ARCH REINSURANCE LTD. AND SUBSIDIARIES

(a wholly-owned subsidiary of Arch Capital Group Ltd.)

Consolidated Financial Statements

December 31, 2019 and 2018

INDEX TO FINANCIAL STATEMENTS

Report of Independent Auditors

To the Board of Directors of Arch Reinsurance Ltd.:

We have audited the accompanying consolidated financial statements of Arch Reinsurance Ltd. and its subsidiaries (the "Company"), which comprise the consolidated balance sheets as of December 31, 2019 and December 31, 2018, and the related consolidated statements of income, comprehensive income, changes in shareholder's equity and cash flows for the years then ended.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on the consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the Company's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Arch Reinsurance Ltd. and its subsidiaries as of December 31, 2019 and December 31, 2018, and the results of their operations and their cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matter

Accounting principles generally accepted in the United States of America require that the incurred and paid loss development for the years ended December 31, 2010 to December 31, 2018 on pages 29 to 37 be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Financial Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

PricewaterhouseCoopers LLP

New York, New York
April 3, 2020

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

	December 31, 2019	December 31, 2018
Assets		
Investments:		
Fixed maturities available for sale, at fair value (amortized cost: $16,593,210 and $14,826,704)	$ 16,888,927	$ 14,695,813
Short-term investments available for sale, at fair value (amortized cost: $957,085 and $956,068)	956,353	955,711
Collateral received under securities lending, at fair value (amortized cost: $388,366 and $274,125)	388,376	274,133
Equity securities, at fair value	838,925	338,899
Investments accounted for using the fair value option	3,663,477	3,983,571
Investments accounted for using the equity method	1,660,396	1,493,791
Total investments	24,396,454	21,741,918
Cash	631,536	570,173
Accrued investment income	117,920	114,619
Securities pledged under securities lending, at fair value (amortized cost: $378,910 and $266,786)	379,868	268,395
Premiums receivable	1,778,717	1,299,150
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	4,346,816	2,919,372
Contractholder receivables	2,119,460	2,079,111
Ceded unearned premiums	1,234,683	975,469
Deferred acquisition costs	633,400	569,574
Receivable for securities sold	24,133	36,246
Goodwill and intangible assets	738,083	634,920
Other assets	1,281,833	882,181
Total assets	$ 37,682,903	$ 32,091,128
Liabilities		
Reserve for losses and loss adjustment expenses	$ 13,891,842	$ 11,853,297
Unearned premiums	4,339,549	3,753,636
Reinsurance balances payable	667,072	393,107
Contractholder payables	2,119,460	2,079,111
Collateral held for insured obligations	206,698	236,630
Senior notes	1,574,372	1,436,378
Revolving credit agreement borrowings	484,287	455,682
Securities lending payable	388,366	274,125
Payable for securities purchased	87,579	90,034
Other liabilities	1,453,970	905,973
Total liabilities	25,213,195	21,477,973
Commitments and Contingencies		
Redeemable noncontrolling interests	55,404	206,292
Shareholder's Equity		
Common shares ($1.00 par, shares authorized: 2,625,000, issued: 2,560,423)	2,560	2,560
Additional paid-in capital	4,138,555	4,095,368
Retained earnings	7,299,888	5,697,375
Accumulated other comprehensive income (loss), net of deferred income tax	210,524	(180,000)
Total shareholder's equity available to Arch	11,651,527	9,615,303
Non-redeemable noncontrolling interests	762,777	791,560
Total shareholder's equity	12,414,304	10,406,863
Total liabilities, noncontrolling interests and shareholder's equity	$ 37,682,903	$ 32,091,128

See Notes to Consolidated Financial Statements

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

	Year Ended December 31, 2019	Year Ended December 31, 2018
Revenues		
Net premiums written	$ 6,039,067	$ 5,346,747
Change in unearned premiums	(252,569)	(114,772)
Net premiums earned	5,786,498	5,231,975
Net investment income	629,308	567,778
Net realized gains (losses)	366,329	(405,368)
Other-than-temporary impairment losses	(3,165)	(2,829)
Other underwriting income	24,861	15,073
Equity in net income of investment funds accounted for using the equity method	123,672	45,641
Other income (loss)	2,996	501
Total revenues	6,930,499	5,452,771
Expenses		
Losses and loss adjustment expenses	3,133,452	2,890,106
Acquisition expenses	840,945	805,135
Other operating expenses	821,884	699,500
Amortization of intangible assets	82,104	105,284
Interest expense	99,591	99,368
Net foreign exchange (gains) losses	20,360	(69,471)
Total expenses	4,998,336	4,529,922
Income before income taxes	1,932,163	922,849
Income taxes:		
Current tax expense (benefit)	143,927	85,380
Deferred tax expense	11,874	28,051
Income tax expense	155,801	113,431
Net income	$ 1,776,362	$ 809,418
Net (income) loss attributable to noncontrolling interests	(56,981)	30,150
Net income available to Arch	$ 1,719,381	$ 839,568

See Notes to Consolidated Financial Statements

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

	Year Ended December 31,	
	2019	**2018**
Comprehensive Income		
Net income	$ 1,776,362	$ 809,418
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	500,457	(270,018)
Reclassification of net realized gains (losses), net of income taxes, included in net income	(118,965)	144,599
Foreign currency translation adjustments	18,162	(23,749)
Comprehensive income	2,176,016	660,250
Net (income) loss attributable to noncontrolling interests	(56,981)	30,150
Other comprehensive (income) loss attributable to noncontrolling interests	(9,130)	3,346
Comprehensive income available to Arch	$ 2,109,905	$ 693,746

See Notes to Consolidated Financial Statements

ARCH REINSURANCE LTD. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDER'S EQUITY
(U.S. dollars in thousands)

	Year Ended December 31,	
	2019	2018
Common shares		
Balance at beginning and end of year	2,560	2,560
Additional paid-in capital		
Balance at beginning of year	4,095,368	4,059,566
Amortization of share-based compensation	39,394	32,350
Other	3,793	3,452
Balance at end of year	4,138,555	4,095,368
Retained earnings		
Balance at beginning of year	5,697,375	5,106,666
Cumulative effect of an accounting change	—	149,794
Balance at beginning of year, as adjusted	5,697,375	5,256,460
Net income	1,776,362	809,418
Net (income) loss attributable to noncontrolling interests	(56,981)	30,150
Dividends paid to parent	(116,868)	(398,653)
Balance at end of year	7,299,888	5,697,375
Accumulated other comprehensive income (loss)		
Balance at beginning of year	(180,000)	115,618
Unrealized appreciation (decline) in value of available-for-sale investments, net of deferred income tax:		
Balance at beginning of year	(114,080)	157,433
Cumulative effect of an accounting change	—	(149,794)
Unrealized holding gains (losses) arising during period, net of reclassification adjustment, net of deferred income tax	381,491	(125,419)
Unrealized holding gains (losses) during period attributable to noncontrolling interests	(9,166)	3,700
Balance at end of year	258,245	(114,080)
Foreign currency translation adjustments, net of deferred income tax:		
Balance at beginning of year	(65,920)	(41,815)
Foreign currency translation adjustments	18,162	(23,749)
Foreign currency translation adjustments attributable to noncontrolling interests	37	(356)
Balance at end of year	(47,721)	(65,920)
Balance at end of year	210,524	(180,000)
Total shareholder's equity available to Arch	11,651,527	9,615,303
Non-redeemable noncontrolling interests	762,777	791,560
Total shareholder's equity	$ 12,414,304	$ 10,406,863

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

	Year Ended December 31, 2019	Year Ended December 31, 2018
Operating Activities		
Net income	$ 1,776,362	$ 809,418
Adjustments to reconcile net income to net cash provided by operating activities:		
Net realized (gains) losses	(381,162)	387,574
Net impairment losses recognized in earnings	3,165	2,829
Equity in net income or loss of investment funds accounted for using the equity method and other income or loss	(14,776)	36,112
Amortization of intangible assets	82,104	105,284
Share-based compensation	41,775	32,263
Changes in:		
Reserve for losses and loss adjustment expenses, net of unpaid losses and loss adjustment expenses recoverable	489,981	243,734
Unearned premiums, net of ceded unearned premiums	252,567	114,772
Premiums receivable	(237,752)	(211,296)
Deferred acquisition costs	(47,260)	(37,847)
Reinsurance balances payable	182,132	73,438
Other items, net	(53,375)	64,483
Net Cash provided by operating activities	2,093,761	1,620,764
Investing Activities		
Purchases of fixed maturity investments	(29,918,457)	(33,285,558)
Purchases of equity securities	(811,967)	(1,001,149)
Purchases of other investments	(1,470,545)	(2,014,622)
Proceeds from sales of fixed maturity investments	28,462,970	31,474,373
Proceeds from sales of equity securities	429,818	1,118,445
Proceeds from sales, redemptions and maturities of other investments	1,209,559	1,561,958
Proceeds from redemptions and maturities of fixed maturity investments	643,265	892,755
Net settlements of derivative instruments	59,982	44,699
Net (purchases) sales of short-term investments	39,858	388,958
Change in cash collateral related to securities lending	(62,193)	180,883
Purchases of fixed assets	(27,790)	(27,638)
Other	(346,981)	22,805
Net cash used For investing activities	(1,792,481)	(644,091)
Financing Activities		
Proceeds from borrowings	200,083	218,259
Repayments of borrowings	(49,182)	(576,401)
Change in securities lending collateral	62,193	(180,883)
Change in third party investment in non-redeemable noncontrolling interests	(75,056)	—
Change in third party investment in redeemable noncontrolling interests	(161,882)	—
Dividends paid to redeemable noncontrolling interests	(12,515)	(17,989)
Other	(6,023)	(3,774)
Dividends paid to parent	(116,868)	(398,653)
Net Cash used for financing activities	(159,250)	(959,441)
Effects of exchange rate changes on foreign currency cash and restricted cash	17,743	(18,942)
Increase (decrease) in cash and restricted cash and restricted cash	159,773	(1,710)
Cash and restricted cash, beginning of year	645,736	647,446
Cash and restricted cash, end of year	$ 805,509	$ 645,736
Income taxes paid (received)	$ 108,232	$ (1,358)
Interest paid	$ 103,947	$ 97,725

See Notes to Consolidated Financial Statements

1. General

Arch Reinsurance Ltd. (“Arch Re Bermuda”) is a Bermuda limited liability company, incorporated in May 2001 in Bermuda, and is a wholly owned subsidiary of Arch Capital Group Ltd. (“Arch Capital”), a Bermuda exempted public limited liability company. Under The Insurance Act 1978, as amended, and related regulations of Bermuda (the “Insurance Act”), Arch Re Bermuda is registered as a Class 4 insurer and Class C long-term insurer and is licensed to underwrite both general and long-term business on an insurance and reinsurance basis. Arch Re Bermuda and its subsidiaries (collectively, the “Company” or “Arch”) provide insurance, reinsurance and mortgage insurance on a worldwide basis.

Operations

Insurance Operations. The Company’s insurance operations are conducted in Bermuda, the United States, Europe, Canada and Australia. The insurance operations in Bermuda are conducted through Arch Insurance (Bermuda), a division of Arch Re Bermuda, and Alternative Re Limited. In the U.S., the Company’s principal insurance subsidiaries are Arch Insurance Company (“Arch Insurance”), Arch Specialty Insurance Company (“Arch Specialty”), Arch Property Casualty Insurance Company (formerly Arch Excess & Surplus Insurance Company (“Arch E&S”)) and Arch Indemnity Insurance Company (“Arch Indemnity”). Arch Insurance is an admitted insurer in 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands and Guam. Arch Specialty is an approved excess and surplus lines insurer in 49 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands and an admitted insurer in one state. Arch Indemnity is an admitted insurer in 49 states and the District of Columbia. Arch Property Casualty Insurance Company, which is not currently writing business, is an approved excess and surplus lines insurer in 47 states and the District of Columbia and an admitted insurer in one state. The insurance operations also operates McNeil, a specialized risk manager and a program administrator based in Cortland, New York. The headquarters for the U.S. support operations (excluding underwriting units) for the insurance operations is in Jersey City, New Jersey. The insurance operations has offices throughout the U.S., including five regional offices located in Alpharetta, Georgia, Chicago, Illinois, New York, New York and San Francisco, California, Dallas, Texas and additional branch offices.

The insurance group’s operations in Canada are conducted through Arch Insurance Canada Ltd. (“Arch Insurance Canada”), a Canada domestic company which is authorized in all Canadian provinces and territories. Arch Insurance Canada is headquartered in Toronto, Ontario. In 2019, Arch Insurance (EU) Designated Activity Company (formerly, Arch Mortgage Insurance Designated Activity Company) (“Arch Insurance (EU)”), based in Dublin, Ireland, received authorization from the Central Bank of Ireland (“CBOI”) to expand its classes of business as part of the Company’s plan to address the U.K.’s departure from the European Union (“Brexit”). As of January 2020, all of the insurance business in the European Union (“EU”) previously written by Arch Insurance (U.K.) is now written through Arch Insurance (EU). Arch Insurance (EU) has branches in Denmark, Italy and the U.K. On November 29, 2019, the Company closed the acquisition of Barbican Group Holdings Limited and its subsidiaries (“Barbican”). Following the acquisition, the Company conducts its insurance operations on several platforms, including Arch Insurance (UK) Limited (formerly Arch Insurance Company (Europe) Limited) (“Arch Insurance (U.K.)”), Arch Syndicate 2012 and Barbican Syndicate 1955. In addition, Barbican Managing Agency Limited (“BMAL”) is the managing agent of Barbican Syndicated 1955 and Arcus Syndicate 1856. Barbican also includes Castel Underwriting Agencies Limited (“Castel”). Collectively, the U.K. insurance operations are referred to as “Arch U.K.”. Arch U.K. operations include the Arch U.K. Regional Division, which underwrites U.K. commercial lines. Arch U.K. conducts its operations from London, England, and other locations in the U.K. and also has branches in Germany, Italy, Spain and Denmark. Arch Underwriting at Lloyd’s Ltd (“AUAL”) is the managing agent of Arch Syndicate 2012 and is responsible for the daily management of Arch Syndicate 2012. Arch Syndicate 2012 and Barbican Syndicate 1955 provide access to Lloyd’s extensive distribution network and worldwide licenses. Arch Underwriting at Lloyd’s (Australia) Pty Ltd, based in Sydney, Australia, is a Lloyd’s services company which underwrites exclusively for Arch Syndicate 2012. Arch Underwriting Agency (Australia) Pty. Ltd. is an Australian agency which also underwrites for Arch Syndicate 2012 and third parties.

Reinsurance Operations. The Company’s reinsurance operations are conducted on a worldwide basis through the following reinsurance subsidiaries: Arch Re Bermuda, Arch Reinsurance Company (“Arch Re U.S.”) and Arch Reinsurance Europe Underwriting Designated Activity Company (“Arch Re Europe”). Arch Re Bermuda is headquartered in Hamilton, Bermuda. Arch Re U.S. is licensed or is an accredited or otherwise approved reinsurer in 50 states and the District of Columbia and the provinces of Ontario and Quebec in Canada with its principal U.S. office in Morristown, New Jersey. Treaty operations in Canada are conducted through the Canadian branch of Arch Re U.S. (“Arch Re Canada”). Arch Re U.S. is also an admitted insurer in Guam. The property facultative reinsurance operations are conducted primarily through Arch Re U.S. with certain executive functions conducted through Arch Re Facultative Underwriters Inc. located in Farmington, Connecticut. The property facultative reinsurance operations have offices throughout the U.S., Canada and in Europe. Arch Re Europe, licensed and authorized as a non-life reinsurer and a life reinsurer, is headquartered in Dublin, Ireland with branch offices in Zurich and London. In February 2017, Arch

Underwriters (Gulf) Limited ("Arch Underwriters Gulf") was licensed as an Insurance Manager by the Dubai Financial Services Authority. Arch Underwriters Gulf is based in the Dubai International Financial Centre and provides underwriting, administrative and support services to Arch Re Bermuda. The acquisition of Barbican in November 2019 also contributed to the Company's reinsurance operations.

Mortgage Operations. The Company's mortgage operations include U.S. and international mortgage insurance and reinsurance operations as well as participation in government sponsored enterprise ("GSE") credit risk-sharing transactions. The Company's mortgage group includes direct mortgage insurance in the U.S. primarily provided by Arch Mortgage Insurance Company and United Guaranty Residential Insurance Company (together, "Arch MI U.S."), mortgage reinsurance by Arch Re Bermuda to mortgage insurers on both a proportional and non-proportional basis globally; direct mortgage insurance in Europe provided by Arch Insurance (EU) and in Hong Kong by Arch MI Asia Limited; and participation in various GSE credit risk-sharing products provided primarily by Arch Re Bermuda.

On January 30, 2014, the Company completed the acquisition of CMG Mortgage Insurance Company from its owners, PMI Mortgage Insurance Co., in Rehabilitation ("PMI") and CMFG Life Insurance Company ("CUNA Mutual") and acquired PMI mortgage insurance platform and related assets. CMG Mortgage Insurance Company was renamed "Arch Mortgage Insurance Company" and entered the U.S. mortgage insurance market place. Arch Mortgage Insurance Company is licensed and operates in all 50 states, the District of Columbia and Puerto Rico.

On December 31, 2016, the Company completed the acquisition of United Guaranty Corporation, a North Carolina corporation ("UGC"), and its primary operating subsidiary, United Guaranty Residential Insurance Company, which is licensed and operates in all 50 states and the District of Columbia. Arch Mortgage Insurance Company and United Guaranty Residential Insurance Company have each been approved as an eligible mortgage insurer by Fannie Mae and Freddie Mac, subject to maintaining certain ongoing requirements ("eligible mortgage insurer"). Arch Mortgage Guaranty Company, offers direct mortgage insurance to U.S. mortgage lenders with respect to mortgages that lenders intend to retain in portfolio or include in non-agency securitizations. Arch Mortgage Guaranty Company, which is licensed in all 50 states, 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.

Arch Insurance (EU) is licensed and authorized by CBOI to operate on a pan-European basis under the European Freedom of Services Act. Arch Insurance (EU) is headquartered in Dublin, Ireland. Arch Underwriters Europe Limited ("Arch Underwriters Europe"), an Irish company authorized as an insurance and reinsurance intermediary by the CBOI, acts on behalf of Arch Insurance (EU) and Arch Re Europe with branch offices in Italy, Switzerland, the U.K., and Finland. In 2017, the Company completed the acquisition of Arch MI Asia from AIG. On January 17, 2019, Arch LMI was authorized by APRA to write lenders' mortgage insurance. Arch LMI is headquartered in Sydney, Australia and will focus on providing direct lenders' mortgage insurance to the Australian market.

Other Operations. In 2014, the Company sponsored, along with HPS Investment Partners, LLC (formerly Highbridge Principal Strategies, LLC ("HPS"), Watford Holdings Ltd. Watford Holdings Ltd. is the parent of Watford Re Ltd., a multi-line Bermuda reinsurance company (together with Watford Holdings Ltd., "Watford"). The Company acts as Watford's reinsurance underwriting manager and HPS, manages Watford's non-investment grade credit portfolios, and Arch Investment Management Ltd. ("AIM"), a wholly-owned subsidiary of Arch Capital, manages Watford's investment grade portfolios, each under separate long term services agreements. Watford's strategy is to combine a diversified reinsurance business with a disciplined investment strategy comprised primarily of non-investment grade credit assets. Watford has its own management and board of directors and is responsible for the overall profitability of its results (see Note 4).

In January 2017, the Company and Kelso & Company ("Kelso") sponsored Premia Holdings Ltd. Premia Holdings Ltd. is the parent of Premia Reinsurance Ltd., a multi-line Bermuda reinsurance company (together with Premia Holdings Ltd., "Premia"). Premia's strategy is to reinsure or acquire companies or reserve portfolios in the non-life property and casualty insurance and reinsurance run-off market. Arch Re Bermuda and certain Arch co-investors invested $100.0 million and acquired approximately 25% of Premia as well as warrants to purchase additional common equity. Affiliates of Kelso invested $300.0 million and acquired the balance of Premia as well as warrants to purchase additional common equity (see Note 13).

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, shareholder's equity or cash flows. Tabular amounts are in U.S. Dollars in thousands, except share amounts, unless otherwise noted.

