2017 and prior periods.

SHARE REPURCHASE PROGRAM

The board of directors of Arch Capital has authorized the investment in Arch Capital's common shares through a share repurchase program. For the three months ended March 31, 2019 , Arch Capital repurchased 0.1 million shares under the share repurchase program with an aggregate purchase price of \$2.9 million . Since the inception of the share repurchase program through March 31, 2019 , Arch Capital has repurchased 386.3 million common shares for an aggregate purchase price of \$3.97 billion . At March 31, 2019 , approximately \$160.9 million of share repurchases were available under the program, which may be effected from time

to time in open market or privately negotiated transactions through December 31, 2019.

The timing and amount of the repurchase transactions under this program will depend on a variety of factors, including market conditions and corporate and regulatory considerations. We will continue to monitor our share price and, depending upon results of operations, market conditions and the development of the economy, as well as other factors, we will consider share repurchases on an opportunistic basis.

CATASTROPHIC EVENTS AND SEVERE ECONOMIC EVENTS

We have large aggregate exposures to natural and man-made catastrophic events and severe economic events. Catastrophes can be caused by various events, including hurricanes, floods, windstorms, earthquakes, hailstorms, tornadoes, explosions, severe winter weather, fires, droughts and other natural disasters. Catastrophes can also cause losses in non-property business such as mortgage insurance, workers' compensation or general liability. In addition to the nature of property business, we believe that economic and geographic trends affecting insured property, including inflation, property value appreciation and geographic concentration, tend to generally increase the size of losses from catastrophic events over time.

Our models employ both proprietary and vendor-based systems and include cross-line correlations for property, marine, offshore energy, aviation, workers compensation and personal accident. We seek to limit the probable maximum pre-tax loss to a specific level for severe catastrophic events. Currently, we seek to limit our 1-in-250 year return period net probable maximum loss from a severe catastrophic event in any geographic zone to approximately 25% of total shareholders' equity available to Arch. We reserve the right to change this threshold at any time.

Based on in-force exposure estimated as of April 1, 2019 , our modeled peak zone catastrophe exposure was a windstorm affecting the Northeastern U.S., with a net probable maximum pre-tax loss of \$371 million , followed by windstorms affecting Florida Tri-County and the Gulf of Mexico regions with net probable maximum pre-tax losses of \$313 million and \$302 million , respectively. Our exposures to other perils, such as U.S. earthquake and international events, were less than the exposures arising from U.S. windstorms and hurricanes. As of April 1, 2019 , our modeled peak zone earthquake exposure (San Francisco earthquake) represented approximately 80% of our peak zone catastrophe exposure, and our modeled peak zone international exposure (Japan earthquake) was substantially less than both our peak zone windstorm and earthquake exposures.

Effective July 1, 2018, our insurance operations had in effect a reinsurance program which provided coverage for certain property-catastrophe related losses equal to \$275 million in excess of various retentions per occurrence. Such amounts compare to \$200 million in excess of a \$150 million retention per occurrence prior to July 1, 2018.

We also have significant exposure to losses due to mortgage defaults resulting from severe economic events in the future. For our U.S. mortgage insurance business, we have developed a proprietary risk model (“Realistic Disaster Scenario” or “RDS”) that simulates the maximum loss resulting from a severe economic downturn impacting the housing market. The RDS models the collective impact of adverse conditions for key economic indicators, the most significant of which is a decline in home prices. The RDS model projects paths of future home prices, unemployment rates, income levels and interest rates and assumes correlation across states and geographic regions. The resulting future performance of our in-force portfolio is then estimated under the economic stress scenario, reflecting loan and borrower information.

Currently, we seek to limit our modeled RDS loss from a severe economic event to approximately 25% of total tangible shareholders’ equity available to Arch (total shareholders’ equity available to Arch less goodwill and intangible assets). We reserve the right to change this threshold at any time. Based on in-force exposure estimated as of April 1, 2019, our modeled RDS loss was less than 10% of tangible shareholders’ equity available to Arch.

