

**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**

June 30, 2016

Or

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

Commission file number: 001-26456



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**
(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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). Yes ☒ No ☐

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

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐

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

As of July 28, 2016, there were 122,572,026 common shares, \$0.0033 par value per share, of the registrant outstanding.

ARCH CAPITAL GROUP LTD.

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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 release 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 release 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 release 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;
- 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, 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 forms 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;
- the integration of businesses we have acquired or may acquire into our existing operations;
- 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 June 30, 2016 ;
- 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 in our insurance or reinsurance business could cause large losses and substantial volatility in our results of operations;
- 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;
- losses relating to aviation business and business produced by a certain managing underwriting agency for which we may be liable to the purchaser of our prior reinsurance business or to others in connection with the May 5, 2000 asset sale described in our periodic reports filed with the SEC;
- 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;
- statutory or regulatory developments, including as to tax policy and 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; 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, 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.:

We have reviewed the accompanying consolidated balance sheet of Arch Capital Group Ltd. and its subsidiaries (the “Company”) as of June 30, 2016 , and the related consolidated statements of income and comprehensive income for the three-month and six-month periods ended June 30, 2016 and June 30, 2015 , and the consolidated statements of changes in shareholders’ equity and cash flows for the six-month periods ended June 30, 2016 and June 30, 2015 . These interim financial statements are the responsibility of the Company’s management.

We conducted our review in accordance with the standards of the Public Company Accounting Oversight Board (United States). 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 Public Company Accounting Oversight Board (United States), 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.

Based on our review, we are not aware of any material modifications that should be made to the accompanying consolidated interim financial statements for them to be in conformity with accounting principles generally accepted in the United States of America.

We previously audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheet as of December 31, 2015 , 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 26, 2016, we expressed an unqualified opinion on those consolidated financial statements. In our opinion, the information set forth in the accompanying consolidated balance sheet information as of December 31, 2015 , is fairly stated in all material respects in relation to the consolidated balance sheet from which it has been derived.

/s/ PricewaterhouseCoopers LLP

August 5, 2016

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

	(Unaudited) June 30, 2016	December 31, 2015
Assets		
Investments:		
Fixed maturities available for sale, at fair value (amortized cost: \$10,879,863 and \$10,515,440)	\$ 11,050,464	\$ 10,459,353
Short-term investments available for sale, at fair value (amortized cost: \$855,764 and \$591,141)	853,531	587,904
Collateral received under securities lending, at fair value (amortized cost: \$338,318 and \$385,984)	338,326	389,336
Equity securities available for sale, at fair value (cost: \$414,537 and \$543,767)	490,815	618,405
Other investments available for sale, at fair value (cost: \$167,914 and \$261,343)	182,957	300,476
Investments accounted for using the fair value option	3,066,029	2,894,494
Investments accounted for using the equity method	685,766	592,973
Total investments	16,667,888	15,842,941
Cash	516,591	553,326
Accrued investment income	85,317	87,206
Securities pledged under securities lending, at fair value (amortized cost: \$328,274 and \$386,411)	330,773	384,081
Premiums receivable	1,260,607	983,443
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	2,034,970	1,867,373
Contractholder receivables	1,600,426	1,486,296
Prepaid reinsurance premiums	540,954	427,609
Deferred acquisition costs, net	462,906	433,477
Receivable for securities sold	142,315	45,505
Goodwill and intangible assets	88,327	97,531
Other assets	680,843	968,482
Total assets	\$ 24,411,917	\$ 23,177,270
Liabilities		
Reserve for losses and loss adjustment expenses	\$ 9,471,647	\$ 9,125,250
Unearned premiums	2,618,359	2,333,932
Reinsurance balances payable	295,987	224,120
Contractholder payables	1,600,426	1,486,296
Collateral held for insured obligations	261,228	248,982
Deposit accounting liabilities	22,325	260,364
Senior notes	791,392	791,306
Revolving credit agreement borrowings	397,830	530,434
Securities lending payable	338,318	393,844
Payable for securities purchased	382,834	64,996
Other liabilities	533,694	568,852
Total liabilities	16,714,040	16,028,376
Commitments and Contingencies		
Redeemable noncontrolling interests	205,366	205,182
Shareholders' Equity		
Non-cumulative preferred shares	325,000	325,000
Common shares (\$0.0033 par, shares issued: 174,355,513 and 173,107,849)	581	577
Additional paid-in capital	517,942	467,339
Retained earnings	7,725,255	7,370,371
Accumulated other comprehensive income (loss), net of deferred income tax	163,834	(16,502)
Common shares held in treasury, at cost (shares: 51,783,253 and 50,480,066)	(2,028,690)	(1,941,904)
Total shareholders' equity available to Arch	6,703,922	6,204,881
Non-redeemable noncontrolling interests	788,589	738,831
Total shareholders' equity	7,492,511	6,943,712
Total liabilities, noncontrolling interests and shareholders' equity	\$ 24,411,917	\$ 23,177,270

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

	(Unaudited)		(Unaudited)	
	Three Months Ended		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Revenues				
Net premiums written	\$ 1,023,563	\$ 943,580	\$ 2,144,798	\$ 2,010,575
Change in unearned premiums	(17,578)	(142)	(187,234)	(156,873)
Net premiums earned	1,005,985	943,438	1,957,564	1,853,702
Net investment income	88,338	86,963	182,073	165,957
Net realized gains (losses)	68,218	(35,725)	105,542	47,623
Other-than-temporary impairment losses	(5,395)	(1,126)	(13,132)	(8,373)
Less investment impairments recognized in other comprehensive income, before taxes	52	13	150	1,461
Net impairment losses recognized in earnings	(5,343)	(1,113)	(12,982)	(6,912)
Other underwriting income	25,224	7,717	30,271	19,253
Equity in net income (loss) of investment funds accounted for using the equity method	8,737	16,167	15,392	22,056
Other income (loss)	(7)	2,205	(32)	317
Total revenues	1,191,152	1,019,652	2,277,828	2,101,996
Expenses				
Losses and loss adjustment expenses	584,592	519,426	1,107,541	1,013,142
Acquisition expenses	175,281	175,425	345,746	338,501
Other operating expenses	159,590	151,190	311,859	299,727
Corporate expenses	17,200	17,418	26,583	26,763
Interest expense	15,663	4,011	31,770	16,747
Net foreign exchange (gains) losses	(24,662)	19,583	(1,096)	(46,918)
Total expenses	927,664	887,053	1,822,403	1,647,962
Income before income taxes	263,488	132,599	455,425	454,034
Income tax expense	(14,131)	(6,780)	(30,441)	(19,458)
Net income	\$ 249,357	\$ 125,819	\$ 424,984	\$ 434,576
Net (income) loss attributable to noncontrolling interests	(38,302)	(10,029)	(59,131)	(35,450)
Net income available to Arch	211,055	115,790	365,853	399,126
Preferred dividends	(5,485)	(5,485)	(10,969)	(10,969)
Net income available to Arch common shareholders	\$ 205,570	\$ 110,305	\$ 354,884	\$ 388,157
Net income per common share				
Basic	\$ 1.70	\$ 0.91	\$ 2.94	\$ 3.16
Diluted	\$ 1.65	\$ 0.88	\$ 2.85	\$ 3.05
Weighted average common shares and common share equivalents outstanding				
Basic	120,599,060	121,719,214	120,513,620	122,957,384
Diluted	124,365,596	125,885,420	124,425,126	127,156,713

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 June 30,		(Unaudited) Six Months Ended June 30,	
	2016	2015	2016	2015
Comprehensive Income				
Net income	\$ 249,357	\$ 125,819	\$ 424,984	\$ 434,576
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	102,460	(81,935)	235,441	2,369
Portion of other-than-temporary impairment losses recognized in other comprehensive income, net of deferred income tax	(52)	(13)	(150)	(1,461)
Reclassification of net realized (gains) losses, net of income taxes, included in net income	(22,094)	(21,214)	(54,317)	(52,146)
Foreign currency translation adjustments	(18,151)	11,580	(838)	(11,177)
Comprehensive income	311,520	34,237	605,120	372,161
Net (income) loss attributable to noncontrolling interests	(38,302)	(10,029)	(59,131)	(35,450)
Foreign currency translation adjustments attributable to noncontrolling interests	42	—	200	—
Comprehensive income available to Arch	\$ 273,260	\$ 24,208	\$ 546,189	\$ 336,711

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) Six Months Ended June 30,	
	2016	2015
Non-cumulative preferred shares		
Balance at beginning and end of period	\$ 325,000	\$ 325,000
Common shares		
Balance at beginning of year	577	572
Common shares issued, net	4	4
Balance at end of period	581	576
Additional paid-in capital		
Balance at beginning of year	467,339	383,073
Common shares issued, net	8,265	7,378
Exercise of stock options	5,143	9,624
Amortization of share-based compensation	35,769	36,044
Other	1,426	1,414
Balance at end of period	517,942	437,533
Retained earnings		
Balance at beginning of year	7,370,371	6,854,571
Net income	424,984	434,576
Net (income) loss attributable to noncontrolling interests	(59,131)	(35,450)
Preferred share dividends	(10,969)	(10,969)
Balance at end of period	7,725,255	7,242,728
Accumulated other comprehensive income (loss), net of deferred income tax		
Balance at beginning of year	(16,502)	128,856
Unrealized appreciation (decline) in value of available-for-sale investments, net of deferred income tax:		
Balance at beginning of year	50,085	161,598
Unrealized holding gains (losses) arising during period, net of reclassification adjustment	181,124	(49,777)
Portion of other-than-temporary impairment losses recognized in other comprehensive income, net of deferred income tax	(150)	(1,461)
Balance at end of period	231,059	110,360
Foreign currency translation adjustments:		
Balance at beginning of year	(66,587)	(32,742)
Foreign currency translation adjustments	(838)	(11,177)
Foreign currency translation adjustments attributable to noncontrolling interests	200	—
Balance at end of period	(67,225)	(43,919)
Balance at end of period	163,834	66,441
Common shares held in treasury, at cost		
Balance at beginning of year	(1,941,904)	(1,562,019)
Shares repurchased for treasury	(86,786)	(372,744)
Balance at end of period	(2,028,690)	(1,934,763)
Total shareholders' equity available to Arch	6,703,922	6,137,515
Non-redeemable noncontrolling interests	788,589	794,880
Total shareholders' equity	\$ 7,492,511	\$ 6,932,395

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

	(Unaudited) Six Months Ended June 30,	
	2016	2015
Operating Activities		
Net income	\$ 424,984	\$ 434,576
Adjustments to reconcile net income to net cash provided by operating activities:		
Net realized (gains) losses	(126,337)	(60,818)
Net impairment losses recognized in earnings	12,982	6,912
Equity in net income or loss of investment funds accounted for using the equity method and other income or loss	11,161	(10,349)
Share-based compensation	35,769	36,044
Changes in:		
Reserve for losses and loss adjustment expenses, net of unpaid losses and loss adjustment expenses recoverable	186,199	91,616
Unearned premiums, net of prepaid reinsurance premiums	187,234	156,873
Premiums receivable	(278,814)	(206,642)
Deferred acquisition costs, net	(33,450)	(39,009)
Reinsurance balances payable	73,712	19,657
Other liabilities	56,314	(94,841)
Other items	(8,530)	51,180
Net Cash Provided By Operating Activities	541,224	385,199
Investing Activities		
Purchases of fixed maturity investments	(17,541,731)	(14,641,391)
Purchases of equity securities	(212,678)	(288,535)
Purchases of other investments	(650,613)	(779,678)
Proceeds from sales of fixed maturity investments	16,978,549	14,333,436
Proceeds from sales of equity securities	337,619	272,343
Proceeds from sales, redemptions and maturities of other investments	636,535	587,650
Proceeds from redemptions and maturities of fixed maturity investments	370,980	474,984
Net settlements of derivative instruments	45,174	19,006
Proceeds from investment in joint venture	—	40,000
Net (purchases) sales of short-term investments	(304,460)	3,707
Change in cash collateral related to securities lending	(18,715)	(18,329)
Purchase of business, net of cash acquired	(1,460)	818
Purchases of fixed assets	(8,284)	(6,396)
Change in other assets	13,416	(36,769)
Net Cash Provided By (Used For) Investing Activities	(355,668)	(39,154)
Financing Activities		
Purchases of common shares under share repurchase program	(75,256)	(361,877)
Proceeds from common shares issued, net	(1,487)	2,178
Proceeds from borrowings	46,000	—
Repayments of borrowings	(179,171)	—
Change in cash collateral related to securities lending	18,715	18,329
Dividends paid to redeemable noncontrolling interests	(8,994)	(9,313)
Other	(2,223)	55,018
Preferred dividends paid	(10,969)	(10,969)
Net Cash Provided By (Used For) Financing Activities	(213,385)	(306,634)
Effects of exchange rate changes on foreign currency cash	(8,906)	(39)
Increase (decrease) in cash	(36,735)	39,372
Cash beginning of year	553,326	485,702
Cash end of period	\$ 516,591	\$ 525,074
Income taxes paid	\$ 26,619	\$ 25,992
Interest paid	\$ 31,524	\$ 25,076

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

1. General

Arch Capital Group Ltd. (“ACGL”) is a Bermuda public limited liability company which provides insurance and reinsurance on a worldwide basis through its wholly-owned subsidiaries. As used herein, the “Company” means ACGL and its subsidiaries. The Company’s consolidated financial statements include the results of Watford Holdings Ltd. and its wholly owned subsidiaries (“Watford Re”). See Note 3.

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 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, 2015 (“2015 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.

2. Recent Accounting Pronouncements

Recently Issued Accounting Standards Adopted

The Company adopted a new accounting standard in the 2016 first quarter that provided targeted improvements to consolidation guidance for limited partnerships and other similarly structured entities. The adoption of this standard resulted in the Company concluding that it no longer had a

variable interest in Alternative Re Ltd. and, as a result, no longer is required to consolidate Alternative Re Ltd. in its financial statements. Alternative Re Ltd. is a Bermuda-domiciled company that provides collateralized segregated accounts to its clients. The Company applied this new standard on a modified retrospective basis as of January 1, 2016. Such adoption did not impact the Company’s shareholders’ equity or net income.

The adoption of the new standard also resulted in a review of certain funds within the Company’s investment portfolio where the Company has a limited partnership interest. See Note 6 for disclosures on limited partnership interests.

The Company also adopted new accounting guidance pertaining to hybrid instruments. The new guidance clarified the evaluation of whether the nature of a host contract within a hybrid instrument issued in the form of a share is more akin to debt or equity. The Company has adopted this new guidance on a modified retrospective basis as of January 1, 2016. Based on a review of hybrid instruments issued in the form of a share (both held in its investment portfolio and issued as part of capital raising), the Company determined the new accounting guidance had no impact on the classification or accounting for its existing hybrid instruments.

Recently Issued Accounting Standards Not Yet Adopted

An accounting standard was issued in the 2015 second quarter requiring new disclosures about the reserve for losses and loss adjustment expenses for short-duration insurance contracts. These disclosures will provide additional insight into an insurance entity’s ability to underwrite and anticipate costs associated with claims. This accounting guidance is effective for the 2016 annual reporting period and interim periods thereafter and should be applied retrospectively. The Company is assessing the impact the implementation of this standard will have on the disclosures included in its consolidated financial statements.

A new accounting standard was issued in the 2016 first quarter to improve and simplify the accounting for employee share-based payment transactions. The new standard provides simplifications with respect to income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows for these types of transactions. The standard is effective in the 2017 first quarter and early adoption is permitted. The application of the new standard is dependent on the specific area that is amended. The Company is assessing the impact the implementation of this standard will have on its consolidated financial statements.

In the 2016 first quarter, new accounting guidance was issued pertaining to the accounting for leases by a lessee. The new accounting guidance requires that the lessee recognize an

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

asset and a liability for leases with a lease term greater than 12 months regardless of whether the lease is classified as operating or financing. Under current accounting, operating leases are not reflected in the balance sheet. This accounting guidance is effective for the 2019 first quarter, though early application is permitted, and should be applied on a modified retrospective basis. The Company is assessing the impact the implementation of this standard will have on its consolidated financial statements.

A new accounting standard was issued in the 2016 second quarter that changes how entities will measure credit losses for most financial assets and certain other instruments that aren't measured at fair value through net income. The standard requires an entity to estimate its lifetime "expected credit loss" and record an allowance that, when deducted from the amortized cost basis of the financial asset, presents the net amount expected to be collected on the financial asset. This accounting guidance is effective for the 2020 first quarter, though early application is permitted in the 2019 first quarter, and should be applied on a modified retrospective basis for the majority of the provisions. The Company is assessing the impact the implementation of this standard will have on its consolidated financial statements.

3. Variable Interest Entities and Noncontrolling Interests

A variable interest entity ("VIE") refers to an entity that has characteristics such as (i) insufficient equity at risk to allow the entity to finance its activities without additional financial support or (ii) instances where the equity investors, as a group, do not have characteristics of a controlling financial interest. The primary beneficiary of a VIE is defined as the variable interest holder that is determined to have the controlling financial interest as a result of having both (i) the power to direct the activities of a VIE that most significantly impact the economic performance of the VIE and (ii) the obligation to absorb losses or right to receive benefits from the VIE that could potentially be significant to the VIE. If a company is determined to be the primary beneficiary, it is required to consolidate the VIE in its financial statements.

Watford Holdings Ltd.

In March 2014, the Company invested \$100.0 million and acquired approximately 11% of Watford Holdings Ltd.'s common equity and a warrant to purchase additional common equity. Watford Holdings Ltd. is the parent of Watford Re Ltd., a multi-line Bermuda reinsurance company (together with Watford Holdings Ltd., "Watford Re"). 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.

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

	June 30, 2016	December 31, 2015
Assets		
Investments accounted for using the fair value option \$	1,677,836	\$ 1,617,107
Cash	74,525	108,550
Accrued investment income	16,329	19,249
Premiums receivable	197,062	162,263
Reinsurance recoverable on unpaid and paid losses	16,675	14,135
Prepaid reinsurance premiums	10,602	11,129
Deferred acquisition costs, net	80,304	75,443
Receivable for securities sold	40,467	34,095
Other assets	92,935	80,361
Total assets of consolidated VIE	\$ 2,206,735	\$ 2,122,332
Liabilities		
Reserves for losses and loss adjustment expenses \$	404,653	\$ 290,997
Unearned premiums	260,721	249,980
Reinsurance balances payable	12,872	14,005
Revolving credit agreement borrowings	297,830	430,434
Payable for securities purchased	34,729	33,062
Other liabilities	89,593	53,624
Total liabilities of consolidated VIE	\$ 1,100,398	\$ 1,072,102
Redeemable noncontrolling interests	\$ 220,066	\$ 219,882

For the six months ended June 30, 2016, Watford Re generated \$131.0 million of cash provided by operating activities, \$13.8 million of cash used for investing activities and \$148.2 million of cash used for financing activities, compared to \$137.8 million of cash provided by operating activities, \$134.9 million of cash used for investing activities and \$40.3 million of cash provided by financing activities for the six months ended June 30, 2015.

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 June 30, 2016. 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.'

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

	June 30,	
	2016	2015
Three Months Ended		
Balance, beginning of period	\$ 754,915	\$ 789,594
Amounts attributable to noncontrolling interests	33,716	5,286
Foreign currency translation adjustments attributable to noncontrolling interests	(42)	—
Balance, end of period	\$ 788,589	\$ 794,880
Six Months Ended		
Balance, beginning of year	\$ 738,831	\$ 769,081
Amounts attributable to noncontrolling interests	49,958	25,799
Foreign currency translation adjustments attributable to noncontrolling interests	(200)	—
Balance, end of period	\$ 788,589	\$ 794,880

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 March 2014 with a par value of \$0.01 per share and a liquidation preference of \$25.00 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:

	June 30,	
	2016	2015
Three Months Ended		
Balance, beginning of period	\$ 205,274	\$ 219,604
Shares acquired by the Company	—	(14,700)
Accretion of preference share issuance costs	92	92
Balance, end of period	\$ 205,366	\$ 204,996
Six Months Ended		
Balance, beginning of year	\$ 205,182	\$ 219,512
Shares acquired by the Company	—	(14,700)
Accretion of preference share issuance costs	184	184
Balance, end of period	\$ 205,366	\$ 204,996

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:

	June 30,	
	2016	2015
Three Months Ended		
Amounts attributable to non-redeemable noncontrolling interests	\$ (33,716)	\$ (5,286)
Dividends attributable to redeemable noncontrolling interests	(4,586)	(4,743)
Net (income) loss attributable to noncontrolling interests	\$ (38,302)	\$ (10,029)
Six Months Ended		
Amounts attributable to non-redeemable noncontrolling interests	\$ (49,958)	\$ (25,799)
Dividends attributable to redeemable noncontrolling interests	(9,173)	(9,651)
Net (income) loss attributable to noncontrolling interests	\$ (59,131)	\$ (35,450)

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4. Earnings Per Common Share

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

	Three Months Ended		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Numerator:				
Net income	\$ 249,357	\$ 125,819	\$ 424,984	\$ 434,576
Net (income) loss attributable to noncontrolling interests	(38,302)	(10,029)	(59,131)	(35,450)
Net income available to Arch	211,055	115,790	365,853	399,126
Preferred dividends	(5,485)	(5,485)	(10,969)	(10,969)
Net income available to Arch common shareholders	\$ 205,570	\$ 110,305	\$ 354,884	\$ 388,157
Denominator:				
Weighted average common shares outstanding — basic	120,599,060	121,719,214	120,513,620	122,957,384
Effect of dilutive common share equivalents:				
Nonvested restricted shares	1,295,342	1,258,741	1,374,272	1,334,633
Stock options (1)	2,471,194	2,907,465	2,537,234	2,864,696
Weighted average common shares and common share equivalents outstanding — diluted	124,365,596	125,885,420	124,425,126	127,156,713
Earnings per common share:				
Basic	\$ 1.70	\$ 0.91	\$ 2.94	\$ 3.16
Diluted	\$ 1.65	\$ 0.88	\$ 2.85	\$ 3.05

- (1) 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 2016 second quarter and 2015 second quarter, the number of stock options excluded were 575,931 and 1,009,113, respectively. For the six months ended June 30, 2016 and 2015, the number of stock options excluded were 1,027,784 and 1,187,162, respectively.

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5. 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 Chairman and Chief Executive Officer, the President and Chief Operating Officer, and the Chief Financial Officer of ACGL. 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 results of Arch Mortgage Insurance Company (“Arch MI U.S.”) and Arch Mortgage Insurance Designated Activity Company, leading providers of mortgage insurance products and services to the U.S. and European markets, respectively. Arch MI U.S. is approved as an eligible mortgage insurer by Federal National Mortgage Association (“Fannie Mae”) and Federal Home Loan Mortgage Corporation (“Freddie Mac”), each a government sponsored enterprise, or “GSE.” The mortgage segment also includes GSE credit risk-sharing transactions and mortgage reinsurance for the U.S. and Australian markets.

The corporate (non-underwriting) segment results include net investment income, other income (loss), corporate expenses, interest expense, 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, income taxes and items related to the Company’s non-cumulative preferred shares. Such amounts exclude the results of the ‘other’ segment.

The ‘other’ segment includes the results of Watford Re (see Note 3). 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 common shareholders:

	Three Months Ended					
	June 30, 2016					
	Insurance	Reinsurance	Mortgage	Sub-Total	Other	Total
Gross premiums written (1)	\$ 762,043	\$ 412,053	\$ 118,434	\$ 1,292,199	\$ 109,285	\$ 1,329,936
Premiums ceded	(246,875)	(119,951)	(6,969)	(373,464)	(4,457)	(306,373)
Net premiums written	515,168	292,102	111,465	918,735	104,828	1,023,563
Change in unearned premiums	12,482	(846)	(44,953)	(33,317)	15,739	(17,578)
Net premiums earned	527,650	291,256	66,512	885,418	120,567	1,005,985
Other underwriting income	—	20,118	4,137	24,255	969	25,224
Losses and loss adjustment expenses	(354,633)	(146,091)	(366)	(501,090)	(83,502)	(584,592)
Acquisition expenses, net	(77,317)	(55,796)	(8,523)	(141,636)	(33,645)	(175,281)
Other operating expenses	(92,371)	(37,115)	(23,991)	(153,477)	(6,113)	(159,590)
Underwriting income (loss)	\$ 3,329	\$ 72,372	\$ 37,769	113,470	(1,724)	111,746
Net investment income				70,397	17,941	88,338
Net realized gains (losses)				40,927	27,291	68,218
Net impairment losses recognized in earnings				(5,343)	—	(5,343)
Equity in net income (loss) of investment funds accounted for using the equity method				8,737	—	8,737
Other income (loss)				(7)	—	(7)
Corporate expenses				(17,200)	—	(17,200)
Interest expense				(12,432)	(3,231)	(15,663)
Net foreign exchange gains (losses)				22,461	2,201	24,662
Income (loss) before income taxes				221,010	42,478	263,488
Income tax expense				(14,131)	—	(14,131)
Net income (loss)				206,879	42,478	249,357
Dividends attributable to redeemable noncontrolling interests				—	(4,586)	(4,586)
Amounts attributable to noncontrolling interests				—	(33,716)	(33,716)
Net income (loss) available to Arch				206,879	4,176	211,055
Preferred dividends				(5,485)	—	(5,485)
Net income (loss) available to Arch common shareholders				\$ 201,394	\$ 4,176	\$ 205,570
Underwriting Ratios						
Loss ratio	67.2%	50.2%	0.6%	56.6%	69.3%	58.1%
Acquisition expense ratio	14.7%	19.2%	12.8%	16.0%	27.9%	17.4%
Other operating expense ratio	17.5%	12.7%	36.1%	17.3%	5.1%	15.9%
Combined ratio	99.4%	82.1%	49.5%	89.9%	102.3%	91.4%
Goodwill and intangible assets	\$ 27,457	\$ 1,440	\$ 59,430	\$ 88,327	\$ —	\$ 88,327

- (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.

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Three Months Ended						
June 30, 2015						
	Insurance	Reinsurance	Mortgage	Sub-Total	Other	Total
Gross premiums written (1)	\$ 744,810	\$ 342,101	\$ 68,572	\$ 1,155,253	\$ 127,954	\$ 1,199,209
Premiums ceded	(235,743)	(89,446)	(6,902)	(331,861)	(7,766)	(255,629)
Net premiums written	509,067	252,655	61,670	823,392	120,188	943,580
Change in unearned premiums	758	21,310	(9,211)	12,857	(12,999)	(142)
Net premiums earned	509,825	273,965	52,459	836,249	107,189	943,438
Other underwriting income	521	2,658	3,686	6,865	852	7,717
Losses and loss adjustment expenses	(320,926)	(111,183)	(9,639)	(441,748)	(77,678)	(519,426)
Acquisition expenses, net	(76,723)	(58,360)	(10,200)	(145,283)	(30,142)	(175,425)
Other operating expenses	(89,054)	(39,007)	(19,679)	(147,740)	(3,450)	(151,190)
Underwriting income (loss)	\$ 23,643	\$ 68,073	\$ 16,627	108,343	(3,229)	105,114
Net investment income				67,171	19,792	86,963
Net realized gains (losses)				(26,860)	(8,865)	(35,725)
Net impairment losses recognized in earnings				(1,113)	—	(1,113)
Equity in net income (loss) of investment funds accounted for using the equity method				16,167	—	16,167
Other income (loss)				2,205	—	2,205
Corporate expenses				(17,418)	—	(17,418)
Interest expense				(4,011)	—	(4,011)
Net foreign exchange gains (losses)				(22,571)	2,988	(19,583)
Income (loss) before income taxes				121,913	10,686	132,599
Income tax expense				(6,780)	—	(6,780)
Net income (loss)				115,133	10,686	125,819
Dividends attributable to redeemable noncontrolling interests				—	(4,743)	(4,743)
Amounts attributable to noncontrolling interests				—	(5,286)	(5,286)
Net income (loss) available to Arch				115,133	657	115,790
Preferred dividends				(5,485)	—	(5,485)
Net income (loss) available to Arch common shareholders				\$ 109,648	\$ 657	\$ 110,305
Underwriting Ratios						
Loss ratio	62.9%	40.6%	18.4%	52.8%	72.5%	55.1%
Acquisition expense ratio	15.0%	21.3%	19.4%	17.4%	28.1%	18.6%
Other operating expense ratio	17.5%	14.2%	37.5%	17.7%	3.2%	16.0%
Combined ratio	95.4%	76.1%	75.3%	87.9%	103.8%	89.7%
Goodwill and intangible assets	\$ 30,968	\$ 2,420	\$ 69,130	\$ 102,518	\$ —	\$ 102,518

(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.

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Six Months Ended						
June 30, 2016						
	Insurance	Reinsurance	Mortgage	Sub-Total	Other	Total
Gross premiums written (1)	\$ 1,560,596	\$ 893,443	\$ 229,714	\$ 2,683,260	\$ 257,891	\$ 2,767,902
Premiums ceded	(495,664)	(280,517)	(11,736)	(787,424)	(8,929)	(623,104)
Net premiums written	1,064,932	612,926	217,978	1,895,836	248,962	2,144,798
Change in unearned premiums	(24,193)	(60,462)	(89,701)	(174,356)	(12,878)	(187,234)
Net premiums earned	1,040,739	552,464	128,277	1,721,480	236,084	1,957,564
Other underwriting income	—	20,443	7,930	28,373	1,898	30,271
Losses and loss adjustment expenses	(678,242)	(257,689)	(8,995)	(944,926)	(162,615)	(1,107,541)
Acquisition expenses, net	(151,671)	(110,583)	(16,908)	(279,162)	(66,584)	(345,746)
Other operating expenses	(178,232)	(73,570)	(48,606)	(300,408)	(11,451)	(311,859)
Underwriting income (loss)	\$ 32,594	\$ 131,065	\$ 61,698	225,357	(2,668)	222,689
Net investment income				140,806	41,267	182,073
Net realized gains (losses)				72,789	32,753	105,542
Net impairment losses recognized in earnings				(12,982)	—	(12,982)
Equity in net income (loss) of investment funds accounted for using the equity method				15,392	—	15,392
Other income (loss)				(32)	—	(32)
Corporate expenses				(26,583)	—	(26,583)
Interest expense				(25,059)	(6,711)	(31,770)
Net foreign exchange gains (losses)				420	676	1,096
Income (loss) before income taxes				390,108	65,317	455,425
Income tax expense				(30,441)	—	(30,441)
Net income (loss)				359,667	65,317	424,984
Dividends attributable to redeemable noncontrolling interests				—	(9,173)	(9,173)
Amounts attributable to noncontrolling interests				—	(49,958)	(49,958)
Net income (loss) available to Arch				359,667	6,186	365,853
Preferred dividends				(10,969)	—	(10,969)
Net income (loss) available to Arch common shareholders				\$ 348,698	\$ 6,186	\$ 354,884
Underwriting Ratios						
Loss ratio	65.2%	46.6%	7.0%	54.9%	68.9%	56.6%
Acquisition expense ratio	14.6%	20.0%	13.2%	16.2%	28.2%	17.7%
Other operating expense ratio	17.1%	13.3%	37.9%	17.5%	4.9%	15.9%
Combined ratio	96.9%	79.9%	58.1%	88.6%	102.0%	90.2%

(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.

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Six Months Ended						
June 30, 2015						
	Insurance	Reinsurance	Mortgage	Sub-Total	Other	Total
Gross premiums written (1)	\$ 1,510,963	\$ 827,213	\$ 129,113	\$ 2,466,931	\$ 256,587	\$ 2,541,231
Premiums ceded	(459,893)	(226,015)	(15,572)	(701,122)	(11,821)	(530,656)
Net premiums written	1,051,070	601,198	113,541	1,765,809	244,766	2,010,575
Change in unearned premiums	(33,331)	(47,516)	(10,715)	(91,562)	(65,311)	(156,873)
Net premiums earned	1,017,739	553,682	102,826	1,674,247	179,455	1,853,702
Other underwriting income	948	4,087	11,404	16,439	2,814	19,253
Losses and loss adjustment expenses	(638,822)	(223,715)	(23,448)	(885,985)	(127,157)	(1,013,142)
Acquisition expenses, net	(151,801)	(114,964)	(20,618)	(287,383)	(51,118)	(338,501)
Other operating expenses	(177,173)	(77,051)	(40,048)	(294,272)	(5,455)	(299,727)
Underwriting income	\$ 50,891	\$ 142,039	\$ 30,116	223,046	(1,461)	221,585
Net investment income				137,459	28,498	165,957
Net realized gains				38,649	8,974	47,623
Net impairment losses recognized in earnings				(6,912)	—	(6,912)
Equity in net income (loss) of investment funds accounted for using the equity method				22,056	—	22,056
Other income (loss)				317	—	317
Corporate expenses				(26,763)	—	(26,763)
Interest expense				(16,747)	—	(16,747)
Net foreign exchange gains (losses)				44,282	2,636	46,918
Income (loss) before income taxes				415,387	38,647	454,034
Income tax expense				(19,458)	—	(19,458)
Net income (loss)				395,929	38,647	434,576
Dividends attributable to redeemable noncontrolling interests				—	(9,651)	(9,651)
Amounts attributable to noncontrolling interests				—	(25,799)	(25,799)
Net income (loss) available to Arch				395,929	3,197	399,126
Preferred dividends				(10,969)	—	(10,969)
Net income (loss) available to Arch common shareholders				\$ 384,960	\$ 3,197	\$ 388,157
Underwriting Ratios						
Loss ratio	62.8%	40.4%	22.8%	52.9%	70.9%	54.7%
Acquisition expense ratio	14.9%	20.8%	20.1%	17.2%	28.5%	18.3%
Other operating expense ratio	17.4%	13.9%	38.9%	17.6%	3.0%	16.2%
Combined ratio	95.1%	75.1%	81.8%	87.7%	102.4%	89.2%

(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.

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6. Investment Information

At June 30, 2016, total investable assets of \$16.88 billion included \$15.18 billion managed by the Company and \$1.70 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 investments classified as available for sale:

	Estimated Fair Value	Gross Unrealized Gains	Gross Unrealized Losses	Cost or Amortized Cost	OTTI Unrealized Losses (2)
June 30, 2016					
Fixed maturities (1):					
Corporate bonds	\$ 2,952,173	\$ 68,437	\$ (17,635)	\$ 2,901,371	\$ (2,304)
Mortgage backed securities	656,891	12,973	(1,177)	645,095	(3,443)
Municipal bonds	1,897,128	47,135	(678)	1,850,671	—
Commercial mortgage backed securities	624,391	13,854	(1,004)	611,541	—
U.S. government and government agencies	2,701,042	33,940	(749)	2,667,851	—
Non-U.S. government securities	1,172,745	46,672	(37,074)	1,163,147	—
Asset backed securities	1,365,766	13,492	(5,413)	1,357,687	(69)
Total	11,370,136	236,503	(63,730)	11,197,363	(5,816)
Equity securities	501,916	87,768	(11,163)	425,311	—
Other investments	182,957	19,550	(4,507)	167,914	—
Short-term investments	853,531	351	(2,584)	855,764	—
Total	\$ 12,908,540	\$ 344,172	\$ (81,984)	\$ 12,646,352	\$ (5,816)
December 31, 2015					
Fixed maturities (1):					
Corporate bonds	\$ 2,725,729	\$ 15,978	\$ (60,508)	\$ 2,770,259	\$ (3,553)
Mortgage backed securities	754,870	9,872	(5,334)	750,332	(3,350)
Municipal bonds	1,626,281	27,014	(1,534)	1,600,801	—
Commercial mortgage backed securities	764,152	3,269	(6,978)	767,861	—
U.S. government and government agencies	2,423,455	6,228	(9,978)	2,427,205	—
Non-U.S. government securities	917,664	10,414	(39,122)	946,372	—
Asset backed securities	1,620,506	3,307	(12,951)	1,630,150	(22)
Total	10,832,657	76,082	(136,405)	10,892,980	(6,925)
Equity securities	629,182	94,341	(17,796)	552,637	—
Other investments	300,476	43,798	(4,665)	261,343	—
Short-term investments	587,904	187	(3,425)	591,142	—
Total	\$ 12,350,219	\$ 214,408	\$ (162,291)	\$ 12,298,102	\$ (6,925)

- (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."
- (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 June 30, 2016, the net unrealized gain related to securities for which a non-credit OTTI was recognized in AOCI was \$1.5 million, compared to a net unrealized loss of \$1.4 million at December 31, 2015.

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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
June 30, 2016						
Fixed maturities (1):						
Corporate bonds	\$ 197,372	\$ (4,776)	\$ 127,233	\$ (12,859)	\$ 324,605	\$ (17,635)
Mortgage backed securities	67,489	(760)	16,999	(417)	84,488	(1,177)
Municipal bonds	109,185	(277)	21,887	(401)	131,072	(678)
Commercial mortgage backed securities	29,312	(526)	29,192	(478)	58,504	(1,004)
U.S. government and government agencies	112,776	(749)	—	—	112,776	(749)
Non-U.S. government securities	299,048	(15,856)	137,035	(21,218)	436,083	(37,074)
Asset backed securities	182,387	(3,147)	79,147	(2,266)	261,534	(5,413)
Total	997,569	(26,091)	411,493	(37,639)	1,409,062	(63,730)
Equity securities	156,789	(11,163)	—	—	156,789	(11,163)
Other investments	37,943	(4,507)	—	—	37,943	(4,507)
Short-term investments	33,404	(2,584)	—	—	33,404	(2,584)
Total	\$ 1,225,705	\$ (44,345)	\$ 411,493	\$ (37,639)	\$ 1,637,198	\$ (81,984)
December 31, 2015						
Fixed maturities (1):						
Corporate bonds	\$ 1,810,988	\$ (37,445)	\$ 129,896	\$ (23,063)	\$ 1,940,884	\$ (60,508)
Mortgage backed securities	487,018	(4,508)	48,991	(826)	536,009	(5,334)
Municipal bonds	269,015	(1,303)	9,692	(231)	278,707	(1,534)
Commercial mortgage backed securities	511,261	(6,639)	20,596	(339)	531,857	(6,978)
U.S. government and government agencies	1,991,163	(9,978)	—	—	1,991,163	(9,978)
Non-U.S. government securities	458,414	(13,494)	138,792	(25,628)	597,206	(39,122)
Asset backed securities	1,217,163	(9,328)	134,841	(3,623)	1,352,004	(12,951)
Total	6,745,022	(82,695)	482,808	(53,710)	7,227,830	(136,405)
Equity securities	232,275	(17,796)	—	—	232,275	(17,796)
Other investments	93,614	(4,665)	—	—	93,614	(4,665)
Short-term investments	30,625	(3,425)	—	—	30,625	(3,425)
Total	\$ 7,101,536	\$ (108,581)	\$ 482,808	\$ (53,710)	\$ 7,584,344	\$ (162,291)

(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.”

At June 30, 2016 , on a lot level basis, approximately 1,410 security lots out of a total of approximately 6,280 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 \$3.4 million . At December 31, 2015 , on a lot level basis, approximately 3,560 security lots out of a total of approximately 5,550 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 \$3.1 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	June 30, 2016		December 31, 2015	
	Estimated Fair Value	Amortized Cost	Estimated Fair Value	Amortized Cost
Due in one year or less	\$ 247,256	\$ 244,247	\$ 337,898	\$ 341,595
Due after one year through five years	5,077,739	5,036,912	4,644,516	4,677,230
Due after five years through 10 years	2,772,938	2,699,463	2,214,413	2,228,638
Due after 10 years	625,155	602,418	496,302	497,174
	8,723,088	8,583,040	7,693,129	7,744,637
Mortgage backed securities	656,891	645,095	754,870	750,332
Commercial mortgage backed securities	624,391	611,541	764,152	767,861
Asset backed securities	1,365,766	1,357,687	1,620,506	1,630,150
Total (1)	\$ 11,370,136	\$ 11,197,363	\$ 10,832,657	\$ 10,892,980

(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 to the Company.

The Company receives collateral in the form of cash or securities. Cash collateral primarily consists of short-term investments. At June 30, 2016, the fair value of the cash collateral received on securities lending was \$75.9 million and the fair value of security collateral received was \$262.4 million. At December 31, 2015, the fair value of the cash collateral received on securities lending was \$52.7 million, which included \$3.0 million that was reinvested in sub-prime mortgage backed securities, and the fair value of security collateral received was \$336.7 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
June 30, 2016					
U.S. government and government agencies	\$ 242,184	\$ 21,539	\$ 4,109	\$ 26,168	\$ 294,000
Corporate bonds	33,120	—	—	—	33,120
Equity securities	11,198	—	—	—	11,198
Total	\$ 286,502	\$ 21,539	\$ 4,109	\$ 26,168	\$ 338,318
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					\$ 338,318
December 31, 2015					
U.S. government and government agencies	\$ 235,728	\$ —	\$ 82,286	\$ 9,598	\$ 327,612
Corporate bonds	55,086	—	—	—	55,086
Equity securities	6,722	4,424	—	—	11,146
Total	\$ 297,536	\$ 4,424	\$ 82,286	\$ 9,598	\$ 393,844
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					\$ 393,844

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Other Investments

The following table summarizes the Company's other investments, including available for sale and fair value option components:

	June 30, 2016	December 31, 2015
Available for sale:		
Asian and emerging markets	\$ 109,767	\$ 206,861
Investment grade fixed income	33,549	31,370
Credit related funds	1,698	22,512
Other	37,943	39,733
Total available for sale	182,957	300,476
Fair value option:		
Term loan investments (par value: \$1,115,627 and \$1,197,143)	1,026,543	1,108,017
Mezzanine debt funds	117,441	121,589
Credit related funds	236,184	219,049
Investment grade fixed income	65,391	63,053
Asian and emerging markets	112,265	34,761
Other (1)	107,916	124,502
Total fair value option	1,665,740	1,670,971
Total	\$ 1,848,697	\$ 1,971,447

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

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 and liabilities which are accounted for using the fair value option:

	June 30, 2016	December 31, 2015
Fixed maturities	\$ 1,047,662	\$ 936,802
Other investments	1,665,740	1,670,971
Short-term investments	344,797	285,923
Equity securities	7,830	798
Investments accounted for using the fair value option	\$ 3,066,029	\$ 2,894,494

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.' Based on the new accounting guidance for consolidation, the Company determined that these limited partnership interests represented variable interests in the funds because the general partner did not have a significant interest in the fund. 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:

	June 30, 2016	December 31, 2015
Investments accounted for using the equity method (1)	\$ 676,893	\$ 584,158
Investments accounted for using the fair value option (2)	83,931	90,969
Total	\$ 760,824	\$ 675,127

(1) Aggregate unfunded commitments were \$794.7 million at June 30, 2016, compared to \$535.4 million at December 31, 2015.