2. Business Acquired

Barbican Group Holdings Limited

On November 29, 2019, the Company closed the acquisition of Barbican Group Holdings Limited and its subsidiaries, including Barbican Managing Agency Limited, Lloyd's Syndicate 1955 ("Barbican Syndicate 1955"), Castel Underwriting Agencies Limited ("Castel") and other associated entities.

The Ardonagh Group

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

McNeil

On December 6, 2018, the Company closed the acquisition of McNeil, a nationwide leader in specialized risk management and insurance programs headquartered in Cortland, New York.

3. Significant Accounting Policies

(a) Basis of Presentation

The consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States of America ("GAAP") and include the accounts of Arch Re Bermuda and its subsidiaries, including Arch Re U.S., Arch Capital Group (U.S.) Inc. ("Arch-U.S."), Arch Insurance, Arch Specialty, Arch E&S, Arch Indemnity, Arch Insurance Canada, Arch Re Europe, Arch Mortgage Insurance Company, United Guaranty Residential Insurance Company, Arch Mortgage Guaranty Company, Arch Insurance (EU), Arch Insurance (U.K.), Arch Syndicate 2012, Barbican and Watford. All significant intercompany transactions and balances have been eliminated in consolidation.

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ materially from those estimates and assumptions. The Company's principal estimates include:

- The reserve for losses and loss adjustment expenses;
- Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses, including the provision for uncollectible amounts;
- Estimates of written and earned premiums;
- The valuation of the investment portfolio and assessment of other-than-temporary impairments ("OTTI");
- The valuation of purchased intangible assets;
- The assessment of goodwill and intangible assets for impairment; and
- The valuation of deferred tax assets.

(b) Premium Revenues and Related Expenses

Insurance. Insurance premiums written are generally recorded at the policy inception and are primarily earned on a pro rata basis over the terms of the policies for all products, usually 12 months. Premiums written include estimates in the Company's programs, specialty lines, lenders products business and for participation in involuntary pools. Such premium estimates are derived from multiple sources which include the historical experience of the underlying business, similar business and available industry information. Unearned premium reserves represent the portion of premiums written that relates to the unexpired terms of in-force insurance policies.

Reinsurance. Reinsurance premiums written include amounts reported by brokers and ceding companies, supplemented by the Company's own estimates of premiums where reports have not been received. The determination of premium estimates requires a review of the Company's experience with the ceding companies, familiarity with each market, the timing of the reported information, an analysis and understanding of the characteristics of each line of business, and management's judgment of the impact of various factors, including premium or loss trends, on the volume of business written and ceded to the Company. On an ongoing basis, the Company's underwriters review the amounts reported by these third parties for reasonableness based on their experience and knowledge of the subject class of business, taking into account the Company's historical experience with the brokers or ceding companies. In addition, reinsurance contracts under which the Company assumes business generally contain specific provisions which allow the Company to perform audits of the ceding company to ensure compliance with the terms and conditions of the contract, including accurate and timely reporting of information. Based on a review of all available information, management establishes premium estimates where reports have not been received. Premium estimates are updated when new information is received and differences between such estimates and actual amounts are recorded in the period in which estimates are changed or the actual amounts are determined.

Reinsurance premiums written are recorded based on the type of contracts the Company writes. Premiums on the Company's excess of loss and pro rata reinsurance contracts are estimated when the business is underwritten. For excess of loss contracts, premiums are recorded as written based on the terms of the contract. Estimates of premiums written under pro rata contracts are recorded in the period in which the underlying risks are expected to incept and are based on information provided by the brokers and the ceding companies. For multi-year reinsurance treaties which are payable in annual installments, generally, only the initial annual installment is included as premiums written at policy inception due to the ability of the reinsured to commute or cancel coverage during the term of the policy. The remaining annual installments are included as premiums written at each successive anniversary date within the multi-year term.

Reinstatement premiums for the Company's insurance and reinsurance operations are recognized at the time a loss event occurs, where coverage limits for the remaining life of the contract are reinstated under pre-defined contract terms. Reinstatement premiums, if obligatory, are fully earned when recognized. The accrual of reinstatement premiums is based on an estimate of losses and loss adjustment expenses, which reflects management's judgment.

Premium estimates are reviewed by management at least quarterly. Such review includes a comparison of actual reported premiums to expected ultimate premiums along with a review of the aging and collection of premium estimates. Based on management's review, the appropriateness of the premium estimates is evaluated, and any adjustment to these estimates is recorded in the period in which it becomes known. Adjustments to premium estimates could be material and such adjustments could directly and significantly impact earnings favorably or unfavorably in the period they are determined because the estimated premium may be fully or substantially earned. A significant portion of amounts included as premiums receivable, which represent estimated premiums written, net of commissions, are not currently due based on the terms of the underlying contracts.

Reinsurance 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. Contracts and policies written on a "losses occurring" basis cover claims that may occur during the term of the contract or policy, which is typically 12 months. Accordingly, the premium is earned evenly over the term. Contracts which are written on a "risk attaching" basis cover claims which attach to the underlying insurance policies written during the terms of such contracts. Premiums earned on such contracts usually extend beyond the original term of the reinsurance contract, typically resulting in recognition of premiums earned over a 24-month period. Certain of the Company's reinsurance contracts include provisions that adjust premiums or acquisition expenses based upon the experience under the contracts. Premiums written and earned, as well as related acquisition expenses, are recorded based upon the projected experience under such contracts.

The Company also writes certain reinsurance business that is intended to provide insurers with risk management solutions that complement traditional reinsurance. Under these contracts, the Company assumes a measured amount of insurance risk in exchange for an anticipated margin, which is typically lower than on traditional reinsurance contracts. The terms and conditions of these contracts may include additional or return premiums based on loss experience, loss corridors, sublimits and caps. Examples of such business include aggregate stop-loss coverages, financial quota share coverages and multi-year retrospectively rated excess of loss coverages. If these contracts are deemed to transfer risk, they are accounted for as reinsurance. Otherwise, such contracts are accounted for under the deposit method.

Mortgage. Mortgage guaranty insurance policies are contracts that are generally non-cancelable by the insurer, are renewable at a fixed price, and provide for payment of premiums on a monthly, annual or single basis. Upon renewal, the Company is not able to re-underwrite or re-price its policies. Consistent with industry accounting practices, premiums written on a monthly basis are earned as coverage is provided. Premiums written on an annual basis are amortized on a monthly pro rata basis over the year of coverage. Primary mortgage insurance premiums written on policies covering more than one year are referred to as single premiums. A portion of the revenue from single premiums is recognized in premiums earned in the current period, and the remaining portion is deferred as unearned premiums and earned over the estimated expiration of risk of the policy. If single premium policies related to insured loans are canceled due to repayment by the borrower and the policy is a non-refundable product, the remaining unearned premium related to each canceled policy is recognized as earned premium upon notification of the cancellation.

Unearned premiums represent the portion of premiums written that is applicable to the estimated unexpired risk of insured loans. A portion of premium payments may be refundable if the insured cancels coverage, which generally occurs when the loan is repaid, the loan amortizes to a sufficiently low amount to trigger a lender permitted or legally required cancellation, or the value of the property has increased sufficiently in accordance with the terms of the contract. Premium refunds reduce premiums earned in the consolidated statements of income. Generally, only unearned premiums are refundable.

Acquisition Costs. Acquisition costs that are directly related and incremental to the successful acquisition or renewal of business are deferred and amortized based on the type of contract. The Company's insurance and reinsurance operations capitalize incremental direct external costs that result from acquiring a contract but do not capitalize salaries, benefits and other internal underwriting costs. For the Company's mortgage insurance operations, which include a substantial direct sales force, both external and certain internal direct costs are deferred and amortized. For property and casualty insurance and reinsurance contracts, deferred acquisition costs are amortized over the period in which the related premiums are earned. Consistent with mortgage insurance industry accounting practice, amortization of acquisition costs related to the mortgage insurance contracts for each underwriting year's book of business is recorded in proportion to estimated gross profits. Estimated gross profits are comprised of earned premiums and losses and loss adjustment expenses. For each underwriting year, the Company estimates the rate of amortization to reflect actual experience and any changes to persistency or loss development.

Deferred acquisition costs are carried at their estimated realizable value and take into account anticipated losses and loss adjustment expenses, based on historical and current experience, and anticipated investment income.

A premium deficiency occurs if the sum of anticipated losses and loss adjustment expenses, unamortized acquisition costs and maintenance costs exceed unearned premiums (including expected future premiums) and anticipated investment income. A premium deficiency reserve ("PDR") is recorded by charging any unamortized acquisition costs to expense to the extent required in order to eliminate the deficiency. If the premium deficiency exceeds unamortized acquisition costs then a liability is accrued for the excess deficiency.

To assess the need for a PDR on mortgage exposures, the Company develops loss projections based on modeled loan defaults related to its current policies in force. This projection is based on recent trends in default experience, severity and rates of defaulted loans moving to claim, as well as recent trends in the rate at which loans are prepaid, and incorporates anticipated interest income. Evaluating the expected profitability of the Company's existing mortgage insurance business and the need for a PDR for its mortgage business involves significant reliance upon assumptions and estimates with regard to the likelihood, magnitude and timing of potential losses and premium revenues.

No premium deficiency charges were recorded by the Company during 2019 and 2018.

(c) Deposit Accounting

Certain assumed reinsurance contracts that are deemed not to transfer insurance risk, are accounted for using the deposit method of accounting. However, it is possible that the Company could incur financial losses on such contracts. Management exercises significant judgment in the assumptions used in determining whether assumed contracts should be accounted for as reinsurance contracts or deposit contracts. For those contracts that contain only significant underwriting risk, the estimated profit margin is deferred and amortized over the contract period and such amount is included in the Company's underwriting results. When the estimated profit margin is explicit, the margin is reflected as other underwriting income and any adverse financial results on such contracts are reflected as incurred losses. When the estimated profit margin is implicit, the margin is reflected as an offset to paid losses and any adverse financial results on such contracts are reflected as incurred losses. Additional judgments are required when applying the accounting guidance with respect to the revenue recognition criteria for contracts deemed to transfer only significant underwriting risk. For those contracts that contain only significant timing risk, an accretion rate is established at inception of the contract based on actuarial estimates whereby the deposit accounting liability is increased to the estimated amount payable over the contract term. The accretion on the deposit is based on the expected rate of return required to fund the expected future payment obligations. Periodically the Company reassesses the estimated ultimate liability and the related expected rate of return. The accretion of the deposit accounting liability as well as changes to the estimated ultimate liability and the accretion rate would be reflected as part of interest expense in the Company's results of operations. Any negative accretion in a deposit accounting liability is shown in other underwriting income in the Company's results of operations.

Under some of these contracts, the ceding company retains the related assets on a funds-held basis. Such amounts are included in "Other assets" on the Company's balance sheet. Interest income produced by those assets are recorded as part of net investment income in the Company's results of operations.

(d) Retroactive Reinsurance

Retroactive reinsurance reimburses a ceding company for liabilities incurred as a result of past insurable events covered by the underlying policies reinsured. In certain instances, reinsurance contracts cover losses both on a prospective basis and on a retroactive basis and, accordingly, the Company bifurcates the prospective and retrospective elements of these reinsurance contracts and accounts for each element separately where practical. Underwriting income generated in connection with retroactive reinsurance contracts is deferred and amortized into income over the settlement period while losses are charged to income immediately. Subsequent changes in estimated amount or timing of cash flows under such retroactive reinsurance contracts are accounted for by adjusting the previously deferred amount to the balance that would have existed had the revised estimate been available at the inception of the reinsurance transaction, with a corresponding charge or credit to income.

(e) Reinsurance Ceded

In the normal course of business, the Company purchases reinsurance to increase capacity and to limit the impact of individual losses and events on its underwriting results by reinsuring certain levels of risk with other insurance enterprises or reinsurers. The Company uses pro rata, excess of loss and facultative reinsurance contracts. Reinsurance ceding commissions that represent a recovery of acquisition costs are recognized as a reduction to acquisition costs while the remaining portion is deferred. The accompanying consolidated statement of income reflects premiums and losses and loss adjustment expenses and acquisition costs, net of reinsurance ceded. See Note 7 for information on the Company's reinsurance usage. Reinsurance premiums ceded and unpaid losses and loss adjustment expenses recoverable are estimated in a manner consistent with that of the original policies issued and the terms of the reinsurance contracts. If the reinsurers are unable to satisfy their obligations under the agreements, the Company's insurance or reinsurance subsidiaries would be liable for such defaulted amounts.

(f) Cash

Cash includes cash equivalents, which are investments with original maturities of three months or less that are not managed by external or internal investment advisors.

(g) Restricted Cash

Restricted cash represents amounts held for the benefit of third parties and is legally or contractually restricted as to withdrawal or usage by the Company. Such amounts are included in "Other assets" on the Company's balance sheet.

(h) Investments

The Company currently classifies substantially all of its fixed maturity investments and short-term investments as "available for sale" and, accordingly, they are carried at estimated fair value (also known as fair value) with the changes in fair value recorded as an unrealized gain or loss component of accumulated other comprehensive income in shareholder's equity. The fair value of fixed maturity securities and equities securities is generally determined from quotations received from nationally recognized pricing services, or when such prices are not available, by reference to broker or underwriter bid indications. Short-term investments comprise securities due to mature within one year of the date of issue. Short-term investments include certain cash equivalents which are part of investment portfolios under the management of external and internal investment managers.

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. Such securities have been reclassified as "Securities pledged under securities lending, at fair value." 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. Collateral received is required at a rate of 102% or greater of the fair value of the loaned securities including accrued investment income and is monitored and maintained by the lending agent. Such collateral is reflected as "Collateral received under securities lending, at fair value."

The Company's investment portfolio includes certain funds that, due to their ownership structure, are accounted for by the Company using the equity method. In applying the equity method, these 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 fair 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. Changes in the carrying value of such investments are recorded in net income as "Equity in net income (loss) of investments accounted for using the equity method." As such, fluctuations in the carrying value of the investments accounted for using the equity method may increase the volatility of the Company's reported results of operations.

The Company's investment portfolio includes equity securities that are accounted for at fair value. Such holdings primarily include publicly traded common stocks. Dividend income on equities is reflected in net investment income. Changes in fair value on equity securities are included in "Net realized gains (losses)" in the consolidated statements of income.

The Company elected to carry certain fixed maturity securities, equity securities and other investments at fair value under the fair value option afforded by accounting guidance regarding the fair value option for financial assets and liabilities. The fair value for certain of the Company's other investments are determined using net asset values ("NAVs") as advised by external fund managers. The NAV is based on the fund manager's valuation of the underlying holdings in accordance with the fund's governing documents. Changes in fair value of investments accounted for using the fair value option are included in "Net realized gains (losses)." The primary reasons for electing the fair value option were to address simplification and cost-benefit considerations.

The Company invests in limited partner interests and shares of limited liability companies. Such amounts are included in investments accounted for using the equity method, other investments available for sale and investments accounted for using the fair value option. These investments can often have characteristics of a variable interest entity ("VIE"). A VIE refers to entities that have 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 the characteristic of a controlling financial interest. If the Company is determined to be the primary beneficiary, it is required to consolidate the VIE. The primary beneficiary 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. At inception of the VIE as well as on an ongoing basis, the Company determines whether it is the primary beneficiary based on an analysis of the Company's level of involvement in the VIE, the contractual terms, and the overall structure of the VIE. 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 sheets and any unfunded commitment.

The Company performs quarterly reviews of its investments to determine whether declines in fair value below the cost basis are considered other-than-temporary in accordance with applicable accounting guidance regarding the recognition and presentation of OTTI. The process of determining whether a security is other-than-temporarily impaired requires judgment and involves analyzing many factors. These factors include (i) an analysis of the liquidity, business prospects and overall financial condition of the issuer, (ii) the time period in which there was a significant decline in value, (iii) the significance of the decline and (iv) the analysis of specific credit events.

When there are credit-related losses associated with debt securities for which the Company does not have an intent to sell and it is more likely than not that it will not be required to sell the security before recovery of its cost basis, the amount of the OTTI related to a credit loss is recognized in earnings and the amount of the OTTI related to other factors (e.g., interest rates, market conditions, etc.) is recorded as a component of other comprehensive income (loss). The amount of the credit loss of an impaired debt security is the difference between the amortized cost and the greater of (i) the present value of expected future cash flows and (ii) the fair value of the security. In instances where no credit loss exists but it is more likely than not that the Company will have to sell the debt security prior to the anticipated recovery, the decline in fair value below amortized cost is recognized as an OTTI in earnings. In periods after the recognition of an OTTI on debt securities, the Company accounts for such securities as if they had been purchased on the measurement date of the OTTI at an amortized cost basis equal to the previous amortized cost basis less the OTTI recognized in earnings. For debt securities for which OTTI were recognized in earnings, the difference between the new amortized cost basis and the cash flows expected to be collected will be accreted or amortized into net investment income. See Note 8, for additional information.

Net investment income includes interest and dividend income together with amortization of market premiums and discounts and is net of investment management and custody fees. Anticipated prepayments and expected maturities are used in applying the interest method for certain investments such as mortgage and other asset-backed securities. When actual prepayments differ significantly from anticipated prepayments, the effective yield is recalculated to reflect actual payments to date and anticipated future payments. The net investment in such securities is adjusted to the amount that would have existed had the new effective yield been applied since the acquisition of the security. Such adjustments, if any, are included in net investment income when determined.

Investment gains or losses realized on the sale of investments, except for certain fund investments, are determined on a first-in, first-out basis and are reflected in net income. Investment gains or losses realized on the sale of certain fund investments are determined on an average cost basis. Unrealized appreciation or decline in the value of available for sale securities, which are carried at fair value, is excluded from net income and recorded as a separate component of accumulated other comprehensive income, net of applicable deferred income tax.

(i) Derivative Instruments

The Company recognizes all derivative instruments, including embedded derivative instruments, at fair value in its consolidated balance sheets. The Company employs the use of derivative instruments within its operations to mitigate risks arising from assets and liabilities held in foreign currencies as well as part of its overall investment strategy. For such instruments, changes in assets and liabilities measured at fair value are recorded as "Net realized gains" in the consolidated statements of income. In addition, the Company's derivative instruments include amounts related to underwriting activities where an insurance or reinsurance contract meets the accounting definition of a derivative instrument. For such contracts, changes in fair value are reflected in "Other underwriting income" in the consolidated statements of income as the underlying contract originates from the Company's underwriting operations. For 2019 and 2018, the Company did not designate any derivative instruments as hedges under the relevant accounting guidance. See Note 10 for information on the Company's derivative instruments.

(j) Reserves for Losses and Loss Adjustment Expenses

Insurance and Reinsurance. The reserve for losses and loss adjustment expenses consists of estimates of unpaid reported losses and loss adjustment expenses and estimates for losses incurred but not reported. The reserve for unpaid reported losses and loss adjustment expenses, established by management based on reports from ceding companies and claims from insureds, excludes estimates of amounts related to losses under high deductible policies, and represents the estimated ultimate cost of events or conditions that have been reported to or specifically identified by the Company. Such reserves are supplemented by management's estimates of reserves for losses incurred for which reports or claims have not been received. The Company's reserves are based on a combination of reserving methods, incorporating both Company and industry loss development patterns. The Company selects the initial expected loss and loss adjustment expense ratios based on information derived by its underwriters and actuaries during the initial pricing of the business, supplemented by industry data where appropriate. Such ratios consider, among other things, rate changes and changes in terms and conditions that have been observed in the market. These estimates are reviewed regularly and, as experience develops and new information becomes known, the reserves are adjusted as necessary. Such adjustments, if any, are reflected in income in the period in which they are determined. As actual loss information has been reported, the Company has developed its own loss experience and its reserving methods include other actuarial techniques. Over time, such techniques have been given further weight in its reserving process based on the continuing maturation of the Company's reserves. Inherent in the estimates of ultimate losses and loss adjustment expenses are expected trends in claims severity and frequency and other factors which may vary significantly as claims are settled. Accordingly, ultimate losses and loss adjustment expenses may differ materially from the amounts recorded in the accompanying consolidated financial statements. Losses and loss adjustment expenses are recorded on an undiscounted basis, except for excess workers' compensation and employers' liability business written by the Company's insurance operations.