Net probable maximum loss estimates are net of expected reinsurance recoveries, before income tax and before excess reinsurance reinstatement premiums. RDS loss estimates are net of expected reinsurance recoveries and after income tax. Catastrophe loss estimates are reflective of the zone indicated and not the entire portfolio. Since hurricanes and windstorms can affect more than one zone and make multiple landfalls, our catastrophe loss estimates include clash estimates from other zones. Our catastrophe loss estimates and RDS loss estimates do not represent our maximum exposures and it is highly likely that our actual incurred losses would vary materially from the modeled estimates. There can be no assurances that we will not suffer pre-tax losses greater than 25% of our total shareholders’ equity or tangible shareholders’ equity from one or more catastrophic events or severe economic events due to several factors, including the inherent uncertainties in estimating the frequency and severity of such events and the margin of error in making such determinations resulting from potential inaccuracies and inadequacies in the data provided by clients and brokers, the modeling techniques and the application of such techniques or as a result of a decision to change the percentage of shareholders’ equity exposed to a single catastrophic event or severe economic event. In addition, actual losses may increase if our reinsurers fail to meet their obligations to us or the reinsurance protections purchased by

us are exhausted or are otherwise unavailable. See “Risk Factors—Risks Relating to Our Industry” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Catastrophic Events and Severe Economic Events” in our 2018 Form 10-K.

OFF-BALANCE SHEET ARRANGEMENTS

Off-balance sheet arrangements are discussed in Management’s Discussion and Analysis of Financial Condition and Results of Operations contained in our 2018 Form 10-K.

MARKET SENSITIVE INSTRUMENTS AND RISK MANAGEMENT

In accordance with the SEC’s Financial Reporting Release No. 48, we performed a sensitivity analysis to determine the effects that market risk exposures could have on the future earnings, fair values or cash flows of our financial instruments as of March 31, 2019. Market risk represents the risk of changes in the fair value of a financial instrument and is comprised of several components, including liquidity, basis and price risks. We have not included Watford Re in the following analyses as we do not guarantee or provide credit support for Watford Re, and our financial exposure to Watford Re is limited to our investment in Watford Re’s common and preferred shares and counterparty credit risk (mitigated by collateral) arising from reinsurance transactions.

An analysis of material changes in market risk exposures at March 31, 2019 that affect the quantitative and qualitative disclosures presented in our 2018 Form 10-K (see section captioned “Management’s Discussion and Analysis of Financial Condition and Results of Operations—Market Sensitive Instruments and Risk Management”) were as follows:

Investment Market Risk

Fixed Income Securities. We invest in interest rate sensitive securities, primarily debt securities. We consider the effect of interest rate movements on the fair value of our fixed maturities, fixed maturities pledged under securities lending agreements, short-term investments and certain of our other investments which invest in fixed income securities and the corresponding change in unrealized appreciation. As interest rates rise, the fair value of our interest rate sensitive securities falls, and the converse is also true. Based on historical observations, there is a low probability that all interest rate yield curves would shift in the same direction at the same time. Furthermore, at times interest rate movements in certain credit sectors exhibit a much lower correlation to changes in U.S. Treasury yields. Accordingly, the actual effect of interest rate movements may differ materially from the amounts set forth in the following tables.

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The following table summarizes the effect that an immediate, parallel shift in the interest rate yield curve would have had on our fixed income securities:

(U.S. dollars in billions)	Interest Rate Shift in Basis Points				
	-100	-50	—	+50	+100
Mar 31, 2019					
Total fair value	\$ 19.61	\$ 19.29	\$ 18.98	\$ 18.64	\$ 18.32
Change from base	3.3%	1.6%		(1.8)%	(3.5)%
Change in unrealized value	\$ 0.63	\$ 0.30		\$ (0.34)	\$ (0.66)
Dec 31, 2018					
Total fair value	\$ 19.23	\$ 18.91	\$ 18.62	\$ 18.30	\$ 17.98
Change from base	3.3%	1.6%		(1.7)%	(3.4)%
Change in unrealized value	\$ 0.61	\$ 0.30		\$ (0.32)	\$ (0.63)

In addition, we consider the effect of credit spread movements on the market value of our fixed maturities, fixed maturities pledged under securities lending agreements, short-term investments and certain of our other investments and investment funds accounted for using the equity method which invest in fixed income securities and the corresponding change in unrealized appreciation. As credit spreads widen, the fair value of our fixed income securities falls, and the converse is also true.