(2) Aggregate unfunded commitments were \$26.6 million at June 30, 2016, compared to \$22.7 million at December 31, 2015.

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Net Investment Income

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

	June 30,	
	2016	2015
Three Months Ended		
Fixed maturities	\$ 77,994	\$ 71,275
Term loan investments	18,608	18,033
Equity securities (dividends)	3,663	2,578
Short-term investments	816	225
Other (1)	8,260	10,489
Gross investment income	109,341	102,600
Investment expenses	(21,003)	(15,637)
Net investment income	\$ 88,338	\$ 86,963

Six Months Ended

Fixed maturities	\$ 151,667	\$ 139,871
Term loan investments	38,620	32,777
Equity securities (dividends)	7,098	5,257
Short-term investments	1,312	421
Other (1)	22,003	23,236
Gross investment income	220,700	201,562
Investment expenses	(38,627)	(35,605)
Net investment income	\$ 182,073	\$ 165,957

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

Net Realized Gains (Losses)

Net realized gains (losses) were as follows, excluding other than-temporary impairment provision.

	June 30,	
	2016	2015
Three Months Ended		
Available for sale securities:		
Gross gains on investment sales	\$ 74,695	\$ 82,233
Gross losses on investment sales	(43,293)	(58,974)
Change in fair value of assets and liabilities accounted for using the fair value option:		
Fixed maturities	18,632	(5,191)
Other investments	13,136	785
Equity securities	401	(69)
Short-term investments	(621)	(4,375)
Derivative instruments (1)	20,334	(41,496)
Other (2)	(15,066)	(8,638)
Net realized gains (losses)	\$ 68,218	\$ (35,725)

Six Months Ended

Available for sale securities:		
Gross gains on investment sales	\$ 182,514	\$ 179,824
Gross losses on investment sales	(106,424)	(114,134)
Change in fair value of assets and liabilities accounted for using the fair value option:		
Fixed maturities	18,299	(8,493)
Other investments	(8,412)	7,072
Equity securities	437	(71)
Short-term investments	(1,043)	1,471
Derivative instruments (1)	41,066	(4,820)
Other (2)	(20,895)	(13,226)

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

The Company recorded \$8.7 million of equity in net income related to investment funds accounted for using the equity method in the 2016 second quarter, compared to \$16.2 million of equity in net income for the 2015 second quarter, and \$15.4 million of equity in net income related to investment funds accounted for using the equity method for the six months ended June 30, 2016, compared to \$22.1 million of equity in net income for the 2015 period. 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.

Other-Than-Temporary Impairments

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:

	June 30,	
	2016	2015
Three Months Ended		
Fixed maturities:		
Mortgage backed securities	\$ (82)	\$ (326)
Corporate bonds	(775)	(10)
Non-U.S. government securities	(51)	—
Asset backed securities	(2,500)	—
Total	(3,408)	(336)
Short-term investments	—	—
Equity securities	(1,935)	(124)
Other investments	—	(653)
Net impairment losses recognized in earnings	\$ (5,343)	\$ (1,113)

Six Months Ended

Fixed maturities:		
Mortgage backed securities	\$ (555)	\$ (1,398)
Corporate bonds	(5,655)	(1,986)
Non-U.S. government securities	(232)	—
Asset backed securities	(2,506)	—
Total	(8,948)	(3,384)
Short-term investments	—	(2,341)
Equity securities	(3,037)	(253)
Other investments	(997)	(934)
Net impairment losses recognized in earnings	\$ (12,982)	\$ (6,912)

Net realized gains (losses)	\$	<u>105,542</u>	\$	<u>47,623</u>
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- (1) See Note 8 for information on the Company’s derivative instruments.
- (2) Includes the re-measurement of contingent consideration liability amounts.

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A description of the methodology and significant inputs used to measure the amount of net impairment losses recognized in earnings in the 2016 periods is as follows:

- Corporate bonds — the Company reviewed the business prospects, credit ratings, estimated loss given default factors, foreign currency impacts and information received from asset managers and rating agencies for certain corporate bonds. Impairment losses primarily resulted from reductions on non-investment grade corporate bonds in the energy sector, reflecting current market conditions;
- Equity securities — the Company utilized information received from asset managers on common stocks, including the business prospects, recent events, industry and market data and other factors. Impairment losses were primarily on equities which were in an unrealized loss position for a significant length of time;
- Asset backed securities — the Company utilized underlying data provided by asset managers, cash flow projections and additional information from credit agencies in order to determine an expected recovery value for each security. Impairment losses primarily reflected a reduction on one security following an analysis of expected cash flows.
- Other investments — the Company utilized information received from asset managers on investment funds, including the business prospects, recent events, industry and market data and other factors. Impairment losses reflected a reduction on one fund which was in an unrealized loss position for a significant length of time;
- Mortgage backed securities — the Company utilized underlying data provided by asset managers, cash flow projections and additional information from credit agencies in order to determine an expected recovery value for each security. The analysis includes a review of cash flow projections under base case and stress case scenarios which modify the expected default expectations and loss severities and slow down prepayment assumptions. The significant inputs in the models include the expected default rates, delinquency rates and foreclosure costs. Impairment losses resulted from relatively small adjustments on a number of mortgage backed securities.

The Company believes that the \$5.8 million of OTTI included in accumulated other comprehensive income at June 30, 2016 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 June 30, 2016 , 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:

	June 30,	
	2016	2015
Three Months Ended		
Balance at start of period	\$ 18,291	\$ 24,344
Credit loss impairments recognized on securities not previously impaired	287	281
Credit loss impairments recognized on securities previously impaired	—	55
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	(3,731)	(3,774)
Balance at end of period	\$ 14,847	\$ 20,906
Six Months Ended		
Balance at start of year	\$ 26,875	\$ 20,196
Credit loss impairments recognized on securities not previously impaired	1,350	4,770
Credit loss impairments recognized on securities previously impaired	522	134
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	(13,900)	(4,194)
Balance at end of period	\$ 14,847	\$ 20,906

Restricted Assets

The Company is required to maintain assets on deposit, which primarily consist of fixed maturities, with various regulatory authorities to support its insurance and reinsurance operations. The Company's insurance and reinsurance subsidiaries maintain assets in trust accounts as collateral for insurance and reinsurance 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 9 for further details.

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The following table details the value of the Company's restricted assets:

	June 30, 2016	December 31, 2015
Assets used for collateral or guarantees:		
Affiliated transactions	\$ 3,903,933	\$ 3,810,104
Third party agreements	1,598,266	1,286,257
Deposits with U.S. regulatory authorities	477,429	391,458
Deposits with non-U.S. regulatory authorities	47,429	38,230
Total restricted assets	\$ 6,027,057	\$ 5,526,049

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 representative of fair value. The Company did not adjust any of the prices obtained from the independent pricing sources at June 30, 2016.

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 \$16.20 billion of financial assets and liabilities measured at fair value at June 30, 2016, approximately \$379.5 million, or 2.4%, were priced using non-binding broker-dealer quotes. Of the \$15.40 billion of financial assets and liabilities measured at fair value at December 31, 2015, approximately \$317.8 million, or 2.1%, 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

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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.
- 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.
- 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-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.

ARCH CAPITAL GROUP LTD. AND SUBSIDIARIES
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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.

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 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.

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

The following table presents the Company's financial assets and liabilities measured at fair value by level at June 30, 2016 :

	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	\$ 2,952,173	\$ —	\$ 2,934,868	\$ 17,305
Mortgage backed securities	656,891	—	656,891	—
Municipal bonds	1,897,128	—	1,897,128	—
Commercial mortgage backed securities	624,391	—	624,391	—
U.S. government and government agencies	2,701,042	2,558,706	142,336	—
Non-U.S. government securities	1,172,745	—	1,172,745	—
Asset backed securities	1,365,766	—	1,316,555	49,211
Total	11,370,136	2,558,706	8,744,914	66,516
Equity securities	501,916	500,158	1,758	—
Short-term investments	853,531	837,202	16,329	—
Other investments	79,174	79,174	—	—
Other investments measured at net asset value (2)	103,783			
Total other investments	182,957	79,174	—	—
Derivative instruments (4)	30,625	—	30,625	—
Fair value option:				
Corporate bonds	754,034	—	754,034	—
Non-U.S. government bonds	101,492	—	101,492	—
Mortgage backed securities	17,560	—	17,560	—
Asset backed securities	22,850	—	22,850	—
U.S. government and government agencies	151,726	151,726	—	—
Short-term investments	344,797	344,797	—	—
Equity securities	7,830	7,090	740	—
Other investments	1,082,309	55,766	1,026,543	—
Other investments measured at net asset value (2)	583,431			
Total	3,066,029	559,379	1,923,219	—
Total assets measured at fair value	\$ 16,005,194	\$ 4,534,619	\$ 10,716,845	\$ 66,516
<u>Liabilities measured at fair value:</u>				
Contingent consideration liabilities	\$ (111,670)	\$ —	\$ —	\$ (111,670)
Securities sold but not yet purchased (3)	(54,668)	—	(54,668)	—
Derivative instruments (4)	(26,428)	—	(26,428)	—
Total liabilities measured at fair value	\$ (192,766)	\$ —	\$ (81,096)	\$ (111,670)

- (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, "Investment Information—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, "Derivative Instruments."

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

The following table presents the Company's financial assets and liabilities measured at fair value by level at December 31, 2015 :

	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	\$ 2,725,729	\$ —	\$ 2,709,361	\$ 16,368
Mortgage backed securities	754,870	—	754,870	—
Municipal bonds	1,626,281	—	1,626,281	—
Commercial mortgage backed securities	764,152	—	764,152	—
U.S. government and government agencies	2,423,455	2,378,662	44,793	—
Non-U.S. government securities	917,664	—	917,664	—
Asset backed securities	1,620,506	—	1,563,006	57,500
Total	10,832,657	2,378,662	8,380,127	73,868
Equity securities	629,182	627,441	1,741	—
Short-term investments	587,904	572,604	15,300	—
Other investments	99,159	99,159	—	—
Other investments measured at net asset value (2)	201,317			
Total other investments	300,476	99,159	—	—
Derivative instruments (4)	20,022	—	20,022	—
Fair value option:				
Corporate bonds	771,733	—	771,733	—
Non-U.S. government bonds	81,824	—	81,824	—
Mortgage backed securities	57,687	—	57,687	—
Asset backed securities	25,444	—	25,444	—
U.S. government and government agencies	114	114	—	—
Short-term investments	285,923	285,923	—	—
Equity securities	798	798	—	—
Other investments	1,176,312	68,295	1,108,017	—
Other investments measured at net asset value (2)	494,659			
Total	2,894,494	355,130	2,044,705	—
Total assets measured at fair value	\$ 15,264,735	\$ 4,032,996	\$ 10,461,895	\$ 73,868
<u>Liabilities measured at fair value:</u>				
Contingent consideration liabilities	\$ (96,048)	\$ —	\$ —	\$ (96,048)
Securities sold but not yet purchased (3)	(30,583)	—	(30,583)	—
Derivative instruments (4)	(11,863)	—	(11,863)	—
Total liabilities measured at fair value	\$ (138,494)	\$ —	\$ (42,446)	\$ (96,048)

- (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 , "Investment Information—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 , "Derivative Instruments."

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

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	Total	Contingent Consideration Liabilities
	Asset Backed Securities	Corporate Bonds		
Three Months Ended June 30, 2016				
Balance at beginning of period	\$ 57,500	\$ 15,166	\$ 72,666	\$ (100,710)
Total gains or (losses) (realized/unrealized)				
Included in earnings (1)	(2,500)	1,363	(1,137)	(10,923)
Included in other comprehensive income	—	—	—	(37)
Purchases, issuances, sales and settlements				
Purchases	—	776	776	—
Issuances	—	—	—	—
Sales	—	—	—	—
Settlements	(5,789)	—	(5,789)	—
Transfers in and/or out of Level 3	—	—	—	—
Balance at end of period	<u>\$ 49,211</u>	<u>\$ 17,305</u>	<u>\$ 66,516</u>	<u>\$ (111,670)</u>
Three Months Ended June 30, 2015				
Balance at beginning of period	\$ 57,500	\$ —	\$ 57,500	\$ (66,461)
Total gains or (losses) (realized/unrealized)				
Included in earnings (1)	—	—	—	(4,795)
Included in other comprehensive income	—	—	—	—
Purchases, issuances, sales and settlements				
Purchases	—	—	—	—
Issuances	—	—	—	—
Sales	—	—	—	—
Settlements	—	—	—	—
Transfers in and/or out of Level 3	—	—	—	—
Balance at end of period	<u>\$ 57,500</u>	<u>\$ —</u>	<u>\$ 57,500</u>	<u>\$ (71,256)</u>
Six Months Ended June 30, 2016				
Balance at beginning of year	\$ 57,500	\$ 16,368	\$ 73,868	\$ (96,048)
Total gains or (losses) (realized/unrealized)				
Included in earnings (1)	(2,500)	161	(2,339)	(16,121)
Included in other comprehensive income	—	—	—	(37)
Purchases, issuances, sales and settlements				
Purchases	—	776	776	—
Issuances	—	—	—	—
Sales	—	—	—	—
Settlements	(5,789)	—	(5,789)	536
Transfers in and/or out of Level 3	—	—	—	—
Balance at end of period	<u>\$ 49,211</u>	<u>\$ 17,305</u>	<u>\$ 66,516</u>	<u>\$ (111,670)</u>
Six Months Ended June 30, 2015				
Balance at beginning of year	\$ 57,500	\$ —	\$ 57,500	\$ (61,845)
Total gains or (losses) (realized/unrealized)				
Included in earnings (1)	—	—	—	(8,343)
Included in other comprehensive income	—	—	—	—
Purchases, issuances, sales and settlements				
Purchases	—	—	—	—
Issuances	—	—	—	(1,068)
Sales	—	—	—	—
Settlements	—	—	—	—
Transfers in and/or out of Level 3	—	—	—	—

Balance at end of period	<u>\$ 57,500</u>	<u>\$ —</u>	<u>\$ 57,500</u>	<u>\$ (71,256)</u>
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(1) Gains or losses on asset backed securities were included in net impairment losses recognized in earnings while gains or losses on corporate bonds and contingent consideration liabilities were included in net realized gains (losses).

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

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 June 30, 2016, due to their respective short maturities. As these financial instruments are not actively traded, their respective fair values are classified within Level 2.

At June 30, 2016, the senior notes of ACGL were carried at their cost, net of debt issuance costs, of \$296.9 million and had a fair value of \$428.0 million while the senior notes of Arch-U.S. were carried at their cost, net of debt issuance costs, of \$494.5 million and had a fair value of \$602.8 million. 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 value of the senior notes is 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 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>June 30, 2016</u>			
Futures contracts (2)	\$ 1,208	\$ (1,673)	\$ 2,287,791
Foreign currency forward contracts (2)	17,032	(18,718)	1,436,006
TBAs (3)	121,760	(117,673)	226,299
Other (2)	12,385	(6,037)	1,938,497
Total	<u>\$ 152,385</u>	<u>\$ (144,101)</u>	
<u>December 31, 2015</u>			
Futures contracts (2)	\$ 2,816	\$ (1,202)	\$ 1,797,115
Foreign currency forward contracts (2)	9,336	(6,344)	773,619
TBAs (3)	6,525	—	6,316
Other (2)	7,870	(4,317)	1,694,935
Total	<u>\$ 26,547</u>	<u>\$ (11,863)</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 June 30, 2016 or December 31, 2015.

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.

At June 30, 2016, asset derivatives and liability derivatives of \$152.2 million and \$144.0 million, respectively, were subject to a master netting agreement, compared to \$26.5 million and \$11.9 million, respectively, at December 31, 2015. The remaining derivatives included in the preceding table were not subject to a master netting agreement.

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

All 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:	June 30,	
	2016	2015
Three Months Ended		
Net realized gains (losses):		
Futures contracts	\$ 34,871	\$ (31,446)
Foreign currency forward contracts	(13,782)	(8,724)
TBAs	37	(182)
Other	(792)	(1,144)
Total	<u>\$ 20,334</u>	<u>\$ (41,496)</u>
Six Months Ended		
Net realized gains (losses):		
Futures contracts	\$ 61,322	\$ (12,120)
Foreign currency forward contracts	(18,534)	8,095
TBAs	334	304
Other	(2,056)	(1,099)
Total	<u>\$ 41,066</u>	<u>\$ (4,820)</u>

9. Commitments and Contingencies

Letter of Credit and Revolving Credit Facilities

As of June 30, 2016, ACGL and its wholly-owned subsidiaries had a \$300.0 million unsecured revolving loan and letter of credit facility and a \$500.0 million secured letter of credit facility (the "Credit Agreement"). Under the terms of the Credit Agreement, Arch Reinsurance Company and Arch Reinsurance Ltd. are limited to issuing an aggregate of \$100.0 million of unsecured letters of credit as part of the unsecured revolving loan. The Credit Agreement expires on June 30, 2019. In addition, certain of ACGL's subsidiaries had outstanding letters of credit of \$242.4 million as of June 30, 2016, which were issued on a limited basis and for limited purposes (together with the secured portion of the Credit Agreement and these letter of credit facilities, the "LOC Facilities"). ACGL and its subsidiaries which are party to the LOC Facilities were in compliance with all covenants contained in the LOC Facilities at June 30, 2016. At such date, \$416.9 million in letters of credit under the LOC Facilities were outstanding, which were secured by investments with a fair value of \$473.9 million, and had \$100.0 million of borrowings outstanding under the Credit Agreement. Under the \$500.0 million secured letter of credit facility, ACGL's subsidiaries had remaining capacity of \$325.4 million (outstanding letters of credit of \$174.6 million) at June 30, 2016.

As of June 30, 2016, Watford Re had a \$100.0 million letter of credit facility expiring on May 19, 2017 and an \$800.0 million secured credit facility expiring on June 4, 2018, that provides for borrowings and the issuance of letters of credit not to exceed \$400.0 million. Borrowings of revolving loans

may be made by Watford Re at a variable rate based on LIBOR or an alternative base rate at the option of Watford Re. At June 30, 2016, Watford Re had \$198.0 million in outstanding letters of credit under the two facilities and \$297.8 million of borrowings outstanding under the secured credit facility, backed by Watford Re's investment portfolio. Watford Re was in compliance with all covenants contained in both of its credit facilities at June 30, 2016. 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 the reinsurance transactions.

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 \$1.35 billion at June 30, 2016, compared to \$1.11 billion at December 31, 2015.

10. Share Transactions

Share Repurchases

The board of directors of ACGL has authorized the investment in ACGL's common shares through a share repurchase program. Since the inception of the share repurchase program, ACGL has repurchased approximately 125.2 million common shares for an aggregate purchase price of \$3.68 billion. For the six months ended June 30, 2016, ACGL repurchased 1.1 million common shares (no repurchases in the 2016 second quarter) for an aggregate purchase price of \$75.3 million. During the 2015 second quarter and six months ended June 30, 2015, ACGL repurchased 3.2 million and 5.9 million common shares, respectively, for an aggregate purchase price of \$199.0 million and \$361.9 million, respectively. At June 30, 2016, \$446.5 million of share repurchases were available under the program. 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.

Share-Based Compensation

During the 2016 second quarter, the Company granted 427,379 stock options and 456,217 restricted shares and units to certain employees and directors with weighted average grant-date fair values of \$17.46 and \$71.61, respectively. During the 2015 second quarter, the Company granted 534,267 stock appreciation rights and stock options and 559,332 restricted shares and units to certain employees and directors with weighted average grant-date fair values of \$16.09 and \$62.51, respectively. The stock appreciation rights and stock options were valued at the grant date using

the Black-Scholes option pricing model. Such values are being amortized over the respective substantive vesting period. For awards granted to retirement-eligible employees where no service is required for the employee to retain the award, the grant date fair value is immediately recognized as compensation expense at the grant date because the employee

is able to retain the award without continuing to provide service. For employees near retirement eligibility, attribution of compensation cost is over the period from the grant date to the retirement eligibility date.

11 . 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		Six Months Ended	
		June 30,		June 30,	
		2016	2015	2016	2015
Unrealized appreciation on available-for-sale investments					
	Net realized gains (losses)	\$ 31,404	\$ 23,259	\$ 76,091	\$ 65,690
	Other-than-temporary impairment losses	(5,395)	(1,126)	(13,132)	(8,373)
	Total before tax	26,009	22,133	62,959	57,317
	Income tax (expense) benefit	(3,915)	(919)	(8,642)	(5,171)
	Net of tax	\$ 22,094	\$ 21,214	\$ 54,317	\$ 52,146

	Before Tax Amount	Tax Expense (Benefit)	Net of Tax Amount
Three Months Ended June 30, 2016			
Unrealized appreciation (decline) in value of investments:			
Unrealized holding gains (losses) arising during period	\$ 117,904	\$ 15,444	\$ 102,460
Portion of other-than-temporary impairment losses recognized in other comprehensive income (loss)	(52)	—	(52)
Less reclassification of net realized gains (losses) included in net income	26,009	3,915	22,094
Foreign currency translation adjustments	(18,186)	(35)	(18,151)
Other comprehensive income (loss)	\$ 73,657	\$ 11,494	\$ 62,163

Three Months Ended June 30, 2015			
Unrealized appreciation (decline) in value of investments:			
Unrealized holding gains (losses) arising during period	\$ (96,630)	\$ (14,695)	\$ (81,935)
Portion of other-than-temporary impairment losses recognized in other comprehensive income (loss)	(13)	—	(13)
Less reclassification of net realized gains (losses) included in net income	22,133	919	21,214
Foreign currency translation adjustments	11,697	117	11,580
Other comprehensive income (loss)	\$ (107,079)	\$ (15,497)	\$ (91,582)

Six Months Ended June 30, 2016			
Unrealized appreciation (decline) in value of investments:			
Unrealized holding gains (losses) arising during period	\$ 270,078	\$ 34,637	\$ 235,441
Portion of other-than-temporary impairment losses recognized in other comprehensive income (loss)	(150)	—	(150)
Less reclassification of net realized gains (losses) included in net income	62,959	8,642	54,317
Foreign currency translation adjustments	(326)	512	(838)
Other comprehensive income (loss)	\$ 206,643	\$ 26,507	\$ 180,136

Six Months Ended June 30, 2015			
Unrealized appreciation (decline) in value of investments:			
Unrealized holding gains (losses) arising during period	\$ (2,243)	\$ (4,612)	\$ 2,369
Portion of other-than-temporary impairment losses recognized in other comprehensive income (loss)	(1,461)	—	(1,461)
Less reclassification of net realized gains (losses) included in net income	57,317	5,171	52,146
Foreign currency translation adjustments	(11,929)	(752)	(11,177)
Other comprehensive income (loss)	\$ (72,950)	\$ (10,535)	\$ (62,415)

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

12. Guarantor Financial Information

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

Condensed Consolidating Balance Sheet	June 30, 2016				
	ACGL (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other ACG Subsidiaries	Consolidating Adjustments and Eliminations	ACGL Consolidated
Assets					
Total investments	\$ 126	\$ 54,433	\$ 16,628,029	\$ (14,700)	\$ 16,667,888
Cash	7,212	15,726	493,653	—	516,591
Investments in subsidiaries	7,092,328	1,802,240	—	(8,894,568)	—
Due from subsidiaries and affiliates	27	50,563	388,302	(438,892)	—
Premiums receivable	—	—	1,775,867	(515,260)	1,260,607
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	—	—	5,993,929	(3,958,959)	2,034,970
Contractholder receivables	—	—	1,600,426	—	1,600,426
Prepaid reinsurance premiums	—	—	1,690,278	(1,149,324)	540,954
Deferred acquisition costs, net	—	—	462,906	—	462,906
Other assets	13,911	46,982	1,417,947	(151,265)	1,327,575
Total assets	\$ 7,113,604	\$ 1,969,944	\$ 30,451,337	\$ (15,122,968)	\$ 24,411,917
Liabilities					
Reserve for losses and loss adjustment expenses	\$ —	\$ —	\$ 13,402,389	\$ (3,930,742)	\$ 9,471,647
Unearned premiums	—	—	3,767,683	(1,149,324)	2,618,359
Reinsurance balances payable	—	—	811,247	(515,260)	295,987
Contractholder payables	—	—	1,600,426	—	1,600,426
Collateral held for insured obligations	—	—	261,228	—	261,228
Deposit accounting liabilities	—	—	22,325	—	22,325
Senior notes	296,914	494,478	—	—	791,392
Revolving credit agreement borrowings	100,000	—	297,830	—	397,830
Due to subsidiaries and affiliates	1	35,003	403,888	(438,892)	—
Other liabilities	12,767	48,023	1,373,538	(179,482)	1,254,846
Total liabilities	409,682	577,504	21,940,554	(6,213,700)	16,714,040
Redeemable noncontrolling interests	—	—	220,066	(14,700)	205,366
Shareholders' Equity					
Total shareholders' equity available to Arch	6,703,922	1,392,440	7,502,128	(8,894,568)	6,703,922
Non-redeemable noncontrolling interests	—	—	788,589	—	788,589
Total shareholders' equity	6,703,922	1,392,440	8,290,717	(8,894,568)	7,492,511
Total liabilities, noncontrolling interests and shareholders' equity	\$ 7,113,604	\$ 1,969,944	\$ 30,451,337	\$ (15,122,968)	\$ 24,411,917

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

Condensed Consolidating Balance Sheet	December 31, 2015				
	ACGL (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other ACGL Subsidiaries	Consolidating Adjustments and Eliminations	ACGL Consolidated
Assets					
Total investments	\$ 50	\$ 42,210	\$ 15,815,381	\$ (14,700)	\$ 15,842,941
Cash	6,809	17,023	529,494	—	553,326
Investments in subsidiaries	6,609,174	1,712,757	—	(8,321,931)	—
Due from subsidiaries and affiliates	23	48,811	384,469	(433,303)	—
Premiums receivable	—	—	1,376,310	(392,867)	983,443
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	—	—	5,783,452	(3,916,079)	1,867,373
Contractholder receivables	—	—	1,486,296	—	1,486,296
Prepaid reinsurance premiums	—	—	1,511,795	(1,084,186)	427,609
Deferred acquisition costs, net	—	—	433,477	—	433,477
Other assets	4,138	45,522	2,119,279	(586,134)	1,582,805
Total assets	\$ 6,620,194	\$ 1,866,323	\$ 29,439,953	\$ (14,749,200)	\$ 23,177,270
Liabilities					
Reserve for losses and loss adjustment expenses	\$ —	\$ —	\$ 13,010,608	\$ (3,885,358)	\$ 9,125,250
Unearned premiums	—	—	3,418,118	(1,084,186)	2,333,932
Reinsurance balances payable	—	—	603,586	(379,466)	224,120
Contractholder payables	—	—	1,486,296	—	1,486,296
Collateral held for insured obligations	—	—	248,982	—	248,982
Deposit accounting liabilities	—	—	463,507	(203,143)	260,364
Senior notes	296,874	494,432	—	—	791,306
Revolving credit agreement borrowings	100,000	—	430,434	—	530,434
Due to subsidiaries and affiliates	26	35,000	398,277	(433,303)	—
Other liabilities	18,413	50,890	1,385,500	(427,111)	1,027,692
Total liabilities	415,313	580,322	21,445,308	(6,412,567)	16,028,376
Redeemable noncontrolling interests	—	—	219,882	(14,700)	205,182
Shareholders' Equity					
Total shareholders' equity available to Arch	6,204,881	1,286,001	7,035,932	(8,321,933)	6,204,881
Non-redeemable noncontrolling interests	—	—	738,831	—	738,831
Total shareholders' equity	6,204,881	1,286,001	7,774,763	(8,321,933)	6,943,712
Total liabilities, noncontrolling interests and shareholders' equity	\$ 6,620,194	\$ 1,866,323	\$ 29,439,953	\$ (14,749,200)	\$ 23,177,270

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

Condensed Consolidating Statement of Income and Comprehensive Income	Three Months Ended June 30, 2016				
	ACGL (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other ACGL Subsidiaries	Consolidating Adjustments and Eliminations	ACGL Consolidated
Revenues					
Net premiums earned	\$ —	\$ —	\$ 1,005,985	\$ —	\$ 1,005,985
Net investment income	—	775	94,097	(6,534)	88,338
Net realized gains (losses)	—	—	68,218	—	68,218
Net impairment losses recognized in earnings	—	—	(5,343)	—	(5,343)
Other underwriting income	—	—	41,450	(16,226)	25,224
Equity in net income (loss) of investment funds accounted for using the equity method	—	—	8,737	—	8,737
Other income (loss)	(7)	—	—	—	(7)
Total revenues	(7)	775	1,213,144	(22,760)	1,191,152
Expenses					
Losses and loss adjustment expenses	—	—	584,592	—	584,592
Acquisition expenses	—	—	175,281	—	175,281
Other operating expenses	—	—	159,590	—	159,590
Corporate expenses	17,441	359	(600)	—	17,200
Interest expense	5,929	6,647	25,527	(22,440)	15,663
Net foreign exchange (gains) losses	—	—	(14,125)	(10,537)	(24,662)
Total expenses	23,370	7,006	930,265	(32,977)	927,664
Income (loss) before income taxes	(23,377)	(6,231)	282,879	10,217	263,488
Income tax (expense) benefit	—	2,086	(16,217)	—	(14,131)
Income (loss) before equity in net income of subsidiaries	(23,377)	(4,145)	266,662	10,217	249,357
Equity in net income of subsidiaries	234,432	19,873	—	(254,305)	—
Net income	211,055	15,728	266,662	(244,088)	249,357
Net (income) loss attributable to noncontrolling interests	—	—	(38,623)	321	(38,302)
Net income available to Arch	211,055	15,728	228,039	(243,767)	211,055
Preferred dividends	(5,485)	—	—	—	(5,485)
Net income available to Arch common shareholders	\$ 205,570	\$ 15,728	\$ 228,039	\$ (243,767)	\$ 205,570
Comprehensive income (loss) available to Arch	\$ 273,260	\$ 28,536	\$ 300,542	\$ (329,078)	\$ 273,260

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

Condensed Consolidating Statement of Income and Comprehensive Income	Three Months Ended June 30, 2015				
	ACGL (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other ACGL Subsidiaries	Consolidating Adjustments and Eliminations	ACGL Consolidated
Revenues					
Net premiums earned	\$ —	\$ —	\$ 943,438	\$ —	\$ 943,438
Net investment income	—	800	87,154	(991)	86,963
Net realized gains (losses)	—	1	(35,726)	—	(35,725)
Net impairment losses recognized in earnings	—	—	(1,113)	—	(1,113)
Other underwriting income	—	—	7,717	—	7,717
Equity in net income (loss) of investment funds accounted for using the equity method	—	—	16,167	—	16,167
Other income (loss)	—	—	2,205	—	2,205
Total revenues	—	801	1,019,842	(991)	1,019,652
Expenses					
Losses and loss adjustment expenses	—	—	519,426	—	519,426
Acquisition expenses	—	—	175,425	—	175,425
Other operating expenses	—	—	151,190	—	151,190
Corporate expenses	16,900	1,012	(494)	—	17,418
Interest expense	5,862	6,769	(7,793)	(827)	4,011
Net foreign exchange (gains) losses	—	—	6,942	12,641	19,583
Total expenses	22,762	7,781	844,696	11,814	887,053
Income (loss) before income taxes	(22,762)	(6,980)	175,146	(12,805)	132,599
Income tax (expense) benefit	—	3,697	(10,477)	—	(6,780)
Income (loss) before equity in net income of subsidiaries	(22,762)	(3,283)	164,669	(12,805)	125,819
Equity in net income of subsidiaries	138,552	14,077	—	(152,629)	—
Net income	115,790	10,794	164,669	(165,434)	125,819
Net (income) loss attributable to noncontrolling interests	—	—	(10,193)	164	(10,029)
Net income available to Arch	115,790	10,794	154,476	(165,270)	115,790
Preferred dividends	(5,485)	—	—	—	(5,485)
Net income available to Arch common shareholders	\$ 110,305	\$ 10,794	\$ 154,476	\$ (165,270)	\$ 110,305
Comprehensive income (loss) available to Arch	\$ 24,208	\$ (13,505)	\$ 50,249	\$ (36,744)	\$ 24,208

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

Condensed Consolidating Statement of Income and Comprehensive Income	Six Months Ended June 30, 2016				
	ACGL (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other ACGL Subsidiaries	Consolidating Adjustments and Eliminations	ACGL Consolidated
Revenues					
Net premiums earned	\$ —	\$ —	\$ 1,957,564	\$ —	\$ 1,957,564
Net investment income	1	1,548	194,358	(13,834)	182,073
Net realized gains (losses)	—	—	105,542	—	105,542
Net impairment losses recognized in earnings	—	—	(12,982)	—	(12,982)
Other underwriting income	—	—	46,769	(16,498)	30,271
Equity in net income (loss) of investment funds accounted for using the equity method	—	—	15,392	—	15,392
Other income (loss)	199	—	(231)	—	(32)
Total revenues	200	1,548	2,306,412	(30,332)	2,277,828
Expenses					
Losses and loss adjustment expenses	—	—	1,107,541	—	1,107,541
Acquisition expenses	—	—	345,746	—	345,746
Other operating expenses	—	—	311,859	—	311,859
Corporate expenses	26,796	941	(1,154)	—	26,583
Interest expense	11,863	13,319	36,279	(29,691)	31,770
Net foreign exchange (gains) losses	—	—	2,370	(3,466)	(1,096)
Total expenses	38,659	14,260	1,802,641	(33,157)	1,822,403
Income (loss) before income taxes	(38,459)	(12,712)	503,771	2,825	455,425
Income tax (expense) benefit	—	4,330	(34,771)	—	(30,441)
Income (loss) before equity in net income of subsidiaries	(38,459)	(8,382)	469,000	2,825	424,984
Equity in net income of subsidiaries	404,312	42,739	—	(447,051)	—
Net income	365,853	34,357	469,000	(444,226)	424,984
Net (income) loss attributable to noncontrolling interests	—	—	(59,773)	642	(59,131)
Net income available to Arch	365,853	34,357	409,227	(443,584)	365,853
Preferred dividends	(10,969)	—	—	—	(10,969)
Net income available to Arch common shareholders	\$ 354,884	\$ 34,357	\$ 409,227	\$ (443,584)	\$ 354,884
Comprehensive income (loss) available to Arch	\$ 546,189	\$ 87,185	\$ 592,793	\$ (679,978)	\$ 546,189

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

Condensed Consolidating Statement of Income and Comprehensive Income	Six Months Ended June 30, 2015				
	ACGL (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other ACGL Subsidiaries	Consolidating Adjustments and Eliminations	ACGL Consolidated
Revenues					
Net premiums earned	\$ —	\$ —	\$ 1,853,702	\$ —	\$ 1,853,702
Net investment income	—	805	173,164	(8,012)	165,957
Net realized gains (losses)	—	1	47,622	—	47,623
Net impairment losses recognized in earnings	—	—	(6,912)	—	(6,912)
Other underwriting income	—	—	19,253	—	19,253
Equity in net income (loss) of investment funds accounted for using the equity method	—	—	22,056	—	22,056
Other income (loss)	—	—	317	—	317
Total revenues	—	806	2,109,202	(8,012)	2,101,996
Expenses					
Losses and loss adjustment expenses	—	—	1,013,142	—	1,013,142
Acquisition expenses	—	—	338,501	—	338,501
Other operating expenses	—	—	299,727	—	299,727
Corporate expenses	25,532	2,271	(1,040)	—	26,763
Interest expense	11,718	13,135	(258)	(7,848)	16,747
Net foreign exchange (gains) losses	—	—	(32,688)	(14,230)	(46,918)
Total expenses	37,250	15,406	1,617,384	(22,078)	1,647,962
Income (loss) before income taxes	(37,250)	(14,600)	491,818	14,066	454,034
Income tax (expense) benefit	—	5,110	(24,568)	—	(19,458)
Income (loss) before equity in net income of subsidiaries	(37,250)	(9,490)	467,250	14,066	434,576
Equity in net income of subsidiaries	436,376	28,572	—	(464,948)	—
Net income	399,126	19,082	467,250	(450,882)	434,576
Net (income) loss attributable to noncontrolling interests	—	—	(35,614)	164	(35,450)
Net income available to Arch	399,126	19,082	431,636	(450,718)	399,126
Preferred dividends	(10,969)	—	—	—	(10,969)
Net income available to Arch common shareholders	\$ 388,157	\$ 19,082	\$ 431,636	\$ (450,718)	\$ 388,157
Comprehensive income (loss) available to Arch	\$ 336,711	\$ (1,755)	\$ 383,442	\$ (381,687)	\$ 336,711

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

Condensed Consolidating Statement of Cash Flows	Six Months Ended June 30, 2016				
	ACGL (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other ACGL Subsidiaries	Consolidating Adjustments and Eliminations	ACGL Consolidated
Operating Activities					
Net Cash Provided By (Used For) Operating Activities	\$ 89,499	\$ 10,732	\$ 588,067	\$ (147,074)	\$ 541,224
Investing Activities					
Purchases of fixed maturity investments	—	—	(17,541,731)	—	(17,541,731)
Purchases of equity securities	—	—	(212,678)	—	(212,678)
Purchases of other investments	—	—	(650,613)	—	(650,613)
Proceeds from the sales of fixed maturity investments	—	—	16,978,549	—	16,978,549
Proceeds from the sales of equity securities	—	—	337,619	—	337,619
Proceeds from the sales, redemptions and maturities of other investments	—	—	636,535	—	636,535
Proceeds from redemptions and maturities of fixed maturity investments	—	41,500	329,480	—	370,980
Net settlements of derivative instruments	—	—	45,174	—	45,174
Net (purchases) sales of short-term investments	(76)	(53,729)	(250,655)	—	(304,460)
Change in cash collateral related to securities lending	—	—	(18,715)	—	(18,715)
Contributions to subsidiaries	(3,300)	—	(2,779)	6,079	—
Intercompany loans issued	—	—	—	—	—
Purchase of business, net of cash acquired	—	—	(1,460)	—	(1,460)
Purchases of fixed assets	(8)	—	(8,276)	—	(8,284)
Change in other assets	2,000	—	11,416	—	13,416
Net Cash Provided By (Used For) Investing Activities	(1,384)	(12,229)	(348,134)	6,079	(355,668)
Financing Activities					
Purchases of common shares under share repurchase program	(75,256)	—	—	—	(75,256)
Proceeds from common shares issued, net	(1,487)	—	6,079	(6,079)	(1,487)
Proceeds from borrowings	—	—	46,000	—	46,000
Repayments of borrowings	—	—	(179,171)	—	(179,171)
Change in cash collateral related to securities lending	—	—	18,715	—	18,715
Dividends paid to redeemable noncontrolling interests	—	—	(9,632)	638	(8,994)
Dividends paid to parent (1)	—	—	(146,436)	146,436	—
Other	—	200	(2,423)	—	(2,223)
Preferred dividends paid	(10,969)	—	—	—	(10,969)
Net Cash Provided By (Used For) Financing Activities	(87,712)	200	(266,868)	140,995	(213,385)
Effects of exchange rates changes on foreign currency cash	—	—	(8,906)	—	(8,906)
Increase (decrease) in cash	403	(1,297)	(35,841)	—	(36,735)
Cash beginning of year	6,809	17,023	529,494	—	553,326
Cash end of period	\$ 7,212	\$ 15,726	\$ 493,653	\$ —	\$ 516,591

(1) Included in net cash provided by (used for) operating activities in the ACGL (Parent Guarantor) column.

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

Condensed Consolidating Statement of Cash Flows	Six Months Ended June 30, 2015				
	ACGL (Parent Guarantor)	Arch-U.S. (Subsidiary Issuer)	Other ACGL Subsidiaries	Consolidating Adjustments and Eliminations	ACGL Consolidated
Operating Activities					
Net Cash Provided By (Used For) Operating Activities	\$ 378,703	\$ 8,282	\$ 433,833	\$ (435,619)	\$ 385,199
Investing Activities					
Purchases of fixed maturity investments	—	—	(14,641,391)	—	(14,641,391)
Purchases of equity securities	—	—	(288,535)	—	(288,535)
Purchases of other investments	—	—	(779,678)	—	(779,678)
Proceeds from the sales of fixed maturity investments	—	20,002	14,313,434	—	14,333,436
Proceeds from the sales of equity securities	—	—	272,343	—	272,343
Proceeds from the sales, redemptions and maturities of other investments	—	—	587,650	—	587,650
Proceeds from redemptions and maturities of fixed maturity investments	—	—	474,984	—	474,984
Net settlements of derivative instruments	—	—	19,006	—	19,006
Proceeds from investment in joint venture	—	—	40,000	—	40,000
Net (purchases) sales of short-term investments	(365)	(12,171)	16,243	—	3,707
Change in cash collateral related to securities lending	—	—	(18,329)	—	(18,329)
Contributions to subsidiaries	—	—	(9,290)	9,290	—
Intercompany loans issued	—	(39,500)	(27,500)	67,000	—
Purchase of business, net of cash acquired	—	—	818	—	818
Purchases of fixed assets	(24)	—	(6,372)	—	(6,396)
Change in other assets	—	—	(36,769)	—	(36,769)
Net Cash Provided By (Used For) Investing Activities	(389)	(31,669)	(83,386)	76,290	(39,154)
Financing Activities					
Purchases of common shares under share repurchase program	(361,877)	—	—	—	(361,877)
Proceeds from common shares issued, net	2,178	—	9,290	(9,290)	2,178
Proceeds from intercompany borrowings	—	27,500	39,500	(67,000)	—
Change in cash collateral related to securities lending	—	—	18,329	—	18,329
Dividends paid to redeemable noncontrolling interests	—	—	(9,632)	319	(9,313)
Dividends paid to parent (1)	—	—	(435,300)	435,300	—
Other	—	28	54,990	—	55,018
Preferred dividends paid	(10,969)	—	—	—	(10,969)
Net Cash Provided By (Used For) Financing Activities	(370,668)	27,528	(322,823)	359,329	(306,634)
Effects of exchange rates changes on foreign currency cash	—	—	(39)	—	(39)
Increase (decrease) in cash	7,646	4,141	27,585	—	39,372
Cash beginning of year	3,218	2,787	479,697	—	485,702
Cash end of period	\$ 10,864	\$ 6,928	\$ 507,282	\$ —	\$ 525,074

(1) Included in net cash provided by (used for) operating activities in the ACGL (Parent Guarantor) column.

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

13 . Income Taxes

The Company's income tax provision on income before income taxes resulted in an expense of 6.7% for the six months ended June 30, 2016 , compared to an expense of 4.3% for the 2015 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.