Mortgage. The reserves for mortgage guaranty insurance losses and loss adjustment expenses are the estimated claim settlement costs on notices of delinquency that have been received by the Company, as well as loan delinquencies that have been incurred but have not been reported by the lenders. Consistent with primary mortgage insurance industry accounting practice, the Company does not establish loss reserves for future claims on insured loans that are not currently delinquent (defined as two consecutive missed payments). The Company establishes loss reserves on a case-by-case basis when insured loans are reported delinquent using estimated claim rates and average claim sizes for each cohort, net of any salvage recoverable. The Company also reserves for delinquencies that have occurred but have not yet been reported to the Company prior to the close of an accounting period. To determine this reserve, the Company estimates the number of delinquencies not yet reported using historical information regarding late reported delinquencies and applies estimated claim rates and claim sizes for the estimated delinquencies not yet reported.

The establishment of reserves across the Company's operations is an inherently uncertain process, are necessarily based on estimates, and the ultimate net cost may vary from such estimates. The methods for making such estimates and for establishing the resulting liability are reviewed and updated using the most current information available. Any resulting adjustments, which may be material, are reflected in current operations.

(k) Contractholder Receivables and Payables and Collateral Held for Insured Obligations

Certain insurance policies written by the Company's insurance operations feature large deductibles, primarily in its construction and national accounts lines of business. Under such contracts, the Company is obligated to pay the claimant for the full amount of the claim. The Company is subsequently reimbursed by the policyholder for the deductible amount. These amounts are included on a gross basis in the consolidated balance sheets in contractholder payables and contractholder receivables, respectively. In the event that the Company is unable to collect from the policyholder, the Company would be liable for such defaulted amounts. Collateral, primarily in the form of letters of credit, cash and trusts, is obtained from the policyholder to mitigate the Company's credit risk. In the instances where the company receives collateral in the form of cash, the company reflects it in "Collateral held for insured obligations."

(l) Foreign Exchange

Assets and liabilities of foreign operations whose functional currency is not the U.S. Dollar are translated at the prevailing exchange rates at each balance sheet date. Revenues and expenses of such foreign operations are translated at average exchange rates during the year. The net effect of the translation adjustments for foreign operations is included in accumulated other comprehensive income, net of applicable deferred income tax. Monetary assets and liabilities, such as premiums receivable and the reserve for losses and loss adjustment expenses, denominated in foreign currencies are revalued at the exchange rate in effect at the balance sheet date with the resulting foreign exchange gains and losses included in net income. Accounts that are classified as non-monetary, such as deferred acquisition costs and the unearned premium reserves, are not revalued. In the case of foreign currency denominated fixed maturity securities which are classified as "available for sale," the change in exchange rates between the local currency in which the investments are denominated and the Company's functional currency at each balance sheet date is included in unrealized appreciation or decline in value of securities, a component of accumulated other comprehensive income, net of applicable deferred income tax.

(m) Income Taxes

Deferred income taxes reflect the expected future tax consequences of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and amounts used for income tax purposes. A valuation allowance is recorded if it is more likely than not that some or all of a deferred tax asset may not be realized. The Company considers future taxable income and feasible tax planning strategies in assessing the need for a valuation allowance. In the event the Company determines that it will not be able to realize all or part of its deferred income tax assets in the future, an adjustment to the deferred income tax assets would be charged to income in the period in which such determination is made. In addition, if the Company subsequently assesses that the valuation allowance is no longer needed, a benefit would be recorded to income in the period in which such determination is made. See Note 12 for more information.

The Company recognizes a tax benefit where it concludes that it is more likely than not that the tax benefit will be sustained on audit by the taxing authority based solely on the technical merits of the associated tax position. If the recognition threshold is met, the Company recognizes a tax benefit measured at the largest amount of the tax benefit that, in the Company's judgment, is greater than 50% likely to be realized. The Company records interest and penalties related to unrecognized tax benefits in the provision for income taxes.

(n) Share-Based Payment Arrangements

The Company applies a fair value based measurement method in accounting for its share-based payment arrangements with eligible employees and directors. Compensation expense is estimated based on the fair value of the award at the grant date and is recognized in net income over the requisite service period with a corresponding increase in shareholder's equity. No value is attributed to awards that employees forfeit because they fail to satisfy vesting conditions. The Company's (i) time-based awards generally vest over a three year period with one-third vesting on the first, second and third anniversaries of the grant date and (ii) performance-based awards cliff vest after each three year performance period based on achievement of the specified performance criteria. The share-based compensation expense associated with awards that have graded vesting features and vest based on service conditions only is calculated on a straight-line basis over the requisite service period for the entire award. Compensation expense recognized in connection with performance awards is based on the achievement of the specified performance and service conditions. The final measure of compensation expense recognized over the requisite service period reflects the final performance outcome. During the recognition period compensation expense is accrued based on the performance condition that is probable of achievement. 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. These charges had no impact on the Company's cash flows or total shareholder's equity. See Note 19 for information relating to the Company's share-based payment awards.

(o) Guaranty Fund and Other Related Assessments

Liabilities for guaranty fund and other related assessments in the Company's insurance and reinsurance operations are accrued when the Company receives notice that an amount is payable, or earlier if a reasonable estimate of the assessment can be made.

(p) Goodwill and Intangible Assets

Goodwill represents the excess of the purchase price of an acquisition over the fair value of the net assets acquired and is assigned to the applicable reporting unit at acquisition. Goodwill is evaluated for impairment on an annual basis. Impairment tests may be performed more frequently if the facts and circumstances indicate a possible impairment. In performing impairment tests, the Company may first assess qualitative factors to determine whether it is more likely than not (that is, more than a 50% probability) that the fair value of a reporting unit exceeds its carrying amount as a basis for determining whether it is necessary to perform the two-step goodwill impairment test described in the accounting guidance.

Indefinite-lived intangible assets, such as insurance licenses are evaluated for impairment similar to goodwill. Finite-lived intangible assets and liabilities include the value of acquired insurance and reinsurance contracts, which are estimated based on the present value of future expected cash flows and amortized in proportion to the estimated profits expected to be realized. Other finite-lived intangible assets or liabilities, including favorable or unfavorable contracts, are amortized over their useful lives. Finite-lived intangible assets and liabilities are periodically reviewed for indicators of impairment. An impairment is recognized when the carrying amount is not recoverable from its undiscounted cash flows and is measured as the difference between the carrying amount and fair value.

If goodwill or intangible assets are impaired, such assets are written down to their fair values with the related expense recorded in the Company's results of operations.

(q) Recent Accounting Pronouncements

Recently Issued Accounting Standards Adopted

The Company adopted ASU 2016-02, "Leases (Topic 842)", which provides a new comprehensive model for lease accounting. Topic 842 requires a lessee to recognize a liability to make lease payments (the lease liability) and a right-of-use asset representing its right to use the underlying asset for the lease term. The Company adopted the modified retrospective approach of this standard, that resulted in the recognition of a right-of-use asset of $96.2 million as part of other assets and a lease liability of $110.8 million as part of other liabilities in the consolidated balance sheet as of January 1, 2019. The Company de-recognized the liability for deferred rent that was required under the previous guidance.

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

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

The Company adopted ASU 2018-02 "Income Statement Reporting Comprehensive Income (Topic 220) - Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income," which was issued in February 2018 to allow the reclassification of the stranded tax effects in accumulated other comprehensive income ("AOCI") resulting from the Tax Cuts and Jobs Act of 2017 ("Tax Cuts Act"). Current guidance requires the effect of a change in tax laws or rates on deferred tax balances to be reported in income from continuing operations in the accounting period that includes the period of enactment, even if the related income tax effects were originally charged or credited directly to AOCI. The amount of the reclassification would include the effect of the change in the U.S. federal corporate income tax rate on the gross deferred tax amounts and related valuation allowances, if any, at the date of the enactment of the Tax Cuts Act related to items in AOCI. The updated guidance is effective for reporting periods beginning after December 15, 2018 and is to be applied retrospectively to each period in which the effect of the Tax Cuts Act related to items remaining in AOCI are recognized or at the beginning of the period of adoption. The adoption of this ASU did not have a material effect on the Company's results of operations, financial position or liquidity.

The Company adopted ASU 2017-08 "Receivables - Nonrefundable Fees and Other Costs (Subtopic 310-20), Premium Amortization on Purchased Callable Debt Securities," which was issued in March 2017. This ASU shortens the amortization period for certain callable debt securities held at a premium and requires the premium to be amortized to the earliest call date. However, the new guidance does not require an accounting change for securities held at a discount whose discount continues to be amortized to maturity. The standard is effective for financial statements issued for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2018, with early adoption permitted. The adoption of the guidance requires a modified retrospective approach with a cumulative-effect adjustment to retained earnings. The adoption of this ASU did not have a material effect on the Company's consolidated financial statements.

The Company adopted Financial Accounting Standards Board ("FASB") Accounting Standard Update ("ASU") 2016-01, "Financial Instruments - Overall (Subtopic 825-10) - Recognition and Measurement of Financial Assets and Financial Liabilities," which enhances the reporting model for financial instruments and provides improved financial information to readers of the financial statements. Among other provisions focused on improving the recognition and measurement of financial instruments, the ASU significantly changes the income statement impact of equity instruments and the recognition of changes in fair value of financial liabilities attributable to an entity's own credit risk when the fair value option is elected. The ASU requires equity instruments that do not result in consolidation and are not accounted for under the equity method to be measured at fair value with any changes in fair value recognized in net income rather than other comprehensive income. Upon adoption of this ASU, the Company recorded a cumulative effect adjustment of $149.8 million in retained earnings and an offsetting decrease in accumulated other comprehensive income. The adoption of this ASU did not have a material impact on the Company's financial position, cash flows, or total comprehensive income, but may increase volatility in the Company's results of operations in future periods.

The Company adopted ASU 2014-09, "Revenue from Contracts with Customers (Topic 606)," which creates a new comprehensive revenue recognition standard that serves as a single source of revenue guidance for all companies in all industries. The guidance applies to all companies that either enter into contracts with customers to transfer goods or services or enter into contracts for the transfer of non-financial assets, unless those contracts are within the scope of other standards, such as insurance contracts or financial instruments. The ASU also requires enhanced disclosures about revenue. The Company adopted the ASU using the modified retrospective method, whereby the cumulative effect of adoption was recognized as an adjustment to retained earnings at the date of initial application. The impact of the adoption of this ASU was not material, mostly because the accounting for insurance contracts is outside of the scope of ASU 2014-09.

The Company adopted ASU 2016-18, “Statement of Cash Flows (Topic 230) - Restricted Cash,” which requires that restricted cash and restricted cash equivalents be included with cash and cash equivalents in the reconciliation of beginning and ending cash on the statements of cash flows. As a result, transfers between cash and cash equivalents and restricted cash and restricted cash equivalents will no longer be presented on the statement of cash flows. The revised presentation required in this ASU is reflected in the Company’s consolidated statements of cash flows for both periods presented. The adoption of this ASU did not have any effect on the Company’s results of operations, financial position or comprehensive income.

The Company adopted ASU 2016-15, “Statement of Cash Flows (Topic 230) - Classification of Certain Cash Receipts and Cash Payments,” which addresses several clarifications on the presentation and classification of certain cash receipts and cash payments in the statement of cash flows. Among several other cash flow issues, the ASU specifically addresses the classification of debt prepayment or debt issuance costs, contingent consideration payments made after a business combination and distributions received from equity method investees. The ASU also provides a broader principle on identifying the type of activity of the cash flow item by focusing on the cash flow item’s nature and the predominant source or use of that item. The adoption of this ASU did not have a material impact on the Company’s consolidated financial statements.

The Company adopted ASU 2016-16, “Income Taxes (Topic 740) - Intra-Entity Transfers of Assets Other than Inventory,” which requires entities to recognize current and deferred income tax resulting from an intra-entity asset transfer when the transfer occurs. Previously, recognition of income tax consequences under GAAP was not allowed until the asset had been sold to a third party. The adoption of this ASU did not have a material impact on the Company’s consolidated financial statements.

Recently Issued Accounting Standards Not Yet Adopted

ASU 2016-13, “Financial Instruments - Credit Losses (Topic 326),” was issued in June, 2016. The ASU 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 ASU 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. The ASU 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 with a cumulative-effect adjustment to retained earnings at the beginning of the year of adoption. Upon adoption, the Company expects the new standard to have an impact on certain type of investment securities, reinsurance recoverables and contractholder receivables. The Company will adopt the ASU on January 1, 2020 by applying the modified retrospective approach. The Company anticipates recording a cumulative-effect adjustment to the opening balance of retained earnings, which is not expected to have a material effect on the consolidated financial statements.

ASU 2018-13, “Fair Value Measurement (Topic 820): Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement,” was issued in August, 2018. The ASU modifies the disclosure requirements on fair value measurement as part of the disclosure framework project with the objective to improve the effectiveness of disclosures in the notes to the financial statements. The amendments in this update allow for removal of (1) the amount and reasons for transfer between Level 1 and Level 2 of the fair value hierarchy; (2) the policy for transfers between levels; and (3) the valuation processes for Level 3 fair value measurements. The ASU is effective for fiscal years beginning after December 15, 2019 and interim periods within those fiscal years. The Company is currently evaluating the impact of the new guidance on its consolidated financial statements.

ASU 2018-15, “Intangibles - Goodwill and Other - Internal-Use Software (Subtopic 350-40),” was issued in the 2018 third quarter. This ASU aligns the requirements for capitalizing certain implementation costs incurred in a cloud computing arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. The standard is effective for financial statements issued for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019, with early adoption permitted. The guidance provides flexibility in adoption, allowing for either retrospective adjustment or prospective adjustment for all implementation costs incurred after the date of adoption. The Company is currently evaluating the impact of the new guidance on the consolidated financial statements.

4. Variable Interest Entity and Noncontrolling Interests

Watford Holdings Ltd.

In March 2014, Watford raised approximately $1.1 billion of capital consisting of $907.3 million in common equity ($895.6 million net of issuance costs) and $226.6 million in preference equity ($219.2 million net of issuance costs and discount). The Company invested $100.0 million and acquired 2,500,000 common shares, approximately 11% of Watford common equity, and a warrant to purchase up to 975,503 additional common shares. The warrants expired on March 31, 2020. Watford's common shares are listed on the Nasdaq Select Global Market under the ticker symbol "WTRE". As of December 31, 2019, the Company owns approximately 13% of Watford's outstanding common equity.

HPS manages Watford's non-investment grade credit portfolios, and the Company manages Watford's investment grade portfolios, each under separate long term services agreements. John Rathgeber, previously Vice Chairman of Arch Worldwide Reinsurance Group, served as CEO of Watford until his retirement on March 31, 2020. Mr. Rathgeber was succeeded by Jonathan D. Levy, who served as Watford's President prior to March 31, 2020. In addition, Maamoun Rajeh and Nicolas Papadopoulo, both officers of the Company, serve on the board of directors of Watford.

Subsidiaries of the Company act as Watford's reinsurance and insurance underwriting managers. The Company concluded that Watford is a VIE and that the Company is the primary beneficiary. Because Watford is an independent company, the assets of Watford can be used only to settle obligations of Watford and Watford is solely responsible for its own liabilities and commitments. The Company's financial exposure to Watford is limited to its investment in Watford's common shares and counterparty credit risk (mitigated by collateral) arising from the reinsurance transactions.

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

	December 31, 2019	December 31, 2018
Assets		
Investments accounted for using the fair value option	$ 1,898,091	$ 2,312,003
Fixed maturities available for sale, at fair value	745,708	393,351
Equity securities, at fair value	65,338	32,206
Cash	102,437	63,529
Accrued investment income	14,025	19,461
Premiums receivable	273,657	227,301
Reinsurance recoverable on unpaid and paid losses and LAE	170,973	86,445
Ceded unearned premiums	132,577	61,587
Deferred acquisition costs, net	64,044	80,858
Receivable for securities sold	16,287	24,507
Goodwill and intangible assets	7,650	7,650
Other assets	60,070	63,959
Total assets of consolidated VIE	$ 3,550,857	$ 3,372,857
Liabilities		
Reserves for losses and loss adjustment expenses	$ 1,263,628	$ 1,032,760
Unearned premiums	438,907	390,114
Reinsurance balances payable	77,066	21,034
Revolving credit agreement borrowings	484,287	455,682
Senior notes	172,418	—
Payable for securities purchased	18,180	60,142
Other liabilities	171,714	302,524
Total liabilities of consolidated VIE	$ 2,626,200	$ 2,262,256
Redeemable noncontrolling interests	$ 52,305	$ 220,992

The following table summarizes Watford's cash flow from operating, investing and financing activities.

	Year Ended December 31,	
	2019	2018
Total cash provided by (used for):		
Operating activities	$ 239,284	$ 229,315
Investing activities	(140,620)	(285,281)
Financing activities	(61,433)	(2,406)

Non-redeemable noncontrolling interests

The Company accounts for the portion of Watford's common equity attributable to third party investors in the shareholder's equity section of its consolidated balance sheets. The noncontrolling ownership in Watford's common shares was approximately 87% at December 31, 2019. The portion of Watford's income or loss attributable to third party investors is recorded in the consolidated statements of income in 'Net (income) loss attributable to noncontrolling interests.'

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

	December 31,	
	2019	2018
Balance, beginning of year	$ 791,560	$ 843,411
Additional paid in capital attributable to non-redeemable noncontrolling interests	(2,929)	—
Repurchases attributable to non-redeemable noncontrolling interests (1)	(75,056)	—
Amounts attributable to noncontrolling interests	40,072	(48,507)
Foreign currency translation adjustments	9,130	(3,344)
Balance, end of year	$ 762,777	$ 791,560

(1) During 2019, Watford's board of directors authorized the investment in Watford's common shares through a share repurchase program.

Redeemable noncontrolling interests

The Company accounts for redeemable noncontrolling interests in the mezzanine section of its consolidated balance sheets. Such redeemable noncontrolling interests primarily relate to the 9,065,200 cumulative redeemable preference shares ("Watford Preference Shares") issued in late March 2014 with a par value of $0.01 per share and a liquidation preference of $25.00 per share. The Watford Preference Shares were issued at a discounted amount of $24.50 per share. Holders of the Watford Preference Shares will be entitled to receive, if declared by Watford's board, quarterly cash dividends on the last day of March, June, September, and December. Dividends accrued from the closing date to June 30, 2019 at a fixed rate of 8.5% per annum. From June 30, 2019 and subsequent, dividends will accrue based on a floating rate equal to the 3 month U.S. dollar LIBOR (with a 1% floor) plus a margin based on the difference between the fixed rate and the 5 year mid swap rate to the floating rate.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. Because the redemption features are not solely within the control of Watford, the Company accounts for the redeemable noncontrolling interests in the Watford Preference Shares in the mezzanine section of its consolidated balance sheets. On August 1, 2019, Watford redeemed 6,919,998 of its 9,065,200 issued and outstanding preference shares at a total redemption price of $25.19748 per share, inclusive of all declared and unpaid dividends. The Company received $11.5 million pursuant to the redemption of Watford Preference Shares. Preferred dividends on the Watford Preference Shares, including the accretion of the discount and issuance costs, was $17.8 million for 2019, compared to $19.6 million for 2018. Preferred dividends, including the accretion of the discount and issuance costs, are included in 'amounts attributable to noncontrolling interests' in the Company's consolidated statements of income.

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

	December 31,	
	2019	2018
Balance, beginning of year	$ 206,292	$ 205,922
Redemption of redeemable noncontrolling interests	(157,709)	—
Accretion of preference share issuance costs	244	370
Other	6,577	—
Balance, end of year	$ 55,404	$ 206,292

The portion of Watford'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' as summarized in the table below:

	December 31,	
	2019	2018
Amounts attributable to non-redeemable noncontrolling interests	$ (40,072)	$ 48,507
Dividends attributable to redeemable noncontrolling interests	(16,909)	(18,357)
Net (income) loss attributable to noncontrolling interests	$ (56,981)	$ 30,150

Bellemeade Re

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

The following table presents total assets of the Bellemeade entities, as well as the Company's maximum exposure to loss associated with these VIEs, calculated as the spread between contractual payments and the value of the underlying notional amount of VIE assets or liabilities. See Note 7.