The following table summarizes the effect that an immediate, parallel shift in credit spreads in a static interest rate environment would have had on our fixed income securities:

(U.S. dollars in billions)	Credit Spread Shift in Percentage Points				
	-100	-50	—	+50	+100
Mar 31, 2019					
Total fair value	\$ 19.42	\$ 19.19	\$ 18.98	\$ 18.77	\$ 18.55
Change from base	2.3%	1.1%		(1.1)%	(2.3)%
Change in unrealized value	\$ 0.44	\$ 0.21		\$ (0.21)	\$ (0.44)
Dec 31, 2018					
Total fair value	\$ 19.08	\$ 18.84	\$ 18.62	\$ 18.39	\$ 18.15
Change from base	2.5%	1.2%		(1.2)%	(2.5)%
Change in unrealized value	\$ 0.47	\$ 0.22		\$ (0.22)	\$ (0.47)

Another method that attempts to measure portfolio risk is Value-at-Risk (“VaR”). VaR attempts to take into account a broad cross-section of risks facing a portfolio by utilizing relevant securities volatility data skewed towards the most recent months and quarters. VaR measures the amount of a portfolio at risk for outcomes 1.65 standard deviations from the mean based on normal market conditions over a one year time horizon and is expressed as a percentage of the portfolio’s initial value. In other words, 95% of the time, should the risks taken into account in the VaR model perform per their historical tendencies, the portfolio’s loss in any one year period is expected to be less than or equal to the calculated VaR, stated

as a percentage of the measured portfolio’s initial value. As of March 31, 2019, our portfolio’s VaR was estimated to be 3.29% compared to an estimated 3.02% at December 31, 2018.

Equity Securities. At March 31, 2019 and December 31, 2018, the fair value of our investments in equity securities totaled \$495.0 million and \$368.8 million, respectively. These investments are exposed to price risk, which is the potential loss arising from decreases in fair value. An immediate hypothetical 10% decline in the value of each position would reduce the fair value of such investments by approximately \$49.5 million and \$36.9 million at March 31, 2019 and December 31, 2018, respectively, and would have decreased book value per share by approximately \$0.12 and \$0.09, respectively. An immediate hypothetical 10% increase in the value of each position would increase the fair value of such investments by approximately \$49.5 million and \$36.9 million at March 31, 2019 and December 31, 2018, respectively, and would have increased book value per share by approximately \$0.12 and \$0.09, respectively.

Investment-Related Derivatives. At March 31, 2019, the notional value of all derivative instruments (excluding to-be-announced mortgage backed securities which are included in the fixed income securities analysis above and foreign currency forward contracts which are included in the foreign currency exchange risk analysis below) was \$6.16 billion, compared to \$4.95 billion at December 31, 2018. If the underlying exposure of each investment-related derivative held at March 31, 2019 depreciated by 100 basis points, it would have resulted in a reduction in net income of approximately \$61.6 million, and a decrease in book value per share of approximately \$0.15 per share, compared to \$49.5 million and \$0.12 per share, respectively, on investment-related derivatives held at December 31, 2018. If the underlying exposure of each investment-related derivative held at March 31, 2019 appreciated by 100 basis points, it would have resulted in an increase in net income of approximately \$61.6 million, and an increase in book value per share of approximately \$0.15 per share, compared to \$49.5 million and \$0.12 per share, respectively, on investment-related derivatives held at December 31, 2018. See [note 8, “Derivative Instruments,”](#) to our consolidated financial statements for additional disclosures concerning derivatives.

For further discussion on investment activity, please refer to “Financial Condition—Investable Assets.”