The Company had a net deferred tax asset of \$113.0 million at June 30, 2016 , compared to \$135.7 million at December 31, 2015 . In addition, the Company paid \$26.6 million and \$26.0 million of income taxes for the six months ended June 30, 2016 and 2015 , respectively.

14 . 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 June 30, 2016 , 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.

15 . Transactions with Related Parties

Kewsong Lee, a director of ACGL, is a Managing Director and Deputy Chief Investment Officer for Corporate Private Equity of The Carlyle Group ("Carlyle"). As part of its investment philosophy, the Company invests a portion of its investment portfolio in alternative investment funds. As of June 30, 2016 , the Company had aggregate commitments of \$770.9 million to funds managed by Carlyle, of which \$513.1 million was unfunded. The Company may make additional commitments to funds managed by Carlyle from time to time. During the six months ended June 30, 2016 and 2015 , the Company made aggregate capital contributions to funds managed by Carlyle of \$56.6 million and \$25.6 million , respectively, and received aggregate cash distributions from funds managed by Carlyle of \$13.8 million and \$19.8 million , respectively.

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, 2015 (“2015 Form 10-K”). In addition, readers should review “Risk Factors” set forth in Item 1A of Part I of our 2015 Form 10-K. Tabular amounts are in U.S. Dollars in thousands, except share amounts, unless otherwise noted.

Arch Capital Group Ltd. (“ACGL” and, together with its subsidiaries, “we” or “us”) is a Bermuda public limited liability company with approximately \$7.60 billion in capital at June 30, 2016 and, through operations in Bermuda, the United States, Europe and Canada, writes specialty lines of property and casualty insurance and reinsurance, as well as mortgage insurance and reinsurance, on a worldwide basis.

CURRENT OUTLOOK

The broad property casualty insurance market environment continues to be competitive in our business, consistent with our view last quarter. In our insurance segment, we experienced a slight deterioration in rates across certain sectors, while there are signs that reinsurance terms, especially ceding commissions, have bottomed out. This has led us to continue to reduce writings in certain property casualty lines in the 2016 second quarter. With the continued low interest rate environment, additional price increases are needed in many lines in order for us to achieve our return requirements. Our underwriting teams continue to execute a disciplined strategy by emphasizing small and medium-sized accounts over large accounts and by utilizing reinsurance purchases to reduce volatility on large account, high capacity business.

Our mortgage segment is experiencing favorable market conditions. Within the U.S. mortgage insurance sector, Arch Mortgage Insurance Company (“Arch MI U.S.”) continues to expand into the marketplace. Our market share continued to increase, reflecting continued growth in the bank channel and the impact of RateStar, our risk-based pricing program, which has met with wide acceptance from banks and credit union clients. In addition, international business and credit risk-sharing transactions continue to provide growth opportunities for our mortgage operations.

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.

Changing economic conditions could have a material impact on the frequency and severity of claims and, therefore, could negatively impact our underwriting returns. In addition, volatility in the financial markets could continue to significantly affect our investment returns, reported results and shareholders’ equity. We consider the potential impact of economic trends in the estimation process for establishing unpaid losses and loss adjustment expenses and in determining our investment strategies. In addition, weakness of the U.S., European countries and other key economies, projected budget deficits for the U.S., European countries and other governments and the consequences associated with potential downgrades of securities of the U.S., European countries and other governments by credit rating agencies is inherently unpredictable and could have a material adverse effect on financial markets and economic conditions in the U.S. and throughout the world. In turn, this could have a material adverse effect on our business, financial condition and results of operations and, in particular, this could have a material adverse effect on the value and liquidity of securities in our investment portfolio.

On June 23, 2016, the U.K. held a referendum in which it was decided that the U.K. would leave the European Union, or EU. As a result of the referendum, commonly referred to as “Brexit,” it is expected that the British government will begin negotiating the terms of the U.K.’s future relationship with the EU. These changes may adversely affect our operations and financial results. For further information see Item 1A. “Risk Factors” in this Form 10-Q.

NATURAL CATASTROPHE RISK

We monitor our natural catastrophe risk globally for all perils and regions, in each case, where we believe there is significant exposure. 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. Currently, we seek to limit our 1-in-250 year return period net probable maximum pre-tax 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 July 1, 2016, our modeled peak zone catastrophe exposure was a windstorm affecting the Northeastern U.S., with a net probable

maximum pre-tax loss of \$495 million, followed by windstorms affecting the Gulf of Mexico and Florida Tri-County regions with net probable maximum pre-tax losses of \$434 million and \$392 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 July 1, 2016, our modeled peak zone earthquake exposure (Los Angeles earthquake) represented approximately 56% 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.

Net probable maximum pre-tax loss estimates are net of expected reinsurance recoveries, before income tax and before excess reinsurance reinstatement premiums. 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 loss estimates include clash estimates from other zones. The loss estimates shown above 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 a net loss greater than 25% of total shareholders' equity available to Arch from one or more catastrophic 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. Actual losses may also 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—Risk Relating to Our Industry" and "Management's Discussion and Analysis of Financial Condition and Results of Operations—Natural and Man-Made Catastrophic Events" in our 2015 Form 10-K.

FINANCIAL MEASURES

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

Book Value per Common Share

Book value per common share represents total common shareholders' equity available to Arch divided by the number of common shares outstanding. Management uses growth in book value per common share as a key measure of the value generated for our common shareholders each period and believes that book value per common share is the key driver of ACGL's share price over time. Book value per common 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 common share depending on the purchase price.

Book value per common share was \$52.04 at June 30, 2016, compared to \$49.87 at March 31, 2016 and \$47.49 at June 30, 2015. The 4.4% increase in the 2016 second quarter reflected strong underwriting and investment returns, while the 9.6% increase over the trailing twelve months reflected strong underwriting returns and mixed results on investments.

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 and net foreign exchange gains or losses, net of income taxes. Management uses Operating ROAE as a key measure of the return generated to common shareholders and has set an objective to achieve an average Operating ROAE of 15% or greater over the insurance cycle, which it believes to be an attractive return to common shareholders given the risks we assume. See "Comment on Non-GAAP Financial Measures."

Our Operating ROAE was 9.0% for the 2016 second quarter, compared to 9.9% for the 2015 second quarter, and 9.3% for the six months ended June 30, 2016, compared to 10.2% for the 2015 period. The lower level of Operating ROAE for the 2016 second quarter primarily reflected the growth in average common equity as compared to the 2015 second quarter.

Total Return on Investments

The following table summarizes the pre-tax total return (before investment expenses) of investments managed by Arch 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
2016 Second Quarter	1.27 %	1.08 %
2015 Second Quarter	(0.04)%	(0.15)%
Six Months Ended June 30, 2016	3.11 %	3.50 %
Six Months Ended June 30, 2015	1.07 %	0.14 %

Excluding the effects of foreign exchange, total return was 1.63% for the 2016 second quarter and 3.14% for the six months ended June 30, 2016, reflecting lower interest rates

and tightening credit spreads on fixed maturity investments, compared to higher interest rates and widening credit spreads during the 2015 periods. Total return for the 2016 second quarter reflected the strengthening of the U.S. Dollar against the Euro, Canadian Dollar, Australian Dollar and other major currencies on non-U.S. Dollar denominated investments.

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 June 30, 2016, the benchmark return index had an average credit quality of “Aa2” by Moody’s Investors Service (“Moody’s”), and an estimated duration of 3.46 years.

The benchmark return index included weightings to the following indices, which are primarily from The Bank of America Merrill Lynch (“BoAML”):

	%
BoAML 1-10 Year AA U.S. Corporate & Yankees Index	21.25%
BoAML 1-5 Year U.S. Treasury Index	13.00
BoAML U.S. Mortgage Backed Securities Index	10.00
BoAML 3-5 Year Fixed Rate Asset Backed Securities Index	7.00
BoAML 1-10 Year U.S. Municipal Securities Index	7.00
BoAML U.S. High Yield Constrained Index	5.50
BoAML 0-3 Month U.S. Treasury Bill Index	5.00
Barclays Capital CMBS Inv. Grade, AAA Rated Index	5.00
Barclays Capital Agency Bullet, 10-10 Year Index	5.00
MSCI All Country World Gross Total Return Index	5.00
BoAML 1-10 Year Euro Government Index	4.50
BoAML 5-10 Year U.S. Treasury Index	3.25
BoAML 1-5 Year U.K. Gilt Index	3.00
BoAML 1-10 Year Australian Governments Index	2.50
BoAML 1-5 Year Canada Government Index	1.50
BoAML Euro Government Index	1.00
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 and net foreign exchange gains or losses, net of 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 and net foreign exchange gains or losses 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. 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 and net foreign exchange gains or losses 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 5, "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 5, "Segment Information" of the notes accompanying 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 intangible assets, 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. 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 available to Arch common shareholders to after-tax operating income 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		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Net income available to Arch common shareholders	\$ 205,570	\$ 110,305	\$ 354,884	\$ 388,157
Net realized (gains) losses	(43,935)	27,837	(76,399)	(39,638)
Net impairment losses recognized in earnings	5,343	1,113	12,982	6,912
Equity in net (income) loss of investment funds accounted for using the equity method	(8,737)	(16,168)	(15,392)	(22,057)
Net foreign exchange (gains) losses	(22,703)	22,241	(494)	(44,574)
Income tax expense	5,036	628	10,735	7,002
After-tax operating income available to Arch common shareholders	\$ 140,574	\$ 145,956	\$ 286,316	\$ 295,802
Beginning common shareholders' equity	\$ 6,088,587	\$ 5,963,702	\$ 5,879,881	\$ 5,805,053
Ending common shareholders' equity	6,378,922	5,812,515	6,378,922	5,812,515
Average common shareholders' equity	\$ 6,233,755	\$ 5,888,109	\$ 6,129,402	\$ 5,808,784
Annualized return on average common equity %	13.2	7.5	11.6	13.4
Annualized operating return on average common equity %	9.0	9.9	9.3	10.2

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 Chairman and Chief Executive Officer, the President and Chief Operating Officer, and the Chief Financial Officer of ACGL. 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 June 30,		
	2016	2015	% Change
Gross premiums written	\$ 762,043	\$ 744,810	2.3
Premiums ceded	(246,875)	(235,743)	
Net premiums written	515,168	509,067	1.2
Change in unearned premiums	12,482	758	
Net premiums earned	527,650	509,825	3.5
Other underwriting income	—	521	
Losses and loss adjustment expenses	(354,633)	(320,926)	
Acquisition expenses, net	(77,317)	(76,723)	
Other operating expenses	(92,371)	(89,054)	
Underwriting income	\$ 3,329	\$ 23,643	(85.9)
Underwriting Ratios			% Point Change
Loss ratio	67.2%	62.9%	4.3
Acquisition expense ratio	14.7%	15.0%	(0.3)
Other operating expense ratio	17.5%	17.5%	—
Combined ratio	99.4%	95.4%	4.0

	Six Months Ended June 30,		
	2016	2015	% Change
Gross premiums written	\$ 1,560,596	\$ 1,510,963	3.3
Premiums ceded	(495,664)	(459,893)	
Net premiums written	1,064,932	1,051,070	1.3
Change in unearned premiums	(24,193)	(33,331)	
Net premiums earned	1,040,739	1,017,739	2.3
Other underwriting income	—	948	
Losses and loss adjustment expenses	(678,242)	(638,822)	
Acquisition expenses, net	(151,671)	(151,801)	
Other operating expenses	(178,232)	(177,173)	
Underwriting income	\$ 32,594	\$ 50,891	(36.0)
Underwriting Ratios			% Point Change
Loss ratio	65.2%	62.8%	2.4
Acquisition expense ratio	14.6%	14.9%	(0.3)
Other operating expense ratio	17.1%	17.4%	(0.3)
Combined ratio	96.9%	95.1%	1.8

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 table sets forth our insurance segment's net premiums written by major line of business:

	Three Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Professional lines	\$ 107,519	20.9	\$ 100,100	19.7
Construction and national accounts	85,260	16.5	77,096	15.1
Programs	75,420	14.6	106,179	20.9
Excess and surplus casualty	60,412	11.7	53,971	10.6
Travel, accident and health	54,456	10.6	35,416	7.0
Property, energy, marine and aviation	50,194	9.7	62,049	12.2
Lenders products	25,254	4.9	24,011	4.7
Other	56,653	11.0	50,245	9.9
Total	\$ 515,168	100.0	\$ 509,067	100.0

2016 Second Quarter versus 2015 Second Quarter . Gross premiums written by the insurance segment in the 2016 second quarter were 2.3% higher than in the 2015 second quarter , while net premiums written were 1.2% higher than in the 2015 second quarter . The increase in net premiums written reflected growth in travel, construction and national accounts, partially offset by a reduction in programs and property lines. The growth in travel reflected both new

business and continued expansion in existing accounts. The increase in construction and national accounts primarily reflected new business and audit premiums. The reduction in program business primarily reflected the continued impact of the non-renewal of a large program in the latter part of 2015 while the lower level of net premiums written in property lines reflected continued weak market conditions.

	Six Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Professional lines	\$ 216,986	20.4	\$ 211,278	20.1
Construction and national accounts	189,734	17.8	173,599	16.5
Programs	165,204	15.5	224,376	21.3
Excess and surplus casualty	114,069	10.7	103,341	9.8
Travel, accident and health	111,719	10.5	74,328	7.1
Property, energy, marine and aviation	100,169	9.4	120,716	11.5
Lenders products	50,038	4.7	46,827	4.5
Other	117,013	11.0	96,605	9.2
Total	\$ 1,064,932	100.0	\$ 1,051,070	100.0

Six Months Ended June 30, 2016 versus 2015 period . Gross premiums written by the insurance segment for the six months ended June 30, 2016 were 3.3% higher than in the 2015 period, while net premiums written were 1.3% higher than in the 2015 period. The increase in net premiums written reflected growth in travel, accident and health, construction and national accounts and alternative markets business, partially offset by a reduction in programs and property lines. The growth in travel, accident and health reflected both new business and continued expansion in existing accounts. The increase in construction and national accounts primarily reflected new business and audit premiums while the increase in alternative markets resulted from new accounts, exposure growth and audit premiums. The reduction in program business primarily reflected the continued impact of the non-renewal of a large program in the latter part of 2015 while the lower level of net premiums written in property lines reflected continued weak market conditions.

Net Premiums Earned .

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

	Three Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Professional lines	\$ 108,556	20.6	\$ 107,420	21.1
Construction and national accounts	84,414	16.0	71,580	14.0
Programs	90,595	17.2	112,942	22.2
Excess and surplus casualty	57,155	10.8	51,709	10.1
Travel, accident and health	59,821	11.3	39,979	7.8
Property, energy, marine and aviation	47,076	8.9	53,825	10.6
Lenders products	23,007	4.4	21,259	4.2
Other	57,026	10.8	51,111	10.0
Total	\$ 527,650	100.0	\$ 509,825	100.0

	Six Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Professional lines	\$ 213,500	20.5	\$ 215,292	21.2
Construction and national accounts	161,457	15.5	143,810	14.1
Programs	189,096	18.2	228,906	22.5
Excess and surplus casualty	112,120	10.8	104,056	10.2
Travel, accident and health	107,366	10.3	73,711	7.2
Property, energy, marine and aviation	96,113	9.2	108,906	10.7
Lenders products	47,409	4.6	44,118	4.3
Other	113,678	10.9	98,940	9.7
Total	\$ 1,040,739	100.0	\$ 1,017,739	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 2016 second quarter were 3.5% higher than in the 2015 second quarter and 2.3% higher for the six months ended June 30, 2016 than in the 2015 period.

Losses and Loss Adjustment Expenses .

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

	Three Months Ended		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Current year	68.1 %	66.5 %	66.3 %	65.5 %
Prior period reserve development	(0.9)%	(3.6)%	(1.1)%	(2.7)%
Loss ratio	67.2 %	62.9 %	65.2 %	62.8 %

Current Year Loss Ratio.

The insurance segment's current year loss ratio in the 2016 second quarter was 1.6 points higher than in the 2015 second quarter and 0.8 points higher than in the 2015 period. The 2016 second quarter loss ratio reflected 3.9 points of current year catastrophic activity, compared to 1.2 points in the 2015 second quarter, and 2.0 points for the six months ended June 30, 2016, compared to 0.9 points for the 2015 period. Events in the 2016 second quarter included the Fort McMurray wildfires, Texas hailstorms and floods and other U.S. weather events.

Prior Period Reserve Development.

2016 Second Quarter : The insurance segment's net favorable development of \$4.9 million, or 0.9 points, consisted of \$8.1 million of net favorable development in long-tailed lines and \$6.5 million of net favorable development in short-tailed lines, partially offset by \$9.7 million of net adverse development in medium-tailed lines. Net favorable development in long-tailed lines reflected net reductions in executive assurance reserves from the 2008 to 2012 accident years (*i.e.*, the year in which a loss occurred), and net reductions in casualty reserves from the 2004 to 2012 accident years, offset by a large energy casualty claim from the 2015 accident year. Net favorable development in short-tailed lines primarily resulted from reductions in property (including special risk other than marine) reserves from the 2012 to 2014 accident years and the 2008 accident year, primarily due to varying levels of reported claims activity. Such amount included \$4.1 million of favorable development on the 2005 to 2015 named catastrophic events. Net adverse development in medium-tailed lines primarily resulted from an increase in programs of \$16.4 million stemming in part from terminated programs, partially offset by favorable development of \$6.7 million in other medium-tailed lines, primarily in professional liability and surety.

2015 Second Quarter : The insurance segment's net favorable development of \$18.6 million, or 3.6 points, consisted of \$13.6 million of net favorable development in short-tailed lines and \$5.0 million of net favorable development in medium-tailed and long-tailed lines. Favorable development in short-tailed lines primarily consisted of reductions in property (including special risk other than marine) reserves from the 2011 to 2014 accident years, primarily due to varying levels of reported claims activity. Development on the 2005 to 2014 named catastrophic events was adverse by \$0.8 million in the quarter. Net favorable development in medium-tailed and long-tailed lines reflected favorable development in marine reserves, primarily from the 2013 accident year, in surety reserves, primarily from the 2012 and 2013 accident years, and in casualty reserves, primarily from the 2007 to 2009 accident years. In addition, the insurance segment's results reflected net favorable development in professional lines of \$0.7 million, including favorable development in healthcare reserves, primarily from the 2008 to 2011 accident years, partially offset by an increase in reserves on professional liability and executive assurance

reserves, primarily in the 2009 and 2011 accident years due to a small number of large losses, largely offset by favorable development in other accident years.

Six Months Ended June 30, 2016 : The insurance segment's net favorable development of \$11.1 million, or 1.1 points, consisted of \$18.0 million of net favorable development in long-tailed lines and \$10.2 million of net favorable development in short-tailed lines, partially offset by \$17.1 million of net adverse development in medium-tailed lines. Net favorable development in long-tailed lines reflected net reductions in executive assurance reserves from the 2008 to 2012 accident years, and net reductions in casualty reserves from the 2004 to 2013 accident years, partially offset by a large energy casualty claim from the 2015 accident year. Net favorable development in short-tailed lines primarily resulted from reductions in property (including special risk other than marine) reserves from the 2012 to 2014 accident years, primarily due to varying levels of reported claims activity. Such amount included \$7.3 million of favorable development on the 2005 to 2015 named catastrophic events. Net adverse development in medium-tailed lines primarily resulted from an increase in programs of \$22.4 million stemming in part from terminated programs, partially offset by favorable development of \$5.3 million in other medium-tailed lines, primarily in professional liability and surety.

Six Months Ended June 30, 2015 : The insurance segment's net favorable development of \$27.3 million, or 2.7 points, consisted of \$25.6 million of net favorable development in short-tailed lines and \$1.7 million of net favorable development in medium-tailed and long-tailed lines. Favorable development in short-tailed lines primarily consisted of reductions in property (including special risk other than marine) reserves from the 2008 to 2014 accident years, primarily due to varying levels of reported claims activity. Development on the 2005 to 2014 named catastrophic events was favorable by \$2.9 million for the 2015 period. Net favorable development in medium-tailed and long-tailed lines reflected favorable development in marine reserves, primarily from the 2010 to 2013 accident years, and in surety reserves, primarily from the 2009 to 2013 accident years. In addition, the insurance segment's results reflected net favorable development in professional lines of \$3.1 million, including favorable development in healthcare reserves, primarily from the 2007 to 2012 accident years, and in executive assurance reserves across most accident years, partially offset by an increase in reserves on professional liability reserves, primarily in the 2011 and 2012 accident years.

Underwriting Expenses .

2016 Second Quarter versus 2015 Second Quarter : The insurance segment's underwriting expense ratio was 32.2% in the 2016 second quarter , compared to 32.5% in the 2015 second quarter . The comparison of the underwriting expense ratios and the underlying acquisition expense and other operating expense ratios reflects changes in the level of reinsurance ceded on a quota share basis and changes in the mix of business.

Six Months Ended June 30, 2016 versus 2015 period: The insurance segment's underwriting expense ratio was 31.7% for the six months ended June 30, 2016 , compared to 32.3% for the 2015 period. The comparison of the underwriting expense ratios and the underlying acquisition expense and other operating expense ratios reflects changes in the level of reinsurance ceded on a quota share basis and changes in the mix of business.

Reinsurance Segment

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

	Three Months Ended June 30,		
	2016	2015	% Change
Gross premiums written	\$ 412,053	\$ 342,101	20.4
Premiums ceded	(119,951)	(89,446)	
Net premiums written	292,102	252,655	15.6
Change in unearned premiums	(846)	21,310	
Net premiums earned	291,256	273,965	6.3
Other underwriting income	20,118	2,658	
Losses and loss adjustment expenses	(146,091)	(111,183)	
Acquisition expenses, net	(55,796)	(58,360)	
Other operating expenses	(37,115)	(39,007)	
Underwriting income	\$ 72,372	\$ 68,073	6.3
Underwriting Ratios			% Point Change
Loss ratio	50.2%	40.6%	9.6
Acquisition expense ratio	19.2%	21.3%	(2.1)
Other operating expense ratio	12.7%	14.2%	(1.5)
Combined ratio	82.1%	76.1%	6.0

	Six Months Ended June 30,		
	2016	2015	% Change
Gross premiums written	\$ 893,443	\$ 827,213	8.0
Premiums ceded	(280,517)	(226,015)	
Net premiums written	612,926	601,198	2.0
Change in unearned premiums	(60,462)	(47,516)	
Net premiums earned	552,464	553,682	(0.2)
Other underwriting income	20,443	4,087	
Losses and loss adjustment expenses	(257,689)	(223,715)	
Acquisition expenses, net	(110,583)	(114,964)	
Other operating expenses	(73,570)	(77,051)	
Underwriting income	\$ 131,065	\$ 142,039	(7.7)

Underwriting Ratios			% Point Change
Loss ratio	46.6%	40.4%	6.2
Acquisition expense ratio	20.0%	20.8%	(0.8)
Other operating expense ratio	13.3%	13.9%	(0.6)
Combined ratio	79.9%	75.1%	4.8

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 of 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 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 table sets forth our reinsurance segment's net premiums written by major line of business:

	Three Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Other specialty	\$ 113,943	39.0	\$ 72,134	28.6
Property excluding property catastrophe	69,831	23.9	57,005	22.6
Casualty	61,555	21.1	64,778	25.6
Property catastrophe	41,771	14.3	46,046	18.2
Marine and aviation	1,463	0.5	9,461	3.7
Other	3,539	1.2	3,231	1.3
Total	\$ 292,102	100.0	\$ 252,655	100.0
Pro rata	\$ 146,231	50.1	\$ 128,976	51.0
Excess of loss	145,871	49.9	123,679	49.0
Total	\$ 292,102	100.0	\$ 252,655	100.0

2016 Second Quarter versus 2015 Second Quarter . Gross premiums written by the reinsurance segment in the 2016 second quarter were 20.4% higher than in the 2015 second quarter , while net premiums written were 15.6% higher than in the 2015 second quarter . The growth reflected the impact of a 2016 second quarter loss portfolio transfer in the other specialty line which resulted in \$52.1 million of gross premiums written and \$40.2 million of net premiums written. Such premium was substantially earned in the period and resulted in a corresponding increase to losses and loss adjustment expenses. Excluding such transaction, net premiums written were flat, reflecting competitive market conditions and a higher level of ceded premiums.

	Six Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Other specialty	\$ 214,763	35.0	\$ 173,282	28.8
Property excluding property catastrophe	143,554	23.4	146,929	24.4
Casualty	188,038	30.7	182,636	30.4
Property catastrophe	39,476	6.4	61,489	10.2
Marine and aviation	19,003	3.1	30,305	5.0
Other	8,092	1.3	6,557	1.1
Total	\$ 612,926	100.0	\$ 601,198	100.0
Pro rata	\$ 258,440	42.2	\$ 259,211	43.1
Excess of loss	354,486	57.8	341,987	56.9
Total	\$ 612,926	100.0	\$ 601,198	100.0

Six Months Ended June 30, 2016 versus 2015 period . Gross premiums written by the reinsurance segment for the six months ended June 30, 2016 were 8.0% higher than in the 2015 period, while net premiums written were 2.0% higher than in the 2015 period. Premiums written reflects the loss portfolio transfer noted above, partially offset by decreases in property lines, reflecting competitive market conditions and a higher level of ceded premiums.

Net Premiums Earned .

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

	Three Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Other specialty	\$ 109,493	37.6	\$ 80,256	29.3
Property excluding property catastrophe	65,487	22.5	69,600	25.4
Casualty	80,157	27.5	83,186	30.4
Property catastrophe	19,823	6.8	24,325	8.9
Marine and aviation	12,559	4.3	13,423	4.9
Other	3,737	1.3	3,175	1.2
Total	\$ 291,256	100.0	\$ 273,965	100.0
Pro rata	\$ 153,933	52.9	\$ 143,835	52.5
Excess of loss	137,323	47.1	130,130	47.5
Total	\$ 291,256	100.0	\$ 273,965	100.0

	Six Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Other specialty	\$ 183,742	33.3	\$ 164,054	29.6
Property excluding property catastrophe	137,440	24.9	149,364	27.0
Casualty	156,210	28.3	156,567	28.3
Property catastrophe	37,776	6.8	51,595	9.3
Marine and aviation	30,437	5.5	26,036	4.7
Other	6,859	1.2	6,066	1.1
Total	\$ 552,464	100.0	\$ 553,682	100.0
Pro rata	\$ 293,626	53.1	\$ 297,350	53.7
Excess of loss	258,838	46.9	256,332	46.3
Total	\$ 552,464	100.0	\$ 553,682	100.0

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. Net premiums earned for the 2016 second quarter were 6.3% higher than in the 2015 second quarter and 0.2% lower for the six months ended June 30, 2016 than in the 2015 period. Net premiums earned reflects the loss portfolio transfer noted above along with changes in net premiums written over the previous five quarters.

Other Underwriting Income .

Other underwriting income was \$20.1 million for the 2016 second quarter , compared to \$2.7 million for the 2015 second quarter , and \$20.4 million for the six months ended June 30, 2016 , compared to \$4.1 million for the 2015 period. The 2016 second quarter amount included \$19.1 million related to a contract which was commuted during the period. This contract had been reflected as a deposit accounting liability (*i.e.* , a contract that, in accordance with GAAP, does not pass risk transfer) prior to the commutation.

Losses and Loss Adjustment Expenses .

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

	Three Months Ended June 30,		Six Months Ended June 30,	
	2016	2015	2016	2015
Current year	74.2 %	61.7 %	67.8 %	61.3 %
Prior period reserve development	(24.0)%	(21.1)%	(21.2)%	(20.9)%
Loss ratio	50.2 %	40.6 %	46.6 %	40.4 %

Current Year Loss Ratio .

The reinsurance segment's current year loss ratio in the 2016 second quarter was 12.5 points higher than in the 2015 second quarter , and 6.5 points higher for the six months ended June 30, 2016 than in the 2015 period. The 2016 second quarter loss ratio reflected 6.1 points of current year catastrophic activity, compared to 3.7 points in the 2015 second quarter , and 3.9 points for the six months ended June 30, 2016 , compared to 2.1 points in the 2015 period. Events in the 2016 second quarter included the Texas hailstorms and floods, Fort McMurray wildfires, earthquake events in Japan and Ecuador and other U.S. weather events. In addition, the 2016 ratios reflect the impact of the loss portfolio transfer noted above (net premiums earned at a high loss ratio), which increased the current year loss ratio by 7.7 points in the 2016 second quarter and 4.0 points for the six months ended June 30, 2016 . The 2016 ratios also reflected the impact of a large marine attritional loss that had no equivalent in the 2015 periods.

Prior Period Reserve Development .

2016 Second Quarter : The reinsurance segment's net favorable development of \$69.8 million , or 24.0 points, consisted of \$48.9 million from short-tailed lines and \$20.9 million from long-tailed and medium-tailed lines. Favorable development in short-tailed lines included \$39.5 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). Such amount did not reflect any significant development on the 2005 to 2015 named catastrophic events. The net reduction of loss estimates for the reinsurance segment's short-tailed lines primarily resulted from varying 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 lines reflected reductions in casualty reserves of \$22.8 million based on varying levels of reported and paid claims activity, primarily from the 2002 to 2009 underwriting years and 2012 to 2013 underwriting years.

2015 Second Quarter : The reinsurance segment's net favorable development of \$57.8 million , or 21.1 points, consisted of \$21.2 million from short-tailed lines and \$36.6

million from long-tailed and medium-tailed lines. Favorable development in short-tailed lines included \$18.4 million from property catastrophe and property other than property catastrophe reserves, primarily from the 2012 to 2014 underwriting years. Contained within this release was favorable development from the 2005 to 2014 named catastrophic events of \$8.3 million. The net reduction of loss estimates for the reinsurance segment's short-tailed lines primarily resulted from varying 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 lines reflected reductions in casualty reserves of \$36.3 million based on varying levels of reported and paid claims activity, primarily from the 2003 to 2009 underwriting years.

Six Months Ended June 30, 2016 : The reinsurance segment's net favorable development of \$117.2 million , or 21.2 points, consisted of \$85.4 million from short-tailed lines and \$31.8 million from long-tailed and medium-tailed lines. Favorable development in short-tailed lines included \$69.4 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). Such amount included \$2.7 million of favorable development from the 2005 to 2015 named catastrophic events. The net reduction of loss estimates for the reinsurance segment's short-tailed lines primarily resulted from varying 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 lines reflected reductions in casualty reserves of \$37.0 million based on varying levels of reported and paid claims activity, primarily from the 2002 to 2013 underwriting years. Such amounts were partially offset by net adverse development on marine reserves of \$3.9 million, primarily from the 2002 and 2015 underwriting years, partially offset by favorable development from most other underwriting years.

Six Months Ended June 30, 2015 : The reinsurance segment's net favorable development of \$115.8 million , or 20.9 points, consisted of \$60.4 million from short-tailed lines and \$55.4 million from long-tailed and medium-tailed lines. Favorable development in short-tailed lines included \$45.9 million from property catastrophe and property other than property catastrophe reserves, primarily from the 2012 to 2014 underwriting years. Contained within this release was favorable development from the 2005 to 2014 named catastrophic events of \$10.3 million. The net reduction of loss estimates for the reinsurance segment's short-tailed lines primarily resulted from varying 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 lines reflected reductions in casualty reserves of \$52.2 million, primarily from the 2003 to 2009 underwriting years based on varying levels of reported and paid claims activity, and a reduction

of \$3.2 million in marine and aviation reserves, primarily from the 2010 to 2012 underwriting years.

Underwriting Expenses .

2016 Second Quarter versus 2015 Second Quarter : The underwriting expense ratio for the reinsurance segment was 31.9% in the 2016 second quarter , compared to 35.5% in the 2015 second quarter . The 2016 second quarter ratio reflected approximately 5.0 points of benefit from the loss portfolio transfer noted above (net premiums earned with no related expenses). The acquisition expense ratio for the 2016 second quarter was 19.2% , compared to 21.3% for the 2015 second quarter . The operating expense ratio for the 2016 second quarter was 12.7% , compared to 14.2% in the 2015 second quarter .

Six Months Ended June 30, 2016 versus 2015 period: The underwriting expense ratio for the reinsurance segment was 33.3% for the six months ended June 30, 2016 , compared to 34.7% for the 2015 period. The ratio for the six months ended June 30, 2016 reflected approximately 2.6 points of benefit from the loss portfolio transfer noted above (net premiums earned with no related expenses). The acquisition expense ratio for the six months ended June 30, 2016 was 20.0% , compared to 20.8% for the 2015 period. The operating expense ratio for the six months ended June 30, 2016 was 13.3% , compared to 13.9% for the 2015 period.

Mortgage Segment

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

	Three Months Ended June 30,		
	2016	2015	% Change
Gross premiums written	\$ 118,434	\$ 68,572	72.7
Premiums ceded	(6,969)	(6,902)	
Net premiums written	111,465	61,670	80.7
Change in unearned premiums	(44,953)	(9,211)	
Net premiums earned	66,512	52,459	26.8
Other underwriting income	4,137	3,686	
Losses and loss adjustment expenses	(366)	(9,639)	
Acquisition expenses, net	(8,523)	(10,200)	
Other operating expenses	(23,991)	(19,679)	
Underwriting income	\$ 37,769	\$ 16,627	127.2
Underwriting Ratios			% Point Change
Loss ratio	0.6%	18.4%	(17.8)
Acquisition expense ratio	12.8%	19.4%	(6.6)
Other operating expense ratio	36.1%	37.5%	(1.4)
Combined ratio	49.5%	75.3%	(25.8)

	Six Months Ended June 30,		
	2016	2015	% Change
Gross premiums written	\$ 229,714	\$ 129,113	77.9
Premiums ceded	(11,736)	(15,572)	
Net premiums written	217,978	113,541	92.0
Change in unearned premiums	(89,701)	(10,715)	
Net premiums earned	128,277	102,826	24.8
Other underwriting income	7,930	11,404	
Losses and loss adjustment expenses	(8,995)	(23,448)	
Acquisition expenses, net	(16,908)	(20,618)	
Other operating expenses	(48,606)	(40,048)	
Underwriting income	\$ 61,698	\$ 30,116	104.9
Underwriting Ratios			% Point Change
Loss ratio	7.0%	22.8%	(15.8)
Acquisition expense ratio	13.2%	20.1%	(6.9)
Other operating expense ratio	37.9%	38.9%	(1.0)
Combined ratio	58.1%	81.8%	(23.7)

The mortgage segment includes the results of Arch MI U.S. and Arch Mortgage Insurance Designated Activity Company, leading providers of mortgage insurance products and services to the U.S. and European markets, respectively. Arch MI U.S. is approved as an eligible mortgage insurer by Federal National Mortgage Association (“Fannie Mae”) and Federal Home Loan Mortgage Corporation (“Freddie Mac”), each a government sponsored enterprise, or “GSE.” The mortgage segment also includes GSE credit risk-sharing transactions and mortgage reinsurance for the U.S. and Australian markets.

Premiums Written .

The following table sets forth our mortgage segment’s net premiums written by client location and underwriting location (*i.e.* , where the business is underwritten):

	Three Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Client location:				
United States	\$ 66,261	59.4	\$ 47,460	77.0
Other	45,204	40.6	14,210	23.0
Total	\$ 111,465	100.0	\$ 61,670	100.0
Underwriting location:				
United States	\$ 42,442	38.1	\$ 30,589	49.6
Other	69,023	61.9	31,081	50.4
Total	\$ 111,465	100.0	\$ 61,670	100.0

2016 Second Quarter versus 2015 Second Quarter . Net premiums written for the 2016 second quarter were 80.7% higher than in the 2015 second quarter . Approximately two thirds of the increase was in Australian mortgage reinsurance business with the remainder split between U.S. primary business, primarily from banks and other non-credit union originators, and in GSE credit risk-sharing transactions receiving insurance accounting treatment. 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 75.6% at June 30, 2016 , compared to 74.2% at March 31, 2016. The persistency rates continue to reflect mortgage refinance activity and the low interest rate environment.

	Six Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Client location:				
United States	122,064	56.0	93,282	82.2
Other	95,914	44.0	20,259	17.8
Total	\$ 217,978	100.0	\$ 113,541	100.0
Underwriting location:				
United States	\$ 77,772	35.7	\$ 58,545	51.6
Other	140,206	64.3	54,996	48.4
Total	\$ 217,978	100.0	\$ 113,541	100.0

Six Months Ended June 30, 2016 versus 2015 period . Net premiums written for the six months ended June 30, 2016 were 92.0 % higher than for the 2015 period. Over two thirds of the increase was in Australian mortgage reinsurance business with the remainder split between U.S. primary business, primarily from banks and other non-credit union originators, and in GSE credit risk-sharing transactions receiving insurance accounting treatment.

Arch MI U.S. generated \$6.42 billion of new insurance written (“NIW”) during the 2016 second quarter , of which approximately 76% was from banks and other non-credit union mortgage originators. NIW 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 client location and underwriting location:

	Three Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Client Location:				
United States	\$ 61,046	91.8	\$ 50,009	95.3
Other	5,466	8.2	2,450	4.7
Total	\$ 66,512	100.0	\$ 52,459	100.0
Underwriting location:				
United States	\$ 34,124	51.3	\$ 27,450	52.3
Other	32,388	48.7	25,009	47.7
Total	\$ 66,512	100.0	\$ 52,459	100.0
	Six Months Ended June 30,			
	2016		2015	
	Amount	%	Amount	%
Client Location:				
United States	\$ 118,178	92.1	\$ 98,084	95.4
Other	10,099	7.9	4,742	4.6
Total	\$ 128,277	100.0	\$ 102,826	100.0
Underwriting location:				
United States	\$ 66,644	52.0	\$ 52,969	51.5
Other	61,633	48.0	49,857	48.5
Total	\$ 128,277	100.0	\$ 102,826	100.0

Net premiums earned for the 2016 periods were higher than in the 2015 periods, primarily due to the growth in insurance in force for Arch MI U.S. along with a higher earned contribution from the mortgage segment's quota share reinsurance business.

Other Underwriting Income .

Other underwriting income, which is primarily related to GSE risk-sharing transactions receiving derivative accounting treatment, was \$4.1 million for the 2016 second quarter, compared to \$3.7 million for the 2015 second quarter, and \$7.9 million for the six months ended June 30, 2016, compared to \$11.4 million for the 2015 period (which included approximately \$3.4 million of catch up income due to the timing of the insurance product and securitization transactions).

Losses and Loss Adjustment Expenses .

Unlike property and casualty business for which we estimate ultimate losses on premiums earned, losses on mortgage insurance business are only recorded at the time a borrower is delinquent on their mortgage, in accordance with mortgage insurance industry practice. Because our mortgage insurance reserving process does not take into account the impact of future losses from loans that are not in default, mortgage insurance loss reserves are not an estimate of ultimate losses. In addition to establishing loss reserves for loans in default,

under GAAP, we are required to establish a premium deficiency reserve for our mortgage insurance products if the amount of expected future losses for a particular product and maintenance costs for such product exceeds expected future premiums, existing reserves and the anticipated investment income for such product. We evaluate whether a premium deficiency exists quarterly. No such reserve was established in the 2016 second quarter.

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

	Three Months Ended		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Current year	17.2 %	20.5 %	17.8 %	26.4 %
Prior period reserve development	(16.6)%	(2.1)%	(10.8)%	(3.6)%
Loss ratio	0.6 %	18.4 %	7.0 %	22.8 %

Current Year Loss Ratio .

The mortgage segment's current year loss ratio was 3.3 points lower in the 2016 second quarter than in the 2015 second quarter, and 8.6 points lower for the six months ended June 30, 2016 than in the 2015 period. The current year loss ratio for the 2016 periods reflect higher premiums driven by growth in insurance in force, the impact of a low number of delinquent loans and a lower claim rate on such loans.

Prior Period Reserve Development .

The mortgage segment's net favorable development was \$11.1 million, or 16.6 points, for the 2016 second quarter, compared to \$1.1 million, or 2.1 points, for the 2015 second quarter, and \$13.8 million, or 10.8 points, for the six months ended June 30, 2016, compared to \$3.7 million, or 3.6 points, for the 2015 period. The reduction in all periods was primarily driven by continued lower than expected claim rates across most origination years.

Underwriting Expenses .

2016 Second Quarter versus 2015 Second Quarter . The underwriting expense ratio for the mortgage segment was 48.9% in the 2016 second quarter, compared to 56.9% in the 2015 second quarter. The acquisition expense ratio was 12.8% for the 2016 second quarter, compared to 19.4% for the 2015 second quarter. The operating expense ratio was 36.1% for the 2016 second quarter, compared to 37.5% in the 2015 second quarter. The underwriting expense ratio is expected to stay at an elevated rate until Arch MI U.S. reaches scale.

Six Months Ended June 30, 2016 versus 2015 period . The underwriting expense ratio for the mortgage segment was 51.1% for the six months ended June 30, 2016, compared to 59.0% for the 2015 period. The acquisition expense ratio was 13.2% for the six months ended June 30, 2016, compared to 20.1% for the 2015 period. The operating expense ratio was

37.9% for the six months ended June 30, 2016 , compared to 38.9% for the 2015 period. The underwriting expense ratio is expected to stay at an elevated rate until Arch MI U.S. reaches scale.

Corporate (Non-Underwriting) Segment

The corporate (non-underwriting) segment results include net investment income, other income (loss), corporate expenses, interest expense, 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, income taxes and items related to our non-cumulative preferred shares. 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		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Fixed maturities	\$ 64,365	\$ 61,191	\$ 123,366	\$ 123,559
Term loan investments	5,669	4,566	10,527	8,841
Equity securities	3,984	2,742	7,740	5,421
Short-term investments	618	183	1,076	378
Other (1)	8,152	10,472	21,824	23,209
Gross investment income	82,788	79,154	164,533	161,408
Investment expenses (2)	(12,391)	(11,983)	(23,727)	(23,949)
Net investment income	\$ 70,397	\$ 67,171	\$ 140,806	\$ 137,459

- (1) Amounts include dividends and interest distributions on investment funds and other items.
(2) Investment expenses were approximately 0.36% of average invested assets for the 2016 second quarter , compared to 0.37% for the 2015 second quarter , and 0.33% for the six months ended June 30, 2016 , compared to 0.39% for the 2015 period.

The pre-tax investment income yield, calculated based on amortized cost and on an annualized basis, was 2.08% for the 2016 second quarter , compared to 2.05% for the 2015 second quarter , and 2.12% for the six months ended June 30, 2016 , compared to 2.07% for the 2015 period. The comparability of net investment income between the periods was influenced by our share repurchase program, as well as the effects of low prevailing interest rates available in the market. Yields in the future may vary based on financial market conditions, investment allocation decisions and other factors.

Other Income (Loss).