		Maximum Exposure to Loss		
	Total VIE Assets	On-Balance Sheet	Off-Balance Sheet	Total
December 31, 2019				
Bellemeade 2017-1 Ltd. (Oct-17)	$ 216,429	$ (442)	$ 2,794	$ 2,352
Bellemeade 2018-1 Ltd. (Apr-18)	328,482	(1,574)	5,757	4,183
Bellemeade 2018-2 Ltd. (Aug-18)	437,009	(877)	2,524	1,647
Bellemeade 2018-3 Ltd. (Oct-18)	426,806	(1,113)	3,937	2,824
Bellemeade 2019-1 Ltd. (Mar-19)	257,358	(226)	3,027	2,801
Bellemeade 2019-2 Ltd. (Apr-19)	525,959	(78)	2,579	2,501
Bellemeade 2019-3 Ltd. (Jul-19)	656,523	(585)	9,273	8,688
Bellemeade 2019-4 Ltd. (Oct-19)	577,267	(302)	12,193	11,891
Total	$ 3,425,833	$ (5,197)	$ 42,084	$ 36,887
December 31, 2018				
Bellemeade 2015-1 Ltd. (Jul-15)	$ 43,246	$ 112	$ 498	$ 610
Bellemeade 2017-1 Ltd. (Oct-17)	304,373	165	1,312	1,477
Bellemeade 2018-1 Ltd. (Apr-18)	374,460	132	3,539	3,671
Bellemeade 2018-2 Ltd. (Aug-18)	653,278	874	4,005	4,879
Bellemeade 2018-3 Ltd. (Oct-18)	506,110	469	1,836	2,305
Total	$ 1,881,467	$ 1,752	$ 11,190	$ 12,942

5. Reserve for Losses and Loss Adjustment Expenses

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

	Year Ended December 31,	
	2019	2018
Reserve for losses and loss adjustment expenses at beginning of year	$ 11,853,297	$ 11,383,792
Unpaid losses and loss adjustment expenses recoverable	2,814,291	2,464,910
Net reserve for losses and loss adjustment expenses at beginning of year	9,039,006	8,918,882
Net incurred losses and loss adjustment expenses relating to losses occurring in:		
Current year	3,297,037	3,162,818
Prior years	(163,585)	(272,712)
Total net incurred losses and loss adjustment expenses	3,133,452	2,890,106
Net losses and loss adjustment expense reserves of acquired business (1)	209,486	—
Retroactive reinsurance transaction (2)	(225,500)	(420,404)
Foreign exchange (gains) losses	36,003	(143,414)
Net paid losses and loss adjustment expenses relating to losses occurring in:		
Current year	(621,202)	(524,048)
Prior years	(1,762,053)	(1,682,116)
Total net paid losses and loss adjustment expenses	(2,383,255)	(2,206,164)
Net reserve for losses and loss adjustment expenses at end of year	9,809,192	9,039,006
Unpaid losses and loss adjustment expenses recoverable	4,082,650	2,814,291
Reserve for losses and loss adjustment expenses at end of year	$ 13,891,842	$ 11,853,297

(1) The 2019 amount primarily related to the acquisition of Barbican.
(2) During the 2019 first quarter and 2018 second quarter, a subsidiary of the Company entered into two separate retroactive reinsurance transactions with third party reinsurers to reinsure run-off liabilities associated with certain U.S. insurance exposures.

2019 Prior Year Reserve Development

During 2019, the Company recorded estimated net favorable development on prior year loss reserves of $163.6 million, which consisted of net favorable development of $15.8 million from the insurance operation, $46.4 million from the reinsurance operation and $125.2 million from the mortgage operation, partially offset by $23.8 million of net adverse development from the 'other' operation.

The insurance operation's net favorable development of $15.8 million, or 7.0 points of net earned premium, consisted of $54.9 million of net favorable development from short-tailed lines and $39.1 million of net adverse development from medium-tailed and long-tailed lines. Net favorable development in short-tailed lines primarily resulted from lenders products and property (including special risk other than marine) reserves across all accident years, (i.e., the year in which a loss occurred) partially offset by net adverse development in travel business, primarily from the 2018 accident year. Net adverse development in medium-tailed and long-tailed lines of $39.1 million was primarily due to net adverse development of $33.6 million in contract binding business, primarily from the 2013 to 2017 accident years, and $30.1 million in programs, primarily from the 2014 and 2018 accident years. Such amounts were partially offset by net favorable development of $19.3 million in professional liability business, primarily from the 2013 to 2016 accident years, and $15.8 million in surety business, primarily from the 2014 to 2016 accident years.

The reinsurance operation's net favorable development of $46.4 million, or 3.2 points of net earned premium, consisted of $70.5 million of net favorable development from short-tailed lines and $16.0 million of net favorable development from medium-tailed lines, partially offset by $40.1 million of net adverse development from long-tailed lines. Favorable development in short-tailed lines included $33.7 million from property catastrophe and property other than property catastrophe reserves, primarily from the 2017 and 2018 underwriting years (i.e., losses attributable to contracts having an inception or renewal date within the given twelve-month period) and $40.8 million in other specialty, primarily from 2016 to 2018 underwriting years.The net reduction of loss estimates for the reinsurance operation'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 2019. Net favorable development of $16.0 million in medium-tailed lines included reductions in marine and aviation reserves, primarily from the 2011 to 2017 underwriting years. Net adverse development in long-tailed lines of $40.1 million was primarily due to net adverse development of $44.5 million in casualty business, primarily from the 2013 to 2018 underwriting years.

The mortgage operation's net favorable development of $125.2 million, or 9.2 points of net earned premium, included $117.1 million of favorable development on U.S. primary mortgage business. Such development was primarily driven by continued lower than expected claim rates on first lien business and subrogation recoveries on second lien business.

2018 Prior Year Reserve Development

During 2018, the Company recorded estimated net favorable development on prior year loss reserves of $272.7 million, which consisted of $138.5 million from the reinsurance operation, $24.4 million from the insurance operation, $107.6 million from the mortgage operation and $2.2 million from the 'other' operation.

The reinsurance operation's net favorable development of $138.5 million, or 11.0 points of net earned premium, consisted of $110.4 million from short-tailed lines and $28.1 million of net favorable development from medium-tailed and long-tailed lines. Favorable development in short-tailed lines included $80.8 million from property catastrophe and property other than property catastrophe reserves, primarily from the 2008 to 2017 underwriting years (i.e., losses attributable to contracts having an inception or renewal date within the given twelve-month period). The net reduction of loss estimates for the reinsurance operation'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 2018. Net favorable development of $28.1 million in medium-tailed and long-tailed lines included reductions in casualty reserves of $12.5 million, primarily from the 2002 to 2010 underwriting years, and in marine and aviation reserves of $15.6 million, spread across most underwriting years.

The insurance operation's net favorable development of $24.4 million, or 1.1 points of net earned premium, consisted of $48.4 million of net favorable development from short-tailed lines and $26.3 million of net favorable development from long-tailed lines, partially offset by $50.3 million of net adverse development from medium-tailed lines. Favorable development in short-tailed lines predominantly consisted of $50.1 million of net favorable development in property lines, primarily from the 2010 to 2017 accident years (i.e., the year in which a loss occurred), partially offset by $5.0 million of adverse development on travel, accident and health business from the 2013 to 2017 accident years. Net favorable development in long-tailed lines of $26.3 million included $19.7 million of net favorable development on executive assurance business, primarily from the 2015 accident year, and $1.4 million of net favorable development in casualty business, primarily from the 2009 to 2015 accident years. Net adverse development in medium tailed lines of $50.3 million was primarily due to net adverse development in contract binding business for accident years 2013 to 2017.

The mortgage operation's net favorable development of $107.6 million, or 9.1 points of net earned premium, included $103.4 million of favorable development on U.S. primary mortgage business. Such development was primarily driven by lower than expected claim emergence across most origination years and also reflected $26.3 million related to second lien and other portfolios, primarily due to subrogation recoveries.

6. Short Duration Contracts

The Company's reserves for losses and loss adjustment expenses primarily relate to short-duration contracts with various characteristics (*e.g.*, type of coverage, geography, claims duration). The Company considered such information in determining the level of disaggregation for disclosures related to its short-duration contracts, as detailed in the table below:

Reportable operations	Level of disaggregation	Included lines of business
Insurance	Property energy, marine and aviation	Property energy, marine and aviation
	Third party occurrence business	Excess and surplus casualty (excluding contract binding); construction and national accounts; and other (including alternative market risks, excess workers' compensation and employer's liability insurance coverages)
	Third party claims-made business	Professional lines
	Multi-line and other specialty	Programs; contract binding (part of excess and surplus casualty); travel, accident and health; lenders products; and other (contract and commercial surety coverages)
Reinsurance	Casualty	Casualty
	Property catastrophe	Property catastrophe
	Property excluding property catastrophe	Property excluding property catastrophe
	Marine and aviation	Marine and aviation
	Other specialty	Other specialty
Mortgage	Direct mortgage insurance in the U.S.	Mortgage insurance on U.S. primary exposures

The Company determined the following to be insignificant for disclosure purposes: (i) amounts included in the 'other' operations (*i.e.*, Watford) as described in Note 4; (ii) certain mortgage business, including non-U.S. primary business, second lien and student loan exposures, global mortgage reinsurance and participation in various GSE credit risk-sharing products; and (iii) certain reinsurance business, including casualty clash and non-traditional lines, and (iv) amounts associated with the Barbican acquisition. Such amounts are included as reconciling items.

The Company is required to establish reserves for losses and loss adjustment expenses ("Loss Reserves") that arise from the business the Company underwrites. Loss Reserves for the insurance, reinsurance and mortgage operations represent estimates of future amounts required to pay losses and loss adjustment expenses for insured or reinsured events which have occurred at or before the balance sheet date. Loss Reserves do not reflect contingency reserve allowances to account for future loss occurrences. Losses arising from future events will be estimated and recognized at the time the losses are incurred and could be substantial.

Insurance Operations

Loss Reserves for the insurance operations are comprised of estimated amounts for (1) reported losses ("case reserves") and (2) incurred but not reported losses ("IBNR reserves"). Generally, claims personnel determine whether to establish a case reserve for the estimated amount of the ultimate settlement of individual claims. The estimate reflects the judgment of claims personnel based on general corporate reserving practices, the experience and knowledge of such personnel regarding the nature and value of the specific type of claim and, where appropriate, advice of counsel. The Company also contracts with a number of outside third party administrators in the claims process who, in certain cases, have limited authority to establish case reserves. The work of such administrators is reviewed and monitored by our claims personnel. Loss Reserves are also established to provide for loss adjustment expenses and represent the estimated expense of settling claims, including legal and other fees and the general expenses of administering the claims adjustment process. Periodically, adjustments to the case reserves may be made as additional information is reported or payments are made. IBNR reserves are established to provide for incurred claims which have not yet been reported at the balance sheet date as well as to adjust for any projected variance in case reserving. Actuaries estimate ultimate losses and loss adjustment expenses using various generally accepted actuarial methods applied to known losses and other relevant information. Like case reserves, IBNR reserves are adjusted as additional information becomes known or payments are made. The process of estimating reserves involves a considerable degree of judgment by management and, as of any given date, is inherently uncertain.

Ultimate losses and loss adjustment expenses are generally determined by extrapolation of claim emergence and settlement patterns observed in the past that can reasonably be expected to persist into the future. In forecasting ultimate losses and loss adjustment expenses with respect to any line of business, past experience with respect to that line of business is the primary resource, developed through both industry and company experience, but cannot be relied upon in isolation. Uncertainties in estimating ultimate losses and loss adjustment expenses are magnified by the length of the time lag between when a claim actually occurs and when it is reported and settled. This time lag is sometimes referred to as the "claim-tail." During this period additional facts regarding coverages written in prior accident years, as well as about actual claims and trends, may become known and, as a result, may lead to adjustments of the related Loss Reserves. If the Company determines that an adjustment is appropriate, the adjustment is recorded in the accounting period in which such determination is made. Accordingly, should Loss Reserves need to be increased or decreased in the future from amounts currently established, future results of operations would be negatively or positively impacted respectively. The Company authorizes managing general agents, general agents and other producers to write program business on the Company's behalf within prescribed underwriting authorities. This delegated authority process introduces additional complexity to the actuarial determination of unpaid future losses and loss adjustment expenses. In order to monitor adherence to the underwriting guidelines given to such parties, the Company periodically performs underwriting and claims due diligence reviews.

In determining ultimate losses and loss adjustment expenses, the cost to indemnify claimants, provide needed legal defense and other services for insureds and administer the investigation and adjustment of claims are considered. These claim costs are influenced by many factors that change over time, such as expanded coverage definitions as a result of new court decisions, inflation in costs to repair or replace damaged property, inflation in the cost of medical services and legislated changes in statutory benefits, as well as by the particular, unique facts that pertain to each claim. As a result, the rate at which claims arose in the past and the costs to settle them may not always be representative of what will occur in the future. The factors influencing changes in claim costs are often difficult to isolate or quantify and developments in paid and incurred losses from historical trends are frequently subject to multiple and conflicting interpretations. Changes in coverage terms or claims handling practices may also cause future experience and/or development patterns to vary from the past. A key objective of actuaries in developing estimates of ultimate losses and loss adjustment expenses, and resulting IBNR reserves, is to identify aberrations and systemic changes occurring within historical experience and adjust for them so that the future can be projected more reliably. Because of the factors previously discussed, this process requires the substantial use of informed judgment and is inherently uncertain.

Although Loss Reserves are initially determined based on underwriting and pricing analyses, the Company's insurance operations applies several generally accepted actuarial methods, as discussed below, on a quarterly basis to evaluate the Loss Reserves, in addition to the expected loss method, in particular for Loss Reserves from more mature accident years (the year in which a loss occurred). Each quarter, as part of the reserving process, the operations' actuaries reaffirm that the assumptions used in the reserving process continue to form a sound basis for the projection of liabilities. If actual loss activity differs substantially from expectations based on historical information, an adjustment to Loss Reserves may be supported. The Company places more or less reliance on a particular actuarial method based on the facts and circumstances at the time the estimates of Loss Reserves are made.

These methods generally fall into one of the following categories or are hybrids of one or more of the following categories:

- *Expected loss methods* - these methods are based on the assumption that ultimate losses vary proportionately with premiums. Expected loss and loss adjustment expense ratios are typically developed based upon the information derived by underwriters and actuaries during the initial pricing of the business, supplemented by industry data available from organizations, such as statistical bureaus and consulting firms, where appropriate. These ratios consider, among other things, rate increases and changes in terms and conditions that have been observed in the market. Expected loss methods are useful for estimating ultimate losses and loss adjustment expenses in the early years of long-tailed lines of business, when little or no paid or incurred loss information is available, and is commonly applied when limited loss experience exists for a company.

- *Historical incurred loss development methods* - these methods assume that the ratio of losses in one period to losses in an earlier period will remain constant in the future. These methods use incurred losses (*i.e.*, the sum of cumulative historical loss payments plus outstanding case reserves) over discrete periods of time to estimate future losses. Historical incurred loss development methods may be preferable to historical paid loss development methods because they explicitly take into account open cases and the claims adjusters' evaluations of the cost to settle all known claims. However, historical incurred loss development methods necessarily assume that case reserving practices are consistently applied over time. Therefore, when there have been significant changes in how case reserves are established, using incurred loss data to project ultimate losses may be less reliable than other methods.

- *Historical paid loss development methods* - these methods, like historical incurred loss development methods, assume that the ratio of losses in one period to losses in an earlier period will remain constant. These methods use historical loss payments over discrete periods of time to estimate future losses and necessarily assume that factors that have affected paid losses in the past, such as inflation or the effects of litigation, will remain constant in the future. Because historical paid loss development methods do not use incurred losses to estimate ultimate losses, they may be more reliable than the other methods that use incurred losses in situations where there are significant changes in how incurred losses are established by a company's claims adjusters. However, historical paid loss development methods are more leveraged (meaning that small changes in payments have a larger impact on estimates of ultimate losses) than actuarial methods that use incurred losses because cumulative loss payments take much longer to equal the expected ultimate losses than cumulative incurred amounts. In addition, and for similar reasons, historical paid loss development methods are often slow to react to situations when new or different factors arise than those that have affected paid losses in the past.

- *Adjusted historical paid and incurred loss development methods* - these methods take traditional historical paid and incurred loss development methods and adjust them for the estimated impact of changes from the past in factors such as inflation, the speed of claim payments or the adequacy of case reserves. Adjusted historical paid and incurred loss development methods are often more reliable methods of predicting ultimate losses in periods of significant change, provided the actuaries can develop methods to reasonably quantify the impact of changes. As such, these methods utilize more judgment than historical paid and incurred loss development methods.

- *Bornhuetter-Ferguson ("B-F") paid and incurred loss methods* - these methods utilize actual paid and incurred losses and expected patterns of paid and incurred losses, taking the initial expected ultimate losses into account to determine an estimate of expected ultimate losses. The B-F paid and incurred loss methods are useful when there are few reported claims and a relatively less stable pattern of reported losses.

- *Frequency-Severity methods* - These methods utilize actual paid and incurred claim experience, but break the data down into its component pieces: claim counts, often expressed as a ratio to exposure or premium (frequency), and average claim size (severity). The component pieces are projected to an ultimate level and multiplied together to result in an estimate of ultimate loss. These methods are especially useful when the severity of claims can be confined to a relatively stable range of estimated ultimate average claim value.

- *Additional analyses* - other methodologies are often used in the reserving process for specific types of claims or events, such as catastrophic or other specific major events. These include vendor catastrophe models, which are typically used in the estimation of Loss Reserves at the early stage of known catastrophic events before information has been reported to an insurer or reinsurer.

In the initial reserving process for short-tail insurance lines (consisting of property, energy, marine and aviation and other exposures including travel, accident and health and lenders products), the Company relies on a combination of the reserving methods discussed above. For catastrophe-exposed business, the reserving process also includes the usage of catastrophe models for known events and a heavy reliance on analysis of individual catastrophic events and management judgment. The development of losses on short-tail business can be unstable, especially for policies characterized by high severity, low frequency losses. As time passes, for a given accident year, additional weight is given to the paid and incurred B-F loss development methods and historical paid and incurred loss development methods in the reserving process. The Company makes a number of key assumptions in their reserving process, including that historical paid and reported development patterns are stable, catastrophe models provide useful information about our exposure to catastrophic events that have occurred and underwriters' judgment as to potential loss exposures can be relied on. The expected loss ratios used in the initial reserving process for short-tail business have varied over time due to changes in pricing, reinsurance structure, estimates of catastrophe losses, policy changes (such as attachment points, class and limits) and geographical distribution. As losses in short-tail lines are reported relatively quickly, expected loss ratios are selected for the current accident year based upon actual attritional loss ratios for earlier accident years, adjusted for rate changes, inflation, changes in reinsurance programs and expected attritional losses based on modeling. Furthermore, ultimate losses for short-tail business are known in a reasonably short period of time.

In the initial reserving process for medium-tail and long-tail insurance lines **(**consisting of third party occurrence business, third party claims made business, and other exposures including surety, programs and contract binding exposures), the Company primarily relies on the expected loss method. The development of the Company's medium-tail and long-tail business may be unstable, especially if there are high severity major events, as a portion of the Company's casualty business is in high excess layers. As time passes, for a given accident year, additional weight is given to the paid and incurred B-F loss development methods and historical paid and incurred loss development methods in the reserving process. The Company makes a number of key assumptions in reserving for medium-tail and long-tail lines, including that the pricing loss ratio is the best estimate of the ultimate loss ratio at the time the policy is entered into, that the loss development patterns, which are based on a combination of company and industry loss development patterns and adjusted to reflect differences in the insurance operation's mix of business, are reasonable and that claims personnel and underwriters analyses of our exposure to major events are assumed to be the best estimate of exposure to the known claims on those events. The expected loss ratios used in the initial reserving process for medium-tail and long-tail business for recent accident years have varied over time, in some cases significantly, from earlier accident years. As the credibility of historical experience for earlier accident years increases, the experience from these accident years will be given a greater weighting in the actuarial analysis to determine future accident year expected loss ratios, adjusted for changes in pricing, loss trends, terms and conditions and reinsurance structure.