Foreign Currency Exchange Risk

Foreign currency rate risk is the potential change in value, income and cash flow arising from adverse changes in foreign currency exchange rates. Through our subsidiaries and branches located in various foreign countries, we conduct our insurance and reinsurance operations in a variety of local currencies other than the U.S. Dollar. We generally hold

investments in foreign currencies which are intended to mitigate our exposure to foreign currency fluctuations in our net insurance liabilities. We may also utilize foreign currency forward contracts and currency options as part of our investment strategy. See [note 8, “Derivative Instruments,”](#) to our consolidated financial statements for additional information.

The following table provides a summary of our net foreign currency exchange exposures, as well as foreign currency derivatives in place to manage these exposures:

(U.S. dollars in thousands, except per share data)	March 31, 2019	December 31, 2018
Net assets (liabilities), denominated in foreign currencies, excluding shareholders' equity and derivatives	\$ (435,022)	\$ (561,311)
Shareholders' equity denominated in foreign currencies (1)	521,206	478,678
Net foreign currency forward contracts outstanding (2)	126,404	241,442
Net exposures denominated in foreign currencies	\$ 212,588	\$ 158,809
Pre-tax impact of a hypothetical 10% appreciation of the U.S. Dollar against foreign currencies:		
Shareholders' equity	\$ (21,259)	\$ (15,881)
Book value per share	\$ (0.05)	\$ (0.04)
Pre-tax impact of a hypothetical 10% decline of the U.S. Dollar against foreign currencies:		
Shareholders' equity	\$ 21,259	\$ 15,881
Book value per share	\$ 0.05	\$ 0.04

- (1) Represents capital contributions held in the foreign currencies of our operating units.
(2) Represents the net notional value of outstanding foreign currency forward contracts.

Although we generally attempt to match the currency of our projected liabilities with investments in the same currencies, from time to time we may elect to over or underweight one or more currencies, which could increase our exposure to foreign currency fluctuations and increase the volatility of our shareholders' equity. Historical observations indicate a low probability that all foreign currency exchange rates would shift against the U.S. Dollar in the same direction and at the same time and, accordingly, the actual effect of foreign currency rate movements may differ materially from the amounts set forth above. For further discussion on foreign exchange activity, please refer to “—Results of Operations.”

Effects of Inflation

We do not believe that inflation has had a material effect on our consolidated results of operations, except insofar as inflation may affect our reserves for losses and loss adjustment expenses and interest rates. The potential exists, after a catastrophe loss, for the development of inflationary pressures in a local economy. The anticipated effects of inflation on us are

considered in our catastrophe loss models. The actual effects of inflation on our results cannot be accurately known until claims are ultimately settled.

OTHER FINANCIAL INFORMATION

The consolidated financial statements as of March 31, 2019 and for the three month periods ended March 31, 2019 and 2018 have been reviewed by PricewaterhouseCoopers LLP, the registrant's independent public accountants, whose report is included as an exhibit to this filing. The report of PricewaterhouseCoopers LLP states that they did not audit and they do not express an opinion on that unaudited financial information. Accordingly, the degree of reliance on their report on such information should be restricted in light of the limited nature of the review procedures applied. PricewaterhouseCoopers LLP is not subject to the liability provisions of Section 11 of the Securities Act of 1933 for their report on the unaudited financial information because that report is not a "report" or a "part" of the registration statement prepared or certified by PricewaterhouseCoopers LLP within the meaning of Sections 7 and 11 of the Securities Act of 1933.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Reference is made to the information appearing above under the subheading “Market Sensitive Instruments and Risk Management” under the caption “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” which information is hereby incorporated by reference.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

In connection with the filing of this Form 10-Q, our management, including the Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness of disclosure controls and procedures pursuant to applicable Exchange Act Rules as of the end of the period covered by this report. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that the disclosure controls and procedures were effective as of the end of and during the period covered by this report with respect to information being recorded, processed, summarized and reported within time periods specified in the SEC's rules and forms and with respect to timely communication to them and other members of management responsible for preparing periodic reports of all material information required to be disclosed in this report as it relates to Arch Capital and its consolidated subsidiaries.