We record income or loss from certain investments using the equity method on a three month lag basis based on the availability of their financial statements, including income

or loss on our investment in Gulf Reinsurance Limited (“Gulf Re”) for the period prior to the closing of our acquisition of Gulf Re on May 14, 2015. In addition, other income (loss) from time to time includes certain non-recurring items. We recorded minimal activity in the 2016 periods, compared to income of \$2.2 million for the 2015 second quarter , and \$0.3 million for the six months ended June 30, 2015 . The 2015 amounts primarily related to Gulf Re.

Corporate Expenses.

Corporate expenses were \$17.2 million for the 2016 second quarter , compared to \$17.4 million for the 2015 second quarter , and \$26.6 million for the six months ended June 30, 2016 , compared to \$26.8 million for the 2015 period. Such amounts primarily represent certain holding company costs necessary to support our worldwide insurance, reinsurance and mortgage operations and costs associated with operating as a publicly traded company.

Interest Expense.

Interest expense was \$12.4 million for the 2016 second quarter , compared to \$4.0 million for the 2015 second quarter , and \$25.1 million for the six months ended June 30, 2016 , compared to \$16.7 million for the 2015 period. The lower level of interest expense in the 2015 periods primarily resulted from an \$8.4 million reduction in interest expense in the 2015 second quarter on a deposit accounting liability contract. Such contract was commuted in the 2016 second quarter (see the reinsurance segment discussion above).

Net Realized Gains or Losses.

We recorded net realized gains of \$40.9 million for the 2016 second quarter , compared to net realized losses of \$26.9 million for the 2015 second quarter , and net realized gains of \$72.8 million for the six months ended June 30, 2016 , compared to net realized gains of \$38.6 million for the 2015 period. 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 includes realized and unrealized contract gains and losses on our derivative instruments, changes in the fair value of assets and liabilities accounted for using the fair value option along with re-measurement of contingent consideration liability amounts.

Net Impairment Losses Recognized in Earnings.

We recorded \$5.3 million of impairment losses for the 2016 second quarter , compared to \$1.1 million for the 2015 second quarter , and \$13.0 million for the six months ended June 30, 2016 , compared to \$6.9 million for the 2015 period. The impairment losses recorded for the 2016 periods primarily

related to corporate bonds, equities, other investments, asset backed securities and mortgage backed securities. See note 6 , “Investment Information—Other-Than-Temporary Impairments,” of the notes accompanying our consolidated financial statements for additional information.

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

We recorded \$8.7 million of equity in net income related to investment funds accounted for using the equity method in the 2016 second quarter , compared to \$16.2 million of equity in net income for the 2015 second quarter , and \$15.4 million of equity in net income for the six months ended June 30, 2016 , compared to \$22.1 million of equity in net income for the 2015 period. Investment funds accounted for using the equity method totaled \$685.8 million at June 30, 2016 , compared to \$593.0 million at December 31, 2015 .

Net Foreign Exchange Gains or Losses.

Net foreign exchange gains for the 2016 second quarter were \$22.5 million , compared to net foreign exchange losses for the 2015 second quarter of \$22.6 million . Net foreign exchange gains for the six months ended June 30, 2016 were \$0.4 million , compared to net foreign exchange gains for the 2015 period of \$44.3 million . Amounts in such 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 6.4% for the 2016 second quarter and 7.8% for the six months ended June 30, 2016 , compared to 5.6% for the 2015 second quarter and 4.7% for the 2015 period. 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 3 , “Variable Interest Entities and Noncontrolling Interests” and note 5 , “Segment Information,” of the notes accompanying 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 2015 Form 10-K, updated where applicable in the notes accompanying our consolidated financial statements, including note 2 , “Recent Accounting Pronouncements.”

FINANCIAL CONDITION, LIQUIDITY AND CAPITAL RESOURCES

Financial Condition

Investable Assets

At June 30, 2016 , total investable assets of \$16.88 billion included \$15.18 billion managed by Arch and \$1.70 billion included in the ‘other’ segment (*i.e.* , attributable to Watford Re).

• ***Investable Assets Managed by Arch***

The finance, investment and risk management (“FI&R”) committee of our board of directors establishes our investment policies and sets the parameters for creating guidelines for our investment managers. The FI&R committee reviews the implementation of the investment strategy on a regular basis. Our current approach stresses preservation of capital, market liquidity and diversification of risk. While maintaining our emphasis on preservation of capital and liquidity, we expect our portfolio to become more diversified and, as a result, we may expand into areas which are not currently part of our investment strategy. Our Chief Investment Officer administers the investment portfolio, oversees our investment managers, formulates investment strategy in conjunction with the FI&R committee and directly manages certain portions of our fixed income and equity portfolios.

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

	Estimated Fair Value	% of Total
Investable assets (1):		
June 30, 2016		
Fixed maturities (2)	\$ 11,747,618	77.4
Short-term investments	853,531	5.6
Cash	442,066	2.9
Equity securities (2)	509,006	3.4
Other investments (2)	1,186,578	7.8
Investments accounted for using the equity method	685,766	4.5
Securities transactions entered into but not settled at the balance sheet date	(246,257)	(1.6)
Total investable assets managed by Arch	<u>\$ 15,178,308</u>	<u>100.0</u>
December 31, 2015		
Fixed maturities (2)	\$ 11,200,437	76.5
Short-term investments	587,904	4.0
Cash	444,776	3.0
Equity securities (2)	629,980	4.3
Other investments (2)	1,209,285	8.3
Investments accounted for using the equity method	592,973	4.0
Securities transactions entered into but not settled at the balance sheet date	(20,524)	(0.1)
Total investable assets managed by Arch	<u>\$ 14,644,831</u>	<u>100.0</u>

- (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 as available for sale, at fair value and at fair value under the fair value option.

At June 30, 2016, our fixed income portfolio, which includes fixed maturity securities and short-term investments, had average credit quality ratings from Standard & Poor's Rating Services ("S&P")/Moody's of "AA/Aa2" and an average yield to maturity (embedded book yield), before investment expenses, of 1.92%. At December 31, 2015, our fixed income portfolio had average credit quality ratings from S&P/Moody's of "AA/Aa2" and an average yield to maturity of 2.16%. Our investment portfolio had an average effective duration of 3.85 years at June 30, 2016, compared to 3.43 years at December 31, 2015. At June 30, 2016, approximately \$10.97 billion, or 72%, of total investable assets managed by Arch were internally managed, compared to \$10.01 billion, or 68%, at December 31, 2015.

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

	Estimated Fair Value	% of Total
June 30, 2016		
Corporate bonds	\$ 3,210,603	27.3
Mortgage backed securities	674,451	5.7
Municipal bonds	1,897,128	16.1
Commercial mortgage backed securities	624,391	5.3
U.S. government and government agencies	2,701,042	23.0
Non-U.S. government securities	1,274,237	10.8
Asset backed securities	1,365,766	11.6
Total	<u>\$ 11,747,618</u>	<u>100.0</u>
December 31, 2015		
Corporate bonds	\$ 2,960,694	26.4
Mortgage backed securities	812,557	7.3
Municipal bonds	1,626,281	14.5
Commercial mortgage backed securities	764,152	6.8
U.S. government and government agencies	2,423,455	21.6
Non-U.S. government securities	992,792	8.9
Asset backed securities	1,620,506	14.5
Total	<u>\$ 11,200,437</u>	<u>100.0</u>

At June 30, 2016, below-investment grade securities comprised approximately 5% of our Fixed Maturities, compared to 5% at December 31, 2015. In accordance with our investment strategy, we invest in high yield fixed income securities which are included in "Corporate bonds." Upon issuance, these securities are typically rated below investment grade (i.e., rating assigned by the major rating agencies of "BB+" or less). At June 30, 2016, corporate bonds represented 62% of the total below investment grade securities at fair value, mortgage backed securities represented 20% of the total and 18% were in other classes. At December 31, 2015, corporate bonds represented 70% of the total below investment grade securities at fair value, mortgage backed securities represented 13% of the total and 17% were in other classes. Unrealized losses include the impact of foreign exchange movements on certain securities denominated in foreign currencies and, as such, the amount of securities in an unrealized loss position fluctuates due to foreign currency movements.

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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
June 30, 2016		
U.S. government and gov't agencies (1)	\$ 3,364,709	28.6
AAA	3,421,385	29.1
AA	2,255,666	19.2
A	1,541,075	13.1
BBB	525,084	4.5
BB	232,859	2.0
B	151,549	1.3
Lower than B	96,726	0.8
Not rated	158,565	1.3
Total	<u>\$ 11,747,618</u>	<u>100.0</u>
December 31, 2015		
U.S. government and gov't agencies (1)	\$ 3,060,869	27.3
AAA	4,000,750	35.7
AA	1,651,760	14.7
A	1,431,138	12.8
BBB	457,251	4.1
BB	203,426	1.8
B	138,770	1.2
Lower than B	130,545	1.2
Not rated	125,928	1.1
Total	<u>\$ 11,200,437</u>	<u>100.0</u>

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

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:

	June 30, 2016		
Severity of gross unrealized losses:	Estimated Fair Value	Gross Unrealized Losses	% of Total Gross Unrealized Losses
June 30, 2016			
0-10%	\$ 1,171,547	\$ (20,224)	31.7
10-20%	215,026	(36,708)	57.6
20-30%	21,037	(5,923)	9.3
Greater than 30%	1,452	(875)	1.4
Total	<u>\$ 1,409,062</u>	<u>\$ (63,730)</u>	<u>100.0</u>
December 31, 2015			
0-10%	\$ 6,956,754	\$ (74,229)	54.4
10-20%	173,441	(28,789)	21.1
20-30%	86,997	(26,227)	19.2
Greater than 30%	10,638	(7,160)	5.2
Total	<u>\$ 7,227,830</u>	<u>\$ (136,405)</u>	<u>100.0</u>

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

	June 30, 2016		
Severity of gross unrealized losses:	Estimated Fair Value	Gross Unrealized Losses	% of Total Gross Unrealized Losses
June 30, 2016			
0-10%	\$ 137,622	\$ (3,391)	5.3
10-20%	21,986	(3,809)	6.0
20-30%	4,895	(1,530)	2.4
Greater than 30%	1,353	(818)	1.3
Total	<u>\$ 165,856</u>	<u>\$ (9,548)</u>	<u>15.0</u>
December 31, 2015			
0-10%	\$ 176,343	\$ (5,139)	3.8
10-20%	28,707	(4,807)	3.5
20-30%	12,500	(4,410)	3.2
Greater than 30%	10,520	(7,107)	5.2
Total	<u>\$ 228,070</u>	<u>\$ (21,463)</u>	<u>15.7</u>

We determine estimated recovery values for our Fixed Maturities following a review of the business prospects, credit ratings, estimated loss given default factors and information received from asset managers and rating agencies for each security. For structured securities, we utilize underlying data, where available, for each security provided by asset managers and additional information from credit agencies in order to determine an expected recovery value for each security. The analysis provided by the asset managers includes expected cash flow projections under base case and stress case scenarios which modify expected default expectations and loss severities and slow down prepayment assumptions.

The following table summarizes our top ten exposures to fixed income corporate issuers by fair value at June 30, 2016, excluding guaranteed amounts and covered bonds:

	Estimated Fair Value	Credit Rating (1)
Apple Inc.	\$ 71,396	AA+/Aa1
Wells Fargo & Company	70,956	A+/Aa3
Coca-Cola Co	70,063	AA-/Aa3
Microsoft Corporation	61,400	AAA/Aaa
Oracle Corporation	59,000	AA-/A1
MassMutual Global Funding II	54,483	AA+/Aa2
Royal Dutch Shell PLC	53,894	A+/Aa2
Anheuser Busch Inbev SA	45,574	A-/A3
JPMorgan Chase & Co	42,737	A-/A3
Toyota Motor Corporation	42,733	AA-/Aa3
Total	<u>\$ 572,236</u>	

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

Our portfolio includes investments, such as mortgage-backed securities, which are subject to prepayment risk. At June 30, 2016, our investments in residential mortgage-backed securities ("RMBS") amounted to approximately \$674.5

million , or 4.4% of total investable assets managed by Arch, compared to \$812.6 million , or 5.5% , at December 31, 2015 . As with other fixed income investments, the fair value of these securities fluctuates depending on market and other general economic conditions and the interest rate environment. Changes in interest rates can expose us to changes in the prepayment rate on these investments. In periods of declining interest rates, mortgage prepayments generally increase and RMBS are prepaid more quickly, requiring us to reinvest the proceeds at the then current market rates. Conversely, in periods of rising rates, mortgage prepayments generally fall, preventing us from taking full advantage of the higher level of rates. However, economic conditions may curtail prepayment activity if refinancing becomes more difficult, thus limiting prepayments on RMBS.

The residential mortgage market in the U.S has experienced a variety of difficulties in certain underwriting periods and is only recently recovering from a period of severe home price depreciation. It is uncertain whether this recovery will continue. A decline or an extended flattening in residential property values may result in additional increases in delinquencies and losses on residential mortgage loans generally, especially with respect to any residential mortgage loans where the aggregate loan amounts (including any subordinate loans) are close to or greater than the related property values. These developments may have a significant adverse effect on the prices of loans and securities, including those in our investment portfolio. The situation continues to have wide ranging consequences, including downward pressure on economic growth and the potential for increased insurance and reinsurance exposures, which could have an adverse impact on our results of operations, financial condition, business and operations.

Our portfolio also includes commercial mortgage backed securities (“CMBS”). At June 30, 2016 , CMBS constituted approximately \$624.4 million , or 4.1% of total investable assets managed by Arch, compared to \$764.2 million , or 5.2% , at December 31, 2015 . The commercial real estate market may experience price deterioration, which could lead to delinquencies and losses on commercial real estate mortgages.

The following table provides information on our non-agency RMBS and non-agency CMBS at June 30, 2016 by issuance year, excluding amounts guaranteed by U.S. government agencies. Non-agency RMBS and non-agency CMBS were 0.6% and 3.6% of total investable assets managed by Arch, respectively.

Issuance Year	Amortized Cost	Average Credit Quality	Estimated Fair Value
2003-2008	\$ 64,394	CC-	\$ 68,802
2009	453	AA	453
2010	1,067	NR	1,142
2014	2,240	NR	2,205
2015	16,215	A	16,434
2016	977	C-	986
Total RMBS	\$ 85,346	CC+	\$ 90,022
2002-2008	27,672	A	27,909
2009	534	BBB	535
2010	8,675	AAA	8,914
2011	576	AAA	579
2012	34,940	AAA	35,575
2013	84,173	AA	86,924
2014	123,512	AA+	125,630
2015	157,786	AAA	161,574
2016	96,050	AA+	97,513
Total CMBS	\$ 533,918	AA+	\$ 545,153

Additional Statistics:	Non-Agency RMBS	Non-Agency CMBS (1)
Weighted average loan age (months)	114	32
Weighted average life (months) (2)	47	81
Weighted average loan-to-value % (3)	62.5%	56.8%
Total delinquencies (4)	15.6%	0.7%
Current credit support % (5)	8.0%	37.1%

- (1) Loans defeased with government/agency obligations were not material to the collateral underlying our CMBS holdings.
- (2) The weighted average life for RMBS is based on the interest rates in effect at June 30, 2016 . The weighted average life for CMBS reflects the average life of the collateral underlying our CMBS holdings.
- (3) The range of loan-to-values is 13% to 96% on RMBS and 3% to 200% on CMBS.
- (4) Total delinquencies includes 60 days and over.
- (5) Current credit support percentage represents the percentage for a collateralized mortgage obligation (“CMO”) or CMBS class/tranche from other subordinate classes in the same CMO or CMBS deal.

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The following table provides information on our asset backed securities (“ABS”) at June 30, 2016 . ABS were 9.0% of total investable assets managed by Arch, respectively.

Sector	Amortized Cost	Weighted Average		Estimated Fair Value
		Credit Quality	Credit Support	
Credit cards	\$ 706,330	AAA	16%	\$ 715,273
Autos	264,955	AAA	26%	266,468
Loans	189,013	A+	12%	186,179
Equipment	119,367	AA-	2%	118,574
Other (1)	78,022	A	20%	79,272
Total ABS (2)	\$ 1,357,687	AA+		\$ 1,365,766

- (1) Including rate reduction bonds, commodities, home equity, U.K. securitized and other.
(2) The effective duration of the total ABS was 1.9 years at June 30, 2016 .

At June 30, 2016 , our fixed income portfolio included \$51.1 million par value in sub-prime securities with a fair value of \$41.8 million and average credit quality ratings from S&P/Moody’s of “ CCC/Caa3 .” At December 31, 2015 , our fixed income portfolio included \$45.5 million par value in sub-prime securities with a fair value of \$35.9 million and average credit quality ratings from S&P/Moody’s of “ CCC/Caa3 .” Such amounts were primarily in the home equity sector of our ABS, with the balance in other ABS, RMBS and CMBS sectors. We define sub-prime mortgage-backed securities as investments in which the underlying loans primarily exhibit one or more of the following characteristics: low FICO scores, above-prime interest rates, high loan-to-value ratios or high debt-to-income ratios.

The following table provides information on the fair value of our Eurozone investments at June 30, 2016 :

Country (1)	Sovereign (2)	Corporate Bonds	Other (3)	Total
Netherlands	\$ 115,660	\$ 87,344	\$ 11,674	\$ 214,678
Germany	84,677	26,803	26,991	138,471
France	14,971	38,133	8,421	61,525
Luxembourg	—	23,086	5,565	28,651
Supranational (4)	17,131	—	—	17,131
Belgium	5,187	8,555	—	13,742
Ireland	—	1,044	6,198	7,242
Spain	—	—	3,168	3,168
Italy	—	—	1,147	1,147
Austria	—	900	—	900
Greece	890	—	—	890
Total	\$ 238,516	\$ 185,865	\$ 63,164	\$ 487,545

- (1) The country allocations set forth in the table are based on various assumptions made by us in assessing the country in which the underlying credit risk resides, including a review of the jurisdiction of organization, business operations and other factors. Based on such analysis, we do not believe that we have any other Eurozone investments at June 30, 2016 .
(2) Includes securities issued and/or guaranteed by Eurozone governments.
(3) Includes bank loans, equities and other.
(4) Includes World Bank, European Investment Bank, International Finance Corp. and European Bank for Reconstruction and Development.

At June 30, 2016 , our equity portfolio included \$509.0 million of equity securities, compared to \$630.0 million at December 31, 2015 . Our equity portfolio includes publicly traded common stocks in the natural resources, energy, consumer staples and other sectors.

The following table provides information on the severity of the unrealized loss position as a percentage of cost for all equity securities classified as available for sale which were in an unrealized loss position:

Severity of gross unrealized losses:	June 30, 2016		
	Estimated Fair Value	Gross Unrealized Losses	% of Total Gross Unrealized Losses
June 30, 2016			
0-10%	\$ 118,525	\$ (3,836)	34.4
10-20%	30,520	(4,401)	39.4
20-30%	5,413	(1,680)	15.0
Greater than 30%	2,331	(1,246)	11.2
Total	\$ 156,789	\$ (11,163)	100.0
December 31, 2015			
0-10%	\$ 176,451	\$ (5,926)	33.3
10-20%	39,728	(6,528)	36.7
20-30%	13,700	(4,164)	23.4
Greater than 30%	2,396	(1,178)	6.6
Total	\$ 232,275	\$ (17,796)	100.0

On a quarterly basis, we evaluate the unrealized losses of our equity securities by issuer and forecast a reasonable period of time by which the fair value of the securities would increase and we would recover the cost basis. All of the unrealized losses on equity securities were on holdings which have been in a continual unrealized loss position for less than 12 months at June 30, 2016 . We believe that a reasonable period of time exists to allow for recovery of the cost basis of our equity securities that are in an unrealized loss position at June 30, 2016 .

The following table summarizes our other investments:

	June 30, 2016	December 31, 2015
Available for sale:		
Asian and emerging markets	\$ 109,767	\$ 206,861
Investment grade fixed income	33,549	31,370
Credit related funds	1,698	22,512
Other	37,943	39,733
Total available for sale	182,957	300,476
Fair value option:		
Term loan investments (par value: \$358,443 and \$356,096)	364,424	345,855
Mezzanine debt funds	117,441	121,589
Credit related funds	236,184	219,049
Investment grade fixed income	65,391	63,053
Asian and emerging markets	112,265	34,761
Other (1)	107,916	124,502
Total fair value option	1,003,621	908,809
Total	\$ 1,186,578	\$ 1,209,285

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

Certain of our other investments are in investment funds for which we have 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 our 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 our investment is eligible to be redeemed, the time to redeem such investment can take weeks or months following the notification.

Certain of our investment managers may use leverage to achieve a higher rate of return on their assets under management, primarily those included in "other investments available for sale, at fair value," "investments accounted for using the fair value option" and "investments accounted for using the equity method" on our balance sheet. While leverage presents opportunities for increasing the total return of such investments, it may increase losses as well. Accordingly, any event that adversely affects the value of the underlying holdings would be magnified to the extent leverage is used and our potential losses would be magnified. In addition, the structures used to generate leverage may lead to such investments being required to meet covenants based

on market valuations and asset coverage. Market valuation declines could force the sale of investments into a depressed market, which may result in significant additional losses. Alternatively, the levered investments may attempt to delever by raising additional equity or potentially changing the terms of the established financing arrangements. We may choose to participate in the additional funding of such investments.

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," of the notes accompanying our consolidated financial statements for additional disclosures concerning 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," of the notes accompanying our consolidated financial statements for a summary of our financial assets and liabilities measured at fair value at June 30, 2016 and December 31, 2015 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 their 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:

	June 30, 2016	December 31, 2015
Cash	\$ 74,525	\$ 108,550
Investments accounted for using the fair value option:		
Term loan investments (par value: \$757,184 and \$841,047)	662,119	762,162
Fixed maturities	670,180	569,022
Short-term investments	344,797	285,923
Equity securities	740	—
Total investments accounted for using the fair value option	1,677,836	1,617,107
Securities sold but not yet purchased	(54,668)	(30,583)
Securities transactions entered into but not settled at the balance sheet date	5,738	1,033
Total investable assets included in 'other' segment	\$ 1,703,431	\$ 1,696,107

Premiums Receivable and Reinsurance Recoverables

At June 30, 2016 , 83.4% of premiums receivable of \$1.26 billion represented amounts not yet due, while amounts in excess of 90 days overdue were 4.2% of the total. At December 31, 2015 , 80.8% of premiums receivable of \$983.4 million represented amounts not yet due, while amounts in excess of 90 days overdue were 5.3% of the total. Our reserves for doubtful accounts were approximately \$18.1 million at June 30, 2016 , compared to \$15.7 million at December 31, 2015 .

At June 30, 2016 and December 31, 2015 , approximately 74.7% and 77.9% of reinsurance recoverables on paid and unpaid losses (not including prepaid reinsurance premiums) of \$2.03 billion and \$1.87 billion , respectively, were due from carriers which had an A.M. Best rating of “A-” or better while 25.3% and 22.1% , respectively, were from companies not rated. For items not rated, over 90% of such amount was collateralized through reinsurance trusts or letters of credit at June 30, 2016 and December 31, 2015 . The largest reinsurance recoverables from any one carrier was approximately 3.3% and 3.4% , respectively, of total shareholders’ equity available to Arch.

Approximately 8.7% of the \$31.2 million of paid losses and loss adjustment expenses recoverable at June 30, 2016 were more than 90 days overdue, compared to 3.9% of the \$38.5 million of paid losses and loss adjustment expenses recoverable at December 31, 2015 . No collection issues were indicated on the amount in excess of 90 days overdue at June 30, 2016 .

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		Six Months Ended	
	June 30,		June 30,	
	2016	2015	2016	2015
Premiums written:				
Direct	\$ 839,844	\$ 776,996	\$ 1,697,954	\$ 1,571,429
Assumed	490,092	422,213	1,069,948	969,802
Ceded	(306,373)	(255,629)	(623,104)	(530,656)
Net	<u>\$ 1,023,563</u>	<u>\$ 943,580</u>	<u>\$ 2,144,798</u>	<u>\$ 2,010,575</u>
Premiums earned:				
Direct	\$ 795,358	\$ 746,837	\$ 1,575,128	\$ 1,481,054
Assumed	473,331	428,254	894,389	825,505
Ceded	(262,704)	(231,653)	(511,953)	(452,857)
Net	<u>\$ 1,005,985</u>	<u>\$ 943,438</u>	<u>\$ 1,957,564</u>	<u>\$ 1,853,702</u>
Losses and LAE:				
Direct	\$ 525,719	\$ 462,967	\$ 981,052	\$ 893,808
Assumed	265,321	214,103	457,781	373,648
Ceded	(206,448)	(157,644)	(331,292)	(254,314)
Net	<u>\$ 584,592</u>	<u>\$ 519,426</u>	<u>\$ 1,107,541</u>	<u>\$ 1,013,142</u>

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 June 30, 2016 and December 31, 2015 , our Loss Reserves, net of unpaid losses and loss adjustment expenses recoverable, by type and by operating segment were as follows:

	June 30, 2016	December 31, 2015
Insurance segment:		
Case reserves	\$ 1,406,699	\$ 1,434,986
IBNR reserves	<u>3,158,524</u>	<u>3,080,122</u>
Total net reserves	4,565,223	4,515,108
Reinsurance segment:		
Case reserves	742,901	699,860
Additional case reserves	104,827	99,343
IBNR reserves	<u>1,566,024</u>	<u>1,593,186</u>
Total net reserves	2,413,752	2,392,389
Mortgage segment:		
Case reserves	68,139	86,278
IBNR reserves	<u>29,588</u>	<u>23,211</u>
Total net reserves	97,727	109,489
Other segment:		
Case reserves	91,524	64,875
Additional case reserves	8,921	5,199
IBNR reserves	<u>290,732</u>	<u>209,353</u>
Total net reserves	391,177	279,427
Total:		
Case reserves	2,309,263	2,285,999
Additional case reserves	113,748	104,542
IBNR reserves	<u>5,044,868</u>	<u>4,905,872</u>
Total net reserves	<u>\$ 7,467,879</u>	<u>\$ 7,296,413</u>

At June 30, 2016 and December 31, 2015, the insurance segment's Loss Reserves by major line of business, net of unpaid losses and loss adjustment expenses recoverable, were as follows:

	June 30, 2016	December 31, 2015
Insurance segment:		
Professional lines (1)	\$ 1,340,244	\$ 1,346,882
Construction and national accounts	915,105	876,278
Excess and surplus casualty (2)	688,296	682,286
Programs	685,522	687,405
Property, energy, marine and aviation	306,599	330,104
Travel, accident and health	72,776	64,537
Lenders products	43,765	44,273
Other (3)	512,916	483,343
Total net reserves	<u>\$ 4,565,223</u>	<u>\$ 4,515,108</u>

- (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.

At June 30, 2016 and December 31, 2015, the reinsurance segment's Loss Reserves by major line of business, net of unpaid losses and loss adjustment expenses recoverable, were as follows:

	June 30, 2016	December 31, 2015
Reinsurance segment:		
Casualty (1)	\$ 1,400,287	\$ 1,386,084
Other specialty (2)	434,450	420,865
Property excluding property catastrophe (3)	294,235	301,757
Marine and aviation	150,062	137,969
Property catastrophe	80,074	94,991
Other (4)	54,644	50,723
Total net reserves	<u>\$ 2,413,752</u>	<u>\$ 2,392,389</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 facultative business.
(4) Includes life, casualty clash and other.

Mortgage Operations Supplemental Information

Arch MI U.S. generated \$6.42 billion of new insurance written ("NIW") during the 2016 second quarter, of which approximately 76% was from banks and other non-credit union mortgage originators. NIW represents the original principal balance of all loans that received coverage during the period.

The following tables provide details on the NIW generated by Arch MI U.S. for the last two quarters by credit quality and loan-to-value ("LTV"):

(U.S. Dollars in millions)	Three Months Ended			
	June 30, 2016		March 31, 2016	
	Amount	%	Amount	%
Total new insurance written (NIW)	\$ 6,420		\$ 2,906	

Total NIW by credit quality (FICO score):				
>=740	\$ 3,950	61.5	\$ 1,808	62.2
680-739	2,162	33.7	959	33.0
620-679	307	4.8	139	4.8
<620	1	—	—	—
Total	<u>\$ 6,420</u>	<u>100.0</u>	<u>\$ 2,906</u>	<u>100.0</u>

Total NIW by LTV:				
95.01% and above	\$ 551	8.6	\$ 175	6.0
90.01% to 95.00%	2,983	46.5	1,233	42.4
85.01% to 90.00%	2,078	32.4	1,021	35.1
85.01% and below	808	12.6	477	16.4
Total	<u>\$ 6,420</u>	<u>100.0</u>	<u>\$ 2,906</u>	<u>100.0</u>

Total NIW purchase vs. refinance:				
Purchase	\$ 5,309	82.7	\$ 2,055	70.7
Refinance	1,111	17.3	851	29.3
Total	<u>\$ 6,420</u>	<u>100.0</u>	<u>\$ 2,906</u>	<u>100.0</u>

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The mortgage segment's insurance in force ("IIF") and risk in force ("RIF") were as follows at the end of the last two quarters:

(U.S. Dollars in millions)	June 30, 2016		March 31, 2016	
	Amount	%	Amount	%
Insurance In Force (IIF) (1):				
U.S. mortgage insurance	\$ 33,367	30.7	\$ 28,433	30.9
Mortgage reinsurance	22,242	20.5	22,393	24.3
Other (3)	52,926	48.8	41,172	44.8
Total	<u>\$ 108,535</u>	<u>100.0</u>	<u>\$ 91,998</u>	<u>100.0</u>
Risk In Force (RIF) (2):				
U.S. mortgage insurance	\$ 8,396	64.8	\$ 7,165	62.5
Mortgage reinsurance	2,567	19.8	2,661	23.2
Other (3)	1,993	15.4	1,636	14.3
Total	<u>\$ 12,956</u>	<u>100.0</u>	<u>\$ 11,462</u>	<u>100.0</u>
Ending number of policies in force	172,666		153,984	

- (1) Represents the aggregate dollar amount of each insured mortgage loan's current principal balance.
- (2) 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.
- (3) Includes GSE credit risk-sharing products and international insurance business.

The following tables provide supplemental disclosures for our mortgage segment's U.S. mortgage insurance operations related to RIF at the end of the last two quarters:

(U.S. Dollars in millions)	June 30, 2016		March 31, 2016	
	Amount	%	Amount	%
Total RIF by credit quality (FICO):				
>=740	\$ 4,766	56.8	\$ 3,995	55.8
680-739	2,779	33.1	2,354	32.9
620-679	753	9.0	712	9.9
<620	98	1.2	104	1.5
Total	<u>\$ 8,396</u>	<u>100.0</u>	<u>\$ 7,165</u>	<u>100.0</u>
Weighted average FICO score	741		739	

Total RIF by LTV:				
95.01% and above	\$ 1,135	13.5	\$ 1,052	14.7
90.01% to 95.00%	4,379	52.2	3,677	51.3
85.01% to 90.00%	2,438	29.0	2,056	28.7
85.00% and below	444	5.3	380	5.3
Total	<u>\$ 8,396</u>	<u>100.0</u>	<u>\$ 7,165</u>	<u>100.0</u>
Weighted average LTV	92.9%		93.0%	

(U.S. Dollars in millions)	June 30, 2016		March 31, 2016	
	Amount	%	Amount	%
Total RIF by State:				
California	\$ 727	8.7	\$ 622	8.7
Wisconsin	620	7.4	585	8.2
Texas	469	5.6	401	5.6
Florida	422	5.0	345	4.8
Minnesota	351	4.2	319	4.5
Massachusetts	330	3.9	262	3.7
Virginia	300	3.6	237	3.3

- (1) Represents the end of period RIF divided by end of period IIF.
- (2) Represents the percentage of IIF at the beginning of a 12-month period that remained in force at the end of the period.
- (3) Represents total current (non-delinquent) RIF, net of reinsurance, divided by total statutory capital. Ratio calculated for Arch MI U.S. only (estimate for June 30, 2016).

The following table provides supplemental disclosures for our mortgage segment's U.S. mortgage insurance operations related to insured loans and loss metrics for the last two quarters:

(U.S. Dollars in thousands, except loan count)	Three Months Ended	
	June 30, 2016	March 31, 2016
Roll-forward of insured loans in default:		
Beginning delinquent number of loans	2,325	2,702
New notices	1,033	1,048
Cures	(919)	(1,206)
Paid claims	(193)	(222)
Delinquent rescissions and denials	(1)	3
Ending delinquent number of loans	<u>2,245</u>	<u>2,325</u>
Ending percentage of loans in default	1.3%	1.5%

Losses:		
Number of claims paid	193	222
Total paid claims	\$ 7,744	\$ 9,168
Average per claim	\$ 40.1	\$ 41.3
Severity (1)	94.8%	93.9%
Average reserve per default (in thousands)	\$ 27.8	\$ 32.1

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

Shareholders' Equity and Book Value per Common Share

Total shareholders' equity available to Arch was \$6.70 billion at June 30, 2016 , compared to \$6.20 billion at December 31, 2015 . The increase was primarily attributable to net income, reflecting contributions from both underwriting and investing activities.

Washington	279	3.3	261	3.6
Illinois	279	3.3	218	3.0
Ohio	260	3.1	212	3.0
Others	4,359	51.9	3,703	51.7
Total	\$ 8,396	100.0	\$ 7,165	100.0

Coverage ratio (1)	25.2%	25.2%
Analysts' persistency (2)	75.6%	74.2%
Risk-to-capital ratio (3)	12.4:1	11.1:1

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

(U.S. dollars in thousands, except share data)	June 30, 2016	December 31, 2015
Total shareholders' equity available to Arch	\$ 6,703,922	\$ 6,204,881
Less preferred shareholders' equity	325,000	325,000
Common shareholders' equity available to Arch	\$ 6,378,922	\$ 5,879,881
Common shares outstanding, net of treasury shares (1)	122,572,260	122,627,783
Book value per common share	\$ 52.04	\$ 47.95

(1) Excludes the effects of 7,222,726 and 7,482,462 stock options and 405,303 and 413,364 restricted stock units outstanding at June 30, 2016 and December 31, 2015, respectively.

Liquidity and Capital Resources

We have not included Watford Re in the following section 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.

ACGL is a holding company whose assets primarily consist of the shares in its subsidiaries. Generally, ACGL 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 the non-cumulative preferred shares and common shares. ACGL's readily available cash, short-term investments and marketable securities, excluding amounts held by our regulated insurance and reinsurance subsidiaries, totaled \$7.3 million at June 30, 2016, compared to \$6.9 million at December 31, 2015. For the six months ended June 30, 2016, ACGL received dividends of \$121.4 million from Arch Reinsurance Ltd. ("Arch Re Bermuda"), our Bermuda-based reinsurer and insurer.

The ability of our regulated insurance and reinsurance subsidiaries to pay dividends or make distributions or other payments to us is dependent on their ability to meet applicable regulatory standards. Under Bermuda law, Arch Re Bermuda is required to maintain statutory capital (i.e., the amount by which the value of its statutory assets exceed its statutory liabilities) equal to or in excess of its minimum solvency margin equal to the greatest of (1) \$100.0 million, (2) 50% of net premiums written (being gross premiums written less any premiums ceded by Arch Re Bermuda, but Arch Re Bermuda may not deduct more than 25% of gross premiums when computing net premiums written), (3) 15% of net aggregated losses and loss expense provisions and other insurance reserves and (4) 25% of its enhanced capital requirement ("ECR") as reported at the end of the relevant year. Arch Re Bermuda is prohibited from declaring or paying any dividends during any financial year if it is not in

compliance with its ECR, minimum solvency margin or minimum liquidity ratio. In addition, Arch Re Bermuda is prohibited from declaring or paying in any financial year dividends of more than 25% of its total statutory capital and surplus (as shown on its previous financial year's statutory balance sheet) unless it files, at least seven days before payment of such dividends, with the Bermuda Monetary Authority ("BMA") an affidavit stating that it will continue to meet the required margins. In addition, Arch Re Bermuda is prohibited, without prior approval of the BMA, from reducing by 15% or more its total statutory capital, as set out in its previous year's statutory financial statements. As a Class 4 insurer, Arch Re Bermuda is required to maintain available statutory capital and surplus pertaining to its general business at a level equal to or in excess of its ECR which is established by reference to either the BSCR model ("BSCR") or an approved internal capital model. At December 31, 2015, as determined under Bermuda law, Arch Re Bermuda had statutory capital of \$2.45 billion (\$2.40 billion at December 31, 2014) and statutory capital and surplus of \$5.43 billion (\$5.42 billion at December 31, 2014), which amounts were in compliance with Arch Re Bermuda's ECR at such date. Such amounts include ownership interests in U.S. insurance and reinsurance subsidiaries. Accordingly, Arch Re Bermuda can pay approximately \$1.24 billion to ACGL during the remainder of 2016 without providing an affidavit to the BMA, as discussed above. Under BMA guidelines, the value of the assets of our insurance group (i.e., the group of companies that conducts exclusively, or mainly, insurance business) must exceed the amount of the group's liabilities by the aggregate minimum margin of solvency of each qualifying member of the group (the "Group MSM"). A member is a qualifying member of the insurance group if it is subject to solvency requirements in the jurisdiction in which it is registered. We were in compliance with the Group MSM at December 31, 2015.

Our U.S. insurance and reinsurance subsidiaries are subject to insurance laws and regulations in the jurisdictions in which they operate. The ability of our regulated insurance subsidiaries to pay dividends or make distributions is dependent on their ability to meet applicable regulatory standards. These regulations include restrictions that limit the amount of dividends or other distributions, such as loans or cash advances, available to shareholders without prior approval of the insurance regulatory authorities. Dividends or distributions, if any, made by Arch Re U.S. would result in an increase in available capital at Arch Capital Group (U.S.) Inc. ("Arch-U.S."), a subsidiary of ACGL. For the six months ended June 30, 2016, Arch-U.S. received dividends of \$25 million from Arch Re U.S. Arch Re U.S. can declare a maximum of approximately \$95 million of dividends during the remainder of 2016 subject to the approval of the Commissioner of the Delaware Department of Insurance ("Commissioner"). In addition, with respect to dividends in excess of the \$95 million (extraordinary dividend), no payment can be made until (1) 30 days after the Commissioner has received notice of the declaration thereof and has not within such period disapproved such payment;

or (2) the Commissioner shall have approved the payment within the 30-day period. Delaware insurance laws also require that the statutory surplus of Arch Re U.S. following any dividend or distribution be reasonable in relation to its outstanding liabilities and adequate to its financial needs.

In April 2015, the GSEs published comprehensive, revised requirements, known as the Private Mortgage Insurer Eligibility Requirements or “PMIERs.” The PMIERs became effective December 31, 2015 and apply to Arch MI U.S., which is a GSE-approved mortgage insurer. They do not apply to Arch Mortgage Guaranty Company, which insures mortgages that are not intended to be sold to the GSEs, and it is therefore not approved by either GSE as an eligible mortgage insurer. In addition to extensive requirements relating to the operation of our mortgage insurance business, the PMIERs include revised financial requirements for mortgage insurers. No later than March 1, 2016, mortgage insurers were required to certify to the GSEs that they meet all of the requirements of the PMIERs or identify specific requirements that they do not meet. If a mortgage insurer is unable to meet the financial requirements of the PMIERs, it was required to submit by March 31, 2016 a transition plan to the GSEs for their review and approval. Mortgage insurers that have not met the financial requirements of the PMIERs by June 30, 2017 will be subject to remediation actions by the GSEs.

The amount of assets required to satisfy the revised financial requirements of the PMIERs at any point in time will be affected by many factors, including macro-economic conditions, the size and composition of Arch MI U.S.’s mortgage insurance portfolio at the point in time, and the amount of risk ceded to reinsurers that may be deducted by Arch MI U.S. in its calculation of “minimum required assets.” Arch MI U.S. satisfied the PMIERs’ financial requirements as of June 30, 2016. Under the PMIERs, Arch MI U.S. is deemed to be a “newly-approved insurer.” As a result of this status, until January 2017, Arch MI U.S. is subject to additional PMIER requirements, including that Arch MI U.S. is prohibited from paying dividends to affiliates or making any investment, contribution or loan to any affiliate.

In addition to meeting applicable regulatory standards, the ability of our insurance and reinsurance subsidiaries to pay dividends to intermediate parent companies owned by Arch Re Bermuda is also constrained by our dependence on the financial strength ratings of our insurance and reinsurance subsidiaries from independent rating agencies. The ratings from these agencies depend to a large extent on the capitalization levels of our insurance and reinsurance subsidiaries. We believe that ACGL has sufficient cash resources and available dividend capacity to service its indebtedness and other current outstanding obligations.

Our insurance and reinsurance subsidiaries are required to maintain assets on deposit, which primarily consist of fixed maturities, with various regulatory authorities to support their operations. The assets on deposit are available to settle

insurance and reinsurance liabilities to third parties. Our insurance and reinsurance subsidiaries maintain assets in trust accounts as collateral for insurance and reinsurance transactions with affiliated companies and also have investments in segregated portfolios primarily to provide collateral or guarantees for letters of credit to third parties. At June 30, 2016 and December 31, 2015, such amounts approximated \$5.65 billion and \$5.20 billion, respectively, excluding amounts related to the ‘other’ segment.

Our non-U.S. operations account for a significant percentage of our net premiums written. In general, the business written by our non-U.S. operations, which is heavily weighted towards reinsurance business, has been more profitable than the business written in our U.S. operations, which is weighted more towards insurance business. In general, our reinsurance segment has operated at a higher margin than our insurance segment, which is due to prevailing market conditions and the mix and type of business written. Historically, the most profitable line of business has been catastrophe-exposed property reinsurance, which is written primarily in our non-U.S. operations. Additionally, a significant component of our pre-tax income is generated through our investment performance. We hold a substantial amount of our investable assets in our non-U.S. operations and, accordingly, a large portion of our investment income is produced in our non-U.S. operations. In addition, ACGL, 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. Our U.S.-based insurance and reinsurance groups enter into separate reinsurance arrangements with Arch Re Bermuda covering individual lines of business. For the 2015 calendar year, the U.S. groups ceded business to Arch Re Bermuda at an aggregate net cession rate (i.e., net of third party reinsurance) of approximately 53%, compared to 53% for 2014. All of the above factors have resulted in the non-U.S. group providing a higher contribution to our overall pre-tax income in the current period than the percentage of net premiums written would indicate.

Except as described in the above paragraph, or where express reinsurance, guarantee or other financial support contractual arrangements are in place, each of ACGL’s subsidiaries or affiliates is solely responsible for its own liabilities and commitments (and no other ACGL subsidiary or affiliate is so responsible). Any reinsurance arrangements, guarantees or other financial support contractual arrangements that are in place are solely for the benefit of the ACGL subsidiary or affiliate involved and third parties (creditors or insureds of such entity) are not express beneficiaries of such arrangements.