In 2019 and 2018, the Company entered into two separate loss portfolio transfers and adverse development cover reinsurance agreements accounted for as retroactive reinsurance. These agreements transfer Loss Reserves and future favorable or adverse development on certain runoff programs, within multi-line and other specialty business, and certain third party occurrence business (the "Covered Lines"). As incurred losses and allocated loss adjustment expenses for the Covered Lines are ceded to the reinsurer, the Company is not exposed to changes in the amount, timing and uncertainty of cash flows arising from the Covered Lines. To avoid distortion, the incurred losses and allocated loss adjustment expenses and cumulative paid losses and loss adjustment expenses for the Covered Lines are excluded entirely from the tables below. Reinsurance recoverables at December 31, 2019 included $319.3 million related to these reinsurance agreements.

The following tables present information on the insurance operation's short-duration insurance contracts:

Property, energy, marine and aviation ($000's except claim count)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 197,399	$ 187,305	$ 151,937	$ 139,757	$ 128,475	$ 128,799	$ 127,530	$ 124,974	$ 120,813	$ 118,570	$ 1,310	3,676
2011		266,725	269,790	229,244	217,753	208,494	205,344	198,763	198,956	198,370	868	4,219
2012			230,399	229,820	203,408	197,187	194,746	190,930	188,649	178,394	2,487	4,266
2013				156,936	154,313	146,777	140,967	132,839	132,211	128,247	752	4,279
2014					146,391	143,825	145,065	134,055	133,482	129,973	6,769	3,930
2015						110,867	108,260	102,535	102,221	97,361	5,669	4,613
2016							102,910	99,899	104,246	100,542	560	6,388
2017								278,549	247,072	235,152	14,830	6,744
2018									185,486	179,262	29,117	5,333
2019										161,850	59,863	5,688
									Total	$1,527,721		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 28,433	$ 65,846	$ 87,476	$ 105,887	$ 110,892	$ 117,737	$ 119,953	$ 118,437	$ 119,276	$ 116,822
2011		34,002	98,616	140,555	165,950	198,128	199,943	195,613	196,272	196,056
2012			20,301	92,034	137,179	159,862	165,488	177,945	179,138	173,058
2013				31,874	83,689	109,088	118,131	120,385	123,392	123,696
2014					25,620	53,060	76,774	83,080	86,518	99,041
2015						23,271	63,990	75,340	84,964	88,433
2016							24,442	82,357	97,147	97,674
2017								29,915	138,525	196,290
2018									29,641	102,798
2019										26,014
									Total	1,219,882
	All outstanding liabilities before 2010, net of reinsurance									32,875
	Liabilities for losses and loss adjustment expenses, net of reinsurance									$ 340,714

Third party occurrence business ($000's except claim count)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 217,431	$ 235,241	$ 230,710	$ 230,859	$ 233,204	$ 229,534	$ 223,618	$ 215,332	$ 218,374	$ 211,046	$ 33,176	62,757
2011		233,958	240,406	253,691	258,348	252,227	253,598	246,721	239,395	233,563	44,601	71,101
2012			240,917	262,373	267,980	270,603	257,059	252,497	242,648	242,454	60,258	65,806
2013				282,629	296,492	306,358	301,403	281,437	275,101	271,116	74,749	66,990
2014					329,448	335,281	338,194	342,455	340,408	341,595	98,049	75,526
2015						358,478	391,198	398,185	394,268	388,744	146,656	77,727
2016							389,333	393,991	406,785	397,914	193,182	77,100
2017								416,856	419,456	421,414	254,057	82,458
2018									434,854	450,950	315,814	74,221
2019										454,723	390,054	62,988
									Total	$3,413,519		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 6,753	$ 25,511	$ 45,550	$ 72,696	$ 102,391	$ 117,250	$ 132,818	$ 142,380	$ 148,140	$ 158,370
2011		7,006	25,142	43,309	73,268	113,283	134,342	152,472	160,326	171,744
2012			6,962	30,799	58,387	83,193	108,087	129,369	142,932	153,263
2013				6,842	29,214	71,328	101,148	122,043	148,951	162,910
2014					9,204	40,232	71,397	112,434	161,780	188,871
2015						11,112	44,522	88,383	139,283	179,435
2016							11,684	41,893	87,424	135,617
2017								13,392	52,283	99,225
2018									16,994	62,762
2019										18,202
									Total	1,330,399
					All outstanding liabilities before 2010, net of reinsurance					181,719
					Liabilities for losses and loss adjustment expenses, net of reinsurance					$2,264,839

Third party claims-made business ($000's except claim count)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 286,202	$ 311,709	$ 332,779	$ 338,238	$ 331,006	$ 314,388	$ 298,444	$ 280,497	$ 283,530	$ 284,427	$ 8,775	12,335
2011		281,448	323,369	314,961	309,684	315,118	294,367	281,487	284,242	279,909	14,003	11,762
2012			309,654	312,143	310,359	305,362	283,903	268,765	271,663	272,826	17,820	14,759
2013				295,759	313,601	317,165	313,738	288,506	286,280	271,290	29,604	14,542
2014					260,698	275,172	293,467	273,876	278,182	287,424	42,805	13,935
2015						254,540	272,413	271,343	257,902	246,366	43,026	13,815
2016							270,537	286,677	306,837	304,266	81,707	15,716
2017								266,526	284,875	300,710	131,795	15,904
2018									272,655	301,247	177,552	14,934
2019										271,824	224,119	9,698
									Total	$2,820,289		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 13,811	$ 70,583	$ 127,531	$ 162,490	$ 197,142	$ 213,530	$ 229,824	$ 233,085	$ 241,887	$ 252,119
2011		13,510	71,038	128,011	171,354	204,215	223,458	235,181	248,524	259,416
2012			17,307	67,314	117,891	160,480	185,656	204,240	221,391	240,281
2013				18,557	85,442	134,509	175,328	193,704	212,488	230,377
2014					13,572	62,308	127,683	170,331	204,330	223,907
2015						8,845	51,064	98,371	124,381	168,664
2016							10,371	67,446	125,740	156,030
2017								9,180	66,582	111,532
2018									12,123	67,567
2019										11,443
									Total	1,721,336
					All outstanding liabilities before 2010, net of reinsurance					126,168
					Liabilities for losses and loss adjustment expenses, net of reinsurance					$1,225,121

Multi-line and other specialty ($000's except claim count)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 173,984	$ 176,796	$ 169,307	$ 166,892	$ 158,092	$ 154,716	$ 153,526	$ 153,598	$ 151,951	$ 150,342	$ 2,508	37,891
2011		182,372	187,924	182,213	175,794	171,923	171,691	168,243	169,851	169,467	3,097	44,881
2012			252,699	263,326	257,420	255,055	254,155	246,077	246,482	243,042	4,255	55,403
2013				263,349	271,603	262,837	263,097	251,187	252,713	247,659	7,096	71,701
2014					300,962	324,736	317,210	317,161	316,047	312,400	11,578	109,295
2015						333,519	356,543	355,484	363,627	355,095	17,097	147,950
2016							406,309	428,530	425,281	413,668	25,881	173,735
2017								479,694	498,860	488,276	46,435	217,360
2018									573,827	621,724	123,652	243,725
2019										604,356	299,028	169,915
									Total	$3,606,029		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 49,906	$ 91,265	$ 111,143	$ 125,897	$ 135,981	$ 140,372	$ 143,459	$ 146,357	$ 146,482	$ 146,413
2011		51,145	102,910	117,372	136,078	147,466	151,126	156,619	158,902	161,887
2012			78,178	165,305	189,330	208,372	222,024	230,929	232,064	235,461
2013				86,403	150,432	179,785	212,713	224,665	233,572	235,784
2014					107,529	196,081	232,950	265,927	279,950	290,702
2015						137,561	235,193	276,608	304,464	319,788
2016							174,366	302,470	339,125	360,602
2017								179,777	339,753	378,500
2018									213,065	399,443
2019										213,559
									Total	2,742,139
									All outstanding liabilities before 2010, net of reinsurance	23,337
									Liabilities for losses and loss adjustment expenses, net of reinsurance	$ 887,227

The following table presents the average annual percentage payout of incurred losses and allocated loss adjustment expenses by age, net of reinsurance, as of December 31, 2019:

	Average annual percentage payout of incurred losses and allocated loss adjustment expenses by age, net of reinsurance									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Property, energy, marine and aviation	19.1%	39.1%	19.2%	9.1%	5.3%	5.1%	0.1%	(1.5)%	0.3%	(2.1)%
Third party occurrence business	3.1%	8.8%	10.9%	12.0%	12.3%	8.5%	6.5%	4.1 %	3.8%	4.8 %
Third party claims-made business	4.6%	19.3%	19.1%	13.4%	11.6%	6.6%	5.7%	4.3 %	3.5%	3.6 %
Multi-line and other specialty	35.2%	29.9%	10.5%	9.4%	5.4%	3.2%	1.7%	1.6 %	0.9%	— %

Reinsurance Operations

Loss Reserves for the Company's reinsurance operations are comprised of (1) case reserves, (2) additional case reserves ("ACRs") and (3) IBNR reserves. The Company receives reports of claims notices from ceding companies and records case reserves based upon the amount of reserves recommended by the ceding company. Case reserves may be supplemented by ACRs, which may be estimated by the Company's claims personnel ahead of official notification from the ceding company, or when judgment regarding the size or severity of the known event differs from the ceding company. In certain instances, the Company establishes ACRs even when the ceding company does not report any liability on a known event. In addition, specific claim information reported by ceding companies or obtained through claim audits can alert the Company to emerging trends such as changing legal interpretations of coverage and liability, claims from unexpected sources or classes of business, and significant changes in the frequency or severity of individual claims. Such information is often used in the process of estimating IBNR reserves. IBNR reserves are established to provide for incurred claims which have not yet been reported at the balance sheet date as well as to adjust for any projected variance in case reserving. Actuaries estimate ultimate losses and loss adjustment expenses using various generally accepted actuarial methods applied to known losses and other relevant information. Like case reserves, IBNR reserves are adjusted as additional information becomes known or payments are made. The process of estimating Loss Reserves involves a considerable degree of judgment by management and, as of any given date, is inherently uncertain.

The estimation of Loss Reserves for the reinsurance operations is subject to the same risk factors as the estimation of Loss Reserves for the insurance operations. In addition, the inherent uncertainties of estimating such reserves are even greater for reinsurers, due primarily to the following factors: (1) the claim-tail for reinsurers is generally longer because claims are first reported to the ceding company and then to the reinsurer through one or more intermediaries, (2) the reliance on premium estimates, where reports have not been received from the ceding company, in the reserving process, (3) the potential for writing a number of reinsurance contracts with different ceding companies with the same exposure to a single loss event, (4) the diversity of loss development patterns among different types of reinsurance contracts, (5) the necessary reliance on the ceding companies for information regarding reported claims and (6) the differing reserving practices among ceding companies.

As with the insurance operations, the process of estimating Loss Reserves for the reinsurance operations involves a considerable degree of judgment by management and, as of any given date, is inherently uncertain. As discussed above, such uncertainty is greater for reinsurers compared to insurers. As a result, our reinsurance operations obtain information from numerous sources to assist in the process. Pricing actuaries from the reinsurance operations devote considerable effort to understanding and analyzing a ceding company's operations and loss history during the underwriting of the business, using a combination of ceding company and industry statistics. Such statistics normally include historical premium and loss data by class of business, individual claim information for larger claims, distributions of insurance limits provided, loss reporting and payment patterns, and rate change history. This analysis is used to project expected loss ratios for each treaty during the upcoming contract period.

As mentioned above, there can be a considerable time lag from the time a claim is reported to a ceding company to the time it is reported to the reinsurer. The lag can be several years in some cases and may be attributed to a number of reasons, including the time it takes to investigate a claim, delays associated with the litigation process, the deterioration in a claimant's physical condition many years after an accident occurs, the case reserving approach of the ceding company, etc. In the reserving process, the Company assumes that such lags are predictable, on average, over time and therefore the lags are contemplated in the loss reporting patterns used in their actuarial methods. This means that the reinsurance operations must rely on estimates for a longer period of time than does an insurance company. Backlogs in the recording of assumed reinsurance can also complicate the accuracy of loss reserve estimation. As of December 31, 2019 there were no significant backlogs related to the processing of assumed reinsurance information at our reinsurance operations.

The reinsurance operations relies heavily on information reported by ceding companies, as discussed above. In order to determine the accuracy and completeness of such information, underwriters, actuaries, and claims personnel often perform audits of ceding companies and regularly review information received from ceding companies for unusual or unexpected results. Material findings are usually discussed with the ceding companies. The Company sometimes encounters situations where they determine that a claim presentation from a ceding company is not in accordance with contract terms. In these situations, the Company attempts to resolve the dispute with the ceding company. Most situations are resolved amicably and without the need for litigation or arbitration. However, in the infrequent situations where a resolution is not possible, the Company will vigorously defend its position in such disputes.

Although Loss Reserves are initially determined based on underwriting and pricing analysis, the Company applies several generally accepted actuarial methods, as discussed above, on a quarterly basis to evaluate its Loss Reserves in addition to the expected loss method, in particular for reserves from more mature underwriting years (the year in which business is underwritten). Each quarter, as part of the reserving process, the Company's actuaries reaffirm that the assumptions used in the reserving process continue to form a sound basis for projection of liabilities. If actual loss activity differs substantially from expectations based on historical information, an adjustment to Loss Reserves may be supported. Estimated Loss Reserves for more mature underwriting years are now based more on actual loss activity and historical patterns than on the initial assumptions based on pricing indications. More recent underwriting years rely more heavily on internal pricing assumptions. The Company places more or less reliance on a particular actuarial method based on the facts and circumstances at the time the estimates of Loss Reserves are made.

In the initial reserving process for short-tail reinsurance lines (consisting of property excluding property catastrophe and property catastrophe exposures), the Company relies on a combination of the reserving methods discussed above. For known catastrophic events, the reserving process also includes the usage of catastrophe models and a heavy reliance on analysis which includes ceding company inquiries and management judgment. The development of property losses may be unstable, especially where there is high catastrophic exposure, may be characterized by high severity, low frequency losses for excess and catastrophe-exposed business and may be highly correlated across contracts. As time passes, for a given underwriting year, additional weight is given to the paid and incurred B-F loss development methods and historical paid and incurred loss development methods in the reserving process. The Company makes a number of key assumptions in reserving for short-tail lines, including that historical paid and reported development patterns are stable, catastrophe models provide useful information about our exposure to catastrophic events that have occurred and our underwriters' judgment and guidance received from ceding companies as to potential loss exposures may be relied on. The expected loss ratios used in the initial reserving process for property exposures have varied over time due to changes in pricing, reinsurance structure, estimates of catastrophe losses, terms and conditions and geographical distribution. As losses in property lines are reported relatively quickly, expected loss ratios are selected for the current underwriting year incorporating the experience for earlier underwriting years, adjusted for rate changes, inflation, changes in reinsurance programs, expectations about present and future market conditions and expected attritional losses based on modeling. Due to the short-tail nature of property business, reported loss experience emerges quickly and ultimate losses are known in a reasonably short period of time.

In the initial reserving process for medium-tail and long-tail reinsurance lines (consisting of casualty, other specialty, marine and aviation and other exposures), the Company primarily relies on the expected loss method. The development of medium-tail and long-tail business may be unstable, especially if there are high severity major events, with business written on an excess of loss basis typically having a longer tail than business written on a pro rata basis. As time passes, for a given underwriting year, additional weight is given to the paid and incurred B-F loss development methods and historical paid and incurred loss development methods in the reserving process. Our reinsurance operations make a number of key assumptions in reserving for medium-tail and long-tail lines, including that the pricing loss ratio is the best estimate of the ultimate loss ratio at the time the contract is entered into, historical paid and reported development patterns are stable and claims personnel and underwriters analyses of our exposure to major events are assumed to be our best estimate of our exposure to the known claims on those events. The expected loss ratios used in our reinsurance operations' initial reserving process for medium-tail and long-tail contracts have varied over time due to changes in pricing, terms and conditions and reinsurance structure. As the credibility of historical experience for earlier underwriting years increases, the experience from these underwriting years will be used in the actuarial analysis to determine future underwriting year expected loss ratios, adjusted for changes in pricing, loss trends, terms and conditions and reinsurance structure.

The following tables present information on the reinsurance operation's short-duration insurance contracts:

Casualty ($000's)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 189,406	$ 190,639	$ 193,935	$ 185,429	$ 175,107	$ 164,530	$ 158,797	$ 154,969	$ 149,360	$ 145,012	$ 22,988	N/A
2011		149,186	152,793	146,786	141,854	137,580	134,486	128,535	125,712	127,056	23,269	N/A
2012			142,523	140,694	136,540	124,626	114,660	109,376	118,026	121,306	32,311	N/A
2013				165,465	158,693	154,478	148,223	136,163	134,615	130,954	39,769	N/A
2014					216,073	221,252	218,392	232,303	228,802	238,510	52,506	N/A
2015						222,008	220,835	229,481	236,743	240,762	65,978	N/A
2016							213,803	226,214	249,540	264,406	73,050	N/A
2017								264,219	250,550	265,751	78,119	N/A
2018									278,129	292,526	167,212	N/A
2019										326,258	254,304	N/A
									Total	$2,152,541		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 2,135	$ 20,781	$ 37,608	$ 51,467	$ 69,362	$ 79,732	$ 90,611	$ 98,414	$ 106,944	$ 108,584
2011		2,300	11,403	21,541	38,315	54,298	63,712	70,578	75,747	81,596
2012			1,294	8,458	14,648	25,468	36,497	47,732	59,423	69,776
2013				2,466	9,902	22,998	43,009	54,496	63,035	70,674
2014					3,912	16,038	40,763	63,376	90,965	114,226
2015						4,457	20,254	47,198	70,956	96,592
2016							5,735	25,643	51,641	86,681
2017								6,425	29,376	59,262
2018									7,579	31,572
2019										16,101
									Total	735,064
							All outstanding liabilities before 2010, net of reinsurance			290,219
							Liabilities for losses and loss adjustment expenses, net of reinsurance			$1,707,696

Property catastrophe ($000's)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 92,632	$ 47,218	$ 38,916	$ 38,823	$ 42,333	$ 42,732	$ 42,535	$ 42,738	$ 42,544	$ 43,500	$ —	N/A
2011		203,903	183,897	165,402	152,784	148,956	148,230	146,028	141,950	140,905	—	N/A
2012			149,918	122,948	108,624	102,158	99,931	99,118	97,084	97,192	164	N/A
2013				66,695	47,409	36,133	31,664	29,119	28,400	27,532	(125)	N/A
2014					44,896	30,625	25,114	22,263	20,527	19,822	(10)	N/A
2015						32,159	16,787	10,497	4,546	2,715	184	N/A
2016							23,411	16,786	13,044	9,370	639	N/A
2017								78,418	45,467	42,594	(3,620)	N/A
2018									72,769	59,033	4,671	N/A
2019										43,497	15,329	N/A
									Total	$ 486,160		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 8,464	$ 23,406	$ 31,371	$ 37,332	$ 38,527	$ 40,092	$ 41,357	$ 41,411	$ 41,593	$ 41,901
2011		59,545	82,065	113,275	127,960	133,439	135,928	137,967	138,355	138,911
2012			25,850	70,836	83,869	90,774	92,933	94,062	94,672	95,359
2013				12,126	19,095	23,872	25,704	27,450	27,690	27,694
2014					13,657	19,823	18,280	19,108	18,699	18,892
2015						(3,689)	(3,422)	784	1,044	569
2016							(7,324)	1,331	1,593	2,778
2017								28,735	27,463	31,558
2018									25,481	11,872
2019										3,903
									Total	373,437
									All outstanding liabilities before 2010, net of reinsurance	330
									Liabilities for losses and loss adjustment expenses, net of reinsurance	$ 113,053