We continue to enhance our operating procedures and internal controls to effectively support our business and our regulatory and reporting requirements. Our management does not expect that our disclosure controls or our internal controls will prevent all errors and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. As a result of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within the company have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons or by collusion of two or more people. The design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, controls may become inadequate because of changes in conditions, or the degree of compliance with the policies or procedures may deteriorate. As a result of the inherent limitations in a cost-effective control system, misstatement due to error or fraud may occur and not be detected. Accordingly, our disclosure controls and procedures are designed to provide reasonable, not absolute, assurance that the disclosure controls and procedures are met.

Changes in Internal Controls Over Financial Reporting

There have been no changes in internal control over financial reporting that occurred during the quarter ended March 31, 2019 that have materially affected, or are reasonably likely to materially affect, internal control over financial reporting.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

We, in common with the insurance industry in general, are subject to litigation and arbitration in the normal course of our business. As of March 31, 2019, we were not a party to any litigation or arbitration which is expected by management to have a material adverse effect on our results of operations and financial condition and liquidity.

ITEM 1A. RISK FACTORS

There were no material changes from the risk factors previously disclosed in our Annual Report on Form 10-K for the year ended December 31, 2018.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

The following table summarizes our purchases of common shares for the 2019 first quarter :

Period	Issuer Purchases of Equity Securities			
	Total Number of Shares Purchased (1)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares that May Yet be Purchased Under the Plan or Programs (2)
1/1/2019 - 1/31/2019	119,663	\$ 26.11	110,598	\$ 160,867
2/1/2019 - 2/28/2019	65,520	31.46	—	\$ 160,867
3/1/2019 - 3/31/2019	31,967	32.50	—	\$ 160,867
Total	217,150	\$ 28.66	110,598	

- (1) Represents repurchases by Arch Capital of shares, from time to time, from employees in order to facilitate the payment of withholding taxes on restricted shares granted and the exercise of stock appreciation rights. We purchased these shares at their fair value, as determined by reference to the closing price of our common shares on the day the restricted shares vested or the stock appreciation rights were exercised.
- (2) Remaining amount available at March 31, 2019 under Arch Capital's share repurchase authorization, under which repurchases may be effected from time to time in open market or privately negotiated transactions through December 31, 2019.

ITEM 5. OTHER INFORMATION

In accordance with Section 10a(i)(2) of the Securities Exchange Act of 1934, as amended, we are responsible for disclosing non-audit services to be provided by our independent auditor, PricewaterhouseCoopers LLP, which are approved by the Audit Committee of our board of directors. During the 2019 first quarter, the Audit Committee approved engagements of PricewaterhouseCoopers LLP for permitted non-audit services, which consisted of tax consulting services, tax compliance services and other accounting consulting services.

Disclosure of Certain Activities Under Section 13(r) of the Securities Exchange Act of 1934

Section 13(r) of the Securities Exchange Act of 1934, as amended, requires an issuer to disclose in its annual or quarterly reports whether it or an affiliate knowingly engaged in certain activities described in that section, including certain activities related to Iran during the period covered by the report.

Certain of our non-U.S. subsidiaries underwrite insurance and facultative reinsurance on a global basis to non-U.S. insureds and insurers, including for liability, marine, aviation and energy risks. Coverage provided to non-Iranian business may indirectly cover an exposure in Iran. For example, certain of our operations underwrite global marine hull and cargo policies that provide coverage for vessels navigating into and out of ports worldwide, including Iran. For the quarter ended March 31, 2019, there has been no material amount of premium allocated or apportioned to activities relating to Iran, and we are unable to attribute gross revenues or net profits from any such policies because they insure multiple voyages and fleets containing multiple ships. Such non-U.S. subsidiaries will continue to provide such coverage only to the extent permitted by applicable law.