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 3 , “Variable Interest Entities,” for cash flows related to Watford Re.

	Six Months Ended	
	June 30,	
	2016	2015
Total cash provided by (used for):		
Operating activities	\$ 410,213	\$ 247,361
Investing activities	(341,885)	95,779
Financing activities	(65,158)	(346,961)
Effects of exchange rate changes on foreign currency cash	(8,991)	(414)
Increase (decrease) in cash	\$ (5,821)	\$ (4,235)

- Cash provided by operating activities for the six months ended June 30, 2016 was higher than in the 2015 period, primarily reflecting a higher level of premiums collected. The 2015 period also reflected a higher level of outflows related to the Company’s mortgage operations.

- Cash used for investing activities for the six months ended June 30, 2016 was higher than in the 2015 period. Activity for the 2016 period reflected higher net purchases of investments than in the 2015 period, reflecting the investment of operating cash flows and the lower level of repurchases under our share repurchase program in the 2016 period.

- Cash used for financing activities for the six months ended June 30, 2016 was lower than in the 2015 period, primarily due to the lower level of repurchases under our share repurchase program in the 2016 period. We repurchased \$75.3 million of our common shares in the 2016 period, compared to \$361.9 million in the 2015 period.

Our insurance and reinsurance operations provide liquidity in that premiums are received in advance, sometimes substantially in advance, of the time losses are paid. The period of time from the occurrence of a claim through the settlement of the liability may extend many years into the future. Sources of liquidity include cash flows from operations, financing arrangements or routine sales of investments.

As part of our investment strategy, we seek to establish a level of cash and highly liquid short-term and intermediate-term securities which, combined with expected cash flow, is believed by us to be adequate to meet our foreseeable payment obligations. However, due to the nature of our operations, cash flows are affected by claim payments that may comprise large payments on a limited number of claims and which can fluctuate from year to year. We believe that our liquid investments and cash flow will provide us with sufficient liquidity in order to meet our claim payment obligations. However, the timing and amounts of actual claim payments related to recorded Loss Reserves vary based on many factors, including large individual losses, changes in the legal environment, as well as general market conditions.

The ultimate amount of the claim payments could differ materially from our estimated amounts. Certain lines of business written by us, such as excess casualty, have loss experience characterized as low frequency and high severity. The foregoing may result in significant variability in loss payment patterns. The impact of this variability can be exacerbated by the fact that the timing of the receipt of reinsurance recoverables owed to us may be slower than anticipated by us. Therefore, the irregular timing of claim payments can create significant variations in cash flows from operations between periods and may require us to utilize other sources of liquidity to make these payments, which may include the sale of investments or utilization of existing or new credit facilities or capital market transactions. If the source of liquidity is the sale of investments, we may be forced to sell such investments at a loss, which may be material.

Our investments in certain securities, including certain fixed income and structured securities, investments in funds accounted for using the equity method, other alternative investments and investments in ventures such as Watford Re and others may be illiquid due to contractual provisions or investment market conditions. If we require significant amounts of cash on short notice in excess of anticipated cash requirements, then we may have difficulty selling these investments in a timely manner or may be forced to sell or terminate them at unfavorable values. Our unfunded investment commitments totaled approximately \$1.35 billion at June 30, 2016 .

At June 30, 2016 , our investable assets were \$15.18 billion (excluding the \$1.70 billion of investable assets related to the ‘other’ segment). The primary goals of our asset liability management process are to satisfy the insurance liabilities, manage the interest rate risk embedded in those insurance liabilities and maintain sufficient liquidity to cover fluctuations in projected liability cash flows, including debt service obligations. Generally, the expected principal and interest payments produced by our fixed income portfolio adequately fund the estimated runoff of our insurance reserves. Although this is not an exact cash flow match in each period, the substantial degree by which the fair value of the fixed income portfolio exceeds the expected present value of the net insurance liabilities, as well as the positive cash flow from newly sold policies and the large amount of high quality liquid bonds, provide assurance of our ability to fund the payment of claims and to service our outstanding debt without having to sell securities at distressed prices or access credit facilities.

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, could have a material adverse effect on financial markets and economic conditions in the U.S. and throughout the world. In turn, this could have a material adverse effect on our business, financial condition and results of operations and, in particular, this could have a material adverse effect on the

value and liquidity of securities in our investment portfolio. Our investment portfolio as of June 30, 2016 included \$238.5 million of securities issued and/or guaranteed by Eurozone governments at fair value, \$2.70 billion of obligations of the U.S. government and government agencies at fair value and \$1.90 billion of municipal bonds at fair value. Please refer to Item 1A “Risk Factors” of our 2015 Form 10-K for a discussion of other risks relating to our business and investment portfolio.

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.

We monitor our capital adequacy on a regular basis and will seek to adjust our capital base (up or down) according to the needs of our business. The future capital requirements of our business will depend on many factors, including our ability to write new business successfully and to establish premium rates and reserves at levels sufficient to cover losses. Our ability to underwrite is largely dependent upon the quality of our claims paying and financial strength ratings as evaluated by independent rating agencies. In particular, we require (1) sufficient capital to maintain our financial strength ratings, as issued by several ratings agencies, at a level considered necessary by management to enable our key operating subsidiaries to compete; (2) sufficient capital to enable our underwriting subsidiaries to meet the capital adequacy tests performed by statutory agencies in the U.S. and other key markets; and (3) our non-U.S. operating companies are required to post letters of credit and other forms of collateral that are necessary for them to operate as they are “non-admitted” under U.S. state insurance regulations.

In December 2013, Arch-U.S., a wholly-owned subsidiary of ACGL, completed a public offering of \$500.0 million principal amount of 5.144% senior notes issued at par and due November 1, 2043 (“Arch-U.S. Senior Notes”), fully and unconditionally guaranteed by ACGL (the “Guarantee”). The Arch-U.S. Senior Notes and the Guarantee are unsecured and unsubordinated obligations of Arch-U.S. and ACGL, respectively, and rank equally and ratably with the other unsecured and unsubordinated indebtedness of Arch-U.S. and ACGL, respectively. A portion of the proceeds from the offering were used to fund the acquisition of the mortgage operations noted below. In addition, the proceeds are available for other corporate purposes.

Pursuant to our January 2014 acquisition of CMG Mortgage Insurance Company and its affiliated mortgage insurance companies (the “CMG Entities”), we are required to make contingent consideration payments based on the closing book value of the pre-closing portfolio of the CMG Entities as re-calculated over an earn-out period and payable at the third, fifth and sixth anniversaries after closing (subject to a one time extension period of one to three years at the sellers’

discretion). The maximum amount of contingent consideration payments is \$136.9 million over the earn-out period (or 150% of the closing book value of the CMG Entities less amounts paid at closing). We currently expect that the maximum amount will be paid over the earn-out period and that the first payment, due in April 2017, will be approximately \$70 million. To the extent that the adjusted book value of the CMG Entities drops below the cumulative amount paid by us, no additional payments would be due.

As part of our capital management program, we may seek to raise additional capital or may seek to return capital to our shareholders through share repurchases, cash dividends or other methods (or a combination of such methods). Any such determination will be at the discretion of our board of directors and will be dependent upon our profits, financial requirements and other factors, including legal restrictions, rating agency requirements and such other factors as our board of directors deems relevant.

The board of directors of ACGL has authorized the investment in ACGL’s common shares through a share repurchase program. Since the inception of the share repurchase program through June 30, 2016, ACGL has repurchased 125.2 million common shares for an aggregate purchase price of \$3.68 billion. At June 30, 2016, approximately \$446.5 million of share repurchases were available under the program. Repurchases under this authorization may be effected from time to time in open market or privately negotiated transactions through December 2016. 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.

To the extent that our existing capital is insufficient to fund our future operating requirements or maintain such ratings, we may need to raise additional funds through financings or limit our growth. We can provide no assurance that, if needed, we would be able to obtain additional funds through financing on satisfactory terms or at all. Adverse developments in the financial markets, such as disruptions, uncertainty or volatility in the capital and credit markets, may result in realized and unrealized capital losses that could have a material adverse effect on our results of operations, financial position and our businesses, and may also limit our access to capital required to operate our business.

If we are not able to obtain adequate capital, our business, results of operations and financial condition could be adversely affected, which could include, among other things, the following possible outcomes: (1) potential downgrades in the financial strength ratings assigned by ratings agencies to our operating subsidiaries, which could place those operating subsidiaries at a competitive disadvantage compared to higher-rated competitors; (2) reductions in the

amount of business that our operating subsidiaries are able to write in order to meet capital adequacy-based tests enforced by statutory agencies; and (3) any resultant ratings downgrades could, among other things, affect our ability to write business and increase the cost of bank credit and letters of credit. In addition, under certain of the reinsurance agreements assumed by our reinsurance operations, upon the occurrence of a ratings downgrade or other specified triggering event with respect to our reinsurance operations, such as a reduction in surplus by specified amounts during specified periods, our ceding company clients may be provided with certain rights, including, among other things, the right to terminate the subject reinsurance agreement and/or to require that our reinsurance operations post additional collateral.

In addition to common share capital, we depend on external sources of finance to support our underwriting activities, which can be in the form (or any combination) of debt securities, preference shares, common equity and bank credit facilities providing loans and/or letters of credit. As noted above, equity or debt financing, if available at all, may be on terms that are unfavorable to us. In the case of equity financings, dilution to our shareholders could result, and, in any case, such securities may have rights, preferences and privileges that are senior to those of our outstanding securities.

In June 2014, ACGL and its wholly-owned subsidiaries entered into a five-year agreement for a \$300.0 million unsecured revolving loan and letter of credit facility and a \$500.0 million secured letter of credit facility. Under the terms of the agreement, Arch Re U.S. and Arch Re Bermuda are limited to issuing an aggregate of \$100.0 million of unsecured letters of credit as part of the unsecured revolving loan. At June 30, 2016, ACGL had \$200.0 million and \$325.4 million in remaining capacity under the unsecured revolving loan facility and the secured letter of credit facility, respectively. Refer to note 9, “Commitments and Contingencies—Letter of Credit and Revolving Credit Facilities,” of the notes accompanying our consolidated financial statements for a discussion of our available facilities, applicable covenants on such facilities and available capacity.

In March 2015, ACGL and Arch-U.S. filed a universal shelf registration statement with the SEC. This registration statement allows for the possible future offer and sale by us of various types of securities, including unsecured debt securities, preference shares, common shares, warrants, share purchase contracts and units and depositary shares. The shelf registration statement enables us to efficiently access the public debt and/or equity capital markets in order to meet our future capital needs. The shelf registration statement also allows selling shareholders to resell common shares that they own in one or more offerings from time to time. We will not receive any proceeds from any shares offered by the selling shareholders. This report is not an offer to sell or the solicitation of an offer to buy nor shall there be any sale of

these securities in any state in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such state.

At June 30, 2016, total capital available to Arch of \$7.60 billion consisted of \$791.4 million of senior notes, representing 10.4% of the total, \$100.0 million of revolving credit agreement borrowings due in June 2019, representing 1.3% of the total, \$325.0 million of preferred shares, representing 4.3% of the total, and common shareholders’ equity of \$6.38 billion, representing 84.0% of the total. At December 31, 2015, total capital available to Arch of \$7.10 billion consisted of \$791.3 million of senior notes, representing 11.2% of the total, \$100.0 million of revolving credit agreement borrowings, representing 1.4% of the total, \$325.0 million of preferred shares, representing 4.6% of the total, and common shareholders’ equity of \$5.88 billion, representing 82.9% of the total.

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 2015 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 June 30, 2016. 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 June 30, 2016 that affect the quantitative and qualitative disclosures presented in our 2015 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. Accordingly, the actual effect of interest rate movements may differ materially from the amounts set forth in the following tables.

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
June 30, 2016					
Total fair value	\$ 14.78	\$ 14.51	\$ 14.23	\$ 13.95	\$ 13.69
Change from base	3.86%	2.01%		(1.95)%	(3.80)%
Change in unrealized value	\$ 0.55	\$ 0.29		\$ (0.28)	\$ (0.54)
Dec. 31, 2015					
Total fair value	\$ 14.04	\$ 13.80	\$ 13.57	\$ 13.34	\$ 13.12
Change from base	3.44%	1.70%		(1.69)%	(3.32)%
Change in unrealized value	\$ 0.47	\$ 0.23		\$ (0.23)	\$ (0.45)

In addition, we consider the effect of credit spread 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 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 Basis Points				
	-100	-50	—	+50	+100
June 30, 2016					
Total fair value	\$ 14.65	\$ 14.44	\$ 14.23	\$ 14.01	\$ 13.80
Change from base	2.99%	1.50%		(1.50)%	(2.99)%
Change in unrealized value	\$ 0.43	\$ 0.21		\$ (0.21)	\$ (0.43)
Dec. 31, 2015					
Total fair value	\$ 13.97	\$ 13.77	\$ 13.57	\$ 13.37	\$ 13.17
Change from base	2.97%	1.48%		(1.48)%	(2.97)%
Change in unrealized value	\$ 0.40	\$ 0.20		\$ (0.20)	\$ (0.40)

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 June 30, 2016, our portfolio’s VaR was estimated to be 4.17%, or \$456.2 million, compared to an estimated 3.01%, or \$408.5 million, at December 31, 2015.

• *Certain Other Investments and Equity Securities*

Our investment portfolio includes certain other investments which do not invest in fixed income securities along with equity holdings. At June 30, 2016 and December 31, 2015, the fair value of such investments totaled \$509.0 million and \$630.0 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 \$50.9 million and \$63.0 million at June 30, 2016 and December 31, 2015, respectively, and would have decreased book value per common share by approximately \$0.42 and \$0.51, respectively. An immediate hypothetical 10% increase in the value of each position would increase the fair value of such investments by approximately \$50.9 million and \$63.0 million at June 30, 2016 and December 31, 2015, respectively, and would have increased book value per common share by approximately \$0.42 and \$0.51, respectively.

• *Investment-Related Derivatives*

At June 30, 2016, 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 \$3.56 billion, compared to \$2.81 billion at December 31, 2015. If the underlying exposure of each investment-related derivative held at June 30, 2016 depreciated by 100 basis points, it would have resulted in a reduction in net income of approximately \$35.6 million, and a decrease in book value per common share of approximately \$0.29 per share, compared to \$28.1 million and \$0.23 per share, respectively, on investment-related derivatives held at December 31, 2015. If the underlying exposure of each investment-related derivative held at June 30, 2016 appreciated by 100 basis points, it would have resulted in an increase in net income of approximately \$35.6 million, and an increase in book value per common share of approximately \$0.29 per share, compared to \$28.1 million and \$0.23 per share, respectively, on investment-related derivatives held at December 31, 2015. See note 8, “Derivative Instruments,” of the notes accompanying our consolidated financial statements for additional disclosures concerning derivatives.

For further discussion on investment activity, please refer to “—Financial Condition, Liquidity and Capital Resources—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,” of the notes accompanying 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)	June 30, 2016	December 31, 2015
Net assets (liabilities), denominated in foreign currencies, excluding shareholders' equity and derivatives	\$ (39,404)	\$ (163,199)
Shareholders' equity denominated in foreign currencies (1)	311,963	328,133
Net foreign currency forward contracts outstanding (2)	178,323	(97,658)
Net exposures denominated in foreign currencies	\$ 450,882	\$ 67,276
Pre-tax impact of a hypothetical 10% appreciation of the U.S. Dollar against foreign currencies:		
Shareholders' equity	\$ (45,088)	\$ (6,728)
Book value per common share	\$ (0.37)	\$ (0.05)
Pre-tax impact of a hypothetical 10% decline of the U.S. Dollar against foreign currencies:		
Shareholders' equity	\$ 45,088	\$ 6,728
Book value per common share	\$ 0.37	\$ 0.05

- (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 the Company generally attempts to match the currency of its projected liabilities with investments in the same currencies, from time to time the Company may elect to over or underweight one or more currencies, which could increase the Company's exposure to foreign currency fluctuations and increase the volatility of the Company's 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.”

Other Financial Information

The consolidated financial statements as of June 30, 2016 and for the three month and six month periods ended June 30, 2016 and 2015 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 ACGL 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 fiscal quarter ended June 30, 2016 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 June 30, 2016, 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

Our business is subject to a number of risks, including those identified in Item 1A. of Part I of our 2015 Form 10-K, that could have a material adverse effect on our business, results of operations, financial condition and/or liquidity and that could cause our operating results to vary significantly from period to period. The risks described in our 2015 Form 10-K are not the only risks we face. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial also could have a material adverse effect on our business, results of operations, financial condition and/or liquidity.

Recent developments relating to the United Kingdom's referendum vote in favor of leaving the European Union could adversely affect us.

On June 23, 2016, a referendum was held in the U.K. in which it was decided that the U.K. would leave the EU ("Brexit"). As a result of this vote, negotiations are expected to commence to determine the terms of the U.K.'s withdrawal from the EU, including the terms of trade between the U.K. and the EU. The effects of Brexit have been, and are expected to continue to be, far reaching. The perceptions as to the impact of Brexit may adversely affect business activity and economic conditions in Europe and globally and could continue to contribute to instability in global financial and foreign exchange markets. Brexit could also have the effect of disrupting the free movement of goods, services and people between the U.K. and the EU. The full effects of Brexit are uncertain and will depend on any agreements the U.K. may make to retain access to EU markets. Lastly, as a result of the Brexit, other European countries may seek to conduct referenda with respect to their continuing membership with the EU. Given these possibilities and others we may not anticipate, as well as the lack of comparable precedent, the full extent to which our business, results of operations and financial condition could be adversely affected by Brexit is uncertain.

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

The following table summarizes our purchases of our common shares for the 2016 second quarter :

Period	Issuer Purchases of Equity Securities				Approximate Dollar Value of Shares that May Yet be Purchased Under the Plan or Programs (2)
	Total Number of Shares Purchased (1)	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs		
4/1/2016 - 4/30/2016	1,772	\$ 71.36	—	\$	446,501
5/1/2016 - 5/31/2016	123,559	71.34	—	\$	446,501
6/1/2016 - 6/30/2016	7,045	70.97	—	\$	446,501
Total	132,376	\$ 71.32	—	\$	446,501

- (1) Includes repurchases by ACGL 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 June 30, 2016 under ACGL's share repurchase authorization, under which repurchases may be effected from time to time in open market or privately negotiated transactions through December 31, 2016.

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 2016 second 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.

Effective January 16, 2016, the Office of Foreign Assets Control of the U.S. Department of the Treasury adopted General License H which authorizes non-U.S. entities that are owned or controlled by a U.S. person to engage in certain activities with Iran so long as they comply with certain specific requirements set forth therein.

Certain of our non-U.S. subsidiaries provide global marine policies that provide coverage for vessels navigating into and out of ports worldwide. In light of European Union and U.S. modifications to Iran sanctions this year, including the issuance of General License H, and consistent with General License H, we have been notified that certain of our policyholders have begun to, or will begin to, ship cargo to and from Iran, and that such cargo may include transporting crude oil from Iran to another country. Since these policies insure multiple voyages and fleets containing multiple ships, we are unable to attribute gross revenues and net profits from such marine policies to these activities involving Iran. We intend for our non-U.S. subsidiaries to continue to provide such coverage to the extent permitted by applicable law.

ITEM 6. EXHIBITS

Exhibit No.	Description
3	Bye-Laws of Arch Capital Group Ltd., a Bermuda company
10.1	Restricted Share Agreement with Arch Capital Group Ltd. substantially in the form signed by the Non-Employee Directors of Arch Capital Group Ltd. for May 6, 2016 grants
10.2	Restricted Share Agreement with Arch Capital Group Ltd. substantially in the form signed by each of Constantine Iordanou, Mark D. Lyons, Marc Grandisson, W. Preston Hutchings, David McElroy and Louis T. Petrillo for May 13, 2016 grants
10.3	Non-Qualified Stock Option Agreement with Constantine Iordanou, Mark D. Lyons, Marc Grandisson, W. Preston Hutchings, David McElroy and Louis T. Petrillo for May 13, 2016 grants
10.4	Restricted Share Unit Agreement, dated as of May 13, 2016, between Arch Capital Group Ltd. and David McElroy
10.5	Share Appreciation Right Agreement, dated February 27, 2015, between Arch Capital Group Ltd. and Constantine Iordanou
10.6	Non-Qualified Stock Option Agreement, dated February 26, 2016, between Arch Capital Group Ltd. and Constantine Iordanou
10.7	Third Amended and Restated Arch Capital Group Ltd. Incentive Compensation Plan
15	Accountants' Awareness Letter (regarding unaudited interim financial information)
31.1	Certification of Chief Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2	Certification of Chief Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1	Certification of Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2	Certification of Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101	The following financial information from Arch Capital Group Ltd.'s Quarterly Report for the quarter ended June 30, 2016 formatted in XBRL: (i) Consolidated Balance Sheets at June 30, 2016 and December 31, 2015; (ii) Consolidated Statements of Income for the three and six month periods ended June 30, 2016 and 2015; (iii) Consolidated Statements of Comprehensive Income for the three and six month periods ended June 30, 2016 and 2015; (iv) Consolidated Statements of Changes in Shareholders' Equity for the six month periods ended June 30, 2016 and 2015; (v) Consolidated Statements of Cash Flows for the six month periods ended June 30, 2016 and 2015; and (vi) Notes to Consolidated Financial Statements.

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: August 5, 2016

/s/ Constantine Iordanou
Constantine Iordanou
Chief Executive Officer (Principal Executive Officer) and Chairman of the Board of Directors

Date: August 5, 2016

/s/ Mark D. Lyons
Mark D. Lyons
Executive Vice President, Chief Financial Officer and Treasurer (Principal Financial and Accounting Officer)

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[Reflecting Amendments Through May 6, 2016]

BYE-LAWS
of
ARCH CAPITAL GROUP LTD.,
a Bermuda company

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1. Interpretation

(1) In these Bye-laws the following words and expressions shall, where not inconsistent with the context, have the following meanings respectively:

“ Act ” means the Bermuda Companies Act 1981 as amended from time to time.

“ Alternate Director ” means an alternate Director appointed in accordance with these Bye-laws and the Act.

“ Auditor ” includes any individual or partnership.

“ Board ” means the board of Directors appointed or elected pursuant to these Bye-laws and acting by resolution in accordance with the Act and these Bye-laws or the Directors present at a meeting of Directors at which there is a quorum.

“ Company ” means the company for which these Bye-laws are approved and confirmed.

“ Controlled Shares ” has the meaning set forth in Bye-law 45.

“ Director ” means a director of the Company and shall include an Alternate Director.

“ Exchange Act ” means the United States Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

“ Fair Market Value ” means, with respect to a repurchase of any shares of any class or series of the Company in accordance with Bye-law 10:

(i) if shares of such class or series are listed on a securities exchange (or quoted in a securities quotation system), the average closing sale price of such shares on such exchange (or in such quotation system), or, if shares of such class or series are listed on (or quoted in) more than one exchange (or quotation system), the average closing sale price of such shares on the principal securities exchange (or quotation system) on which such shares are then traded, or, if shares of such class or series are not then listed on a securities exchange (or quotation system) but are traded in the over-the-counter market, the average of the latest bid and asked quotations for such shares in such market, in each case for the last five trading days immediately preceding the day on which notice of the repurchase of such shares is sent pursuant to these Bye-laws, or

(ii) if no such closing sales prices or quotations are available because shares of such class or series are not publicly traded or otherwise, the fair value of such shares as determined by one independent internationally recognized investment banking firm chosen in good faith by the Board, provided that the calculation of the Fair Market Value of the shares made by such appointed investment banking firm (x) shall not include any discount relating to the absence of a public trading market for, or any transfer restrictions on, such shares, and (y) such calculation shall be final and the

fees and expenses stemming from such calculation shall be borne by the Company or its assignee, as the case may be.

“ general meeting ” means either an annual general meeting or a special general meeting of the Members.

“ Member ” means the person registered in the Register of Members as the holder of shares in the Company and, when two or more persons are so registered as joint holders of shares, means the person whose name stands first in the Register of Members as one of such joint holders or all of such persons as the context so requires.

“ notice ” means written notice as further defined in these Bye-laws unless otherwise specifically stated.

“ Officer ” means any person appointed by the Board to hold an office in the Company.

“ person ” means any individual, partnership, limited liability company, joint venture, firm, corporation, association, trust, fund or other enterprise.

“ Register of Directors and Officers ” means the Register of Directors and Officers referred to in these Bye-laws.

“ Register of Members ” means the Register of Members referred to in these Bye-laws.

“ Resident Representative ” means any person appointed to act as resident representative and includes any deputy or assistant resident representative.

“ Secretary ” means the person appointed to perform any or all the duties of secretary of the Company and includes any deputy or assistant secretary.

“ Treasury Share ” means a share of the Company that was or is treated as having been acquired by the Company and has not been cancelled but has been held by the Company continuously since it was acquired.

(2) In these Bye-laws, where not inconsistent with the context:

(a) words denoting the plural number include the singular number and vice versa;

(b) words denoting the masculine gender include the feminine gender;

(c) words importing persons include companies, associations or bodies of persons whether corporate or not;

(d) the word:

(i) “may” shall be construed as permissive;

(ii) “shall” shall be construed as imperative; and

(e)unless otherwise provided herein words or expressions defined in the Act shall bear the same meaning in these Bye-laws.

(3) Expressions referring to writing or written shall, unless the contrary intention appears, include facsimile, printing, lithography, photography, e-mail and other modes of representing words in a visible form.

(4) Headings used in these Bye-laws are for convenience only and are not to be used or relied upon in the construction hereof.

BOARD OF DIRECTORS

2. Management of the Company

(1) The business of the Company shall be managed and conducted by the Board. In managing the business of the Company, the Board may exercise all corporate and other powers of the Company as are not, by statute or by these Bye-laws, required to be exercised by the Company in general meeting, and the business and affairs of the Company shall be so controlled by the Board. The Board may also present any petition and make any application in connection with the liquidation or reorganization of the Company.

(2) No regulation or alteration to these Bye-laws made by the Company in general meeting shall invalidate any prior act of the Board.

(3) The Board may procure that the Company pays all expenses incurred in promoting and incorporating the Company.

3. Power to appoint managing director or chief executive officer

The Board may from time to time appoint one or more persons to the office of managing director or chief executive officer of the Company who shall, subject to the control of the Board, supervise and administer all of the general business and affairs of the Company.

4. Power to appoint manager

The Board may appoint a person to act as manager of the Company's day to day business and may entrust to and confer upon such manager such powers and duties as it deems appropriate for the transaction or conduct of such business.

5. Power to authorize specific actions

The Board may from time to time and at any time authorize any person to act on behalf of the Company for any specific purpose and in connection therewith to execute any agreement, document or instrument on behalf of the Company.

6. Power to appoint attorney

The Board may from time to time and at any time by power of attorney appoint any company, firm, person or body of persons, whether nominated directly or indirectly by the Board, to be an attorney of the Company for such purposes and with such powers, authorities and discretions (not

exceeding those vested in or exercisable by the Board) and for such period and subject to such conditions as it may think fit and any such power of attorney may contain such provisions for the protection and convenience of persons dealing with any such attorney as the Board may think fit and may also authorise any such attorney to sub-delegate all or any of the powers, authorities and discretions so vested in the attorney. Such attorney may, if so authorised under the seal of the Company, execute any deed or instrument under such attorney's personal seal with the same effect as the affixation of the seal of the Company.

7. Power to delegate to a committee

(1) The Board may appoint Board Committees from among its members to consist of not less than one (1) Director for each Board Committee. The Board may designate one or more Directors as alternate members of any Board Committee, who may replace any absent or disqualified members at a meeting of such Board Committee. The Board Committees shall have such of the powers and authority of the Board in the management of the business and affairs of the Company as shall, from time to time, so be delegated to them by the Board.

(2) The Board may appoint other committees to consist of such number of members as may be fixed by the Board, none of whom need be a member of the Board, and may prescribe the powers and authority of such committees.

(3) Meetings and actions of Board Committees and other committees of the Company shall be governed by, held and taken in accordance with these Bye-laws, with such changes in the context of those Bye-laws as are necessary to substitute the committee and its members for the Board and its members, except that the time of regular meetings of committees may also be determined by resolution of the Board and notice of special meetings of committees shall also be given to all alternate members, who shall have the right to attend all meetings of the committee. Further, the Board or the committee may adopt rules for the governance of any committee not inconsistent with the provisions of these Bye-laws.

8. Power to appoint and dismiss employees

The Board may appoint, suspend or remove any manager, secretary, clerk, agent or employee of the Company and may fix their remuneration and determine their duties.

9. Power to borrow and charge property

The Board may exercise all the powers of the Company to borrow money and to mortgage or charge its undertaking, property and uncalled capital, or any part thereof, and may issue debentures, debenture stock and other securities whether outright or as security for any debt, liability or obligation of the Company or any third party.

10. Exercise of power to purchase shares of or discontinue the Company

(1) The Board may exercise all the powers of the Company to purchase all or any part of its own shares pursuant to Section 42A of the Act.

(2) The Board may exercise all the powers of the Company to discontinue the Company to a named country or jurisdiction outside Bermuda pursuant to Section 132G of the Act.

11. Election of Directors

(1) The Board shall consist of not less than three Directors nor more than eighteen Directors with the exact number of Directors to be determined from time to time by resolution adopted by the affirmative vote of a majority of the Board.

(2) The Directors shall be divided into three classes designated Class I, Class II and Class III. Each class shall consist, as nearly as may be possible, of one-third of the total number of Directors constituting the entire Board. At the date these Bye-laws become effective, (i) the Class I directors, with a term ending in 2002, are Thomas V. A. Kelsey, Robert F. Works and Philip L. Wroughton, (ii) the Class II directors, with a term ending in 2003, are Peter A. Appel, Lewis L. Glucksman and Ian R. Heap and (iii) the Class III directors, with a term ending in 2001, are Robert Clements, Michael P. Esposito, Jr. and Mark D. Mosca. At each succeeding annual general meeting beginning in 2001, successors to the class of directors whose term expires at that annual general meeting shall be elected for a three-year term. If the number of Directors is changed, any increase or decrease shall be apportioned among the classes so as to maintain the number of Directors in each class as nearly equal as possible, and any additional Director of any class elected to fill a vacancy resulting from an increase in such class shall hold office for a term that shall coincide with the remaining term of that class, but in no case will a decrease in the number of Directors shorten the term of any incumbent Director. A Director shall hold office until the annual general meeting for the year in which his term expires and until his successor shall be elected and shall qualify, subject, however, to prior death, resignation, retirement, disqualification or removal from office.

(3) Notwithstanding the foregoing, whenever the holders of any one or more classes or series of Preference Shares issued by the Company shall have the right, voting separately by class or series, to elect Directors at an annual or special general meeting, the election, term of office, filling of vacancies and other features of such directorships shall be governed by the terms of the Board resolution creating such classes or series of Preference Shares, and such directors so elected shall not be divided into classes pursuant to this Bye-law 11 unless expressly provided by such terms.

12. Defects in appointment of Directors

All acts done bona fide by any meeting of the Board or by a committee of the Board or by any person acting as a Director shall, notwithstanding that it be afterwards discovered that there was some defect in the appointment of any Director or person acting as aforesaid, or that they or any of them were disqualified, be as valid as if every such person had been duly appointed and was qualified to be a Director.

13. Notification of nominations

Subject to the rights of the holders of any class or series of Preference Shares, nominations for the election of Directors may be made by the Board or by any Member entitled to vote for the election of Directors. Any Member entitled to vote for the election of Directors may nominate persons for election as Directors only if written notice of such Member's intent to make such nomination is delivered to the Secretary of the Company not later than (i) with respect to an election to be held at an annual general meeting, 50 days prior to the date of the meeting at which such nominations are proposed to be voted upon (or if less than 55 days' notice of the meeting is given, not later than the close of business on the seventh day following the day notice of the meeting is first given to Members) and (ii) with respect to an election to be held at a special general meeting for the election of Directors,

the close of business on the seventh day following the date on which notice of such meeting is first given to Members. Each such notice shall set forth: (a) the name and address of the Member who intends to make the nomination and of the person or persons to be nominated; (b) a representation that the Member is a holder of record of shares of the Company entitled to vote at such meeting and intends to appear in person or by proxy at the meeting to nominate the person or persons specified in the notice; (c) a description of all arrangements or understandings between the Member and each such nominee and any other person or persons (naming such person or persons) pursuant to which the nomination or nominations are to be made by the Member; (d) such other information regarding each nominee proposed by such Member as would have been required to be included in a proxy statement filed pursuant to the proxy rules of the United States Securities and Exchange Commission had each such nominee been nominated, or intended to be nominated, by the Board; and (e) the consent of each such nominee to serve as a director of the Company if so elected. The Chairman of the meeting may refuse to acknowledge the nomination of any person not made in compliance with the foregoing procedure.

14. Alternate Directors

An individual may be appointed an Alternate Director by or in accordance with a resolution of the members. Unless otherwise determined by the Board (and subject to such limitations as may be set by the Board), no Director shall have the right to appoint another person to act as his Alternate Director.

15. Vacancies on the Board; Removal of Directors, Etc.

(1) Except in the case of vacancies on the Board that under applicable law must be filled by the Members, any vacancy on the Board that results from an increase in the number of directors shall be filled by a majority of the Directors then in office, provided that a quorum is present, and any other vacancy occurring in the Board shall be filled by a majority of the Directors then in office, even if less than a quorum, or a sole remaining director and the Board shall have the power to appoint an Alternate Director for any Director appointed to fill a vacancy. Any Director elected to fill a vacancy not resulting from an increase in the number of directors shall have the same remaining term as that of his predecessor. If the number of Directors is changed, any increase or decrease shall be apportioned among the three classes so as to make all classes as nearly equal in number as possible. No decrease in the number of Directors shall shorten the term of any incumbent Director.

(2) A Director may be removed only for cause as determined by the affirmative vote of the holders of at least a majority of the shares then entitled to vote generally in an election of Directors, which vote may only be taken at a special general meeting of the Members called expressly for that purpose. Cause for removal shall be deemed to exist only if the Director whose removal is proposed has been convicted of a felony by a court of competent jurisdiction or has been adjudged by a court of competent jurisdiction to be liable for gross negligence or misconduct in the performance of such Director's duty to the Company and such adjudication is no longer subject to direct appeal.

16. Notice of meetings of the Board; Adjournment

(1) Notice of the time and place of each meeting of the Board shall be served upon or telephoned or telegraphed or transmitted by facsimile or e-mail to each Director at his residence or usual place of business, at least two (2) business days before the time fixed for the meeting, or so mailed at least five (5) business days before the time fixed for the meeting.

(2) A majority of the Directors present, whether or not a quorum is present, may adjourn any Directors meeting to another time and place. Notice of the time and place of holding an adjourned meeting need not be given to absent Directors if the time and place be fixed at the meeting adjourned.

(3) Notice of any meeting or any irregularity in any notice may be waived by any Director before the meeting is held. Attendance of a Director at a meeting shall constitute a waiver of notice of such meeting by such Director.

17. Quorum at meetings of the Board

At all meetings of the Board, one half (1/2) of the Directors then in office (but not less than two (2) Directors) if present in person at such meeting shall be sufficient to constitute a quorum a meeting of Directors.

18. Meetings of the Board

(1) All meetings of the Directors shall be held at the registered office of the Company or at such other place either within or without Bermuda as shall be designated by the Board.

(2) The Board may meet for the transaction of business, adjourn and otherwise regulate its meetings as it sees fit.

(3) Directors may participate in a meeting of the Board through use of conference telephone or similar communications equipment, so long as all Directors participating in such meeting can hear one another. Participation in a meeting of the Board by this means constitutes presence in person at such meeting.

(4) Unless a greater number is otherwise expressly required by statute or these Bye-laws, every act or decision done or made by a majority of the Directors present at a meeting duly held, at which a quorum is present, shall be regarded as the act of the Board.

19. Regular Board meetings

The next meeting of the Board subsequent to the annual general meeting shall be held for the purpose of organizing the Board, electing officers and transacting such other business as may come before the meeting. Thereafter regular meetings of the Board shall be held at such time as may be designated by the Board. If the day fixed for any regular meeting shall fall on a holiday, the meeting shall take place on the next business day, unless otherwise determined by the Board.

20. Special Board meetings

Special meetings of the Board may be called by the Chairman of the Board, or by the President, or by three Directors or a majority of the total number of Directors (whichever is fewer), upon the notice specified in Bye-law 16(1).

21. Chairman of meetings

The Chairman of the Board, or in the Chairman's absence, any Director selected by the Directors present, shall preside as chairman at meetings of the Board.

22. Unanimous written resolutions

Any action required or permitted to be taken by the Board may be taken without a meeting if all members of the Board shall consent thereto in writing. Such written consent or consents shall be filed with the minutes of the proceedings of the Board. For the purposes of this Bye-law, "Director" shall not include an Alternate Director.

23. Contracts and disclosure of Directors' interests

(1) Any Director, or any Director's firm, partner or any company with whom any Director is associated, may act in a professional capacity for the Company and such Director or such Director's firm, partner or such company shall be entitled to remuneration for professional services as if such Director were not a Director.

(2) A Director who is directly or indirectly interested in a contract or proposed contract or arrangement with the Company shall declare the nature of such interest.

(3) Following a declaration being made pursuant to this Bye-law, and unless disqualified by the chairman of the relevant Board meeting, a Director may vote in respect of any contract or proposed contract or arrangement in which such Director is interested and may be counted in the quorum at such meeting.

24. Remuneration of Directors

(1) The remuneration (if any) of the Directors shall be as determined by the Directors and shall be deemed to accrue from day to day. The Directors shall also be paid all travel, hotel and other expenses properly incurred by them in attending and returning from meetings of the Board, any committee appointed by the Board, general meetings of the Company, or in connection with the business of the Company or their duties as Directors generally.

(2) The Directors may by resolution award special remuneration to any Director of the Company undertaking any special work or services for, or undertaking any special mission on behalf of, the Company other than his ordinary routine work as a Director. Any fees paid to a Director who is also counsel or solicitor to the Company, or otherwise serves it in a professional capacity, shall be in addition to his remuneration as a Director.

25. Register of Directors and Officers

The Board shall cause to be kept in one or more books at the registered office of the Company a Register of Directors and Officers and shall enter therein the particulars required by the Act.

OFFICERS

26. Principal Officers

The principal Officers of the Company shall be a President, one or more Vice Presidents, a Secretary and such officers as the Board may determine. Any two or more of such offices, except those of President and Secretary, may be held by the same person except as prohibited by the Act. The Chairman of the Board need not be an executive officer of the Company.

27. Other Officers

The Board, the Chairman of the Board or the President may appoint such other Officers as the conduct of the business of the Company may require, each of whom shall hold office for such period as the Board, the Chairman of the Board or the President may from time to time determine.

28. Remuneration of Officers

The Officers shall receive such remuneration as the Board may from time to time determine.

29. Duties of Officers

Each Officer shall have such powers and perform such duties in the management, business and affairs of the Company as may be delegated to him by the Board, or, if such Officer was appointed by the Chairman of the Board or the President, as may be delegated to him by either such person, from time to time.

MINUTES

30. Obligations of Board to keep minutes

- (1) The Board shall cause minutes to be duly entered in books provided for the purpose:
 - (a) of all elections and appointments of Officers;
 - (b) of the names of the Directors present at each meeting of the Board and of any committee appointed by the Board; and
 - (c) of all resolutions and proceedings of general meetings of the Members, meetings of the Board and meetings of committees appointed by the Board.
- (2) Minutes prepared in accordance with the Act and these Bye-laws shall be kept by the Secretary at the registered office of the Company.

INDEMNITY

31. Right to indemnification

(1) The Company shall indemnify its officers and directors to the fullest extent possible except as prohibited by the Act. Without limiting the foregoing, the Directors, Secretary and other Officers (such term to include, for the purposes of this Bye-law, any Alternate Director or any person appointed to any committee by the Board or any person who is or was serving at the request of the Company as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise (including, without limitation, any employee benefit plan)) and every one of them, and their heirs, executors and administrators, shall be indemnified and secured harmless out of the assets of the Company from and against all actions, costs, charges, losses, damages and expenses which they or any of them, their heirs, executors or administrators, shall or may incur or sustain by or by reason of any act done, concurred in or omitted (actual or alleged) in or about the execution of their duty, or supposed duty, or in their respective offices or trusts, and none of them shall be answerable for the acts, receipts, neglects or defaults of the others of them or for joining in any receipts for the sake of

conformity, or for any bankers or other persons with whom any moneys or effects belonging to the Company shall or may be lodged or deposited for safe custody, or for insufficiency or deficiency of any security upon which any moneys of or belonging to the Company shall be placed out on or invested, or for any other loss, misfortune or damage which may happen in the execution of their respective offices or trusts, or in relation thereto, provided that this indemnity shall not extend to any matter in respect of which such person is, or may be, found guilty of fraud or dishonesty.

(2) The Company may purchase and maintain insurance to protect itself and any Director, Officer or other person entitled to indemnification pursuant to this Bye-law to the fullest extent permitted by law.

(3) All reasonable expenses incurred by or on behalf of any person entitled to indemnification pursuant to Bye-law 31(1) in connection with any proceeding shall be advanced to such person by the Company within twenty (20) business days after the receipt by the Company of a statement or statements from such person requesting such advance or advances from time to time, whether prior to or after final disposition of such proceeding. Such statement or statements shall reasonably evidence the expenses incurred by such person and, if required by law or requested by the Company at the time of such advance, shall include or be accompanied by an undertaking by or on behalf of such person to repay the amounts advanced if it should ultimately be determined that such person is not entitled to be indemnified against such expenses pursuant to this Bye-law.

(4) The right of indemnification and advancement of expenses provided in this Bye-law shall not be exclusive of any other rights to which those seeking indemnification may otherwise be entitled, and the provisions of this Bye-law shall inure to the benefit of the heirs and legal representatives of any person entitled to indemnity under this Bye-law and shall be applicable to proceedings commenced or continuing after the adoption of this Bye-law, whether arising from acts or omissions occurring before or after such adoption. Any repeal or modification of the foregoing provisions of this section shall not adversely affect any right or protection existing at the time of such repeal or modification.

32. Waiver of claims

The Company and each Member agrees to waive any claim or right of action it might have, whether individually or by or in the right of the Company, against any Director or Officer, and no Director or Officer shall have any liability for monetary damages, on account of any action taken by such Director or Officer, or the failure of such Director or Officer to take any action in the performance of his duties with or for the Company, provided that such waiver shall not extend to any matter in respect of which such person is, or may be, found guilty of fraud or dishonesty.