Property excluding property catastrophe ($000's)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 142,466	$ 128,147	$ 117,919	$ 112,249	$ 110,319	$ 108,188	$ 104,403	$ 101,224	$ 100,442	$ 99,299	$ 821	N/A
2011		206,803	179,479	166,987	163,262	159,117	157,811	155,539	154,519	153,198	1,531	N/A
2012			156,087	121,698	123,613	119,040	114,617	112,398	110,927	108,374	850	N/A
2013				115,375	76,856	70,499	66,121	64,397	63,616	62,423	787	N/A
2014					143,307	117,304	99,198	90,708	88,436	84,134	3,430	N/A
2015						213,740	188,293	183,977	188,219	187,493	13,082	N/A
2016							176,017	145,251	137,493	136,298	19,522	N/A
2017								256,757	239,608	226,555	21,691	N/A
2018									222,345	240,094	31,217	N/A
2019										213,206	94,880	N/A
									Total	$1,511,074		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 37,776	$ 76,429	$ 88,196	$ 93,354	$ 95,571	$ 96,718	$ 97,363	$ 97,793	$ 97,733	$ 97,842
2011		47,605	121,234	141,120	145,621	147,675	148,777	149,019	149,291	150,305
2012			26,109	77,957	93,165	101,831	102,801	103,435	102,612	102,552
2013				25,955	42,669	49,753	52,931	53,730	55,609	61,118
2014					23,500	62,790	71,691	76,632	78,271	78,659
2015						75,325	118,655	149,122	160,029	165,186
2016							33,282	94,875	98,708	104,085
2017								25,258	116,304	145,172
2018									29,478	107,496
2019										45,380
									Total	1,057,795
									All outstanding liabilities before 2010, net of reinsurance	5,302
									Liabilities for losses and loss adjustment expenses, net of reinsurance	$ 458,581

Marine and aviation ($000's)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 40,973	$ 42,297	$ 38,520	$ 35,428	$ 33,524	$ 31,910	$ 31,160	$ 30,331	$ 28,521	$ 28,347	$ 32	N/A
2011		39,323	32,910	35,848	32,405	28,785	27,188	27,253	24,863	23,783	1,541	N/A
2012			59,013	58,857	55,027	52,261	51,053	49,697	46,019	43,000	4,052	N/A
2013				39,025	37,841	36,796	35,364	35,265	34,528	34,084	8,204	N/A
2014					30,949	29,140	27,334	25,633	23,635	23,270	6,819	N/A
2015						33,831	37,614	31,831	31,770	30,822	5,769	N/A
2016							27,366	22,752	23,569	19,279	10,917	N/A
2017								28,796	26,342	23,806	10,283	N/A
2018									28,164	26,206	13,754	N/A
2019										39,801	23,090	N/A
									Total	$ 292,398		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 8,523	$ 13,402	$ 16,752	$ 18,478	$ 20,220	$ 26,535	$ 27,182	$ 27,544	$ 27,119	$ 27,118
2011		4,420	12,121	16,529	19,231	15,952	16,626	21,979	21,903	21,965
2012			2,657	11,434	27,518	33,294	35,033	36,232	37,719	38,010
2013				4,932	13,845	18,511	21,500	22,510	23,778	24,155
2014					4,151	7,946	11,538	12,410	14,583	15,016
2015						5	13,436	19,052	20,888	22,663
2016							(7,317)	(1,676)	523	3,258
2017								1,657	6,516	9,339
2018									2,001	7,015
2019										9,074
									Total	177,613
									All outstanding liabilities before 2010, net of reinsurance	17,110
									Liabilities for losses and loss adjustment expenses, net of reinsurance	$ 131,895

Other specialty ($000's)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance										December 31, 2019	
	Year ended December 31,											
Accident year	2010 unaudited	2011 unaudited	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of reported claims
2010	$ 43,160	$ 32,881	$ 26,070	$ 23,827	$ 22,821	$ 22,461	$ 22,222	$ 21,990	$ 21,382	$ 21,171	$ 670	N/A
2011		112,256	97,229	93,206	91,553	89,670	88,313	87,708	85,812	86,232	2,679	N/A
2012			221,101	210,448	200,482	194,895	192,692	195,632	193,811	188,044	12,317	N/A
2013				251,978	225,620	215,711	212,088	213,089	210,698	210,201	15,212	N/A
2014					275,419	256,819	258,738	251,960	246,896	248,573	19,791	N/A
2015						210,183	201,558	199,726	196,972	197,337	24,609	N/A
2016							223,625	221,177	215,354	210,053	26,895	N/A
2017								275,721	265,098	255,873	44,453	N/A
2018									333,228	328,750	80,916	N/A
2019										372,747	170,179	N/A
									Total	$2,118,981		

	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2010	$ 4,049	$ 13,424	$ 16,559	$ 17,584	$ 18,366	$ 18,943	$ 19,165	$ 19,783	$ 19,802	$ 19,818
2011		28,875	57,832	69,981	74,604	78,073	79,803	81,984	83,080	82,787
2012			45,128	120,600	143,106	154,202	161,902	166,066	170,374	172,137
2013				56,857	118,642	144,491	160,651	170,279	175,474	182,911
2014					68,948	146,900	182,625	195,903	202,401	213,450
2015						54,762	114,768	138,794	145,820	154,816
2016							64,928	138,782	162,836	174,625
2017								74,926	167,782	197,699
2018									74,550	208,755
2019										83,456
									Total	1,490,454
									All outstanding liabilities before 2010, net of reinsurance	9,262
									Liabilities for losses and loss adjustment expenses, net of reinsurance	$ 637,789

The following table presents the average annual percentage payout of incurred losses and allocated loss adjustment expenses by age, net of reinsurance, as of December 31, 2019:

	Average annual percentage payout of incurred losses and allocated loss adjustment expenses by age, net of reinsurance									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Casualty	2.2%	7.5%	9.7%	11.4%	10.8 %	8.0%	7.1%	6.0%	5.2 %	1.1%
Property catastrophe	10.7%	25.5%	28.8%	9.2%	(0.7)%	1.7%	1.2%	0.4%	0.4 %	0.7%
Property excluding property catastrophe	27.2%	38.8%	11.6%	5.3%	1.7 %	1.2%	2.2%	0.2%	0.3 %	0.1%
Marine and aviation	8.7%	25.0%	17.3%	9.1%	2.4 %	6.7%	7.3%	0.5%	(0.6)%	—%
Other specialty	26.4%	35.7%	12.9%	5.5%	3.9 %	2.8%	2.4%	1.7%	(0.1)%	0.1%

Mortgage Operations

The Company’s mortgage operations includes (1) direct mortgage insurance in the U.S., (2) direct mortgage insurance in Europe, (3) global mortgage reinsurance and (4) participation in various GSE credit risk-sharing products, with the latter three categories along with second lien and student loan exposures excluded on the basis of insignificance for the purposes of presenting disclosures related to short duration contracts.

For direct mortgage insurance business, the Company establishes case reserves for loans that have been reported as delinquent by loan servicers as well as those that are delinquent but not reported (IBNR reserves). The Company’s U.S. mortgage insurance operations also reserve for the expenses of adjusting claims related to these delinquencies. The trigger that creates a case reserve estimate is that an insured loan is reported to us as being two payments in arrears. The actuarial reviews and documentation created in the reserving process are completed in accordance with generally accepted actuarial standards. The selected assumptions reflect the actuary’s judgment based on historical data and experience combined with information concerning current underwriting, economic, judicial, regulatory and other influences on ultimate claim settlements.

Because the reserving process requires the Company to forecast future conditions, it is inherently uncertain and requires significant judgment and estimation. The use of different estimates would result in the establishment of different reserve levels. Additionally, changes in accounting estimates are likely to occur from period to period as economic conditions change and the ultimate liability may vary significantly from the estimates used. Major risk factors include (but are not limited to) changes in home prices and borrower equity, which can limit the borrower’s ability to sell the property and satisfy the outstanding loan balance, and changes in unemployment, which can affect the borrower’s income and ability to make mortgage payments.

The lead methodology used by the Company is a frequency-severity method based on the inventory of pending delinquencies. Each month the loan servicers report the delinquency status of each insured loan. Using the frequency-severity method allows the Company to take advantage of its knowledge of the number of delinquent loans and the coverage provided (“risk size”) on those loans by directly relating the reserves to these amounts. The delinquencies are grouped into homogeneous cohorts for analysis, reflecting product type and age of delinquency. A claim rate is then developed for each cohort which represents the frequency with which the delinquencies become claims. The claim frequency rates are based on an analysis of the patterns of emerging cure counts and claim counts, the foreclosure status of the pending delinquencies, the product and geographical mix of the delinquencies and our view of future economic and claim conditions, which include trends in home prices and unemployment. Claim rates can vary materially by age of delinquency, depending on the mix of delinquencies and economic conditions.

Claim size severity estimates are determined by examining the risk sizes on the delinquent loans and estimating the portion of risk that will be paid, as well as any expenses. This is done based on a review of historical development patterns, an assessment of economic conditions and the level of equity the borrowers may have in their homes, as well as considering economic conditions and loss mitigation opportunities. Mortgage insurance is generally not subject to large claim sizes, as with some other lines of insurance. A claim size over $250,000 is rare, and this helps reduce the volatility of claim size estimates. The claim rate and claim size assumptions generate case reserves for the population of reported delinquencies. The reserve for unreported delinquencies (included in IBNR reserves) is estimated by looking at historical patterns of reporting. Claim rates and claim sizes can then be assigned to estimated unreported delinquencies using assumptions made in the establishment of case reserves.

Mortgage insurance Loss Reserves are short-tail, in the sense that the vast majority of delinquencies are resolved within two years of being reported. While reserves are initially analyzed by reserve cohort, as described above, they are also rolled up by underwriting year to ensure that reserve assumptions are consistent with the performance of the underwriting year. The accuracy of prior reserve assumptions is also checked in hindsight to determine if adjustments to the assumptions are needed.

Loss Reserves for the Company's mortgage reinsurance business and GSE credit-risk sharing transactions are comprised of case reserves and IBNR reserves. The Company's mortgage reinsurance operations receive reports of delinquent loans and claims notices from ceding companies and record case reserves based upon the amount of reserves recommended by the ceding company. In addition, specific claim and delinquency information reported by ceding companies is used in the process of estimating IBNR reserves.

The tables below include the acquired business of United Guaranty Corporation ("UGC") (including United Guaranty Residential Insurance Company), across all periods presented. Due to the length of time for which claims incurred typically remain outstanding prior to payment and the Company's formation of the mortgage operations in 2014, the Company determined that eight accident years was sufficient for its current disclosures. The following table presents information on the mortgage operation's short-duration insurance contracts:

Direct mortgage insurance business in the U.S. ($000's except claim count)

	Incurred losses and allocated loss adjustment expenses, net of reinsurance								December 31, 2019	
	Year ended December 31,									
Accident year	2012 unaudited	2013 unaudited	2014 unaudited	2015 unaudited	2016 unaudited	2017 unaudited	2018 unaudited	2019	Total of IBNR liabilities plus expected development on reported claims	Cumulative number of paid claims
2012	$ 520,835	$ 480,592	$ 475,317	$ 469,238	$ 467,296	$ 459,467	$ 458,065	$ 456,286	$ 46	15,052
2013		469,311	419,668	411,793	405,809	395,693	393,149	390,987	38	9,445
2014			316,095	297,151	279,434	266,027	265,992	261,091	68	6,250
2015				222,790	197,238	198,001	194,677	189,235	67	4,490
2016					183,556	170,532	148,715	140,608	111	3,334
2017						179,376	132,220	107,255	212	2,241
2018							132,318	96,357	616	1,006
								108,424	11,315	87
							Total	$ 1,750,243		
	Cumulative paid losses and allocated loss adjustment expenses, net of reinsurance									
2012	$ (106,065)	$ 186,605	$ 327,605	$ 395,695	$ 426,024	$ 441,577	$ 448,151	$ 452,348		
2013		41,447	203,957	308,956	353,189	373,909	382,200	386,853		
2014			20,099	129,159	201,925	233,879	247,038	254,175		
2015				16,159	92,431	151,222	171,337	180,321		
2016					11,462	72,201	113,357	127,286		
2017						8,622	48,112	78,650		
2018							3,966	31,478		
								2,899		
								1,514,010		
							All outstanding liabilities before 2012, net of reinsurance	19,005		
							Liabilities for losses and loss adjustment expenses, net of reinsurance	$ 255,238		

The following table presents the average annual percentage payout of incurred losses and allocated loss adjustment expenses by age, net of reinsurance, as of December 31, 2019:

Average annual percentage payout of incurred losses and allocated loss adjustment expenses by age, net of reinsurance								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
U.S. Primary	3.3%	42.3%	29.1%	11.8%	5.4%	2.8%	1.3%	0.9%

Other Operations

Loss Reserves for the 'other' operations (*i.e.*, Watford) are comprised of case reserves, ACRs and IBNR reserves. For all business assumed by Watford, the Company acts as reinsurance underwriting manager, provides actuarial and risk management services and recommends a level of Loss Reserves to Watford Re. The Company does not guarantee or provide credit support for Watford, and the Company's financial exposure to Watford is limited to its investment in Watford's common and preferred shares and counterparty credit risk (mitigated by collateral) arising from the reinsurance transactions. The estimation of Loss Reserves for Watford is subject to the same risk factors as the estimation of Loss Reserves for the Company's insurance, reinsurance and mortgage operations as described earlier. Watford performs its own reserve reviews and sets its reserves independently. As noted previously, the Company determined that amounts in the 'other' operations are insignificant for the purposes of these footnote disclosures.

For the year ended December 31, 2019, the Company did not make any significant changes in its methodologies or assumptions as described above (a) to determine the presented amounts of IBNR reserves, (b) for expected development on case reserves.

The Company measures claim frequency information on an individual claim count basis. Claim counts are provided for the insurance and mortgage operations, where reliable information is available. For insurance business, any claim which is reported to the Company is included in the count, even if it is subsequently settled without liability to the Company. The Company does not include claim count information for losses from U.S. insurance pool business where individual loss information is unavailable and impracticable to obtain. For mortgage business, only delinquencies which subsequently become claims are included in the claim count. For reinsurance business, claim counts are not provided. A significant amount of the Company's reinsurance business is written on a proportional basis, for which individual loss information is typically unavailable and impracticable to obtain.

For the year ended December 31, 2019, the Company did not make any significant changes in its methodologies or assumptions as described above to calculate the cumulative claim frequency.

The following table represents a reconciliation of the disclosures of net incurred and paid loss development tables to the reserve for losses and loss adjustment expenses at December 31, 2019:

	December 31, 2019
Net outstanding liabilities	
Insurance	
Property, energy, marine and aviation	$ 340,714
Third party occurrence business	2,264,839
Third party claims-made business	1,225,121
Multi-line and other specialty	887,227
Reinsurance	
Casualty	1,707,696
Property catastrophe	113,053
Property excluding property catastrophe	458,581
Marine and aviation	131,895
Other specialty	637,789
Mortgage	
U.S. primary	255,238
Other short duration lines not included in disclosures (1)	1,514,373
Total for short duration lines	**9,536,526**
Unpaid losses and loss adjustment expenses recoverable	
Insurance	
Property, energy, marine and aviation	213,004
Third party occurrence business	1,105,669
Third party claims-made business	728,511
Multi-line and other specialty	189,613
Reinsurance	
Casualty	532,387
Property catastrophe	282,910
Property excluding property catastrophe	48,554
Marine and aviation	28,893
Other specialty	206,022
Mortgage	
U.S. primary	21,875
Other short duration lines not included in disclosures (2)	1,472,777
Intercompany eliminations	(696,931)
Total for short duration lines	**4,133,284**
Lines other than short duration	55,989
Discounting	(22,012)
Unallocated claims adjustment expenses	188,055
	222,032
Total gross reserves for losses and loss adjustment expenses	**$ 13,891,842**

(1) Includes net outstanding liabilities of $1.1 billion for the 'other' operation.
(2) Includes unpaid loss and loss adjustment expenses recoverable related to the acquisition of Barbican and $319.3 million related to the loss portfolio transfer reinsurance agreement.

7. Reinsurance

In the normal course of business, the Company's insurance subsidiaries cede a portion of their premium through pro rata and excess of loss reinsurance agreements on a treaty or facultative basis. The Company's reinsurance subsidiaries participate in "common account" retrocessional arrangements for certain pro rata treaties. Such arrangements reduce the effect of individual or aggregate losses to all companies participating on such treaties, including the reinsurers, such as the Company's reinsurance subsidiaries, and the ceding company. In addition, the Company's reinsurance subsidiaries may purchase retrocessional coverage as part of their risk management program. The Company's mortgage subsidiaries cede a portion of their premium through quota share arrangements and enter into various aggregate excess of loss mortgage reinsurance agreements with various special purpose reinsurance companies. Reinsurance recoverables are recorded as assets, predicated on the reinsurers' ability to meet their obligations under the reinsurance agreements. If the reinsurers are unable to satisfy their obligations under the agreements, the Company's insurance or reinsurance subsidiaries would be liable for such defaulted amounts.

The effects of reinsurance on the Company's written and earned premiums and losses and loss adjustment expenses with unaffiliated reinsurers were as follows:

	Year Ended December 31,	
	2019	2018
Premiums Written		
Direct	$ 5,681,523	$ 4,838,902
Assumed	2,457,437	2,122,102
Ceded	(2,099,893)	(1,614,257)
Net	$ 6,039,067	$ 5,346,747
Premiums Earned		
Direct	$ 5,447,829	$ 4,799,842
Assumed	2,337,950	1,988,038
Ceded	(1,999,281)	(1,555,905)
Net	$ 5,786,498	$ 5,231,975
Losses and Loss Adjustment Expenses		
Direct	$ 2,953,072	$ 2,472,133
Assumed	1,602,528	1,307,317
Ceded	(1,422,148)	(889,344)
Net	$ 3,133,452	$ 2,890,106

Reinsurance Recoverables

The Company monitors the financial condition of its reinsurers and attempts to place coverages only with substantial, financially sound carriers. Although the Company has not experienced any material credit losses to date, an inability of its reinsurers or retrocessionaires to meet their obligations to it over the relevant exposure periods for any reason could have a material adverse effect on its financial condition and results of operations. The following table summarizes the Company's reinsurance recoverables on paid and unpaid losses (not including ceded unearned premiums) at December 31, 2019 and 2018:

	December 31,	
	2019	2018
Reinsurance recoverable on unpaid and paid losses and loss adjustment expenses	$ 4,346,816	$ 2,919,372
% due from carriers with A.M. Best rating of "A-" or better	61.2%	63.0%
% due from unrated fully collateralized reinsurers (1)	13.5%	12.9%
% due from all other carriers with no A.M. Best rating (2)	25.3%	24.1%
Largest balance due from any one carrier as % of total shareholder's equity	1.7%	2.7%

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

Bellemeade Re

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

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

	Initial Coverage at Issuance	Coverage at Dec. 31, 2019	First Layer Retention
Bellemeade 2017-1 Ltd. (1)	$ 368,114	$ 216,429	$ 165,652
Bellemeade 2018-1 Ltd. (2)	374,460	328,482	168,510
Bellemeade 2018-2 Ltd. (3)	653,278	437,009	352,258
Bellemeade 2018-3 Ltd. (4)	506,110	426,806	179,331
Bellemeade 2019-1 Ltd. (5)	341,790	257,358	208,046
Bellemeade 2019-2 Ltd. (6)	621,022	525,959	221,794
Bellemeade 2019-3 Ltd. (7)	700,920	656,523	232,093
Bellemeade 2019-4 Ltd. (8)	577,267	577,267	162,357
Total	$ 4,142,961	$ 3,425,833	$ 1,690,041

(1) Issued in October 2017, covering in-force policies issued between January 1, 2017 and June 30, 2017.
(2) Issued in April 2018, covering in-force policies issued between July 1, 2017 and December 31, 2017.
(3) Issued in August 2018, covering in-force policies issued between April 1, 2013 and December 31, 2015.
(4) Issued in October 2018, covering in-force policies issued between January 1, 2018 and June 30, 2018.
(5) Issued in March 2019, covering in-force policies primarily issued between 2005 to 2008 under United Guaranty Residential Insurance Company ("UGRIC"); as well as policies issued through 2015 under both UGRIC and Arch Mortgage Insurance Company.
(6) Issued in April 2019, covering in-force policies issued between July 1, 2018 and December 31, 2018.
(7) Issued in July 2019, covering in-force policies issued in 2016.
(8) Issued in October 2019, covering in-force policies issued between January 1, 2019 and June 30, 2019.

8. Investment Information

At December 31, 2019, total investable assets of $24.89 billion included $22.19 billion held by the Company and $2.70 billion attributable to Watford.