ITEM 6. EXHIBITS

Exhibit Number	Exhibit Description	Incorporated by Reference			Filed Herewith
		Form	Original Number	Date Filed	
10.1	Agreement dated as of March 15, 2019 between the Company and Constantine Iordanou†	8-K	10.1	March 21, 2019	
15	Accountants' Awareness Letter (regarding unaudited interim financial information)				X
31.1	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				X
31.2	Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				X
32.1	Certification of Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002				X
32.2	Certification of Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002				X
101	The following financial information from Arch Capital Group Ltd.'s Quarterly Report for the quarter ended March 31, 2019 formatted in XBRL: (i) Consolidated Balance Sheets at March 31, 2019 and December 31, 2018; (ii) Consolidated Statements of Income for the three month periods ended March 31, 2019 and 2018; (iii) Consolidated Statements of Comprehensive Income for the three month periods ended March 31, 2019 and 2018; (iv) Consolidated Statements of Changes in Shareholders' Equity for the three month periods ended March 31, 2019 and 2018; (v) Consolidated Statements of Cash Flows for the three month periods ended March 31, 2019 and 2018; and (vi) Notes to Consolidated Financial Statements.				X
†	Management contract or compensatory plan or arrangement				

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.

ARCH CAPITAL GROUP LTD.
(REGISTRANT)

Date: May 7, 2019

/s/ Marc Grandisson

Marc Grandisson
President and Chief Executive Officer (Principal Executive Officer)

Date: May 7, 2019

/s/ François Morin

François Morin
Executive Vice President, Chief Financial Officer and Treasurer (Principal Financial and Accounting Officer)

May 7, 2019

Securities and Exchange Commission
100 F Street, N.E.
Washington, DC 20549

Commissioners:

We are aware that our report dated May 7, 2019, on our review of interim financial information of Arch Capital Group Ltd., which appears in this Quarterly Report on Form 10-Q, is incorporated by reference in the Registration Statements on Form S-3 (Nos. 333-221344, 333-221344-01 and 333-221344-02) and in the Registration Statements on Form S-8 (Nos. 333-211193, 333-98971, 333-142835, 333-181308, 333-203993 and 333-224783) of Arch Capital Group Ltd.

Very truly yours,

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
New York, NY

1 of 1

Certification
of Chief Executive Officer
Pursuant to Section 302 of the
Sarbanes-Oxley Act of 2002

I, Marc Grandisson, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Arch Capital Group Ltd.;
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 the 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 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 to the audit committee of 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: May 7, 2019

By: /s/ Marc Grandisson

Name: Marc Grandisson

Title: President and Chief Executive Officer

Certification
of Chief Financial Officer
Pursuant to Section 302 of the
Sarbanes-Oxley Act of 2002

I, François Morin, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Arch Capital Group Ltd.;
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 the 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 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 to the audit committee of 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: May 7, 2019

By: /s/ François Morin

Name: François Morin

Title: Executive Vice President, Chief Financial Officer
and Treasurer

Certification Pursuant to Chapter 63, Title 18 United States Code §1350**As Adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002**

In connection with the Quarterly Report of Arch Capital Group Ltd. (the “Company”) on Form 10-Q for the period ending March 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), Marc Grandisson, as President and Chief Executive Officer of the Company, certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) the Report fully complies with the requirements of section 13(a) of the Securities Exchange Act of 1934; and
- (2) the information contained in such report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: May 7, 2019

By: /s/ Marc Grandisson

Name: Marc Grandisson

Title: President and Chief Executive Officer

A signed original of this written statement required by Section 906 or other document authenticating, acknowledging or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to Arch Capital Group Ltd. and will be retained by Arch Capital Group Ltd. and furnished to the Securities and Exchange Commission or its staff upon request.

Certification Pursuant to Chapter 63, Title 18 United States Code §1350**As Adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002**

In connection with the Quarterly Report of Arch Capital Group Ltd. (the “Company”) on Form 10-Q for the period ending March 31, 2019 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), François Morin, as Executive Vice President, Chief Financial Officer and Treasurer of the Company, certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) the Report fully complies with the requirements of section 13(a) of the Securities Exchange Act of 1934; and
- (2) the information contained in such report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: May 7, 2019

By: /s/ François Morin

Name: François Morin

Title: Executive Vice President, Chief Financial Officer and
Treasurer

A signed original of this written statement required by Section 906 or other document authenticating, acknowledging or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to Arch Capital Group Ltd. and will be retained by Arch Capital Group Ltd. and furnished to the Securities and Exchange Commission or its staff upon request.