33. Indemnification of employees

The Board may provide indemnification and advancement of expenses to the employees of the Company for their acts or omissions as the Board may, from time to time, determine.

MEMBERS MEETINGS

34. Place of meeting

All meetings of Members shall be held either at the registered office of the Company or at any other place within or without Bermuda as may be designated by the Board.

35. Annual meeting

The annual general meeting shall be held on such date, at such time and at such place as shall be designated by the Board and any annual general meeting may be adjourned as provided by law or pursuant to these Bye-laws. At each annual general meeting there shall be elected Directors to serve for the designated term, and such other business shall be transacted as shall properly come before the meeting.

36. Special general meeting

(1) Special general meetings for any purpose or purposes may be called only (i) by the Chairman of the Board; (ii) by the President; (iii) by a majority of the Directors in office or (iv) as required by the Act.

(2) Only such business as is specified in the notice of any special general meeting shall come before such meeting.

37. Accidental omission of notice of general meeting

The accidental omission to give notice of a general meeting to, or the non-receipt of notice of a general meeting by, any person entitled to receive notice shall not invalidate the proceedings at that meeting.

38. Business to be conducted at meetings

(1) At any general meeting, only such business shall be conducted as shall have been properly brought before such meeting.

(2) To be properly brought before an annual general meeting, business must be (1) specified in the notice of meeting (or any supplement thereto) given by or at the direction of the Board, (2) otherwise properly brought before the meeting by or at the direction of the Board or (3) otherwise properly brought before the meeting by a Member. For business to be properly brought before an annual general meeting by a Member, the Member must have given timely notice thereof in writing to the Secretary of the Company. To be timely, a Member's notice must be received not later than 50 days prior to the date of the meeting (or if less than 55 days' notice of the meeting is given, not later than the close of business on the seventh day following the day notice of the meeting is first given to Members).

(3) To be properly brought before a special general meeting, business must be (i) specified in the notice of meeting (or any supplement thereto) given by or at the direction of the person or persons calling such meeting in accordance with Bye-law 36 or (ii) otherwise properly brought before the meeting by or at the direction of such person or persons. Members may not bring matters before a special general meeting except as specified under the Act. To the extent any Member or Members are specifically permitted under the Act to bring matters before a special meeting, such Member or Members must give timely notice thereof in writing to the Secretary of the Company to properly bring business before a special general meeting and satisfy applicable requirements of the Act. To be timely,

a Member's notice must be received no later than the close of business on the seventh day following the date notice of the meeting is first given to Members.

(4) Each such notice shall set forth as to each matter the Member proposes to bring before the meeting: (a) a brief description of the business desired to be brought before the meeting and the reasons for conducting such business at the meeting, (b) the name and address, as they appear on the Company's books, of the Member proposing such business, (c) a representation that the Member is a holder of record of stock of the Company entitled to vote at the meeting and intends to appear in person or by proxy at the meeting to bring such business before the meeting, (d) the class, series and number of shares of the Company which are beneficially owned by the Member, (e) any material interest of the Member in such business, and (f) such other information regarding the business to be brought before the meeting by such Member as would be required to be included in a proxy statement filed pursuant to the proxy rules of the United States Securities and Exchange Commission.

(5) No business shall be conducted at any meeting of the Members except in accordance with the procedures set forth in the preceding paragraph. The chairman of the meeting shall, if the facts warrant, determine and declare to the meeting that business was not properly brought before the meeting and in accordance with the provisions of these Bye-laws and applicable law, and if he or she should so determine, any such business not properly brought before the meeting shall not be transacted.

39. Notice of general meeting

Notice of each general meeting, whether annual or special, shall be given in writing to the Members entitled to vote thereat, not less than then (10) nor more than sixty (60) days before such meeting. Notice of any meeting of Members shall specify the place, the day, and the hour of the meeting, as well as the general nature of the business to be transacted. A notice may be given by the Company to any Member either personally or by mail or other means of written communication addressed to the Member at his address appearing on the Register of Members.

40. Postponement of meetings

The Secretary may postpone any general meeting called in accordance with the provisions of these Bye-laws (other than a meeting requisitioned under these Bye-laws) provided that notice of postponement is given to each Member before the time for such meeting. Fresh notice of the date, time and place for the postponed meeting shall be given to each Member in accordance with the provisions of these Bye-laws.

41. Quorum for general meeting

The presence of two or more persons representing, in person or by proxy, not less than a majority of the voting power represented by the shares entitled to vote thereat shall constitute a quorum for the transaction of business at any general meeting.

42. Adjournment of meetings

(1) Any general meeting, annual or special, whether or not a quorum is present, may be adjourned from time to time by the vote of the majority of the voting power represented by the shares represented at the meeting, either in person or by proxy, but in the absence of a quorum no other business may be transacted at that meeting.

(2) When any general meeting, either annual or special, is adjourned to another time or place, notice need not be given of the adjourned meeting if the date, time and place are announced at a meeting at which the adjournment occurs, unless a new record date for the adjourned meeting is fixed, or unless the adjournment is for more than thirty (30) days from the date set for the original meeting, in which case the Board shall set a new record date. Notice of any such adjourned meeting, if required, shall be given to each Member of record entitled to vote at the adjourned meeting in accordance with the provisions of Bye-law 37. At any adjourned meeting the Company may transact any business that might have been transacted at the original meeting.

43. Written resolutions

Subject to applicable law, the Members shall have the power to consent in writing, without a meeting, to the taking of any action.

44. Attendance of Directors

The Directors of the Company shall be entitled to receive notice of and to attend and be heard at any general meeting.

45. Limitation on voting rights of Controlled Shares

(1) Except as provided in the other paragraphs of this Bye-law 45, every Member of record owning shares conferring the right to vote present in person or by proxy shall have one vote, or such other number of votes as may be specified in the terms of the issue and rights and privileges attaching to such shares or in these Bye-laws, for each such share registered in such Member's name.

(2) If, as a result of giving effect to the foregoing provisions of this Bye-law 45 or otherwise, the votes conferred by the Controlled Shares, directly or indirectly or by attribution, to any U.S. Person would otherwise represent more than 9.9% of the voting power of all shares entitled to vote generally at an election of Directors, the votes conferred by the Controlled Shares on such U.S. Person shall be reduced by whatever amount is necessary so that after any such reduction the votes conferred by the Controlled Shares to such U.S. Person shall constitute 9.9% of the total voting power of all shares of the Company entitled to vote generally at any election of Directors (provided, however, that (a) votes shall be reduced only (i) in shares of the Company, if any, held by such U.S. Person within the meaning of Section 958(a) of the Internal Revenue Code of 1986, as amended (the "Code") and (ii) in shares of the Company if any (other than shares held directly by the H&F Funds or the WP Funds) held by such U.S. Person within the meaning of Section 958(b) of the Code, (b) votes shall be reduced in shares of the Company held directly by the H&F Funds and the WP Funds only if and to the extent that reductions in the vote of other shares do not result in satisfaction of the 9.9% threshold set forth in this paragraph (2), (c) such reduction (or portion thereof) in votes conferred by shares held directly by an H&F Fund shall not be effective on or after such date, if any, as such H&F Fund reasonably objects in writing to such reduction (or portion thereof) after reasonable notice given to such H&F Fund in advance (to the extent feasible) of any meeting of shareholders (which notice the Company shall provide in writing) and (d) such reduction (or portion thereof) in votes conferred by shares held directly by a WP Fund shall not be effective on or after such date, if any, as such WP Fund reasonably objects in writing to such reduction (or portion thereof) after reasonable notice given to such WP Fund in advance (to the extent feasible) of any meeting of shareholders (which notice the Company shall provide in writing)).

(3) (a) “Controlled Shares” in reference to any person means all shares of the Company directly, indirectly or constructively owned by such person within the meaning of Section 958 of the Code;

(b) “U.S. Person” means a United States person as defined in Section 7701(a)(30) of the Code;

(c) “H&F Fund” means the Hellman & Friedman parties to the Shareholders Agreement by and among the Company and certain investors dated as of November 20, 2001 (the “Shareholders Agreement”); and

(d) “WP Fund” means the Warburg Pincus parties to the Shareholders Agreement.

(4) Upon written notification by a Member to the Board, the number of votes conferred by the total number of shares held directly by such Member shall be reduced to that percentage of the total voting power of the Company, as so designated by such Member (subject to acceptance of such reduction by the Board in its sole discretion), so that (and to the extent that) such Member may meet any applicable insurance or other regulatory requirement or voting threshold or limitation that may be applicable to such Member or to evidence that such person’s voting power is no greater than such threshold.

(5) Notwithstanding the foregoing provisions of this Bye-law 45, after having applied such provisions as best as they consider reasonably practicable, the Board may make such final adjustments to the aggregate number of votes conferred, directly or indirectly or by attribution, by the Controlled Shares on any U.S. Person that they consider fair and reasonable in all the circumstances to ensure that such votes represent 9.9% (or the percentage designated by a Member pursuant to paragraph (4) of this Bye-law 45) of the aggregate voting power of the votes conferred by all the shares of the Company entitled to vote generally at any election of Directors. Such adjustments intended to implement the 9.9% limitation set forth in paragraph (2) of this Bye-law 45 shall be subject to the proviso contained in such paragraph (2), but adjustments intended to implement the limitation set forth in a notification pursuant to paragraph (4) of this Bye-law 45 shall not be subject to the proviso contained in paragraph (2).

(6) Each Member shall provide the Company with such information as the Company may reasonably request so that the Company and the Board may make determinations as to the ownership (direct or indirect or by attribution) of Controlled Shares to such Member or to any person to which Shares may be attributed as a result of the ownership of Shares by such Member.

46. Voting at meetings

(1) Unless a different number is otherwise expressly required by statute (without modification of these Bye-laws) or these Bye-laws, every act or decision (including any act or resolution regarding any amalgamation, scheme of arrangement, merger, consolidation or sale or transfer of assets that has been approved by the affirmative vote of at least two-thirds of the Directors in office) done or made by a majority of the voting power held by the Members present in person or by proxy at a meeting duly held, at which a quorum is present, shall be regarded as the act or resolution of the Members; ; provided, that in any uncontested election of Directors, the majority of the voting power represented by the votes cast at a meeting duly held, at which a quorum is present, shall be regarded as the act or resolution of the Members; provided, further, where the number of nominees exceeds the

number of Directors to be elected, nominees shall be elected by a plurality of the votes cast –“for” such Directors. A majority of the voting power represented by the votes cast shall mean that the number of votes cast “for” exceeds the number of votes cast “against” or “withheld”, and shall not include abstentions or shares present at the meeting as to which a shareholder gives no authority or discretion. In any election of Directors, where the number of nominees exceeds the number of Directors to be elected: (i) each Member shall be entitled to cast a number of votes for each share held by such Member equal to the number of Directors to be elected, but may only cast one of such votes for each nominee; and (ii) the number of nominees for Director equal to the number of Directors to be elected that receive the largest number of votes shall be elected as Directors.

(2) No Member shall be entitled to vote at any general meeting unless he or she is a Member on the record date for such meeting.

(3) No objection shall be raised to the qualification of any voter except at the general meeting or adjourned general meeting at which the vote objected to is given or tendered and every vote not disallowed at such general meeting shall be valid for all purposes. Any such objection made in due time shall be referred to the Chairman of the general meeting whose decisions shall be final and conclusive. Notwithstanding, however, the foregoing or any other provision in these Bye-laws, the Chairman of the general meeting may, in his discretion, whether or not an objection has been raised, and if the Chairman considers that such action is necessary to determine accurately the vote count, defer until after the conclusion of the general meeting a decision as to the proper application of Bye-law 45 to any vote at such meeting. If the decision has been so deferred, then the Chairman of the general meeting or, failing such decision within ninety (90) days of the general meeting, the Board, shall make such decision and such decision shall be final and conclusive.

47. Presiding Officer

The Chairman of the Board, the President, or another person selected by the Board shall act as chairman of general meetings. The Secretary of the Company, or, in the Secretary’s absence, an Assistant Secretary of the Company, shall act as secretary of every meeting, but if neither the Secretary nor an Assistant Secretary is present, the Board shall choose any person present to act as secretary of the meeting.

48. Conduct of meeting; Decision of chairman

(1) The chairman shall conduct each general meeting in a manner consistent with the Act and these Bye-laws, but shall not be obligated to follow any technical, formal or parliamentary rules or principles of procedure. Except as otherwise provided by law, the chairman’s rulings on procedural matters shall be conclusive and binding on all Members.

(2) At any general meeting if an amendment shall be proposed to any resolution under consideration but shall be ruled out of order by the chairman of the meeting the proceedings on the substantive resolution shall not be invalidated by any error in such ruling.

(3) At any general meeting a declaration by the chairman of the meeting that a question proposed for consideration has, on a show of hands, been carried, or carried unanimously, or by a particular majority, or lost, and an entry to that effect in a book containing the minutes of the proceedings of the Company shall, subject to the provisions of these Bye-laws, be conclusive evidence of that fact.

49. Seniority of joint holders voting

In the case of joint holders the vote of the senior who tenders a vote, whether in person or by proxy, shall be accepted to the exclusion of the votes of the other joint holders, and for this purpose seniority shall be determined by the order in which the names stand in the Register of Members.

50. Proxies

Every person entitled to vote shares has the right to do so either in person or by one or more persons authorized by a written proxy executed by such Member and filed with the Secretary. Any proxy duly executed shall continue in full force and effect unless revoked by the person executing it by a writing delivered to the Company stating that the proxy is revoked or by a subsequent proxy executed by such Member presented to the meeting or by attendance at a meeting and voting in person by such Member. However, no proxy shall be valid after the expiration of eleven (11) months from the date of its execution unless otherwise provided in the proxy. The decision of the chairman of any general meeting as to the validity of any instrument of proxy shall be final.

51. Representation of corporations at meetings

A corporation which is a Member may, by written instrument, authorize such person as it thinks fit to act as its representative at any general meeting and the person so authorized shall be entitled to exercise the same powers on behalf of the corporation which such person represents as that corporation could exercise if it were an individual Member. Notwithstanding the foregoing, the chairman of the meeting may accept such assurances as he or she thinks fit as to the right of any person to attend and vote at general meetings on behalf of a corporation which is a Member.

SHARE CAPITAL AND SHARES

52. Rights of shares

(1) At the date these Bye-laws become effective, the total number of authorized common shares is two hundred million (200,000,000) common shares having a par value of U.S. \$0.01 per share (the “Common Shares”), and the total number of authorized preference shares is fifty million (50,000,000) preference shares having a par value of U.S. \$0.01 per share (the “Preference Shares”).

(2) The holders of Common Shares shall, subject to the provisions of these Bye-laws:

- (a) be entitled (subject to Bye-law 45) to one vote per share;
- (b) be entitled to such dividends as the Board may from time to time declare;
- (c) in the event of a winding-up or dissolution of the Company, whether voluntary or involuntary or for the purpose of a reorganisation or otherwise or upon any distribution of capital, be entitled to the surplus assets of the Company; and
- (d) generally be entitled to enjoy all of the rights attaching to shares.

(3) All the rights attaching to a Treasury Share shall be suspended and shall not be exercised by the Company while it holds such Treasury Share and, except where required by the Act, all Treasury Shares shall be excluded from the calculation of any percentage or fraction of the share capital, or number of shares, of the Company.

(4) The Board shall have the full power to issue any unissued shares of the Company on such terms and conditions as it may, in its absolute discretion, determine. The Board is authorized to provide for the issuance of the Preference Shares in one or more series, and to establish from time to time the number of shares to be included in each such series, and to fix the designation, powers, preferences and rights of the shares of each such series and the qualifications, limitations or restrictions thereof.

The authority of the Board with respect to each series shall include, but not be limited to, determination of the following:

- (a) The number of shares constituting that series and the distinctive designation of that series;
- (b) The dividend rate on the shares of that series, whether dividends shall be cumulative, and, if so, from which date or dates, and the relative rights of priority, if any, of payment of dividends on shares of that series;
- (c) Whether that series shall have voting rights, in addition to the voting rights provided by law, and, if so, the terms of such voting rights;
- (d) Whether that series shall have conversion or exchange privileges (including, without limitation, conversion into Common Shares), and, if so, the terms and conditions of such conversion or exchange, including provision for adjustment of the conversion or exchange rate in such events as the Board shall determine;
- (e) Whether or not the shares of that series shall be redeemable, and, if so, the terms and conditions of such redemption, including the manner of selecting shares for redemption if less than all shares are to be redeemed, the date or dates upon or after which they shall be redeemable, and the amount per share payable in case of redemption, which amount may vary under different conditions and at different redemption dates;
- (f) Whether that series shall have a sinking fund for the redemption or purchase of shares of that series, and, if so, the terms and amount of such sinking fund;
- (g) The right of the shares of that series to the benefit of conditions and restrictions upon the creation of indebtedness of the Company or any subsidiary, upon the issue of any additional shares (including additional shares of such series or any other series) and upon the payment of dividends or the making of other distributions on, and the purchase, redemption or other acquisition by the Company or any subsidiary of any outstanding shares of the Company;

(h) The rights of the shares of that series in the event of voluntary or involuntary liquidation, dissolution or winding up of the Company, and the relative rights of priority, if any, of payment of shares of that series; and

(i) Any other relative participating, optional or other special rights, qualifications, limitations or restrictions of that series.

53. Power to issue shares

(1) The issuance of any authorized Common Shares or Preference Shares and any other actions permitted to be taken by the Board pursuant to Bye-law 52 must be authorized by the Board.

(2) Any Preference Shares of any series which have been redeemed (whether through the operation of a sinking fund or otherwise) or which, if convertible or exchangeable, have been converted into or exchanged for shares of any other class or classes shall have the status of authorized and unissued Preference Shares of the same series and may be reissued as a part of the series of which they were originally a part or may be reclassified and reissued as part of a new series of Preference Shares to be created by resolution or resolutions of the Board or as part of any other series of Preference Shares, all subject to the conditions and the restrictions on issuance set forth in the resolution or resolutions adopted by the Board providing for the issue of any series of Preference Shares.

(3) At the discretion of the Board, whether or not in connection with the issuance and sale of any of its shares or other securities, the Company may issue securities, contracts, warrants or other instruments evidencing any shares, option rights, securities having conversion or option rights, or obligations on such terms, conditions and other provisions as are fixed by the Board, including, without limiting the generality of this authority, conditions that preclude or limit any person or persons owning or offering to acquire a specified number or percentage of the outstanding Common Shares, other shares, option rights, securities having conversion or option rights, or obligations of the company or transferee of the person or persons from exercising, converting, transferring or receiving the shares, option rights, securities having conversion or option rights, or obligations.

54. Variation of rights, alteration of share capital and purchase of shares of the Company

(1) If at any time the share capital is divided into different classes of shares, the rights attached to any class (unless otherwise provided by the terms of issue of the shares of that class) may, whether or not the Company is being wound-up, be varied with the consent in writing of the holders of a majority of the voting power represented by the issued shares of that class or with the sanction of a resolution passed by a majority of the voting power represented by the votes cast at a separate general meeting of the holders of the shares of the class in accordance with Section 47(7) of the Act. The rights conferred upon the holders of the shares of any class issued with preferred or other rights shall not, unless otherwise expressly provided by the terms of issue of the shares of that class, be deemed to be varied by the creation or issue of further shares ranking *pari passu* therewith.

(2) The Company may from time to time if authorized by resolution of the Members change the currency denomination of, increase, alter or reduce its share capital in accordance with the provisions of Sections 45 and 46 of the Act. Where, on any alteration of share capital, fractions of shares or some other difficulty would arise, the Board may deal with or resolve the same in such manner as it thinks fit including, without limiting the generality of the foregoing, the issue to Members, as appropriate, of fractions of shares and/or arranging for the sale or transfer of the fractions of shares of Members.

(3) The Company may from time to time, acting through the Board, purchase its own shares for cancellation or acquire them as Treasury Shares in accordance with the Act on such terms as the Board shall deem fit.

55. Registered holder of shares

(1) The Company shall be entitled to treat the registered holder of any share as the absolute owner thereof and accordingly shall not be bound to recognise any equitable or other claim to, or interest in, such share on the part of any other person.

(2) Any dividend, interest or other moneys payable in cash in respect of shares may be paid by cheque or draft sent through the post directed to the Member at such Member's address in the Register of Members or, in the case of joint holders, to such address of the holder first named in the Register of Members, or to such person and to such address as the holder or joint holders may in writing direct. If two or more persons are registered as joint holders of any shares any one can give an effectual receipt for any dividend paid in respect of such shares.

56. Death of a joint holder

Where two or more persons are registered as joint holders of a share or shares then in the event of the death of any joint holder or holders the remaining joint holder or holders shall be absolutely entitled to the said share or shares and the Company shall recognise no claim in respect of the estate of any joint holder except in the case of the last survivor of such joint holders.

57. Share certificates

(1) Share certificates shall be in such form as shall be required by law and as shall be approved by the Board. Each certificate shall have the corporate seal affixed thereto by impression or in facsimile and shall be signed by the Chairman of the Board, the President, or any Vice President, and countersigned by the Secretary or any Assistant Secretary; provided that certificates may be signed, countersigned or authenticated by facsimile signatures as provided by law.

(2) Except as provided in this Bye-law 57, new certificates for shares shall not be issued to replace an old certificate unless the latter is surrendered to the Company and cancelled at the same time. The Board may, in case any share certificate or certificate for any other security is lost, stolen, or destroyed, authorize the issuance of a replacement certificate on such terms and conditions as the Board may require, including provision for indemnification of the Company secured by a bond or other adequate security which the Board deems sufficient to protect the Company against any claim that may be made against it, including any expense or liability, on account of the alleged loss, theft, or destruction of the certificate or the issuance of the replacement certificate.

RECORD DATES

58. Determination of record dates

Notwithstanding any other provision of these Bye-laws, the Board may fix any date as the record date for:

- (a) determining the Members entitled to receive any dividend; and
- (b) determining the Members entitled to receive notice of and to vote at any general meeting of the Company.

TRANSFER OF SHARES

59. Instrument of transfer

(1) An instrument of transfer shall be in such common form as the Board may accept. Such instrument of transfer shall be signed by or on behalf of the transferor. The transferor shall be deemed to remain the holder of such share until the same has been transferred to the transferee in the Register of Members.

(2) The Board may refuse to recognize any instrument of transfer unless it is accompanied by the certificate in respect of the shares to which it relates and by such other evidence as the Board may reasonably require to show the right of the transferor to make the transfer.

60. Restriction on transfer

(1) The Board shall refuse to register a transfer unless all applicable consents, authorisations and permissions of any governmental body or agency in Bermuda have been obtained.

(2) If the Board refuses to register a transfer of any share the Secretary shall, within three months after the date on which the transfer was lodged with the Company, send to the transferor and transferee notice of the refusal.

61. Transfers by joint holders

The joint holders of any share or shares may transfer such share or shares to one or more of such joint holders, and the surviving holder or holders of any share or shares previously held by them jointly with a deceased Member may transfer any such share to the executors or administrators of such deceased Member.

TRANSMISSION OF SHARES

62. Representative of deceased Member

In the case of the death of a Member, the survivor or survivors where the deceased Member was a joint holder, and the legal personal representatives of the deceased Member where the deceased Member was a sole holder, shall be the only persons recognized by the Company as having any title to the deceased Member's interest in the shares. Nothing herein contained shall release the estate of a deceased joint holder from any liability in respect of any share which had been jointly held by such

deceased Member with other persons. Subject to the provisions of Section 52 of the Act, for the purpose of this Bye-law, legal personal representative means the executor or administrator of a deceased Member or such other person as the Board may in its absolute discretion decide as being properly authorized to deal with the shares of a deceased Member.

63. Registration on death or bankruptcy

Any person becoming entitled to a share in consequence of the death or bankruptcy of any Member may be registered as a Member upon such evidence as the Board may deem sufficient or may elect to nominate some person to be registered as a transferee of such share, and in such case the person becoming entitled shall execute in favour of such nominee an instrument of transfer satisfactory to the Board. On the presentation thereof to the Board, accompanied by such evidence as the Board may require to prove the title of the transferor, the transferee shall be registered as a Member but the Board shall, in either case, have the same right to decline or suspend registration as it would have had in the case of a transfer of the share by that Member before such Member's death or bankruptcy, as the case may be.

DIVIDENDS AND OTHER DISTRIBUTIONS

64. Declaration of dividends by the Board

The Board may declare and make such dividends or other distributions (in each case in cash or in specie, as valued by the Board, or a combination thereof) to the Members as may be lawfully made out of the assets of the Company.

65. Unclaimed dividends

Any dividend or other monies payable in respect of a share which has remained unclaimed for 5 years from the date when it became due for payment shall, if the Board so resolves, be forfeited and cease to remain owing by the Company. The payment of any unclaimed dividend or other moneys payable in respect of a share may (but need not) be paid by the Company into an account separate from the Company's own account. Such payment shall not constitute the Company a trustee in respect thereof.

66. Undelivered payments

The Company shall be entitled to cease sending dividend payments and cheques by post or otherwise to a Member if those instruments have been returned undelivered to, or left uncashed by, that Member on at least two consecutive occasions, or, following one such occasion, reasonable enquiries have failed to establish the Member's new address. The entitlement conferred on the Company by this Bye-law in respect of any Member shall cease if the Member claims a dividend or cashes a dividend warrant or cheque.

67. Interest on dividends

No dividend or distribution shall bear interest against the Company.

CAPITALIZATION

68. Issue of bonus shares

The Board may resolve to capitalize any part of the amount for the time being standing to the credit of any of the Company's share premium or other reserve accounts or to the credit of the profit and loss account or otherwise available for distribution by applying such sum in paying up unissued shares to be allotted as fully paid bonus shares to the Members.

FISCAL YEAR

69. Financial year end

The financial year end of the Company may be determined by resolution of the Board and failing such resolution shall be 31st December in each year.

AUDIT

70. Appointment of Auditor

Subject to Section 88 of the Act, at the annual general meeting or at a subsequent special general meeting in each year, an independent representative of the Members shall be appointed by them as Auditor of the accounts of the Company.

71. Remuneration of Auditor

The Board may fix the remuneration of the Auditor as it may determine.

NOTICES

72. Notices to Members of the Company

A notice may be given by the Company to any Member either by delivering it to such Member in person or by sending it to such Member's address in the Register of Members or to such other address given for the purpose. For the purposes of this Bye-law, a notice may be sent by mail, courier service, cable, telex, telecopier, facsimile, e-mail or other mode of representing words in a legible and non-transitory form.

73. Notices to joint Members

Any notice required to be given to a Member shall, with respect to any shares held jointly by two or more persons, be given to whichever of such persons is named first in the Register of Members and notice so given shall be sufficient notice to all the holders of such shares.

74. Service and delivery of notice

Any notice shall be deemed to have been served at the time when the same would be delivered in the ordinary course of transmission and, in proving such service, it shall be sufficient to prove that the notice was properly addressed and prepaid, if posted, and the time when it was posted, delivered to

the courier or to the cable company or transmitted by telex, facsimile or other method as the case may be.

CERTAIN SUBSIDIARIES

75. Certain Subsidiaries

With respect to any company incorporated under the laws of Bermuda, Barbados or the Cayman Islands all of the voting shares of which are owned (directly or indirectly through subsidiaries) by the Company, and any other subsidiary of the Company designated by the Board of the Company (together, the “Designated Companies”), the board of directors of each such Designated Company shall consist of the persons who have been elected by the Members as Designated Company Directors. Notwithstanding the general authority set out in Bye-law 2(1), the Board shall vote all shares owned by the Company in each Designated Company to ensure the constitutional documents of such Designated Company require such Designated Company Directors to be elected as the directors of such Designated Company, and to elect such Designated Company Directors as the directors of such Designated Company. The Company shall enter into agreements with each such Designated Company to effectuate or implement this Bye-law.

SEAL OF THE COMPANY

76. The seal

The seal of the Company shall be in such form as the Board may from time to time determine. The Board may adopt one or more duplicate seals for use outside Bermuda.

WINDING-UP

77. Winding-up/distribution by liquidator

If the Company shall be wound up the liquidator may, with the sanction of a resolution of the Members, divide amongst the Members in specie or in kind the whole or any part of the assets of the Company (whether they shall consist of property of the same kind or not) and may, for such purpose, set such value as he or she deems fair upon any property to be divided as aforesaid and may determine how such division shall be carried out as between the Members or different classes of Members. The liquidator may, with the like sanction, vest the whole or any part of such assets in trustees upon such trusts for the benefit of the Members as the liquidator shall think fit, but so that no Member shall be compelled to accept any shares or other securities or assets whereon there is any liability.

BUSINESS COMBINATIONS

78. Business Combinations

(1) The Company shall not engage in any business combination with any Interested Member for a period of three years following the time that such Member became an Interested Member, unless:

- (a) prior to such time the Board approved either the business combination or the transaction which resulted in the Member becoming an Interested Member, or

- (b) upon consummation of the transaction which resulted in the Member becoming an Interested Member, the Interested Member owned at least 85% of the voting shares of the Company outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding those shares owned (i) by persons who are Directors and also officers and (ii) employee share plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer, or
- (c) at or subsequent to such time the business combination is approved by the Board and authorized at an annual or special general meeting, and not by written consent, by the affirmative vote of holders of shares representing at least 66 2/3% of the outstanding voting power of the shares of the Company entitled to vote generally at an election of Directors (excluding shares owned by the Interested Member).

(2) The restrictions contained in this Bye-law shall not apply if:

- (a) a Member becomes an Interested Member inadvertently and (i) as soon as practicable divests itself of ownership of sufficient shares so that the Member ceases to be an Interested Member and (ii) would not, at any time within the 3 year period immediately prior to a business combination between the Company and such Member, have been an Interested Member but for the inadvertent acquisition of ownership; or
- (b) the business combination is proposed prior to the consummation or abandonment of and subsequent to the earlier of the public announcement or the notice required hereunder of a proposed transaction which (i) constitutes one of the transactions described in the second sentence of this paragraph; (ii) is with or by a person who either was not an Interested Member during the previous 3 years or who became an Interested Member with the approval of the Board; and (iii) is approved or not opposed by a majority of the members of the Board then in office (but not less than 1) who were Directors prior to any person becoming an Interested Member during the previous 3 years or were recommended for election or elected to succeed such Directors by a majority of such Directors. The proposed transactions referred to in the preceding sentence are limited to (x) an amalgamation, scheme of arrangement, merger, consolidation or similar transaction involving the Company (except for any such transaction in respect of which no vote of the Members of the Company is required); (y) a sale, lease, exchange, mortgage, pledge, transfer or other disposition (in one transaction or a series of transactions), whether as part of a dissolution or otherwise, of assets of the Company or of any direct or indirect subsidiary of the Company (other than to any direct or indirect wholly-owned subsidiary of the Company or to the Company) having an aggregate market value equal to 50% or more of either that aggregate market value of all of the assets of the Company determined on a consolidated basis or the aggregate market value of all the outstanding shares of the Company; or (z) a proposed tender or exchange offer for 50% or more of the outstanding voting shares of the Company. The Company shall give not less than 20 days notice to all

Interested Members prior to the consummation of any of the transactions described in clauses (x) or (y) of the second sentence of this paragraph.

(3) As used in this Bye-law only, the term:

- (a) “affiliate” means a person that directly, or indirectly through one or more intermediaries, controls, or is controlled by, or is under common control with, another person.
- (b) “associate,” when used to indicate a relationship with any person, means (i) any corporation, partnership, unincorporated association or other entity of which such person is a director, officer or partner or is, directly or indirectly, the owner of 20% or more of any class of voting shares, (ii) any trust or other estate in which such person has at least a 20% beneficial interest or as to which such person serves as trustee or in a similar fiduciary capacity, and (iii) any relative or spouse of such person, or any relative of such spouse, who has the same residence as such person.
- (c) “business combination,” when used in reference to the Company and any Interested Member of the Company, means:
 - (i) any amalgamation, scheme of arrangement, merger, consolidation or similar transaction involving the Company or any direct or indirect subsidiary of the Company with (A) the Interested Member, or (B) with any other corporation, partnership, unincorporated association or other entity if such transaction is caused by the Interested Member and as a result of such transaction subsection (a) of this section is not applicable to the surviving entity;
 - (ii) any sale, lease, exchange, mortgage, pledge, transfer or other disposition (in one transaction or a series of transactions), except proportionately as a Member of such Company, to or with the Interested Member, whether as part of a dissolution or otherwise, of assets of the Company or of any direct or indirect subsidiary of the Company which assets have an aggregate market value equal to 10% or more of either the aggregate market value of all the assets of the Company determined on a consolidated basis or the aggregate market value of all the outstanding shares of the Company;
 - (iii) any transaction which results in the issuance or transfer by the Company or by any direct or indirect subsidiary of the Company of any shares of the Company or of such subsidiary to the Interested Member, except (A) pursuant to the exercise, exchange or conversion of securities exercisable for, exchangeable for or convertible into shares of the Company or any such subsidiary which securities were outstanding prior to the time that the Interested Member became such, (B) pursuant to a Subsidiary Amalgamation; (C) pursuant to a dividend or distribution paid or made, or the exercise, exchange or conversion of securities exercisable for, exchangeable for or convertible into shares

of the Company or any such subsidiary which security is distributed, pro rata to all holders of a class or series of shares of the Company subsequent to the time the Interested Member became such, (D) pursuant to an exchange offer by the Company to purchase shares made on the same terms to all holders of said shares, or (E) any issuance or transfer of shares by the Company, provided however, that in no case under (C)-(E) above shall there be an increase in the Interested Member's proportionate share of the shares of any class or series of the Company or of the voting shares of the Company;

- (iv) any transaction involving the Company or any direct or indirect subsidiary of the Company which has the effect, directly or indirectly, of increasing the proportionate share of the shares of any class or series, or securities convertible into the shares of any class or series, of the Company or of any such subsidiary which is owned by the Interested Member, except as a result of immaterial changes due to fractional share adjustments or as a result of any purchase or redemption of any shares of stock not caused, directly or indirectly, by the Interested Member; or
 - (v) any receipt by the Interested Member of the benefit, directly or indirectly (except proportionately as a Member of the Company) of any loans, advances, guarantees, pledges, or other financial benefits (other than those expressly permitted in subparagraphs (i)-(iv) above) provided by or through the Company or any direct or indirect subsidiary.
- (d) “control,” including the term “controlling,” “controlled by” and “under common control with,” means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of a person, whether through the ownership of voting stock, by contract, or otherwise. A person who is the owner of 20% or more of the outstanding voting stock of any corporation, partnership, unincorporated association or other entity shall be presumed to have control of such entity, in the absence of proof by a preponderance of the evidence to the contrary. Notwithstanding the foregoing, a presumption of control shall not apply where such person holds voting stock, in good faith and not for the purpose of circumventing this Bye-law, as an agent, bank, broker, nominee, custodian or trustee for one or more owners who do not individually or as a group have control of such entity.
- (e) “Interested Member” means any person (other than the Company and any direct or indirect subsidiary of the Company) that (i) is the owner of 15% or more of the outstanding voting shares of the Company, or (ii) is an affiliate or associate of the Company and was the owner of 15% or more of the outstanding voting shares of the Company at any time within the 3-year period immediately prior to the date on which it is sought to be determined whether such person is an Interested Member, and the affiliates and associates of such person; provided, however, that the term “Interested Member” shall not include any person whose ownership of shares in excess of the 15% limitation set forth

herein is the result of action taken solely by the Company provided that such person shall be an Interested Member if thereafter such person acquires additional shares of voting shares of the Company, except as a result of further corporate action not caused, directly or indirectly, by such person. For the purpose of determining whether a person is an Interested Member, the voting shares of the Company deemed to be outstanding shall include shares deemed to be owned by the person through application of Paragraph (h) of this subsection but shall not include any other unissued shares of such Company which may be issuable pursuant to any agreement, arrangement or understanding, or upon exercise of conversion rights, warrants or options, or otherwise.

(f)“ stock ” means, with respect to any corporation, capital stock and, with respect to any other entity, any equity interest.

(g)“ voting stock ” means, with respect to any corporation, stock of any class or series entitled to vote generally in the election of directors and, with respect to any entity that is not a corporation, any equity interest entitled to vote generally in the election of the governing body of such entity.

(h)“ owner ” including the terms “ own ” and “ owned ” when used with respect to any stock means a person that individually or with or through any of its affiliates or associates:

(i)beneficially owns such stock, directly or indirectly; or

(ii)has (A) the right to acquire such stock (whether such right is exercisable immediately or only after the passage of time) pursuant to any agreement, arrangement or understanding, or upon the exercise of conversion rights, exchange rights, warrants or options, or otherwise; provided, however, that a person shall not be deemed the owner of stock tendered pursuant to a tender or exchange offer made by such person or any of such person’s affiliates or associates until such tendered stock is accepted for purchase or exchange; or (B) the right to vote such stock pursuant to any agreement, arrangement or understanding; provided, however, that a person shall not be deemed the owner of any stock because of such person’s right to vote such stock if the agreement, arrangement or understanding to vote such stock arises solely from a revocable proxy or consent given in response to a proxy or consent solicitation made to 10 or more persons; or

(iii)has any arrangement or understanding for the purpose of acquiring, holding, voting (except voting pursuant to a revocable proxy or consent as described in item (B) of clause (ii) of this paragraph), or disposing of such stock with any other person that beneficially owns, or whose affiliates or associates beneficially own, directly or indirectly, such stock.

(i) “Subsidiary Amalgamation” means an amalgamation, scheme of arrangement, merger, consolidation or similar transaction with or into a single direct or indirect wholly-owned subsidiary of the Company if: (1) the Company and the direct or indirect wholly-owned subsidiary of the Company are the only constituent companies to such transaction; (2) each share or fraction of a share of the Company outstanding immediately prior to the effective time of such transaction is converted in such transaction into a share or equal fraction of a share of shares of a holding company having the same designations, rights, powers and preferences, and the qualifications, limitations and restrictions thereof, as the share of the constituent company being converted in such transaction; (3) the holding company and each of the constituent companies to such transaction are companies incorporated in Bermuda; (4) the memorandum of association and bye-laws of the holding company immediately following the effective time of such transaction contain provisions identical to the memorandum of continuance and bye-laws of the Company immediately prior to the effective time of such transaction (other than provisions, if any, regarding the incorporator or incorporators, the corporate name, the registered office and agent, the initial board of directors and the initial subscribers for shares and such provisions contained in any amendment to the charter documents as were necessary to effect a change, exchange, reclassification or cancellation of shares, if such change, exchange, reclassification or cancellation has become effective); (5) as a result of such transaction the Company or its successor or continuing company becomes or remains a direct or indirect wholly-owned subsidiary of the holding company; (6) the directors of the Company become or remain the directors of the holding company upon the effective time of such transaction; (7) the memorandum of association and bye-laws of the surviving or continuing company immediately following the effective time of such transaction are identical to the memorandum of association and bye-laws of the Company immediately prior to the effective time of such transaction (other than provisions, if any, regarding the incorporator or incorporators, the corporate name, the registered office and agent, the initial board of directors and the initial subscribers for shares and such provisions contained in any amendment to the charter documents as were necessary to effect a change, exchange, reclassification or cancellation of shares, if such change, exchange, reclassification or cancellation has become effective); provided, however, that (i) the memorandum of association and bye-laws of the surviving or continuing company shall be amended in such transaction to contain a provision requiring that any act or transaction by or involving the surviving or continuing company that requires for its adoption under the Act or its bye-laws the approval of the Members of the surviving or continuing company shall, by specific reference to this subsection, require, in addition, the approval of the Members of the holding company (or any successor), by the same vote as is required by the Act and/or by its bye-laws of the surviving or continuing company, and (ii) the bye-laws of the surviving or continuing company may be amended in such transaction to reduce the number of classes and shares of capital stock that the surviving or continuing company is authorized to issue; and (8) the Members of the Company do not recognize gain or loss for United States federal income

tax purposes as determined by the board of directors of the constituent company.

(4) Notwithstanding any other provisions of these Bye-laws (and notwithstanding the fact that a lesser percentage or separate class vote may be specified by law or these Bye-laws), the affirmative vote of the holders of shares representing not less than sixty-six and two-thirds percent (662/3%) of the voting power of all the then outstanding voting shares voting together as a single class, excluding voting shares beneficially owned by any Interested Member, shall be required to amend, alter, change, or repeal, or adopt any provision as part of these Bye-laws inconsistent with the purpose and intent of, this Bye-law 76; provided, however, that this Bye-law 78(4) shall not apply to, and such sixty-six and two-thirds percent (662/3%) vote shall not be required for, any such amendment, repeal or adoption recommended by the affirmative vote of at least seventy-five percent (75%) of the Directors in office (not including Directors who are affiliates of any Interested Member).

ALTERATION OF BYE-LAWS, ETC.

79. Alteration of Bye-laws, Etc.

(1) No Bye-law shall be rescinded, altered or amended and no new Bye-law shall be made until the same has been approved both by a resolution of the Board and by a resolution of the Members.

(2) Notwithstanding any other provisions of these Bye-laws:

(a) the affirmative vote of the holders of at least sixty-five percent (65%) of the voting power of the shares entitled to vote generally at an election of directors shall be required to amend, alter, change or repeal, or adopt any provision inconsistent with the purpose or intent of, Bye-laws 10(2), 11, 15, 31, 32, 33, 39, 45, 46(3), 52, 53, 79(1) and 79(2); and

(b) the affirmative vote set forth in Bye-law 78(4) shall be required to amend, alter, change or repeal, or adopt any provision inconsistent with the purpose or intent of, Bye-law 78.

(3) In addition to any affirmative vote required by law, by these Bye-laws or otherwise, and except as otherwise expressly provided by the last sentence of this Bye-law 79:

(i) the adoption of any agreement for, or the approval of, any amalgamation, merger or consolidation of the Company or any subsidiary with or into any person or group that is the beneficial owner of 10% or more of the then outstanding shares of voting stock of the Company (“Non-exempted Beneficial Owner”) or any affiliate thereof;

(ii) the sale, lease, transfer or other disposition of all or any portion of the assets of the Company or any subsidiary (other than in the ordinary course of business) to any Non-exempted Beneficial Owner or its affiliates;

(iii)the issuance or transfer by the Company or any subsidiary of voting securities of the Company or any subsidiary to a Non-exempted Beneficial Owner or any affiliate thereof; or

(iv)any amendment of this Bye-law 79(3).

shall require the affirmative vote of the holders of at least 80% of the voting power of the shares of the Company entitled to vote generally at an election of Directors (including a majority of the voting power of such shares held by Members other than Non-exempted Beneficial Owners).

The requirements of Bye-law 79(3) shall not apply to any transaction which is approved by the Board; *provided , however* , that a majority of the Directors voting in favor thereof were duly elected and acting members of the Board prior to the time such person or group or affiliate thereof became a Non-exempted Beneficial Owner.