Available For Sale Investments

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

	Estimated Fair Value	Gross Unrealized Gains	Gross Unrealized Losses	Cost or Amortized Cost	OTTI Unrealized Losses (2)
December 31, 2019					
Fixed maturities (1):					
Corporate bonds	$ 6,406,591	$ 191,889	$ (12,793)	$ 6,227,495	$ —
Mortgage backed securities	562,309	9,669	(931)	553,571	(6)
Municipal bonds	881,926	24,628	(2,213)	859,511	—
Commercial mortgage backed securities	733,108	14,951	(2,330)	720,487	—
U.S. government and government agencies	4,910,993	36,598	(10,133)	4,884,528	—
Non-U.S. government securities	2,078,757	48,549	(20,330)	2,050,538	—
Asset backed securities	1,683,753	24,017	(4,724)	1,664,460	—
Total	17,257,437	350,301	(53,454)	16,960,590	(6)
Short-term investments	956,353	811	(1,548)	957,085	—
Total	$ 18,213,790	$ 351,112	$ (55,002)	$ 17,917,675	$ (6)
December 31, 2018					
Fixed maturities (1):					
Corporate bonds	$ 5,537,548	$ 14,476	$ (105,428)	$ 5,628,500	$ (69)
Mortgage backed securities	541,193	3,991	(3,216)	540,418	(6)
Municipal bonds	1,013,395	5,380	(11,891)	1,019,906	—
Commercial mortgage backed securities	729,442	2,650	(10,751)	737,543	—
U.S. government and government agencies	3,755,501	27,189	(8,472)	3,736,784	—
Non-U.S. government securities	1,771,338	14,477	(50,948)	1,807,809	—
Asset backed securities	1,600,896	8,060	(14,798)	1,607,634	—
Total	14,949,313	76,223	(205,504)	15,078,594	(75)
Short-term investments	955,710	36	(394)	956,068	—
Total	$ 15,905,023	$ 76,259	$ (205,898)	$ 16,034,662	$ (75)

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

(2) Represents the total OTTI recognized in accumulated other comprehensive income ("AOCI"). It does not include the change in fair value subsequent to the impairment measurement date. At December 31, 2019, the net unrealized gain related to securities for which a non-credit OTTI was recognized in AOCI was nil, compared to a net unrealized loss of nil at December 31, 2018.

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
December 31, 2019						
Fixed maturities (1):						
Corporate bonds	$ 675,131	$ (12,350)	$ 37,671	$ (443)	$ 712,802	$ (12,793)
Mortgage backed securities	102,887	(927)	203	(4)	103,090	(931)
Municipal bonds	220,296	(2,213)	—	—	220,296	(2,213)
Commercial mortgage backed securities	147,290	(2,302)	2,683	(28)	149,973	(2,330)
U.S. government and government agencies	1,373,127	(10,089)	30,059	(44)	1,403,186	(10,133)
Non-U.S. government securities	1,224,243	(20,163)	37,610	(167)	1,261,853	(20,330)
Asset backed securities	441,522	(3,334)	48,313	(1,390)	489,835	(4,724)
Total	4,184,496	(51,378)	156,539	(2,076)	4,341,035	(53,454)
Short-term investments	95,777	(1,548)	—	—	95,777	(1,548)
Total	$ 4,280,273	$ (52,926)	$ 156,539	$ (2,076)	$ 4,436,812	$ (55,002)
December 31, 2018						
Fixed maturities (1):						
Corporate bonds	$ 2,983,195	$ (68,910)	$ 1,234,865	$ (36,518)	$ 4,218,060	$ (105,428)
Mortgage backed securities	84,296	(695)	109,009	(2,521)	193,305	(3,216)
Municipal bonds	233,081	(2,074)	408,155	(9,817)	641,236	(11,891)
Commercial mortgage backed securities	223,341	(2,831)	193,956	(7,920)	417,297	(10,751)
U.S. government and government agencies	632,106	(1,352)	391,102	(7,120)	1,023,208	(8,472)
Non-U.S. government securities	1,028,340	(35,524)	389,671	(15,424)	1,418,011	(50,948)
Asset backed securities	533,592	(8,832)	368,095	(5,966)	901,687	(14,798)
Total	5,717,951	(120,218)	3,094,853	(85,286)	8,812,804	(205,504)
Short-term investments	122,878	(394)	—	—	122,878	(394)
Total	$ 5,840,829	$ (120,612)	$ 3,094,853	$ (85,286)	$ 8,935,682	$ (205,898)

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

At December 31, 2019, on a lot level basis, approximately 2,228 security lots out of a total of approximately 9,584 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 $0.9 million. The Company believes that such securities were temporarily impaired at December 31, 2019. At December 31, 2018, on a lot level basis, approximately 5,866 security lots out of a total of approximately 8,440 security lots were in an unrealized loss position and the largest single unrealized loss from a single lot in the Company’s fixed maturity portfolio was $2.6 million.

The contractual maturities of the Company's fixed maturities and fixed maturities pledged under securities lending agreements 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	December 31, 2019 Estimated Fair Value	December 31, 2019 Amortized Cost	December 31, 2018 Estimated Fair Value	December 31, 2018 Amortized Cost
Due in one year or less	$ 426,660	$ 421,617	$ 276,682	$ 279,135
Due after one year through five years	10,122,803	9,992,608	8,663,100	8,735,745
Due after five years through 10 years	3,317,535	3,219,567	2,919,232	2,951,582
Due after 10 years	411,269	388,280	218,768	226,537
	14,278,267	14,022,072	12,077,782	12,192,999
Mortgage backed securities	562,309	553,571	541,193	540,418
Commercial mortgage backed securities	733,108	720,487	729,442	737,543
Asset backed securities	1,683,753	1,664,460	1,600,896	1,607,634
Total (1)	$ 17,257,437	$ 16,960,590	$ 14,949,313	$ 15,078,594

(1) In securities lending transactions, the Company receives collateral in excess of the fair value of the fixed maturities pledged. For purposes of this table, the Company has excluded the collateral received and reinvested and included the fixed maturities pledged. 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 December 31, 2019, the fair value of the cash collateral received on securities lending was $81.2 million and the fair value of security collateral received was $307.2 million. At December 31, 2018, the fair value of the cash collateral received on securities lending was $19.0 million and the fair value of security collateral received was $255.1 million.

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

	Remaining Contractual Maturity of the Agreements				
	Overnight and Continuous	Less than 30 Days	30-90 Days	90 Days or More	Total
December 31, 2019					
U.S. government and government agencies	$ 240,332	$ —	$ 115,973	$ —	$ 356,305
Corporate bonds	2,570	—	—	—	2,570
Equity securities	29,491	—	—	—	29,491
Total	$ 272,393	$ —	$ 115,973	$ —	$ 388,366
Gross amount of recognized liabilities for securities lending in offsetting disclosure in Note 10					$ —
Amounts related to securities lending not included in offsetting disclosure in Note 10					$ 388,366
December 31, 2018					
U.S. government and government agencies	$ 219,276	$ —	$ 32,583	$ —	$ 251,859
Corporate bonds	7,129	—	—	—	7,129
Equity securities	15,137	—	—	—	15,137
Total	$ 241,542	$ —	$ 32,583	$ —	$ 274,125
Gross amount of recognized liabilities for securities lending in offsetting disclosure in Note 10					$ —
Amounts related to securities lending not included in offsetting disclosure in Note 10					$ 274,125

Equity Securities, at Fair Value

At December 31, 2019, the Company held $838.9 million of equity securities, at fair value, compared to $338.9 million at December 31, 2018. Pursuant to applicable accounting guidance, changes in fair value on equity securities are recorded through net income effective January 1, 2018.

Other Investments

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

	December 31,	
	2019	2018
Term loan investments	1,326,018	1,282,287
Lending	602,841	524,112
Credit related funds	123,020	202,123
Energy	97,402	117,509
Investment grade fixed income	151,594	101,902
Infrastructure	61,786	45,371
Private equity	49,376	24,383
Real estate	17,279	14,252
Total	$ 2,429,316	$ 2,311,939

Certain of the Company's other investments and investments accounted for using the equity method 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:

	December 31,	
	2019	2018
Fixed maturities	$ 754,452	$ 1,245,562
Other investments	2,429,316	2,311,939
Short-term investments	377,014	322,177
Equity securities	102,695	103,893
Investments accounted for using the fair value option	$ 3,663,477	$ 3,983,571

Limited Partnership Interests

In the normal course of its activities, the Company invests in limited partnerships as part of its overall investment strategy. Such amounts are included in 'Investments accounted for using the equity method' and 'Investments accounted for using the fair value option.' The Company determined that these limited partnership interests represented variable interests in the funds because the general partner did not have a significant interest in 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 sheets and any unfunded commitment.

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

	December 31, 2019	December 31, 2018
Investments accounted for using the equity method (1)	$ 1,660,396	$ 1,493,791
Investments accounted for using the fair value option (2)	188,283	162,398
Total	$ 1,848,679	$ 1,656,189

(1) Aggregate unfunded commitments were $1.36 billion at December 31, 2019, compared to $1.22 billion at December 31, 2018.
(2) Aggregate unfunded commitments were $41.7 million at December 31, 2019, compared to $117.5 million at December 31, 2018.

Net Investment Income

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

	Year Ended December 31, 2019	Year Ended December 31, 2018
Fixed maturities	$ 504,916	$ 470,832
Equity securities (dividends)	15,857	13,154
Short-term investments	15,780	18,587
Other (1)	178,964	152,741
Gross investment income	715,517	655,314
Investment expenses	(86,209)	(87,536)
Net investment income	$ 629,308	$ 567,778

(1) Includes income distributions from investment funds, term loan investments and other items.

Net Realized Gains (Losses)

Net realized gains (losses) were as follows, excluding the other-than-temporary impairment provisions discussed below:

	Year Ended December 31, 2019	Year Ended December 31, 2018
Available for sale securities:		
Gross gains on investment sales	$ 235,629	$ 69,259
Gross losses on investment sales	(104,556)	(223,105)
Change in fair value of assets and liabilities accounted for using the fair value option:		
Fixed maturities	41,910	(90,897)
Other investments	(35,734)	(90,779)
Equity securities	15,869	(5,984)
Short term investments	3,801	(461)
Equity securities at fair value (1):		
Net realized gains (losses) on sales during the period	11,313	(40,117)
Net unrealized gains (losses) on equity securities still held at reporting date	97,768	(22,828)
Derivative instruments (2)	119,741	15,635
Other (3)	(19,412)	(16,091)
Net realized gains (losses)	$ 366,329	$ (405,368)

(1) Effective January 1, 2018, changes in fair value on equity securities are recorded through net income.
(2) See Note 10 for information on the Company's derivative instruments.
(3) Includes the re-measurement of contingent consideration liability amounts.

Equity in Net Income (Loss) of Investments Accounted For Using the Equity Method

The Company recorded equity in net income related to investments accounted for using the equity method of $123.7 million for 2019, compared to $45.6 million for 2018. 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 fair 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.

Investments Accounted For Using the Equity Method

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

	December 31,	
	2019	2018
Credit related funds	428,437	429,402
Equities	293,686	375,273
Real Estate	246,851	232,647
Lending	202,690	125,041
Private equity	144,983	114,019
Infrastructure	235,033	113,748
Energy	108,716	103,661
Total	$ 1,660,396	$ 1,493,791

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:

	Year Ended December 31,	
	2019	2018
Fixed maturities:		
Mortgage backed securities	$ (915)	$ (437)
Corporate bonds	(1,256)	(1,232)
Non-U.S. government securities	—	(290)
Asset backed securities	(994)	(811)
Total	(3,165)	(2,770)
Short-term investments	—	(59)
Net impairment losses recognized in earnings	$ (3,165)	$ (2,829)

A description of the methodology and significant inputs used to measure the amount of net impairment losses recognized in earnings in 2019 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 were primarily from foreign currency impacts;

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

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

	Year Ended December 31,	
	2019	2018
Balance at start of year	$ 637	$ 767
Credit loss impairments recognized on securities not previously impaired	—	—
Credit loss impairments recognized on securities previously impaired	—	—
Reductions for increases in cash flows expected to be collected that are recognized over the remaining life of the security	—	—
Reductions for securities sold during the period	(291)	(130)
Balance at end of year	$ 346	$ 637

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 16 for further details.

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

	December 31,	
	2019	2018
Assets used for collateral or guarantees:		
Affiliated transactions	$ 4,526,761	$ 4,623,483
Third party agreements	2,278,248	2,179,158
Deposits with U.S. regulatory authorities	797,371	689,114
Deposits with non-U.S. regulatory authorities	119,238	59,624
Total restricted assets	$ 7,721,618	$ 7,551,379

In addition, Watford maintains a secured credit facility to provide borrowing capacity for investment purposes and a total return swap agreement and maintains assets pledged as collateral for such purposes. The Company does not guarantee or provide credit support for Watford, and the Company's financial exposure to Watford is limited to its investment in Watford's senior notes, common and preferred shares and counterparty credit risk (mitigated by collateral) arising from reinsurance transactions. As of December 31, 2019 and December 31, 2018, Watford held $1.0 billion and $1.3 billion, respectively, in pledged assets to collateralize the credit facility mentioned above.

Reconciliation of Cash and Restricted Cash

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

	December 31,	
	2019	2018
Cash	$ 631,536	$ 570,173
Restricted cash (included in 'other assets')	173,973	75,563
Cash and restricted cash	$ 805,509	$ 645,736

9. 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 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.

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 $22.9 billion of financial assets and liabilities measured at fair value at December 31, 2019, approximately $179.6 million, or 0.8%, were priced using non-binding broker-dealer quotes. Of the $20.4 billion of financial assets and liabilities measured at fair value at December 31, 2018, approximately $217.9 million, or 1.1%, were priced using non-binding broker-dealer quotes.

Fixed maturities

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

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

- Corporate bonds — valuations provided by independent pricing services, substantially all through index providers and pricing vendors with a small amount through broker-dealers. The fair values of these securities are generally determined using the spread above the risk-free yield curve. These spreads are generally obtained from the new issue market, secondary trading and from broker-dealers who trade in the relevant security market. As the significant inputs used in the pricing process for corporate bonds are observable market inputs, the fair value of these securities are classified within Level 2. During 2019, the Company transferred $25.8 million of corporate bonds from Level 2 to Level 3 based on a review of the pricing of such securities, as described above.

- 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. 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. 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. A small number of securities are included in Level 3 due to a low level of transparency on the inputs used in the pricing process.

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. A small number of securities are included in Level 3 due to the lack of an available independent price source for such securities. As the significant inputs used to price these securities are unobservable, the fair value of such securities are classified as Level 3. During the 2019 second quarter, the Company transferred $107.4 million of equity securities from Level 2 to Level 3 based on a review of the pricing of such securities, as described above.

Other investments

The Company determined that exchange-traded investments 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. A small number of securities are included in Level 3 due to the lack of an available independent price source for such securities. During 2019, the Company transferred $31.6 million of other investments from Level 2 to Level 3 based on a review of the pricing of such securities, as described above.

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, U.S. Treasury bills and commercial paper would be included in Level 1 as their fair values are based on quoted market prices in active markets. The fair values of other short-term investments are generally determined using the spread above the risk-free yield curve and are classified within Level 2.

Contingent consideration liabilities

Contingent consideration liabilities (included in 'Other liabilities' in the consolidated balance sheets) include amounts related to the Company's 2014 acquisition of CMG Mortgage Insurance Company and its affiliated mortgage insurance companies (the "CMG Entities") 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.

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

	Estimated Fair Value	Fair Value Measurement Using: Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets measured at fair value (1):				
Available for sale securities:				
Fixed maturities:				
Corporate bonds	$ 6,406,591	$ —	$ 6,397,740	$ 8,851
Mortgage backed securities	562,309	—	562,055	254
Municipal bonds	881,926	—	881,926	—
Commercial mortgage backed securities	733,108	—	733,108	—
U.S. government and government agencies	4,910,993	4,799,982	111,011	—
Non-U.S. government securities	2,078,757	—	2,078,757	—
Asset backed securities	1,683,753	—	1,678,791	4,962
Total	17,257,437	4,799,982	12,443,388	14,067
Equity securities, at fair value	850,283	789,596	4,798	55,889
Short-term investments	956,353	904,610	51,742	—
Derivative instruments (4)	48,946	—	48,946	—
Fair value option:				
Corporate bonds	488,402	—	487,470	932
Non-U.S. government bonds	50,465	—	50,465	—
Mortgage backed securities	11,947	—	11,947	—
Municipal bonds	377	—	377	—
Commercial mortgage backed securities	1,134	—	1,134	—
Asset backed securities	200,163	—	200,163	—
U.S. government and government agencies	1,962	1,852	110	—
Short-term investments	377,014	333,320	43,694	—
Equity securities	102,697	43,962	641	58,094
Other investments	1,418,273	53,287	1,296,169	68,817
Other investments measured at net asset value (2)	1,011,043			
Total	3,663,477	432,421	2,092,170	127,843
Total assets measured at fair value	$ 22,776,496	$ 6,926,609	$ 14,641,044	$ 197,799
Liabilities measured at fair value:				
Contingent consideration liabilities	$ (7,998)	$ —	$ —	$ (7,998)
Securities sold but not yet purchased (3)	(66,257)	—	(66,257)	—
Derivative instruments (4)	(39,750)	—	(39,750)	—
Total liabilities measured at fair value	$ (114,005)	$ —	$ (106,007)	$ (7,998)

(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.

(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 10 for information on the Company's derivative instruments.

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

		Fair Value Measurement Using:		
	Estimated Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets measured at fair value:				
Available for sale securities (1):				
Fixed maturities:				
Corporate bonds	$ 5,537,548	$ —	$ 5,529,407	$ 8,141
Mortgage backed securities	541,193	—	540,884	309
Municipal bonds	1,013,395	—	1,013,395	—
Commercial mortgage backed securities	729,442	—	729,438	4
U.S. government and government agencies	3,755,501	3,653,984	101,517	—
Non-U.S. government securities	1,771,338	—	1,771,338	—
Asset backed securities	1,600,896	—	1,600,896	—
Total	14,949,313	3,653,984	11,286,875	8,454
Equity securities	353,794	321,927	31,867	—
Short-term investments	955,710	875,711	79,999	—
Derivative instruments (4)	73,893	—	73,893	—
Fair value option:				
Corporate bonds	852,585	—	846,827	5,758
Non-U.S. government bonds	79,066	—	79,066	—
Mortgage backed securities	16,731	—	16,731	—
Municipal bonds	7,144	—	7,144	—
Asset backed securities	178,790	—	178,790	—
U.S. government and government agencies	111,246	111,138	108	—
Short-term investments	322,177	278,579	43,598	—
Equity securities	103,893	48,827	55,066	—
Other investments	1,254,220	39,107	1,152,408	62,705
Other investments measured at net asset value (2)	1,057,719			
Total	3,983,571	477,651	2,379,738	68,463
Total assets measured at fair value	$ 20,316,281	$ 5,329,273	$ 13,852,372	$ 76,917
Liabilities measured at fair value:				
Contingent consideration liabilities	(66,665)	—	—	(66,665)
Securities sold but not yet purchased (3)	(7,790)	—	(7,790)	—
Derivative instruments (4)	(20,664)	—	(20,664)	—
Total liabilities measured at fair value	$ (95,119)	$ —	$ (28,454)	$ (66,665)

(1) In securities lending transactions, the Company receives collateral in excess of the fair value of the securities pledged. For purposes of this table, the Company has excluded the collateral received under securities lending, at fair value and included the securities pledged under securities lending, at fair value.
(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 10 for information on the Company's derivative instruments.