ARCH CAPITAL GROUP LTD.
Restricted Share Agreement

THIS AGREEMENT, dated as of May 6, 2016, between Arch Capital Group Ltd. (the “Company”), a Bermuda company, and [Director Name] (the “Director”).

WHEREAS, the following terms reflect the Company’s 2012 Long Term Incentive and Share Award Plan (the “Plan”);

NOW, THEREFORE, in consideration of the premises and mutual covenants contained herein, the parties hereto agree as follows.

1. Award of Shares. Pursuant to the provisions of the Plan, the terms of which are incorporated herein by reference, the Director is hereby awarded 1,066 Restricted Shares (the “Award”), subject to the terms and conditions herein set forth. Capitalized terms used herein and not defined shall have the meanings set forth in the Plan. In the event of any conflict between this Agreement and the Plan, the Plan shall control.

2. Terms and Conditions. It is understood and agreed that the Award of Restricted Shares evidenced hereby is subject to the following terms and conditions:

(a) Vesting of Award. Subject to Section 2(b) below and the other terms and conditions of this Agreement, this Award shall become vested on May 1, 2017. Unless otherwise provided by the Company, all dividends and other amounts receivable in connection with any adjustments to the Shares under Section 4(c) of the Plan shall be subject to the vesting schedule in this Section 2(a). Notwithstanding the foregoing, if a Change in Control occurs and the Director ceases to be a director of the Company for any reason, then the Restricted Shares shall become immediately vested in full upon such termination of service.

“Change in Control” shall mean:

- (A) any person (within the meaning of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), other than a Permitted Person, is or becomes the “beneficial owner” (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of Voting Securities representing 50% or more of the total voting power or value of all the then outstanding Voting Securities; or
 - (B) the individuals who, as of the date hereof, constitute the Board of Directors of the Company (the “Board”) together with those who become directors subsequent to such date and whose recommendation, election or nomination for election to the Board was approved by a vote of at least a majority of the directors then still in office who either were directors as of such date or whose recommendation, election or nomination for election was previously so approved, cease for any reason to
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- (C) constitute a majority of the members of the Board; or the consummation of a merger, consolidation, recapitalization, liquidation, sale or disposition by the Company of all or substantially all of the Company's assets, or reorganization of the Company, other than any such transaction which would (x) result in more than 50% of the total voting power and value represented by the voting securities of the surviving entity outstanding immediately after such transaction being beneficially owned by the former shareholders of the Company and (y) not otherwise be deemed a Change in Control under subparagraphs (A) or (B) of this paragraph.

“Permitted Persons” means (A) the Company; (B) any Related Party; or (C) any group (as defined in Rule 13b-3 under the Exchange Act) comprised of any or all of the foregoing.

“Related Party” means (A) a majority-owned subsidiary of the Company; (B) a trustee or other fiduciary holding securities under an employee benefit plan of the Company or any majority-owned subsidiary of the Company; or (C) any entity, 50% or more of the voting power of which is owned directly or indirectly by the shareholders of the Company in substantially the same proportion as their ownership of Voting Securities immediately prior to the transaction.

“Voting Security” means any security of the Company which carries the right to vote generally in the election of directors.

(b) Termination of Service; Forfeiture of Unvested Shares. Except as otherwise set forth in Section 2(a) above, in the event the Director ceases to be a director of the Company prior to the date the Restricted Shares otherwise become vested due to his or her death or Permanent Disability (as defined in the Company's Incentive Compensation Plan), the Restricted Shares shall become immediately vested in full upon such termination of service. If the Director ceases to be a director of the Company for any other reason prior to the date the Restricted Shares become vested, the Award shall be forfeited by the Director and become the property of the Company.

(c) Certificates. Each certificate issued in respect of Restricted Shares awarded hereunder shall be issued in book entry format with the Company's transfer agent and shall bear a legend disclosing the restrictions on transferability imposed on such Restricted Shares by this Agreement (the “Restrictive Legend”). Upon the vesting of Restricted Shares pursuant to Section 2(a) hereof and the satisfaction of any withholding tax liability pursuant to Section 5 hereof, such vested Shares, not bearing the Restrictive Legend, shall be delivered to the Director.

(d) Rights of a Stockholder. Prior to the time a Restricted Share is fully vested hereunder, the Director shall have no right to transfer, pledge, hypothecate or otherwise encumber such Restricted Shares. During such period, the Director shall have all other rights of a

stockholder, including, but not limited to, the right to vote and to receive dividends (subject to Section 2(a) hereof) at the time paid on such Restricted Shares.

(e) No Right to Continued Services. This Award shall not confer upon the Director any right with respect to continuance of services with the Company nor shall this Award interfere with the right of the Company to terminate the Director's services at any time.

3. Transfer of Shares. The Shares delivered hereunder, or any interest therein, may be sold, assigned, pledged, hypothecated, encumbered, or transferred or disposed of in any other manner, in whole or in part, only in compliance with the terms, conditions and restrictions as set forth in the governing instruments of the Company, applicable United States federal and state securities laws or any other applicable laws or regulations and the terms and conditions hereof.

4. Expenses of Issuance of Shares. The issuance of stock certificates hereunder shall be without charge to the Director. The Company shall pay, and indemnify the Director from and against any issuance, stamp or documentary taxes (other than transfer taxes) or charges imposed by any governmental body, agency or official (other than income taxes) or by reason of the issuance of Shares.

5. Withholding. No later than the date of vesting of (or the date of an election by the Director under Section 83(b) of the Code with respect to) the Award granted hereunder, the Director shall make arrangements satisfactory to the Committee regarding payment of any federal, state or local taxes of any kind required by law to be withheld at such time with respect to such Award and the Company shall, to the extent permitted or required by law, have the right to deduct from any payment of any kind otherwise due to the Director, federal, state and local taxes of any kind required by law to be withheld at such time.

6. References. References herein to rights and obligations of the Director shall apply, where appropriate, to the Director's legal representative or estate without regard to whether specific reference to such legal representative or estate is contained in a particular provision of this Agreement.

7. Notices. Any notice required or permitted to be given under this Agreement shall be in writing and shall be deemed to have been given when delivered personally or by courier, or sent by certified or registered mail, postage prepaid, return receipt requested, duly addressed to the party concerned at the address indicated below or to such changed address as such party may subsequently by similar process give notice of:

If to the Company:

Arch Capital Group Ltd.
Waterloo House
100 Pitts Bay Road
Pembroke HM 08, Bermuda
Attn.: Secretary

If to the Director:

To the last address delivered to the Company by the
Director in the manner set forth herein.

8. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of New York, without giving effect to principles of conflict of laws.

9. Entire Agreement. This Agreement and the Plan constitute the entire agreement among the parties relating to the subject matter hereof, and any previous agreement or understanding among the parties with respect thereto is superseded by this Agreement and the Plan.

10. Counterparts. This Agreement may be executed in two counterparts, each of which shall constitute one and the same instrument.

IN WITNESS WHEREOF, the undersigned have executed this Agreement as of the date first above written.

ARCH CAPITAL GROUP LTD.

By: _____
Dawna Ferguson

Secretary

/s/ Director Signature

ARCH CAPITAL GROUP LTD.
Restricted Share Agreement

THIS AGREEMENT, dated as of May 13, 2016, between Arch Capital Group Ltd. (the “Company”), a Bermuda company, and [Employee Name] (the “Employee”).

WHEREAS, the Employee has been granted the following award under the Company’s 2015 Long Term Incentive and Share Award Plan (the “Plan”);

NOW, THEREFORE, in consideration of the premises and mutual covenants contained herein, the parties hereto agree as follows.

1. Award of Shares. Pursuant to the provisions of the Plan, the terms of which are incorporated herein by reference, the Employee is hereby awarded ____ Restricted Shares (the “Award”), subject to the terms and conditions herein set forth. Capitalized terms used herein and not defined shall have the meanings set forth in the Plan. In the event of any conflict between this Agreement and the Plan, the Plan shall control.

2. Terms and Conditions. It is understood and agreed that the Award of Restricted Shares evidenced hereby is subject to the following terms and conditions:

(a) Vesting of Award. Subject to Section 2(b) below and the other terms and conditions of this Agreement, this Award shall become vested in three equal annual installments on the first, second and third anniversaries of the date hereof. Unless otherwise provided by the Company, all dividends and other amounts receivable in connection with any adjustments to the Shares under Section 4(c) of the Plan shall be subject to the vesting schedule in this Section 2(a).

(b) Termination of Service; Forfeiture of Unvested Shares.

(i) In the event the Employee ceases to be an employee of the Company prior to the date the Restricted Shares otherwise become vested due to his or her death or Permanent Disability (as defined in the Company’s Incentive Compensation Plan on the date hereof), the Restricted Shares shall become immediately vested in full upon such termination of employment.

(ii) In the event of termination of employment (other than by the Company for Cause, as such term is defined in the Company’s Incentive Compensation Plan on the date hereof, and other than as set forth in Section 2(b)(i) or (iii) hereof) after the attainment of Retirement Age (as defined in the Company’s Incentive Compensation Plan on the date hereof), the Restricted Shares shall continue to vest on the schedule set forth in Section 2(a) above so long as the Employee does not, without the written consent of the Company, engage in any activity in competition with any activity of the Company or any of its Subsidiaries other than (i) serving on the board of directors (or similar governing body) of another company or (ii) serving as a consultant for no more than 26 weeks per calendar year providing services that do not, in whole or in part, relate to the business or operations of an insurance or reinsurance company (“Competitive Activity”). In the event the Employee engages in a Competitive Activity, any unvested Restricted Shares shall be forfeited by the Employee and become the property of the Company.

(iii) In the event the Employee ceases to be an employee of the Company after a Change in Control (as defined below) due to termination (A) by the Company not for Cause or (B) by the Employee for Good Reason (as defined in the Employment Agreement, dated as of ____, between the Employee and the Company), in either case, on or before the second anniversary of the occurrence of the Change in Control, the Restricted Shares, to the extent not already vested, shall become immediately vested in full upon such termination of employment.

(iv) If the Employee ceases to be an Employee of the Company for any other reason prior to the date the Restricted Shares become vested, the Award shall be forfeited by the Employee and become the property of the Company.

(v) For purposes of this Agreement, service with any of the Company's Subsidiaries (as defined in the Plan) shall be considered to be service with the Company.

(vi) "Change in Control" shall mean:

- (A) any person (within the meaning of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), other than a Permitted Person, is or becomes the "beneficial owner" (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of Voting Securities representing 50% or more of the total voting power or value of all the then outstanding Voting Securities; or
- (B) the individuals who, as of the date hereof, constitute the Board of Directors of the Company (the "Board") together with those who become directors subsequent to such date and whose recommendation, election or nomination for election to the Board was approved by a vote of at least a majority of the directors then still in office who either were directors as of such date or whose recommendation, election or nomination for election was previously so approved, cease for any reason to constitute a majority of the members of the Board; or
- (C) the consummation of a merger, consolidation, recapitalization, liquidation, sale or disposition by the Company of all or substantially all of the Company's assets, or reorganization of the Company, other than any such transaction which would (x) result in more than 50% of the total voting power and value represented by the voting securities of the surviving entity outstanding immediately after such transaction being beneficially owned by the former shareholders of the Company and (y) not otherwise be deemed a Change in Control under subparagraphs (A) or (B) of this paragraph.

"Permitted Persons" means (A) the Company; (B) any Related Party; or (C) any group (as defined in Rule 13b-3 under the Exchange Act) comprised of any or all of the foregoing.

“Related Party” means (A) a majority-owned subsidiary of the Company; (B) a trustee or other fiduciary holding securities under an employee benefit plan of the Company or any majority-owned subsidiary of the Company; or (C) any entity, 50% or more of the voting power of which is owned directly or indirectly by the shareholders of the Company in substantially the same proportion as their ownership of Voting Securities immediately prior to the transaction.

“Voting Security” means any security of the Company which carries the right to vote generally in the election of directors.

(c) Certificates. Each certificate issued in respect of Restricted Shares awarded hereunder shall be issued in book entry format with the Company’s transfer agent and shall bear a legend disclosing the restrictions on transferability imposed on such Restricted Shares by this Agreement (the “Restrictive Legend”). Upon the vesting of Restricted Shares pursuant to Section 2 hereof and the satisfaction of any withholding tax liability pursuant to Section 5 hereof, such vested Shares, not bearing the Restrictive Legend, shall be delivered to the Employee.

(d) Rights of a Stockholder. Prior to the time a Restricted Share is fully vested hereunder, the Employee shall have no right to transfer, pledge, hypothecate or otherwise encumber such Restricted Share. During such period, the Employee shall have all other rights of a stockholder, including, but not limited to, the right to vote and to receive dividends (subject to Section 2(a) hereof) at the time paid on such Restricted Shares.

(e) No Right to Continued Employment. This Award shall not confer upon the Employee any right with respect to continuance of employment by the Company nor shall this Award interfere with the right of the Company to terminate the Employee’s employment at any time.

3. Transfer of Shares. The Shares delivered hereunder, or any interest therein, may be sold, assigned, pledged, hypothecated, encumbered, or transferred or disposed of in any other manner, in whole or in part, only in compliance with the terms, conditions and restrictions as set forth in the governing instruments of the Company, applicable United States federal and state securities laws or any other applicable laws or regulations and the terms and conditions hereof.

4. Expenses of Issuance of Shares. The issuance of stock certificates hereunder shall be without charge to the Employee. The Company shall pay any issuance, stamp or documentary taxes (other than transfer taxes) or charges imposed by any governmental body, agency or official (other than income taxes) or by reason of the issuance of Shares.

5. Withholding. No later than the date of vesting of (or the date of an election by the Employee under Section 83(b) of the Code with respect to) the Award granted hereunder, the Employee shall pay to the Company or make arrangements satisfactory to the Committee regarding payment of any federal, state or local taxes of any kind required by law to be withheld at such time with respect to such Award and the Company shall, to the extent permitted or required by law, have the right to deduct from any payment of any kind otherwise due to the Employee, federal, state and local taxes of any kind required by law to be withheld at such time.

6. References. References herein to rights and obligations of the Employee shall apply, where appropriate, to the Employee's legal representative or estate without regard to whether specific reference to such legal representative or estate is contained in a particular provision of this Agreement.

7. Notices. Any notice required or permitted to be given under this Agreement shall be in writing and shall be deemed to have been given when delivered personally or by courier, or sent by certified or registered mail, postage prepaid, return receipt requested, duly addressed to the party concerned at the address indicated below or to such changed address as such party may subsequently by similar process give notice of:

If to the Company:

Arch Capital Group Ltd.
Waterloo House
100 Pitts Bay Road
Pembroke HM 08 Bermuda
Attn.: Secretary

If to the Employee:

To the last address delivered to the Company by the
Employee in the manner set forth herein.

8. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of New York, without giving effect to principles of conflict of laws.

9. Entire Agreement. This Agreement and the Plan constitute the entire agreement among the parties relating to the subject matter hereof, and any previous agreement or understanding among the parties with respect thereto is superseded by this Agreement and the Plan.

10. Counterparts. This Agreement may be executed in two counterparts, each of which shall constitute one and the same instrument.

IN WITNESS WHEREOF, the undersigned have executed this Agreement as of the date first above written.
ARCH CAPITAL GROUP LTD.

By: /s/ Dawna Ferguson
Name: Dawna Ferguson
Title: Secretary

/s/ Employee Signature

ARCH CAPITAL GROUP LTD.
Non-Qualified Stock Option Agreement

FOR GOOD AND VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, Arch Capital Group Ltd. (the “Company”), a Bermuda company, hereby grants to [Employee Name], an employee of the Company on the date hereof (the “Option Holder”), the option to purchase common shares, \$0.0033 par value per share, of the Company (“Shares”), upon the following terms:

WHEREAS, the Option Holder has been granted the following award under the Company’s 2015 Long Term Incentive and Share Award Plan (the “Plan”);

(a) Grant. The Option Holder is hereby granted an option (the “Option”) to purchase _____ Shares (the “Option Shares”) pursuant to the Plan, the terms of which are incorporated herein by reference. The Option is granted as of May 13, 2016, (the “Date of Grant”) and such grant is subject to the terms and conditions herein and the terms and conditions of the applicable provisions of the Plan. This Option shall not be treated as an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended. In the event of any conflict between this Agreement and the Plan, the Plan shall control.

(b) Status of Option Shares. Upon issue, the Option Shares shall rank equally in all respects with the other Shares.

(c) Option Price. The purchase price for the Option Shares shall be, except as herein provided, \$71.70 per Option Share, hereinafter sometimes referred to as the “Option Price,” payable immediately in full upon the exercise of the Option.

(d) Term of Option. The Option may be exercised only during the period (the “Option Period”) set forth in paragraph (f) below and shall remain exercisable until the tenth anniversary of the Date of Grant. Thereafter, the Option Holder shall cease to have any rights in respect thereof. The right to exercise the Option shall be subject to sooner termination as provided in paragraph (j) below.

(e) No Rights of Shareholder. The Option Holder shall not, by virtue hereof, be entitled to any rights of a shareholder in the Company, either at law or in equity.

(f) Exercisability. Except as otherwise set forth in paragraph (j) below, the Option shall become exercisable in three equal annual installments on the first, second and third anniversaries of the Date of Grant, in each case subject to paragraph (j) below. Subject to paragraph (j) below, the Option may be exercised at any time or from time to time during the Option Period in regard to all or any portion of the Option which is then exercisable, as may be adjusted pursuant to paragraph (g) below

(g) Anti-dilution Adjustment. For the avoidance of doubt, the terms of Section 4(c) of the Plan, relating to anti-dilution adjustments, will apply to the Option.

(h) Nontransferability. The Option, or any interest therein, may not be assigned or otherwise transferred, disposed of or encumbered by the Option Holder, other than by will or by the laws of descent and distribution. During the lifetime of the Option Holder, the Option shall be exercisable only by

the Option Holder or by his or her guardian or legal representative. Notwithstanding the foregoing, the Option may be transferred by the Option Holder to members of his or her “immediate family” or to a trust or other entity established for the exclusive benefit of solely one or more members of the Option Holder’s “immediate family.” Any Option held by the transferee will continue to be subject to the same terms and conditions that were applicable to the Option immediately prior to the transfer, except that the Option will be transferable by the transferee only by will or the laws of descent and distribution. For purposes hereof, “immediate family” means the Option Holder’s children, stepchildren, grandchildren, parents, stepparents, grandparents, spouse, siblings (including half brother and sisters), in laws, and relationships arising because of legal adoption.

(i) Exercise of Option . In order to exercise the Option, the Option Holder shall, in the manner directed by the Company, specify the whole number of Option Shares in respect of which the Option is being exercised, accompanied by payment, in a manner acceptable to the Company (which shall include a broker assisted exercise arrangement), of the Option Price for the Option Shares for which the Option is being exercised. Payment to the Company in cash or Shares already owned by the Option Holder (provided that the Option Holder has owned such Shares for a minimum period of six months or has purchased such Shares on the open market) and having a total Fair Market Value equal to the exercise price, or in a combination of cash and such Shares, shall be deemed acceptable for purposes hereof. In addition, in lieu of making payment of the exercise price of the Option and receiving the number of Shares for which the Option is being exercised as described above, the Option Holder may instead elect to exercise the Option by making no cash exercise price payment but having the Company issue to the Option Holder the number of Shares (rounded down to the nearest whole number) equal to the net result obtained by (A) subtracting the exercise price per Share from the Fair Market Value per Share on the date of exercise, (B) multiplying the difference by the number of Shares for which the Option is being exercised, and (C) dividing the product by the Fair Market Value per Share on the date of exercise. For the avoidance of doubt, if the calculation in the immediately preceding sentence results in a negative number, no Shares will be issued upon exercise. Option Shares will be issued accordingly by the Company, and a share certificate dispatched or electronic delivery of such Option Shares to the Option Holder within 30 days.

The Company shall not be required to issue fractional Shares upon the exercise of the Option. If any fractional interest in a Share would be deliverable upon the exercise of the Option in whole or in part but for the provisions of this paragraph, the Company, in lieu of delivering any such fractional share therefor, shall pay a cash adjustment therefor in an amount equal to their Fair Market Value multiplied by the fraction of the fractional share which would otherwise have been issued hereunder. Anything to the contrary herein notwithstanding, the Company shall not be obligated to issue any Option Shares hereunder if the issuance of such Option Shares would violate the provision of any applicable law, in which event the Company shall, as soon as practicable, take whatever action it reasonably can so that such Option Shares may be issued without resulting in such violations of law.

(j) Termination of Service.

1. In the event the Option Holder ceases to be an employee of the Company due to the Option Holder's death or Permanent Disability (as defined in the Company's Incentive Compensation Plan on the date hereof), the Option, to the extent not already exercisable in full, shall become immediately exercisable in full and shall continue to be exercisable by the Option Holder (or the Option Holder's Beneficiary or estate in the event of the Option Holder's death) for a period of three years following such termination of employment (but not beyond the Option Period).

2. In the event of termination of employment (other than by the Company for Cause, as such term is defined in the Company's Incentive Compensation Plan on the date hereof and other than as set forth in paragraphs (j)(1) or (j)(3) hereof) after the attainment of Retirement Age (as defined in the Company's Incentive Compensation Plan on the date hereof), the Option shall continue to become exercisable on the schedule set forth in paragraph (f) above so long as the Option Holder does not, without the written consent of the Company, engage in any activity in competition with any activity of the Company or any of its Subsidiaries other than (i) serving on the board of directors (or similar governing body) of another company or (ii) serving as a consultant for no more than 26 weeks per calendar year providing services that do not, in whole or in part, relate to the business or operations of an insurance or reinsurance company ("Competitive Activity") and shall continue to be exercisable by the Option Holder (or the Option Holder's Beneficiary or estate in the event of the Option Holder's death) for the remainder of the Option Period. In the event the Option Holder engages in a Competitive Activity, (A) the Option, to the extent then exercisable, may be exercised for 30 days following the date on which the Option Holder engages in such Competitive Activity (but not beyond the Option Period) and (B) the Option, to the extent then not exercisable, shall be immediately forfeited.

3. In the event the Option Holder ceases to be an employee of the Company after a Change in Control (as defined below) due to termination (A) by the Company not for Cause or (B) by the Option Holder for Good Reason (as defined in the Employment Agreement, as of __, between the Option Holder and the Company), in either case, on or before the second anniversary of the occurrence of the Change in Control, the Option, to the extent not already exercisable in full, shall become immediately exercisable in full and shall continue to be exercisable by the Option Holder for a period of 90 days following such termination of employment (but not beyond the Option Period).

4. In the event that the Option Holder ceases to be an employee of the Company for any other reason, except due to a termination of the Option Holder's employment by the Company for Cause, (A) the Option, to the extent then exercisable, may be exercised for 90 days following termination of employment (but not beyond the Option Period) and (B) the Option, to the extent then not exercisable, shall be immediately forfeited.

5. In the event of a termination of the Option Holder's employment for Cause, the Option shall immediately cease to be exercisable and shall be immediately forfeited.

6. For purposes of this Option, service with any of the Company's Subsidiaries (as defined in the Plan) shall be considered to be service with the Company.

7. “Change in Control” shall mean:

- (A) any person (within the meaning of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), other than a Permitted Person, is or becomes the “beneficial owner” (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of Voting Securities representing 50% or more of the total voting power or value of all the then outstanding Voting Securities; or
- (B) the individuals who, as of the date hereof, constitute the Board of Directors of the Company (the “Board”) together with those who become directors subsequent to such date and whose recommendation, election or nomination for election to the Board was approved by a vote of at least a majority of the directors then still in office who either were directors as of such date or whose recommendation, election or nomination for election was previously so approved, cease for any reason to constitute a majority of the members of the Board; or
- (C) the consummation of a merger, consolidation, recapitalization, liquidation, sale or disposition by the Company of all or substantially all of the Company's assets, or reorganization of the Company, other than any such transaction which would (x) result in more than 50% of the total voting power and value represented by the voting securities of the surviving entity outstanding immediately after such transaction being beneficially owned by the former shareholders of the Company and (y) not otherwise be deemed a Change in Control under subparagraphs (A) or (B) of this paragraph.

“Permitted Persons” means (A) the Company; (B) any Related Party; or (C) any group (as defined in Rule 13b-3 under the Exchange Act) comprised of any or all of the foregoing.

“Related Party” means (A) a majority-owned subsidiary of the Company; (B) a trustee or other fiduciary holding securities under an employee benefit plan of the Company or any majority-owned subsidiary of the Company; or (C) any entity, 50% or more of the voting power of which is owned directly or indirectly by the shareholders of the Company in substantially the same proportion as their ownership of Voting Securities immediately prior to the transaction.

“Voting Security” means any security of the Company which carries the right to vote generally in the election of directors.

(k) Obligations as to Capital. The Company agrees that it will at all times maintain authorized and unissued share capital sufficient to fulfill all of its obligations under the Option.

(l) Transfer of Shares. The Option, the Option Shares, or any interest in either, may be sold, assigned, pledged, hypothecated, encumbered, or transferred or disposed of in any other manner, in whole or in part, only in compliance with the terms, conditions and restrictions as set

forth in the governing instruments of the Company, applicable United States federal and state securities laws and the terms and conditions hereof.

(m) Expenses of Issuance of Option Shares. The issuance of stock certificates or the electronic delivery of Option Shares upon the exercise of the Option in whole or in part, shall be without charge to the Option Holder. The Company shall pay any issuance, stamp or documentary taxes (other than transfer taxes) or charges imposed by any governmental body, agency or official (other than income taxes) by reason of the exercise of the Option in whole or in part or the resulting issuance of the Option Shares.

(n) Withholding. No later than the date of exercise of the Option granted hereunder, the Option Holder shall pay to the Company or make arrangements satisfactory to the Committee regarding payment of any federal, state or local taxes of any kind required by law to be withheld upon the exercise of such Option and the Company shall, to the extent permitted or required by law, have the right to deduct from any payment of any kind otherwise due to the Option Holder, federal, state and local taxes of any kind required by law to be withheld upon the exercise of such Option.

(o) References. References herein to rights and obligations of the Option Holder shall apply, where appropriate, to the Option Holder's legal representative or estate without regard to whether specific reference to such legal representative or estate is contained in a particular provision of this Option.

(p) Notices. Any notice required or permitted to be given under this agreement shall be in writing and shall be deemed to have been given when delivered personally or by courier, or sent by certified or registered mail, postage prepaid, return receipt requested, duly addressed to the party concerned at the address indicated below or to such changed address as such party may subsequently by similar process give notice of:

If to the Company:

Arch Capital Group Ltd.:
Waterloo House, Ground Floor
100 Pitts Bay Road
Pembroke HM 08 Bermuda
Attn: Secretary

If to the Option Holder:

The last address delivered to the Company by the Option Holder in the manner set forth herein.

(q) Governing Law. This agreement shall be governed by and construed in accordance with the laws of New York, without giving effect to principles of conflict of laws thereof.

(r) Entire Agreement. This agreement and the Plan constitute the entire agreement among the parties relating to the subject matter hereof, and any previous agreement or understanding among the parties with respect thereto is superseded by this agreement and the Plan.

(s) Counterparts. This agreement may be executed in two counterparts, each of which shall constitute one and the same instrument.

IN WITNESS WHEREOF, the undersigned have executed this agreement as of the Date of Grant.

ARCH CAPITAL GROUP LTD.

By: /s/ Dawna Ferguson

Name: Dawna Ferguson
Title: Secretary

/s/ Employee Signature

ARCH CAPITAL GROUP LTD.

Restricted Share Unit Agreement

THIS AGREEMENT, dated as of May 13, 2016, between Arch Capital Group Ltd. (the “Company”), a Bermuda company, and David McElroy (the “Employee”).

WHEREAS, the Employee has been granted the following award under the Company’s 2015 Long Term Incentive and Share Award Plan (the “Plan”);

NOW, THEREFORE, in consideration of the premises and mutual covenants contained herein, the parties hereto agree as follows.

1. Award of Share Units. Pursuant to the provisions of the Plan, the terms of which are incorporated herein by reference, the Employee is hereby awarded 8,130 Restricted Share Units (the “Award”), subject to the terms and conditions herein set forth. Capitalized terms used herein and not defined shall have the meanings set forth in the Plan. In the event of any conflict between this Agreement and the Plan, the Plan shall control.

2. Terms and Conditions. It is understood and agreed that the Award of Restricted Share Units evidenced hereby is subject to the following terms and conditions:

(a) Vesting of Award. Subject to Section 2(b) below and the other terms and conditions of this Agreement, this Award shall become vested in three equal annual installments on the first, second and third anniversaries of the date hereof. Unless otherwise provided by the Company, all amounts receivable in connection with any adjustments to the Shares under Section 4(c) of the Plan or Section 2(e) below shall be subject to the vesting schedule in this Section 2(a).

(b) Termination of Service; Forfeiture of Unvested Share Units.

(i) In the event the Employee ceases to be an employee of the Company prior to the date the Restricted Share Units otherwise become vested due to his or her death or Permanent Disability (as defined in the Company’s Incentive Compensation Plan on the date hereof), the Restricted Share Units shall become immediately vested in full upon such termination of employment.

(ii) In the event of termination of employment (other than by the Company for Cause, as such term is defined in the Company’s Incentive Compensation Plan on the date hereof, and other than as set forth in Section 2(b)(i) or (iii) hereof) after the attainment of Retirement Age (as defined in the Company’s Incentive Compensation Plan on the date hereof), the Restricted Share Units shall continue to vest on the schedule set forth in paragraph 2(a) above so long as the Employee does not, without the written consent of the Company, engage in any activity in competition with any activity of the Company or any of its Subsidiaries other than (i) serving on the board of directors (or similar governing body) of another company or (ii) serving as a consultant for no more than 26 weeks per calendar year providing services that do not, in whole or in part, relate to the business or operations of an insurance or reinsurance company (“Competitive Activity”). In the event the Employee engages in a Competitive Activity, any unvested Restricted Share Units shall be forfeited by the Employee and become the property of the Company.

(iii) In the event the Employee ceases to be an employee of the Company after a Change in Control (as defined below) due to termination (A) by the Company not for Cause or (B) by the Employee for Good Reason (as defined in the Employment Agreement dated as of June 5, 2009, and as amended on July 25, 2012, between the Employee and Arch Insurance Group Inc.), in either case, on or before the second anniversary of the occurrence of the Change in Control, the Restricted Share Units, to the extent not already vested, shall become immediately vested in full upon such termination of employment.

(iv) If the Employee ceases to be an Employee of the Company for any other reason prior to the date the Restricted Share Units become vested, the unvested Restricted Share Units shall be forfeited by the Employee and become the property of the Company.

(v) For purposes of this Agreement, service with any of the Company's Subsidiaries (as defined in the Plan) shall be considered to be service with the Company.

(vi) "Change in Control" shall mean:

- (A) any person (within the meaning of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), other than a Permitted Person, is or becomes the "beneficial owner" (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of Voting Securities representing 50% or more of the total voting power or value of all the then outstanding Voting Securities; or
- (B) the individuals who, as of the date hereof, constitute the Board of Directors of the Company (the "Board") together with those who become directors subsequent to such date and whose recommendation, election or nomination for election to the Board was approved by a vote of at least a majority of the directors then still in office who either were directors as of such date or whose recommendation, election or nomination for election was previously so approved, cease for any reason to constitute a majority of the members of the Board; or
- (C) the consummation of a merger, consolidation, recapitalization, liquidation, sale or disposition by the Company of all or substantially all of the Company's assets, or reorganization of the Company, other than any such transaction which would (x) result in more than 50% of the total voting power and value represented by the voting securities of the surviving entity outstanding immediately after such transaction being beneficially owned by the former shareholders of the Company and (y) not otherwise be deemed a Change in Control under subparagraphs (A) or (B) of this paragraph.

"Permitted Persons" means (A) the Company; (B) any Related Party; or (C) any group (as defined in Rule 13b-3 under the Exchange Act) comprised of any or all of the foregoing.

“Related Party” means (A) a majority-owned subsidiary of the Company; (B) a trustee or other fiduciary holding securities under an employee benefit plan of the Company or any majority-owned subsidiary of the Company; or (C) any entity, 50% or more of the voting power of which is owned directly or indirectly by the shareholders of the Company in substantially the same proportion as their ownership of Voting Securities immediately prior to the transaction.

“Voting Security” means any security of the Company which carries the right to vote generally in the election of directors.

(c) Distribution of Shares. At the time the Employee ceases to be an employee of the Company for any reason prior to attaining Retirement Age, the Company shall distribute to the Employee (or his or her heirs in the event of the Employee’s death) a number of Shares equal to the number of vested Restricted Share Units then held by the Employee. In the event the Employee ceases to be an employee of the Company after attaining Retirement Age, a number of Shares equal to the number of vested Restricted Share Units held by the Employee will be distributed by the Company to the Employee (or his or her heirs in the event of the Employee’s death) at the later of (i) the time the Employee ceases to be an employee of the Company, and (ii) the date the Restricted Share Units are scheduled to vest pursuant to the schedule set forth in Section 2(a) above (without regard to any acceleration of such vesting), so long as the Restricted Share Units are not forfeited before such time as provided in Section 2(b).

(d) Rights and Restrictions. The Restricted Share Units shall not be transferable, other than pursuant to will or the laws of descent and distribution. Prior to vesting of the Restricted Share Units and delivery of the Shares to the Employee following his termination of employment, the Employee shall not have any rights or privileges of a shareholder as to the Shares subject to the Award. Specifically, the Employee shall not have the right to receive dividends or the right to vote such Shares prior to vesting of the Award and delivery of the Shares.

(e) Anti-dilution Adjustment. For the avoidance of doubt, the terms of Section 4(c) of the Plan, relating to anti-dilution adjustments, will apply to the Restricted Share Units.

(f) Dividend Equivalents. As of each date on which a cash dividend is paid on Shares, there shall be granted to the Employee that number of additional Restricted Share Units (including fractional units) determined by (i) multiplying the amount of such dividend per Share by the number of Restricted Share Units held by the Employee, and (ii) dividing the total so determined by the Fair Market Value of a Share on the date of payment of such cash dividend. The Restricted Share Units granted pursuant to this Section 2(f) will have the same terms and conditions (including vesting dates) as the Restricted Share Units with respect to which they are granted.

(g) No Right to Continued Employment. This Award shall not confer upon the Employee any right with respect to continuance of employment by the Company nor shall this Award interfere with the right of the Company to terminate the Employee’s employment at any time.

3. Transfer of Shares. The Shares delivered hereunder, or any interest therein, may be sold, assigned, pledged, hypothecated, encumbered, or transferred or disposed of in any other manner,

in whole or in part, only in compliance with the terms, conditions and restrictions as set forth in the governing instruments of the Company, applicable United States federal and state securities laws or any other applicable laws or regulations and the terms and conditions hereof.

4. Expenses of Issuance of Shares. The issuance of stock certificates hereunder shall be without charge to the Employee. The Company shall pay any issuance, stamp or documentary taxes (other than transfer taxes) or charges imposed by any governmental body, agency or official (other than income taxes) or by reason of the issuance of Shares.

5. Withholding. The Employee shall pay to the Company or make arrangements satisfactory to the Committee regarding payment of any federal, state or local taxes of any kind required by law to be withheld with respect to the Award and the Company shall, to the extent permitted or required by law, have the right to deduct from any payment of any kind otherwise due to the Employee, federal, state and local taxes of any kind required by law to be withheld.

6. References. References herein to rights and obligations of the Employee shall apply, where appropriate, to the Employee's legal representative or estate without regard to whether specific reference to such legal representative or estate is contained in a particular provision of this Agreement.

7. Notices. Any notice required or permitted to be given under this Agreement shall be in writing and shall be deemed to have been given when delivered personally or by courier, or sent by certified or registered mail, postage prepaid, return receipt requested, duly addressed to the party concerned at the address indicated below or to such changed address as such party may subsequently by similar process give notice of:

If to the Company:

Arch Capital Group Ltd.
Waterloo House
100 Pitts Bay Road
Pembroke HM 08 Bermuda

Attn.: Secretary

If to the Employee:

To the last address delivered to the Company by the
Employee in the manner set forth herein.

8. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of New York, without giving effect to principles of conflict of laws.

9. Entire Agreement. This Agreement and the Plan constitute the entire agreement among the parties relating to the subject matter hereof, and any previous agreement or understanding among the parties with respect thereto is superseded by this Agreement and the Plan.

10. Counterparts. This Agreement may be executed in two counterparts, each of which shall constitute one and the same instrument.

11. Section 409A. It is intended that this Agreement and the Award will comply with Section 409A of the Code (and any regulations and guidelines issued thereunder), to the extent the Agreement and Award are subject thereto, and the Agreement shall be interpreted on a basis consistent with such intent. If an amendment of the Agreement is necessary in order for it to comply with Section 409A, the parties hereto will negotiate in good faith to amend the Agreement in a manner that preserves the original intent of the parties to the extent reasonably possible. Notwithstanding any provision of this Agreement to the contrary, for purposes of any provision of this Agreement providing for the distribution of any Shares upon or following a termination of employment that is considered deferred compensation under Section 409A, references to the Employee's "termination of employment" (and corollary terms) with the Company shall be construed to refer to the Employee's "separation from service" (within the meaning of Treas. Reg. Section 1.409A-1(h)) with the Company. Notwithstanding any provision to the contrary in this Agreement, if the Employee is deemed on the date of his or her "separation from service" (within the meaning of Treas. Reg. Section 1.409A-1(h)) to be a "specified employee" (within the meaning of Treas. Reg. Section 1.409A-1(i)), then with regard to any payment that is considered deferred compensation under Section 409A payable on account of a "separation from service" that is required to be delayed pursuant to Section 409A(a)(2)(B) of the Code (after taking into account any applicable exceptions to such requirement), such payment shall not be made prior to the earlier of (i) the expiration of the six (6)-month period measured from the date of the Employee's "separation from service," or (ii) the date of the Employee's death (the "Delay Period"). Upon the expiration of the Delay Period, all payments delayed pursuant hereto (whether they would have otherwise been payable in a single sum or in installments in the absence of such delay) shall be paid to the Employee in a lump sum and any remaining payments due under this Agreement shall be paid in accordance with the normal payment dates specified for them herein. Whenever payments under this Agreement are to be made in installments, each such installment shall be deemed to be a separate payment for purposes of Section 409A. No action or failure to act, pursuant to this Section 11 shall subject the Company to any claim, liability, or expense, and the Company shall not have any obligation to indemnify or otherwise protect the Employee from the obligation to pay any taxes, interest or penalties pursuant to Section 409A of the Code.

IN WITNESS WHEREOF, the undersigned have executed this Agreement as of the date first above written.

ARCH CAPITAL GROUP LTD.

By: /s/ Dawna Ferguson
Name: Dawna Ferguson
Title: Secretary

/s/ David McElroy
David McElroy

ARCH CAPITAL GROUP LTD.
Share Appreciation Right Agreement

AGREEMENT, made and entered into this 27th day of February, 2015, by and between Arch Capital Group Ltd. (the “Company”), a Bermuda company, and Constantine Iordanou (the “SAR Holder”).

WHEREAS, the SAR Holder has been granted the following award under the Company’s 2012 Long Term Incentive and Share Award Plan (the “Plan”);

NOW, THEREFORE, in consideration of the premises and mutual covenants contained herein, and for other good and valuable consideration, the Company and the SAR Holder agree as follows:

(a) Grant. Pursuant to the provisions of the Plan, the terms of which are incorporated herein by reference, the Company hereby grants to the SAR Holder a Share Appreciation Right (the “SAR”) with respect to 149,556 Shares. The SAR represents a right to be paid, upon exercise of the SAR, an amount measured by (x) the difference between the Fair Market Value per Share on the date of exercise and the exercise price per Share of the SAR, multiplied by (y) the number of Shares with respect to which the SAR is exercised, with such amount to be paid in the form of Shares valued at their Fair Market Value on the date of exercise. The SAR is granted as of February 27, 2015 (the “Date of Grant”), and such grant is subject to the terms and conditions herein and the terms and conditions of the Plan. In the event there is any conflict between the terms of the Plan and this Agreement, the terms of the Plan shall control. Capitalized terms used herein but not defined shall have the meanings given to them in the Plan.

(b) Exercise Price. The exercise price of the SAR shall be equal to \$59.16 per Share.

(c) Status of Shares. Upon issue, the shares received upon exercise of the SAR shall rank equally in all respects with the other Shares.

(d) Term of SAR. The SAR may be exercised only during the period (the “SAR Period”) set forth in paragraph (f) below and shall remain exercisable until the tenth anniversary of the Date of Grant. Thereafter, the SAR Holder shall cease to have any rights in respect thereof. The right to exercise the SAR shall be subject to sooner termination as provided in paragraph (j) below.

(e) No Rights of Shareholder. The SAR Holder shall not, by virtue hereof, be entitled to any rights of a shareholder in the Company, either at law or in equity.

(f) Exercisability. The SAR shall be fully exercisable on the Date of Grant. The SAR may be exercised at any time or from time to time during the SAR Period in regard to all of the SAR, as may be adjusted pursuant to paragraph (g) below.

(g) Adjustments for Recapitalization and Dividends. In the event that, prior to the expiration of the SAR, any dividend in Shares, recapitalization, Share split, reverse split, reorganization,

merger, consolidation, spin-off, combination, repurchase, or share exchange, or other such change affects the Shares such that they are increased or decreased or changed into or exchanged for a different number or kind of shares, other securities of the Company or of another corporation or other consideration, then in order to maintain the proportionate interest of the SAR Holder and preserve the value of the SAR, (i) there shall automatically be substituted for each Share subject to the unexercised SAR the number and kind of shares, other securities or other consideration (including cash) into which each outstanding Share shall be changed or for which each such Share shall be exchanged, and (ii) the exercise price shall be increased or decreased proportionately so that the aggregate purchase price for the Shares subject to the unexercised SAR shall remain the same as immediately prior to such event.

(h) Nontransferability. The SAR, or any interest therein, may not be assigned or otherwise transferred, disposed of or encumbered by the SAR Holder, other than by will or by the laws of descent and distribution. During the lifetime of the SAR Holder, the SAR shall be exercisable only by the SAR Holder or by his or her guardian or legal representative. Notwithstanding the foregoing, the SAR may be transferred by the SAR Holder to members of his or her “immediate family” or to a trust or other entity established for the exclusive benefit of solely one or more members of the SAR Holder’s “immediate family.” Any SAR held by the transferee will continue to be subject to the same terms and conditions that were applicable to the SAR immediately prior to the transfer, except that the SAR will be transferable by the transferee only by will or the laws of descent and distribution. For purposes hereof, “immediate family” means the SAR Holder’s children, stepchildren, grandchildren, parents, stepparents, grandparents, spouse, siblings (including half brother and sisters), in laws, and relationships arising because of legal adoption.

(i) Exercise of SAR. In order to exercise the SAR, the SAR Holder shall submit to the Company an instrument specifying the whole number of Shares in respect of which the SAR is being exercised. Shares will be issued accordingly by the Company within 30 days. The payment upon a SAR exercise shall be solely the number of whole Shares calculated in paragraph (a) above. Fractional Shares shall be rounded down to the nearest whole Share with no cash consideration being paid upon exercise. Anything to the contrary herein notwithstanding, the Company shall not be obligated to issue any Shares hereunder if the issuance of such Shares would violate the provision of any applicable law, in which event the Company shall, as soon as practicable, take whatever action it reasonably can so that such Shares may be issued without resulting in such violations of law.

(j) Termination of Service. In the event of a termination of the SAR Holder's employment for Cause, as such term is defined in the Company's Incentive Compensation Plan on the date hereof, the SAR shall immediately cease to be exercisable and shall be immediately forfeited.

(k) Obligations as to Capital. The Company agrees that it will at all times maintain authorized and unissued share capital sufficient to fulfill all of its obligations under the SAR.

(l) Transfer of Shares. The SAR, the Shares issued hereunder, or any interest in either, may be sold, assigned, pledged, hypothecated, encumbered, or transferred or disposed of in any other manner, in whole or in part, only in compliance with the terms, conditions and restrictions as set forth in the governing instruments of the Company, applicable United States federal and state securities laws and the terms and conditions hereof.

(m) Expenses of Issuance of Shares. The issuance of stock certificates upon the exercise of the SAR in whole or in part, shall be without charge to the SAR Holder. The Company shall pay any issuance, stamp or documentary taxes (other than transfer taxes) or charges imposed by any governmental body, agency or official (other than income taxes) by reason of the exercise of the SAR in whole or in part or the resulting issuance of Shares hereunder.

(n) Withholding. No later than the date of exercise of the SAR granted hereunder, the SAR Holder shall pay to the Company or make arrangements satisfactory to the Committee regarding payment of any federal, state or local taxes of any kind required by law to be withheld upon the exercise of such SAR and the Company shall, to the extent permitted or required by law, have the right to deduct from any payment of any kind otherwise due to the SAR Holder, federal, state and local taxes of any kind required by law to be withheld upon the exercise of such SAR.

(o) References. References herein to rights and obligations of the SAR Holder shall apply, where appropriate, to the SAR Holder's legal representative or estate without regard to whether specific reference to such legal representative or estate is contained in a particular provision of this SAR.

(p) Notices. Any notice required or permitted to be given under this agreement shall be in writing and shall be deemed to have been given when delivered personally or by courier, or sent by certified or registered mail, postage prepaid, return receipt requested, duly addressed to the party concerned at the address indicated below or to such changed address as such party may subsequently by similar process give notice of:

If to the Company:

Arch Capital Group Ltd.:
Waterloo House
100 Pitts Bay Road
Pembroke HM 08 Bermuda
Attn: Secretary

If to the SAR Holder:

The last address delivered to the Company by the SAR Holder in the manner set forth herein.

(q) Governing Law. This agreement shall be governed by and construed in accordance with the laws of New York, without giving effect to principles of conflict of laws thereof.

(r) Entire Agreement. This agreement and the Plan constitute the entire agreement among the parties relating to the subject matter hereof, and any previous agreement or understanding among the parties with respect thereto is superseded by this agreement and the Plan.

(s) Counterparts. This agreement may be executed in two counterparts, each of which shall constitute one and the same instrument.

IN WITNESS WHEREOF, the undersigned have executed this agreement as of the Date of Grant.

ARCH CAPITAL GROUP LTD.

By: /s/ Dawna Ferguson

Name: Dawna Ferguson
Title: Secretary

/s/ Constantine Iordanou
Constantine Iordanou

ARCH CAPITAL GROUP LTD.
Non-Qualified Stock Option Agreement

FOR GOOD AND VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, Arch Capital Group Ltd. (the “Company”), a Bermuda company, hereby grants to Constantine Iordanou, an employee of the Company on the date hereof (the “Option Holder”), the option to purchase common shares, \$0.0033 par value per share, of the Company (“Shares”), upon the following terms:

WHEREAS, the Option Holder has been granted the following award under the Company’s 2012 Long Term Incentive and Share Award Plan (the “Plan”);

(a) Grant. The Option Holder is hereby granted an option (the “Option”) to purchase 244,750 Shares (the “Option Shares”) pursuant to the Plan, the terms of which are incorporated herein by reference. The Option is granted as of February 26, 2016, (the “Date of Grant”) and such grant is subject to the terms and conditions herein and the terms and conditions of the applicable provisions of the Plan. This Option shall not be treated as an incentive stock option as defined in Section 422 of the Internal Revenue Code of 1986, as amended. In the event of any conflict between this Agreement and the Plan, the Plan shall control.

(b) Status of Option Shares. Upon issue, the Option Shares shall rank equally in all respects with the other Shares.

(c) Option Price. The purchase price for the Option Shares shall be, except as herein provided, \$68.20 per Option Share, hereinafter sometimes referred to as the “Option Price,” payable immediately in full upon the exercise of the Option.

(d) Term of Option. The Option may be exercised only during the period (the “Option Period”) set forth in paragraph (f) below and shall remain exercisable until the tenth anniversary of the Date of Grant. Thereafter, the Option Holder shall cease to have any rights in respect thereof. The right to exercise the Option shall be subject to sooner termination as provided in paragraph (j) below.

(e) No Rights of Shareholder. The Option Holder shall not, by virtue hereof, be entitled to any rights of a shareholder in the Company, either at law or in equity.

(f) Exercisability. Except as otherwise set forth in paragraph (j) below, the Option shall be fully exercisable on the Date of Grant. The Option may be exercised at any time or from time to time during the Option Period in regard to all or any portion of the Option, as may be adjusted pursuant to paragraph (g) below.

(g) Anti-dilution Adjustment. For the avoidance of doubt, the terms of Section 4(c) of the Plan, relating to anti-dilution adjustments, will apply to the Option.

(h) Nontransferability. The Option, or any interest therein, may not be assigned or otherwise transferred, disposed of or encumbered by the Option Holder, other than by will or by

the laws of descent and distribution. During the lifetime of the Option Holder, the Option shall be exercisable only by the Option Holder or by his or her guardian or legal representative. Notwithstanding the foregoing, the Option may be transferred by the Option Holder to members of his or her “immediate family” or to a trust or other entity established for the exclusive benefit of solely one or more members of the Option Holder’s “immediate family.” Any Option held by the transferee will continue to be subject to the same terms and conditions that were applicable to the Option immediately prior to the transfer, except that the Option will be transferable by the transferee only by will or the laws of descent and distribution. For purposes hereof, “immediate family” means the Option Holder’s children, stepchildren, grandchildren, parents, stepparents, grandparents, spouse, siblings (including half brother and sisters), in laws, and relationships arising because of legal adoption.

(i) Exercise of Option. In order to exercise the Option, the Option Holder shall, in the manner directed by the Company, specify the whole number of Option Shares in respect of which the Option is being exercised, accompanied by payment, in a manner acceptable to the Company (which shall include a broker assisted exercise arrangement), of the Option Price for the Option Shares for which the Option is being exercised. Payment to the Company in cash or Shares already owned by the Option Holder (provided that the Option Holder has owned such Shares for a minimum period of six months or has purchased such Shares on the open market) and having a total Fair Market Value equal to the exercise price, or in a combination of cash and such Shares, shall be deemed acceptable for purposes hereof. In addition, in lieu of making payment of the exercise price of the Option and receiving the number of Shares for which the Option is being exercised as described above, the Option Holder may instead elect to exercise the Option by making no cash exercise price payment but having the Company issue to the Option Holder the number of Shares (rounded down to the nearest whole number) equal to the net result obtained by (A) subtracting the exercise price per Share from the Fair Market Value per Share on the date of exercise, (B) multiplying the difference by the number of Shares for which the Option is being exercised, and (C) dividing the product by the Fair Market Value per Share on the date of exercise. For the avoidance of doubt, if the calculation in the immediately preceding sentence results in a negative number, no Shares will be issued upon exercise. Option Shares will be issued accordingly by the Company, and a share certificate dispatched or electronic delivery of such Option Shares to the Option Holder within 30 days.

The Company shall not be required to issue fractional Shares upon the exercise of the Option. If any fractional interest in a Share would be deliverable upon the exercise of the Option in whole or in part but for the provisions of this paragraph, the Company, in lieu of delivering any such fractional share therefor, shall pay a cash adjustment therefor in an amount equal to their Fair Market Value multiplied by the fraction of the fractional share which would otherwise have been issued hereunder. Anything to the contrary herein notwithstanding, the Company shall not be obligated to issue any Option Shares hereunder if the issuance of such Option Shares would violate the provision of any applicable law, in which event the Company shall, as soon as practicable, take whatever action it reasonably can so that such Option Shares may be issued without resulting in such violations of law.

(j) Termination of Service. In the event of a termination of the Option Holder's employment for Cause, as such term is defined in the Company's Incentive Compensation Plan on the date hereof, the Option shall immediately cease to be exercisable and shall be immediately forfeited.

(k) Obligations as to Capital. The Company agrees that it will at all times maintain authorized and unissued share capital sufficient to fulfill all of its obligations under the Option.

(l) Transfer of Shares. The Option, the Option Shares, or any interest in either, may be sold, assigned, pledged, hypothecated, encumbered, or transferred or disposed of in any other manner, in whole or in part, only in compliance with the terms, conditions and restrictions as set forth in the governing instruments of the Company, applicable United States federal and state securities laws and the terms and conditions hereof.

(m) Expenses of Issuance of Option Shares. The issuance of stock certificates or the electronic delivery of Option Shares upon the exercise of the Option in whole or in part, shall be without charge to the Option Holder. The Company shall pay any issuance, stamp or documentary taxes (other than transfer taxes) or charges imposed by any governmental body, agency or official (other than income taxes) by reason of the exercise of the Option in whole or in part or the resulting issuance of the Option Shares hereunder.

(n) Withholding. No later than the date of exercise of the Option granted hereunder, the Option Holder shall pay to the Company or make arrangements satisfactory to the Committee regarding payment of any federal, state or local taxes of any kind required by law to be withheld upon the exercise of such Option and the Company shall, to the extent permitted or required by law, have the right to deduct from any payment of any kind otherwise due to the Option Holder, federal, state and local taxes of any kind required by law to be withheld upon the exercise of such Option.

(o) References. References herein to rights and obligations of the Option Holder shall apply, where appropriate, to the Option Holder's legal representative or estate without regard to whether specific reference to such legal representative or estate is contained in a particular provision of this Option.

(p) Notices. Any notice required or permitted to be given under this agreement shall be in writing and shall be deemed to have been given when delivered personally or by courier, or sent by certified or registered mail, postage prepaid, return receipt requested, duly addressed to the party concerned at the address indicated below or to such changed address as such party may subsequently by similar process give notice of:

If to the Company:

Arch Capital Group Ltd.:
Waterloo House, Ground Floor
100 Pitts Bay Road
Pembroke HM 08 Bermuda
Attn: Secretary

If to the Option Holder:

The last address delivered to the Company by the Option Holder in the manner set forth herein.

(q) Governing Law. This agreement shall be governed by and construed in accordance with the laws of New York, without giving effect to principles of conflict of laws thereof.

(r) Entire Agreement. This agreement and the Plan constitute the entire agreement among the parties relating to the subject matter hereof, and any previous agreement or understanding among the parties with respect thereto is superseded by this agreement and the Plan.

(s) Counterparts. This agreement may be executed in two counterparts, each of which shall constitute one and the same instrument.

IN WITNESS WHEREOF, the undersigned have executed this agreement as of the Date of Grant.

ARCH CAPITAL GROUP LTD.

By: /s/ Dawna Ferguson

Name: Dawna Ferguson
Title: Secretary

/s/ Constantine Iordanou
Constantine Iordanou

**THIRD AMENDED AND RESTATED
ARCH CAPITAL GROUP LTD. INCENTIVE COMPENSATION PLAN**

SECTION 1. Purpose.

Arch Capital Group Ltd., a Bermuda company (the “Company”), hereby establishes this Incentive Compensation Plan (as amended from time to time, the “Plan”) in order to provide the Company’s employees with an opportunity to earn annual bonus compensation as an incentive and reward for their efforts to achieve the financial and strategic objectives of the Company.

SECTION 2. Definitions.

2.1 “After-Tax Profit (Loss)” has the meaning specified on Schedule I hereto.

2.2 “Aggregate Target Amount” has the meaning specified in Section 4.3(a) hereof.

2.3 “Award” means the amount of bonus compensation to which an Eligible Employee is entitled for each Plan Year as determined by the Committee pursuant to Section 4 and 5 of the Plan.

2.4 “Board” means the Board of Directors of the Company.

2.5 “Cash Flow” has the meaning specified on Schedule I hereto.

2.6 “CAT Business” means business classified by the Company as property catastrophe reinsurance.

2.7 “Cause” means, with respect to an Eligible Employee, (a) theft or embezzlement by the Eligible Employee with respect to the Company or its Subsidiaries; (b) malfeasance or negligence in the performance of the Eligible Employee’s duties; (c) the commission by the Eligible Employee of any felony or any crime involving moral turpitude; (d) willful or prolonged absence from work by the Eligible Employee (other than by reason of disability due to physical or mental illness); (e) failure, neglect or refusal by the Eligible Employee to adequately perform his or her duties and responsibilities as determined by the Company; (f) continued and habitual use of alcohol by the Eligible Employee to an extent which materially impairs the Eligible Employee’s performance of his or her duties without the same being corrected within ten (10) days after being given written notice thereof; or (g) the Eligible Employee’s use of illegal drugs without the same being corrected within ten (10) days after being given written notice thereof.

2.8 “Code” means the Internal Revenue Code of 1986, as amended, including applicable regulations thereunder.

2.9 “Committee” means the Compensation Committee of the Board, or such other Board committee or subcommittee (or the entire Board) as may be designated by the Board to administer the Plan.

2.10 “Company” has the meaning specified in Section 1 hereof or any successor.

2.11 “Deficits” has the meaning specified in Section 4.3(d) hereof.

2.12 “Development Period” has the meaning specified in Section 4.3(e) hereof.

2.13 “Earned” has the meaning specified in Section 4.3(c) hereof.

2.14 “Eligible Employee” means an employee of the Company or its Subsidiaries, including any director who is an employee, who is selected to participate in the Plan by the Committee.

2.15 “Employer” means the Company, Arch Reinsurance Ltd., Arch Reinsurance Company, Arch Capital Group (U.S.) Inc., Arch Insurance Group Inc. and its Subsidiaries, Arch Capital Services Inc., and any other Subsidiary of the Company that becomes an Employer in accordance with Section 8.1 hereof.

2.16 “Equity” has the meaning specified on Schedule I hereto.

2.17 “Formula Approach” has the meaning specified in Section 4.1 hereof.

2.18 “Formula Approach Pool” has the meaning specified in Section 4.3(a) hereof.

2.19 “Hurdle ROE” has the meaning specified in Section 4.3(b) hereof.

2.20 “Insurance Segment” means the insurance business segment of the Company and its Subsidiaries.

2.21 “Investment Income” has the meaning specified on Schedule I hereto.

2.22 “Maximum Carryforward Amount” has the meaning specified in Section 4.3(c) hereof.

2.23 “Maximum Formula Approach Pool” has the meaning specified in Section 4.3(c) hereof.

2.24 “Mortgage Segment” means the mortgage business segment of the Company and its Subsidiaries.

2.25 “Operating Expenses” has the meaning specified on Schedule I hereto.

2.26 “Permanent Disability” means, with respect to an Eligible Employee, those circumstances where the Eligible Employee is unable to continue to perform the usual customary duties of his or her assigned job for a period of six (6) months in any twelve (12) month period because of physical, mental or emotional incapacity resulting from injury, sickness or disease. Any questions as to the existence of a Permanent Disability shall be determined by a qualified, independent physician selected by the Company and approved by the Eligible Employee (which approval shall not be unreasonably withheld). The determination of any such physician shall be final and conclusive for all purposes of this Plan.

2.27 “Plan” has the meaning specified in Section 1 hereof.

2.28 Plan Year” means (i) with respect to the Target Bonus Approach, a calendar year and (ii) with respect to the Formula Approach, an underwriting (or policy) year commencing on January 1 and ending on December 31 during which an accounting shall be made for all Underwriting Profit (Loss) attributable to Policies having an inception or renewal date during such 12-month period.

- 2.29 “ Policies ” means policies, binders, contracts or agreements of insurance or reinsurance.
- 2.30 “ Pre-Tax Profit ” has the meaning specified on Schedule I hereto.
- 2.31 “ Reinsurance Segment ” means the reinsurance business segment of the Company and its Subsidiaries.
- 2.32 “ ROE ” has the meaning specified on Schedule I hereto.
- 2.33 “ Senior Executives ” has the meaning set forth in Section 4.1 hereof.
- 2.34 “ Subsidiary ” means any corporation (other than the Company) in an unbroken chain of corporations beginning with the Company if each of the corporations (other than the last corporation in the unbroken chain) owns shares possessing 50% or more of the total combined voting power of all classes of stock in one of the other corporations in the chain.
- 2.35 “ Target Bonus Approach ” has the meaning specified in Section 4.1 hereof.
- 2.36 “ Target Bonus Approach Pool ” has the meaning specified in Section 4.2(a) hereof.
- 2.37 “ Target Bonus Opportunity ” means, with respect to each Eligible Employee, a target bonus expressed as a percentage of his or her annual base salary, which is intended as an approximation of the bonus payment that would be paid if aggressive performance goals and other expectations are met by both the Eligible Employee and the business segment or unit he or she is employed by. The Target Bonus Opportunity for each Eligible Employee shall be periodically established (i) by senior management of the applicable business segment or unit and (ii) by the Committee, in the case of certain Senior Executives designated by the Committee (subject to applicable employment agreements).
- 2.38 “ Underwriting Profit (Loss) ” has the meaning specified on Schedule I hereto.
- 2.39 “ Retirement Age ” means the later of an Eligible Employee’s 55th birthday or the fifth anniversary of the first day of the Plan Year in which such Eligible Employee’s participation in the Plan commenced.

SECTION 3. Administration.

The Plan shall be administered by the Committee. The Committee shall have the authority, in its sole discretion, to administer the Plan and to exercise all of the powers and authorities either specifically granted to it under the Plan or necessary or advisable in the administration of the Plan, including, without limitation, the authority to (i) establish performance goals for the awarding of Awards for each Plan Year; (ii) determine the Eligible Employees to whom Awards are to be made for each Plan Year; (iii) determine whether performance goals for each Plan Year have been achieved; (iv) authorize payment of Awards under the Plan; (v) adopt, alter and repeal such administrative rules, guidelines and practices governing the Plan and make all other determinations and judgments relating to the Plan as it shall deem advisable; and (vi) interpret the terms and provisions of the Plan; provided that neither the Committee nor the Board shall have any discretion to reduce any previously determined Award. All determinations made by the Committee with respect to the Plan and Awards thereunder shall be final and binding on all persons, including the Company and all Eligible Employees.

SECTION 4. Determination of Awards.

4.1 Performance Measures. The Plan combines two sets of performance measures: (i) a qualitative judgment about progress and performance each Plan Year based on a number of factors, including the management plan for such Plan Year and non-prescribed measures (the “Target Bonus Approach”), as set forth in Section 4.2 hereof; and (ii) a quantitative, formula-based measure (the “Formula Approach”), as set forth in Section 4.3 hereof. The Target Bonus Approach shall apply to certain senior executives (the “Senior Executives”) of the Company and its Subsidiaries designated by the Committee from time to time. The Formula Approach shall apply to those Eligible Employees designated by the Senior Executives. All Eligible Employees of Arch Capital Services Inc. and any non-designated Eligible Employees shall be subject to the Target Bonus Approach. Awards under the Target Bonus Approach and the Formula Approach shall be determined as set forth in Section 4.2 and Section 4.3, respectively, and shall be payable as set forth in Section 5 hereof.

4.2 Target Bonus Approach.

(a) Target Bonus Approach Pool. Under the Target Bonus Approach, a separate bonus pool shall be established for the Company and certain of its Subsidiaries, the Insurance Segment, the Mortgage Segment, the Reinsurance Segment and Arch Capital Services Inc. for each Plan Year (each, a “Target Bonus Approach Pool”). The Target Bonus Approach Pool for each segment for any given Plan Year shall initially equal the sum of the individual Target Bonus Opportunities for each Eligible Employee included in such segment, which amount shall be adjusted upward or downward to reflect the segment’s actual performance as recommended by senior management of the applicable business segment or unit but determined by the Committee. Performance shall be judged against the achievement of the strategic and financial objectives contained in the applicable management plan submitted to the Board for the Plan Year, peer group performance and other measures deemed applicable by the Committee.

(b) Individual Participation. At the individual level, actual performance bonuses for each Eligible Employee shall reflect both individual and segment performance. An Eligible Employee’s participation in the applicable Target Bonus Approach Pool shall be initially based on his or her Target Bonus Opportunity, which participation shall be adjusted based on his or her performance. Any such adjustments (other than those for Senior Executives, as determined by the Committee) shall be made in a zero sum manner and not affect the overall size of the Target Bonus Approach Pool. All performance assessments shall include both objective and subjective elements, and the general performance weighting guidelines between segment and individual performance to be applied to an Eligible Employee’s Target Bonus Opportunity shall be determined by senior management of the applicable business segment or unit.

4.3 Formula Approach.

(a) Formula Approach Pool. Under the Formula Approach, a separate bonus pool shall be established for the Insurance Segment, the Mortgage Segment and the Reinsurance Segment for each Plan Year and other separate bonus pools may be established by the Committee (each, a “Formula Approach Pool”). The Formula Approach Pool for each of the Insurance Segment, the Mortgage Segment, the Reinsurance Segment and any other segment pools for any given Plan Year shall initially equal the sum of the individual Target Bonus Opportunities for each Eligible Employee included in such segment (each, an “Aggregate Target Amount”). The actual Formula Approach Pool will be a percentage of the Aggregate Target Amount based upon

the ROE achieved for such Plan Year. Schedule II sets forth the size of the Formula Approach Pool based on various levels of ROE, which schedule shall be reviewed and may be adjusted by the Committee for each Plan Year.

(b) Hurdle ROE. With respect to the Insurance Segment, the Mortgage Segment, the Reinsurance Segment and any other segments, no Awards shall be payable for a given Plan Year unless a minimum ROE equal to the applicable hurdle rate set forth on Schedule II for the Plan Year, without taking into account any amounts carried forward pursuant to Section 5.3(c) hereof (the “Hurdle ROE”), is achieved by such segment for such Plan Year.

(c) Maximum Formula Approach Pool: Carryforwards. For any given Plan Year, the maximum Formula Approach Pool for each of the Insurance Segment, the Mortgage Segment, the Reinsurance Segment and any other segments shall equal 200% of the applicable Aggregate Target Amount (each, a “Maximum Formula Approach Pool”). For any given Plan Year, on and after the third anniversary of the end of such Plan Year, Earned amounts in excess of each Maximum Formula Approach Pool up to an additional 200% of such applicable Aggregate Target Amount (the “Maximum Carryforward Amount”) shall be carried forward and made available, only to Eligible Employees who participated in such Plan Year, in Plan Years subsequent to such Plan Year where the applicable Maximum Formula Approach Pool is not expected to be Earned by the end of the applicable Development Period, provided that the Earned amount which may be carried forward to any subsequent Plan Year shall not exceed 25% of the Earned Maximum Carryforward Amount. Notwithstanding anything set forth in the Plan, for a given Plan Year, amounts payable with respect to each of the Insurance Segment, the Mortgage Segment, the Reinsurance Segment and any other segment shall not exceed 15% of the Pre-Tax Profit for such segment, respectively, for such Plan Year. For purposes hereof, with respect to a given amount, “Earned” means the inception-to-date actual amount calculated for the applicable item through the end of the period being calculated.

(d) Deficits. After-Tax Losses (and not After-Tax Profit that is below the Hurdle ROE) for a given Plan Year (“Deficits”) shall offset available After-Tax Profit in subsequent Plan Years until all Deficits are eliminated.

(e) Development Period. For each Plan Year, the Formula Approach Pool for each of the Insurance Segment, the Mortgage Segment, the Reinsurance Segment and any other segment shall be calculated annually for 10 years (a “Development Period”). The first calculation shall be made within two and one half months following the end of the initial 12-month calendar year period included in each Plan Year, and the final calculation shall be made within two and one half months following the end of the tenth year following the commencement of such Plan Year, with losses and loss adjustment expenses (if any) projected to ultimate and discounted to present value basis at such time.

(f) CAT Business. The results of CAT Business shall be calculated over five-year periods based on actual catastrophe experience (terrorism included). Accordingly, at the end of (i) the fifth Plan Year and (ii) each five-year period thereafter, Underwriting Profit (Loss) and Cash Flow shall be initially determined for CAT Business for such five-year period, and then such Underwriting Profit (Loss) and Cash Flow shall be allocated to each Plan Year included in the five-year period based on net premiums written attributable to CAT Business Policies having an inception or renewal date within such Plan Year. Following such initial calculation, the results of

CAT Business shall be part of the annual recalculations of Underwriting Profit (Loss) and Cash Flow for the remainder of the respective Development Period relating to each Plan Year.

(g) Individual Participation. Individual participation in the applicable Formula Approach Pool shall be initially determined based on the relative Target Bonus Opportunity of each of the designated Eligible Employees and shall be subject to adjustment each Plan Year by senior management of the applicable business segment or unit based on criteria it deems appropriate, provided that any such adjustments shall be made in a zero sum manner and not affect the overall size of the applicable Formula Approach Pool.

(h) Board Review of Formula Approach. If the Board or the Committee determines that the Formula Approach results in compensation levels that do not appropriately reflect the Company's underlying performance, then the Board or the Committee may terminate the Formula Approach or make adjustments to it that it deems appropriate.

SECTION 5. Payment of Awards.

5.1 Form of Award. Except as otherwise provided in Section 8.9 below, any Awards payable under this Plan shall be paid in cash.

5.2 Payout Period. For each Plan Year, and subject to Section 5.3 hereof, Awards under the Target Bonus Approach shall be paid after the end of the Plan Year and no later than March 15 of the of the year immediately following the Plan Year. For each Plan Year, and subject to Section 5.3 hereof, Awards under the Formula Approach shall be paid over a four-year period as follows: 40% shall be paid after the end of the Plan Year and no later than March 15 of the of the year immediately following the Plan Year (based on Company performance determined consistent with Section 4.3 above through the end of the Plan Year), and 20% shall be paid no earlier than January 1 and no later than March 15 of each of the years immediately following the end of each of the next three calendar years, in each case based on Company performance determined consistent with Section 4.3 above through the end of the calendar year immediately preceding the year of payment. Notwithstanding the foregoing, in the case of the property facultative reinsurance division of the Reinsurance Segment, for each Plan Year, and subject to Section 5.3 hereof, Awards under the Formula Approach shall be paid over a three-year period as follows: 60% shall be paid after the end of the Plan Year and no later than March 15 of the of the year immediately following the Plan Year (based on Company performance determined consistent with Section 4.3 above through the end of the Plan Year), and 20% shall be paid no earlier than January 1 and no later than March 15 of each of the years immediately following the end of each of the next two calendar years, in each case based on Company performance determined consistent with Section 4.3 above through the end of the calendar year immediately preceding the year of payment. If, following such initial four-year or three year, as applicable, period relating to a given Plan Year, any additional amounts are owed to Eligible Employees under the Formula Approach as a result of recalculation of the applicable Formula Approach Pool based on Company performance through the end of a calendar year, then such amounts shall be paid to such Eligible Employees no earlier than January 1 and no later than March 15 of the immediately following calendar year. Notwithstanding the foregoing, the payment schedule for Eligible Employees subject to the Formula Approach who are junior employees may be modified by senior management, but no such modification may result in any amount being paid later than March 15 of the calendar year immediately following the calendar year for which Company performance is used to determine the amount of the payment.

5.3 Continued Service. Each Eligible Employee must be employed by the Company at the time of each payment of an Award; provided, however, that, (x) in the event an Eligible Employee ceases to be an employee of the Company after the Award for a Plan Year is determined and communicated to the Eligible Employee but prior to the date all payments under an Award are made (i) due to termination (A) by the Company not for Cause or (B) with respect to an Eligible Employee designated by the Committee, by the Eligible Employee for Good Reason (as defined within such Eligible Employee's employment agreement, unless otherwise determined by the Committee), or (ii) as a result of death of the Eligible Employee, the Award shall no longer be subject to the condition that the Eligible Employee remain employed through the time of payment and payments under the Award shall be made when such Award payments are regularly made hereunder following such termination of employment (the amount of such payments, if any, shall be as calculated herein and, in the case of Formula Approach Awards, shall be based on the continued performance of the Company as set forth in Section 4.3 hereof); and (y) in the event an Eligible Employee ceases to be an employee of the Company prior to the date all payments under an Award are made (i) due to termination as a result of Permanent Disability or (ii) due to termination of employment (other than by the Company for Cause) after the attainment of Retirement Age, payments under such Award shall continue to be made when the Award payments are normally made hereunder (the amount of such payments, if any, shall be as calculated herein and, in the case of Formula Approach Awards, be based on the continued performance of the Company as set forth in Section 4.3 hereof), so long as, prior to the applicable payment date, such Eligible Employee does not, without the written consent of the Company, engage in any activity in competition with any activity of the Company or any of its Subsidiaries other than (i) serving on the board of directors (or similar governing body) of another company or (ii) serving as a consultant for no more than 26 weeks per calendar year providing services that do not, in whole or in part, relate to the business or operations of an insurance or reinsurance company; provided that if the Eligible Employee does engage in such activity after termination for such reasons, any unpaid portion of the Award shall be forfeited by the Eligible Employee and become the property of the Company. For purposes hereof, service with any of the Company's Subsidiaries shall be considered to be service with the Company.

If the Eligible Employee ceases to be an employee of the Company for any other reason prior to the date that all amounts under an Award are paid, the Award, including applicable carryforwards, shall be forfeited by the Eligible Employee and become the property of the Company. For purposes hereof, service with any of the Subsidiaries shall be considered to be service with the Company. In the case of Awards made under the Formula Approach, the Awards shall include applicable carryforwards and Deficits, and terminated employees' forfeited Awards, including applicable carryforwards, shall be removed from the applicable bonus pool.

SECTION 6. Non-Transferability.

No Award or rights under this Plan may be transferred or assigned other than by will or by the laws of descent and distribution.

SECTION 7. Amendments and Termination.

The Board may terminate the Plan at any time and may amend it from time to time, provided, however, that no termination or amendment of the Plan shall adversely affect the rights of an Eligible Employee or a beneficiary to a previously determined Award without the written consent of such Eligible Employee or beneficiary.

SECTION 8. General Provisions.

8.1 Subsidiaries. Any Subsidiary of the Company may, upon approval by the Committee, become an Employer under the terms of the Plan. Notwithstanding any provision of the Plan to the contrary, benefits payable under the Plan to an Eligible Employee or his or her beneficiary shall be the obligation of the Employer who actually employs (or, in the case an Eligible Employee who is no longer employed by an Employer, last employed) the Eligible Employee; provided, however, that in the event the Eligible Employee's employer fails to make a payment of benefits to the Eligible Employee or his or her beneficiary when due under the terms of the Plan, the Company (the parent company of the Employers) shall be obligated to make such benefit payments in accordance with the terms of the Plan.

8.2 Unfunded Plan. The Plan shall be an unfunded incentive compensation arrangement. Nothing contained in the Plan, and no action taken pursuant to the Plan, shall create or be construed to create a trust of any kind. An Eligible Employee's right to receive a bonus shall be no greater than the right of an unsecured general creditor of the Company. All bonuses shall be paid from the general funds of the Employers, and no segregation of assets shall be made to ensure payment of bonuses.

8.3 Withholding. The Company may provide for the withholding from any benefits payable under this Plan all Federal, state, city or other taxes as shall be required pursuant to any law or governmental regulation or ruling.

8.4 Excess Parachute Payments.

(a) Notwithstanding any other provision of the Plan, in the event that the amount of payments or other benefits payable to any Eligible Employee under the Plan (including, without limitation, the acceleration of any payment or the accelerated vesting of any payment or other benefit), together with any payments, awards or benefits payable under any other plan, program, arrangement or agreement maintained by the Company or one of its affiliates, would constitute an "excess parachute payment" (within the meaning of Section 280G of the Code), the payments under this Plan shall be reduced (by the minimum possible amounts) until no amount payable to the Eligible Employee under the Plan constitutes an "excess parachute payment" (within the meaning of Section 280G of the Code); provided, however, that no such reduction shall be made if the net after-tax payment (after taking into account Federal, state, local or other income, employment and excise taxes) to which the Eligible Employee would otherwise be entitled without such reduction would be greater than the net after-tax payment (after taking into account Federal, state, local or other income, employment and excise taxes) to the Eligible Employee resulting from the receipt of such payments with such reduction.

(b) All determinations required to be made under this Section 8.4, including whether a payment would result in an "excess parachute payment" and the assumptions to be utilized in arriving at such determinations, shall be made by an accounting firm designated by the Company (the "Accounting Firm") which shall provide detailed supporting calculations both to the Company and the Eligible Employee as requested by the Company or the Eligible Employee. All fees and expenses of the Accounting Firm shall be borne solely by the Company and shall be paid by the Company. Absent manifest error, all determinations made by the Accounting Firm under this Section 8.4 shall be final and binding upon the Company and the Eligible Employee.

(c) In the event the Eligible Employee has an employment agreement in effect with the Company or an affiliate providing for a similar excess parachute payment cutback, the cutback calculations and determinations under this Section 8.4 will be coordinated with the

cutback calculations and determinations under the employment agreement, resulting in one calculation and one cutback determination. Any required cutback shall be made first to payments as provided under the employment agreement and then to payments under this Plan.

8.5 Hold Harmless. No member of the Board of the Committee, nor any officer or employee of the Company acting on behalf of the Board or the Committee, shall be personally liable for any action, determination or interpretation taken or made with respect to the Plan, and all members of the Board or the Committee and all officers or employees or the Company acting on their behalf shall, to the extent permitted by law, be fully indemnified and protected by the Company in respect of any such action, determination or interpretation.

8.6 Other Benefits; No Right of Employment. Nothing set forth in this Plan shall prevent the Board or the Committee from adopting other or additional compensation arrangements. Neither the adoption of the Plan or any Award hereunder shall confer upon an Eligible Employee any right to continued employment.

8.7 Captions. The captions preceding the sections and articles hereof have been inserted solely as a matter of convenience and in no way define or limit the scope or intent of any provisions of the Plan.

8.8 Governing Law. The Plan shall be interpreted, construed and administered in accordance with the laws of the State of New York, without giving effect to principles of conflict of laws.

8.9 Section 162(m). Payments under this Plan may be deferred by the Committee to the extent that the Committee reasonably anticipates that, if the payment were made as scheduled, the United States federal income tax deduction of any Subsidiary that is subject to United States federal income tax would not be permitted for the payment due to the application of Section 162(m) of the Code. Any payment deferred under this Section 8.9 shall be made, subject to the possible application of the delay provided for in Section 8.10 below, as soon as reasonably practicable following the first date on which the Company anticipates or reasonably should anticipate that, if the payment were made on such date, the Subsidiary's deduction with respect to such payment would no longer be restricted due to the application of Section 162(m) of the Code. With respect to any amount deferred under this Section 8.9, the Committee, in its discretion, may credit notional earnings on the amount or substitute for the deferred payment, restricted share units in respect of common shares of the Company having a fair market value equal to the amount of the deferred payment, and common shares subject to the restricted share units shall be distributed at the time payments are to be made in accordance with this Section 8.9. Any restricted share units shall be granted under the Company's 2015 Long Term Incentive and Share Award Plan (or any successor plan). If any scheduled payment to an Eligible Employee in a calendar year is delayed in accordance with this Section 8.9, all scheduled payments to that Eligible Employee that could be delayed in accordance with Treas. Reg. § 1.409A-2(b)(7)(i) shall also be delayed. For purposes of any deferral under this Section 8.9, the Company shall treat all payments to similarly situated employees on a reasonably consistent basis.

8.10 Sections 409A and 457A. It is intended that the Plan will comply with Sections 409A and 457A of the Code (and any regulations and guidelines issued thereunder) to the extent it is subject thereto, and the Plan shall be interpreted on a basis consistent with such intent. The Plan may be amended in any respect deemed by the Board or the Committee to be necessary in order to preserve compliance with Sections 409A and 457A of the Code. Notwithstanding any provision to the contrary in this Plan, if an Eligible Employee is deemed on the date of his or her "separation from service" (within

the meaning of Treas. Reg. Section 1.409A-1(h)) with the Company and its affiliates to be a “specified employee” (within the meaning of Treas. Reg. Section 1.409A-1(i)), then with regard to any payment that is considered deferred compensation under Section 409A payable on account of a “separation from service” that is required to be delayed pursuant to Section 409A(a)(2)(B) of the Code (after taking into account any applicable exceptions to such requirement), such payment shall be made on the date that is the earlier of (i) the expiration of the six (6)-month period measured from the date of the Eligible Employee’s “separation from service,” or (ii) the date of the Eligible Employee’s death (the “Delay Period”). Upon the expiration of the Delay Period, all payments delayed pursuant to this Section shall be paid to the Eligible Employee in a lump sum. The Company shall not have any obligation to indemnify or otherwise protect the Eligible Employee from any obligation to pay any taxes, interest or penalties pursuant to Sections 409A or 457A of the Code. Whenever payments under this Plan are to be made in installments, each such installment shall be deemed to be a separate payment for purposes of Section 409A.

SECTION 9. Effective Date of Plan.

The Plan became effective as of January 1, 2003, and shall remain in effect until such time as it may be terminated pursuant to Section 7 hereof. This Third Amendment and Restatement of the Plan became effective as of January 1, 2016.

Unless otherwise indicated, all capitalized terms used below have the meanings specified in the Plan.

“ROE” means, with respect to each of the Insurance Segment, the Mortgage Segment and the Reinsurance Segment for a given Plan Year, After-Tax Profit (Loss) divided by Equity. For each Plan Year, ROE shall be recalculated annually during the Development Period relating to such Plan Year.

“After-Tax Profit (Loss)” means, with respect to each of the Insurance Segment, the Mortgage Segment and the Reinsurance Segment for a given Plan Year, the sum of (i) Underwriting Profit (Loss) and (ii) Investment Income, taxed based upon the effective tax rate of the Insurance Segment, Mortgage Segment or Reinsurance Segment, as applicable.

“Cash Flow” means, with respect to the Insurance Segment, the Mortgage Segment and the Reinsurance Segment for a given Plan Year, net operating cash flow for such segment reflecting premiums and fees collected, net of reinsurance, loss and loss adjustment expenses paid, underwriting expenses paid and all other operating expenses, including unallocated loss adjustment expenses, allocation of expenses from the Company and Arch Capital Services Inc., federal excise taxes, applicable income taxes and costs of letters of credit, but excluding bonuses payable to Eligible Employees (“Operating Expenses”). For such purposes, CAT Business shall be reflected in the Formula Approach in the manner described in Section 4.3(f) of the Plan.

“Equity” means, with respect to each of the Insurance Segment, the Mortgage Segment and the Reinsurance Segment for a given Plan Year, the amount of capital allocated to each such segment as recommended by senior management and determined by the Committee.

“Investment Income” means, with respect to the Insurance Segment, the Mortgage Segment and the Reinsurance Segment for a given Plan Year, the sum of investment income, compounded as per the applicable U.S. treasury security, on:

- (i) Equity, calculated at a rate equal to the average rate earned on the investment portfolios of the Company and its Subsidiaries during the initial 12-month calendar year period included in the Plan Year, net of investment expenses relating to such portfolios; and
 - (ii) Cash Flow, calculated at the following rates: (A) with respect to all business other than property business, the average risk free rate equal to the yield on a U.S. Treasury security with a duration equal to estimated weighted average duration of the underwriting (or policy) year liabilities, net of estimated investment expenses relating to a portfolio of U.S. Treasury securities, and, (B) with respect to property business, the average
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risk free rate equal to the yield on a U.S. Treasury security with a one year duration, net of estimated investment expenses relating to a portfolio of U.S. Treasury securities.

“ Pre-Tax Profit ” means, with respect to each of the Insurance Segment, the Mortgage Segment and the Reinsurance Segment for a given Plan Year, the sum of (i) Underwriting Profit (Loss) and (ii) Investment Income.

“ Underwriting Profit (Loss) ” reflects, with respect to each of the Insurance Segment, the Mortgage Segment and the Reinsurance Segment for a given Plan Year, (i) net premiums earned, fee income, losses and loss adjustment expenses incurred and acquisition expenses attributable to Policies having an inception or renewal date within the Plan Year and (ii) all other Operating Expenses incurred during the initial 12-month calendar year period included in the Plan Year. For such purposes, CAT Business shall be reflected in the Formula Approach in the manner described in Section 4.3(f) of the Plan.

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

Commissioners:

We are aware that our report dated August 5, 2016 on our review of interim financial information of Arch Capital Group Ltd. and its subsidiaries (the “Company”) for the three-month and six-month periods ended June 30, 2016 and June 30, 2015 and included in the Company's quarterly report on Form 10-Q for the quarter ended June 30, 2016 is incorporated by reference in the Registration Statement on Form S-3 (Registration No. 333-202440) and in the Registration Statements on Forms S-8 (Registration No. 333-211193, Registration No. 333-99974, Registration No. 333-86145, Registration No. 333-82772, Registration No. 333-72182, Registration No. 333-98971, Registration No. 333-124422, Registration No. 333-142835, Registration No. 333-181308 and Registration No. 333-203993).

Very truly yours,

/s/ PricewaterhouseCoopers LLP

August 5, 2016

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

I, Constantine Iordanou, 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: August 5, 2016

By: /s/ Constantine Iordanou

Name: Constantine Iordanou

Title: Chief Executive Officer

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

I, Mark D. Lyons, 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: August 5, 2016

By: /s/ Mark D. Lyons

Name: Mark D. Lyons

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 June 30, 2016 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), Constantine Iordanou, as 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: August 5, 2016

By: /s/ Constantine Iordanou

Name: Constantine Iordanou

Title: 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 June 30, 2016 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), Mark D. Lyons, 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: August 5, 2016

By: /s/ Mark D. Lyons

Name: Mark D. Lyons

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.