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 for 2019 and 2018:

	Assets						Liabilities
	Available For Sale		Fair Value Option			Fair Value	
	Structured Securities (1)	Corporate Bonds	Corporate Bonds	Other Investments	Equity Securities	Equity Securities	Contingent Consideration Liabilities
Year Ended December 31, 2019							
Balance at beginning of year	$ 313	$ 8,141	$ 5,758	$ 62,705	$ —	$ —	$ (66,665)
Total gains or (losses) (realized/unrealized)							
Included in earnings (2)	1,760	2	(162)	(8,119)	1,949	(3,418)	(1,478)
Included in other comprehensive income	3	(267)	—	—	—	—	—
Purchases, issuances, sales and settlements							
Purchases	—	881	—	3,746	—	36,077	—
Issuances	—	—	—	—	—	—	(548)
Sales	(1,757)	—	(28,583)	(20,495)	—	(27,982)	—
Settlements	(552)	(1,766)	—	(600)	—	—	60,693
Transfers in and/or out of Level 3	5,449	1,860	23,919	31,580	56,145	51,212	—
Balance at end of year	$ 5,216	$ 8,851	$ 932	$ 68,817	$ 58,094	$ 55,889	$ (7,998)
Year Ended December 31, 2018							
Balance at beginning of year	$ 5,927	$ 9,460	$ 12,217	$ 59,167	$ —	$ —	$ (60,996)
Total gains or (losses) (realized/unrealized)							
Included in earnings (2)	4	(1)	(334)	(1,416)	—	—	(5,669)
Included in other comprehensive income	(11)	(296)	—	—	—	—	—
Purchases, issuances, sales and settlements							
Purchases	—	802	—	6,250	—	—	—
Issuances	—	—	—	—	—	—	—
Sales	(5,003)	—	—	(296)	—	—	—
Settlements	(604)	(1,824)	(6,125)	(1,000)	—	—	—
Transfers in and/or out of Level 3	—	—	—	—	—	—	—
Balance at end of year	$ 313	$ 8,141	$ 5,758	$ 62,705	$ —	$ —	$ (66,665)

(1) Includes asset backed securities, mortgage backed securities and commercial mortgage backed securities.
(2) Gains or losses were included in net realized gains (losses).

Financial Instruments Disclosed, But Not Carried, At Fair Value

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

At December 31, 2019, the Company's senior notes were carried at their cost, net of debt issuance costs, of $1.6 billion and had a fair value of $1.9 billion. At December 31, 2018, the Company's senior notes were carried at their cost, net of debt issuance costs, of $1.4 billion and had a fair value of $1.5 billion. The fair values of the senior notes were obtained from a third party pricing service and are based on observable market inputs. As such, the fair value of the senior notes is classified within Level 2.

Fair Value Measurements on a Non-Recurring Basis

The Company measures the fair value of certain assets on a non-recurring basis, generally quarterly, annually, or when events or changes in circumstances indicate that the carrying amount of the assets may not be recoverable. These assets include investments accounted for using the equity method, certain other investments, goodwill and intangible assets, and long-lived assets.

The Company uses a variety of techniques to measure the fair value of these assets when appropriate, as described below:

Investments accounted for using the equity method. When the Company determines that the carrying value of these assets may not be recoverable, the Company records the assets at fair value with the loss recognized in income. In such cases, the Company measures the fair value of these assets using the techniques discussed above in "Fair Value Measurements on a Recurring Basis."

Goodwill and Intangible Assets. The Company tests goodwill and intangible assets for impairment whenever events or changes in circumstances indicate the carrying amount may not be recoverable. When the Company determines goodwill and intangible assets may be impaired, the Company uses techniques including discounted expected future cash flows, to measure fair value.

Long-Lived Assets. The Company tests its long-lived assets for impairment whenever events or changes in circumstances indicate the carrying amount of a long-lived asset may not be recoverable.

10. 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)
December 31, 2019			
Futures contracts (2)	$ 10,065	$ (13,722)	$ 4,104,559
Foreign currency forward contracts (2)	5,352	(5,327)	686,876
TBAs (3)	55,010	—	53,229
Other (2)	33,529	(20,701)	4,356,300
Total	$ 103,956	$ (39,750)	
December 31, 2018			
Futures contracts (2)	$ 51,800	$ (2,115)	$ 3,153,518
Foreign currency forward contracts (2)	8,147	(7,796)	1,008,907
TBAs (3)	8,292	—	8,132
Other (2)	13,946	(10,753)	2,213,981
Total	$ 82,185	$ (20,664)	

(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.' Such amounts include risk in force on GSE credit-risk sharing transactions that are accounted for as derivatives.
(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 December 31, 2019 or 2018.

The Company's derivative instruments can be traded under master netting agreements, which establish terms that apply to all derivative transactions with a counterparty. In the event of a bankruptcy or other stipulated event of default, such agreements provide that the non-defaulting party may elect to terminate all outstanding derivative transactions, in which case all individual derivative positions (loss or gain) with a counterparty are closed out and netted and replaced with a single amount, usually referred to as the termination amount, which is expressed in a single currency. The resulting single net amount, where positive, is payable to the party “in-the-money” regardless of whether or not it is the defaulting party, unless the parties have agreed that only the non-defaulting party is entitled to receive a termination payment where the net amount is positive and is in its favor. Effectively, contractual close-out netting reduces the derivatives credit exposure from a gross to a net exposure. At December 31, 2019, $97.8 million and $37.8 million, respectively, of asset derivatives and liability derivatives were subject to a master netting agreement compared to $80.4 million and $18.9 million, respectively, at December 31, 2018. The remaining derivatives included in the table above were not subject to a master netting agreement.

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:

	Year Ended December 31,	
Derivatives not designated as hedging instruments	**2019**	**2018**
Net realized gains (losses):		
Futures contracts	$ 114,123	$ 48,443
Foreign currency forward contracts	(9,499)	(21,770)
TBAs	463	(133)
Other	14,654	(10,904)
Total	$ 119,741	$ 15,636

11. Other Comprehensive Income (Loss)

The following table presents the changes in each component of AOCI, net of noncontrolling interests:

	Unrealized Appreciation on Available-For-Sale Investments	Foreign Currency Translation Adjustments	Total
Year Ended December 31, 2019			
Beginning balance	$ (114,080)	$ (65,920)	$ (180,000)
Other comprehensive income (loss) before reclassifications	491,290	18,199	509,489
Amounts reclassified from accumulated other comprehensive income	(118,965)	—	(118,965)
Net current period other comprehensive income (loss)	372,325	18,199	390,524
Ending balance	$ 258,245	$ (47,721)	$ 210,524
Year Ended December 31, 2018			
Beginning balance	$ 157,433	$ (41,815)	$ 115,618
Cumulative effect of an accounting change	(149,794)	—	(149,794)
Other comprehensive income (loss) before reclassifications	(266,318)	(24,105)	(290,423)
Amounts reclassified from accumulated other comprehensive income	144,599	—	144,599
Net current period other comprehensive income (loss)	(121,719)	(24,105)	(145,824)
Ending balance	$ (114,080)	$ (65,920)	$ (180,000)

The following table presents details about amounts reclassified from accumulated other comprehensive income:

	Consolidated Statement of Income	Amounts Reclassed from AOCI	
	Line Item That Includes	Year Ended December 31,	
Details About AOCI Components	**Reclassification**	**2019**	**2018**
Unrealized appreciation on available-for-sale investments			
	Net realized gains	$ 131,073	$ (153,847)
	Other-than-temporary impairment losses	(3,165)	(2,829)
	Total before tax	127,908	(156,676)
	Income tax expense	(8,943)	12,077
	Net of tax	$ 118,965	$ (144,599)

Following are the related tax effects allocated to each component of other comprehensive income (loss):

	Before Tax Amount	Tax Expense (Benefit)	Net of Tax Amount
Year Ended December 31, 2019			
Unrealized appreciation (decline) in value of available-for-sale investments:			
Unrealized holding losses arising during period	$ 562,267	$ 61,810	$ 500,457
Less reclassification of net realized gains included in net income	127,908	8,943	118,965
Foreign currency translation adjustments	18,516	354	18,162
Other comprehensive income (loss)	$ 452,875	$ 53,221	$ 399,654
Year Ended December 31, 2018			
Unrealized appreciation (decline) in value of available-for-sale investments:			
Unrealized holding gains arising during period	$ (294,226)	$ (24,208)	$ (270,018)
Less reclassification of net realized gains included in net income	(156,676)	(12,077)	(144,599)
Foreign currency translation adjustments	(23,925)	(176)	(23,749)
Other comprehensive income (loss)	$ (161,475)	$ (12,307)	$ (149,168)

12. Income Taxes

Arch Re Bermuda is incorporated under the laws of Bermuda and, under current Bermuda law, is not obligated to pay any taxes in Bermuda based upon income or capital gains. The Company has received a written undertaking from the Minister of Finance in Bermuda under the Exempted Undertakings Tax Protection Act 1966 that, in the event that any legislation is enacted in Bermuda imposing any tax computed on profits, income, gain or appreciation on any capital asset, or any tax in the nature of estate duty or inheritance tax, such tax will not be applicable to Arch Capital or any of its operations until March 31, 2035. This undertaking does not, however, prevent the imposition of taxes on any person ordinarily resident in Bermuda or any company in respect of its ownership of real property or leasehold interests in Bermuda.

Arch Re Bermuda and its non-U.S. subsidiaries will be subject to U.S. federal income tax only to the extent that they derive U.S. source income that is subject to U.S. withholding tax or income that is effectively connected with the conduct of a trade or business within the U.S. and is not exempt from U.S. tax under an applicable income tax treaty with the U.S. Arch Re Bermuda and its non-U.S. subsidiaries will be subject to a withholding tax on dividends from U.S. investments and interest from certain U.S. payors (subject to reduction by any applicable income tax treaty). Arch Re Bermuda and its non-U.S. subsidiaries intend to conduct their operations in a manner that will not cause them to be treated as engaged in a trade or business in the United States and, therefore, will not be required to pay U.S. federal income taxes (other than U.S. excise taxes on insurance and reinsurance premium and withholding taxes on dividends and certain other U.S. source investment income). However, because there is uncertainty as to the activities which constitute being engaged in a trade or business within the United States, there can be no assurances that the U.S. Internal Revenue Service will not contend successfully that Arch Re Bermuda or its non-U.S. subsidiaries are engaged in a trade or business in the United States. If Arch Re Bermuda or any of its non-U.S. subsidiaries were subject to U.S. income tax, Arch Re Bermuda’s shareholder’s equity and earnings could be materially adversely affected. Arch Re Bermuda has subsidiaries and branches that operate in various jurisdictions around the world that are subject to tax in the jurisdictions in which they operate. The significant jurisdictions in which Arch Re Bermuda’s subsidiaries and branches are subject to tax are the United States, United Kingdom, Ireland, Canada, Switzerland, Australia and Denmark.

The components of income taxes attributable to operations were as follows:

	Year Ended December 31,	
	2019	2018
Current expense (benefit):		
United States	$ 139,177	$ 72,827
Non-U.S.	4,722	12,553
	143,899	85,380
Deferred expense (benefit):		
United States	12,236	19,453
Non-U.S.	(334)	8,598
	11,902	28,051
Income tax expense (benefit)	$ 155,801	$ 113,431

The Company's income or loss before income taxes was earned in the following jurisdictions:

	Year Ended December 31,	
	2019	2018
Income (Loss) Before Income Taxes:		
Bermuda	$ 1,209,047	$ 475,577
United States	697,863	435,093
Other	25,254	12,180
Total	$ 1,932,164	$ 922,850

The expected tax provision computed on pre-tax income or loss at the weighted average tax rate has been calculated as the sum of the pre-tax income in each jurisdiction multiplied by that jurisdiction's applicable statutory tax rate. The 2019 applicable statutory tax rates by jurisdiction were as follows: Bermuda (0.0%), United States (21.0%), United Kingdom (19.0%), Ireland (12.5%), Denmark (22.0%), Canada (26.5%), Gibraltar (10.0%), Australia (30.0%), Hong Kong (16.5%) and the Netherlands (19.0%). The United States tax rate was 35% in 2017.

A reconciliation of the difference between the provision for income taxes and the expected tax provision at the weighted average tax rate follows:

	Year Ended December 31,	
	2019	2018
Expected income tax expense (benefit) computed on pre-tax income at weighted average income tax rate	$ 148,874	$ 89,335
Addition (reduction) in income tax expense (benefit) resulting from:		
Tax-exempt investment income	(3,091)	(4,789)
Meals and entertainment	1,069	1,012
State taxes, net of U.S. federal tax benefit	3,103	2,045
Foreign branch taxes	1,231	5,428
Prior year adjustment	679	(2,175)
Foreign exchange gains & losses	436	1,293
Changes in applicable tax rate	—	29
Dividend withholding taxes	6,510	6,594
Change in valuation allowance	1,628	18,416
Contingent consideration	190	740
Share based compensation	(5,109)	(4,911)
Other	281	414
Income tax expense (benefit)	$ 155,801	$ 113,431

The effect of a change in tax laws or rates on deferred taxes assets and liabilities is recognized in income in the period in which such change is enacted.

On December 22, 2017, the Tax Cuts Act was signed into law by the President of the United States which significantly changed the U.S. tax law in many ways including a reduction of the U.S. federal income tax rate from 35% to 21% effective January 1, 2018. Also on December 22, 2017, the Securities and Exchange Commission issued, Staff Accounting Bulletin No. 118 ("SAB 118") which provided guidance on accounting for tax effects of the Tax Cuts Act. SAB 118 provided a measurement period of up to one year from the enactment date to complete the accounting. During 2018, the Company finalized its accounting for the income tax impact of the Tax Cuts Act resulting in a tax expense of $1.2 million primarily attributable to the write down of temporary differences identified following the filing of the Company's 2017 corporate tax return offset by alternative minimum tax ("AMT") credits that were currently recoverable.

Deferred income tax assets and liabilities reflect temporary differences based on enacted tax rates between the carrying amounts of assets and liabilities for financial reporting and income tax purposes. Significant components of the Company's deferred income tax assets and liabilities were as follows:

	December 31,	
	2019	2018
Deferred income tax assets:		
Net operating loss	$ 30,778	$ 23,613
AMT credit carryforward	1,323	2,652
Uncrystalized losses	1,565	7,960
Discounting of net loss reserves	52,582	43,130
Net unearned premium reserve	64,269	68,305
Compensation liabilities	18,438	17,729
Foreign tax credit carryforward	9,521	9,116
Interest expense	—	1,387
Goodwill and intangible assets	11,644	17,127
Bad debt reserves	5,983	5,626
Lease liability	18,527	—
Net unrealized foreign exchange losses	598	949
Net unrealized decline of investments	—	13,453
Other, net	—	3,196
Deferred tax assets before valuation allowance	215,228	214,243
Valuation allowance	(48,219)	(44,659)
Deferred tax assets net of valuation allowance	167,009	169,584
Deferred income tax liabilities:		
Depreciation and amortization	(1,211)	(2,602)
Deferred policy acquisition costs	(29,847)	(32,105)
Deposit accounting liability	(2,169)	(2,292)
Contingency reserve	(132,831)	(112,852)
Net unrealized appreciation of investments	(38,764)	—
Right of use asset	(16,047)	—
Other, net	(3,554)	(732)
Total deferred tax liabilities	(224,423)	(150,583)
Net deferred income tax assets (liabilities)	$ (57,414)	$ 19,001

The Company provides a valuation allowance to reduce certain deferred tax assets to an amount which management expects to more likely than not be realized. As of December 31, 2019, the Company's valuation allowance was $48.2 million, compared to $44.7 million at December 31, 2018. The valuation allowance in both periods was primarily attributable to valuation allowances on the Company's U.K., Canadian and Australian operations and certain other deferred tax assets relating to loss carryforwards that have a limited use.

At December 31, 2019, the Company's net operating loss carryforwards and tax credits were as follows:

	December 31,	
	2019	Expiration
Operating Loss Carryforwards:		
United Kingdom	89,000	No expiration
Ireland	10,200	No expiration
Australia	22,000	No expiration
Hong Kong	17,600	No expiration
Denmark	400	No expiration
United States (1) (2)	22,900	2029-2038
Tax Credits:		
U.K. foreign tax credits	9,521	No expiration
U.S. refundable AMT credits	1,323	No expiration

(1) Includes $0.6 million net operating loss carryforwards from Watford.

(2) On January 30, 2014, the Company's U.S. mortgage operations underwent an ownership change for U.S. federal income tax purposes as a result of the Company's acquisition of the CMG Entities. As a result of this ownership change, a limitation has been imposed upon the utilization of approximately $8.9 million of the Company's existing U.S. net operating loss carryforwards. Utilization is limited to approximately $0.6 million per year in accordance with Section 382 of the Internal Revenue Code of 1986 as amended ("the Code").

The Company's U.S. mortgage operations are eligible for a tax deduction, subject to certain limitations, under Section 832(e) of the Code for amounts required by state law or regulation to be set aside in statutory contingency reserves. The deduction is allowed only to the extent that the Company purchases non-interest bearing U.S. Mortgage Guaranty Tax and Loss Bonds ("T&L Bonds") issued by the U.S. Treasury Department in an amount equal to the tax benefit derived from deducting any portion of the statutory contingency reserves. T&L bonds are reflected in 'other assets' on the Company's balance sheet and totaled approximately $207 million at December 31, 2019, compared to $182.7 million at December 31, 2018.

Deferred income tax liabilities have not been accrued with respect to the undistributed earnings of the Company's U.S., U.K. and Ireland subsidiaries as it is the Company's intention that all such earnings will be indefinitely reinvested. If the earnings were to be distributed, as dividends or otherwise, such amounts may be subject to withholding tax in the jurisdiction of the paying entity. The Company no longer intends to indefinitely reinvest earnings from the Company's Canada subsidiary, however, no income or withholding taxes have been accrued as the Canada subsidiary does not have positive cumulative earnings and profits and therefore a distribution from this particular subsidiary would not be subject to income taxes or withholding taxes. Potential tax implications of repatriation from the Company's unremitted earnings that are indefinitely reinvested are driven by facts at the time of distribution. Therefore it is not practicable to estimate the income tax liabilities that might be incurred if such earnings were remitted. Distributions from the U.K. or Ireland would not be subject to withholding tax and no deferred income tax liability would need to be accrued.

The Company recognizes interest and penalties relating to unrecognized tax benefits in the provision for income taxes. As of December 31, 2019, the Company's total unrecognized tax benefits, including interest and penalties, were $2.0 million. If recognized, the full amount of the unrecognized tax benefit would impact the consolidated effective tax rate. A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

	Year Ended December 31,	
	2019	2018
Balance at beginning of year	$ 2,008	$ 2,008
Additions based on tax positions related to the current year	—	—
Additions for tax positions of prior years	—	—
Balance at end of year	$ 2,008	$ 2,008

The Company or its subsidiaries or branches files income tax returns in the U.S. federal jurisdiction and various state, local and foreign jurisdictions. The following table details open tax years that are potentially subject to examination by local tax authorities, in the following major jurisdictions:

Jurisdiction	Tax Years
United States	2016-2019
United Kingdom	2018-2019
Ireland	2015-2019
Canada	2016-2019
Switzerland	2017-2019
Denmark	2015-2019

As of December 31, 2019, the Company's current income tax payable (included in "Other liabilities") was $14.2 million.

13. Transactions with Related Parties

In 2017, the Company acquired approximately 25% of Premia Holdings Ltd. Premia Holdings Ltd. is the parent of Premia Reinsurance Ltd., a multi-line Bermuda reinsurance company (together with Premia Holdings Ltd., "Premia"). Premia's strategy is to reinsure or acquire companies or reserve portfolios in the non-life property and casualty insurance and reinsurance run-off market. Arch Re Bermuda and certain Arch co-investors invested $100.0 million and acquired approximately 25% of Premia as well as warrants to purchase additional common equity. Arch has appointed two directors to serve on the seven person board of directors of Premia. Arch Re Bermuda is providing a 25% quota share reinsurance treaty on certain business written by Premia.

In the 2019 fourth quarter, Barbican entered into certain reinsurance and related transactions with Premia pursuant to which Premia assumed a transfer of liability for the 2018 and prior years of account of Barbican as of July 1, 2019. Barbican recorded reinsurance recoverable on unpaid and paid losses and funds held liability of $177.7 million and $180.0 million, respectively, at December 31, 2019.

Certain directors and executive officers of the Company own common and preference shares of Watford See Note 4 for information about Watford.

During 2019 and 2018, the Company incurred approximately $75.4 million and $58.4 million, respectively, of administrative and support service fees to a wholly owned subsidiary of Arch Capital, Arch Capital Services Inc., and its subsidiary, Arch International Services Inc. (collectively, "ACSI"). Such fees were incurred pursuant to the terms of specific administrative and support service agreements between Arch Re Bermuda and certain of its subsidiaries and ACSI, and are included in "Other operating expenses" in the consolidated statements of income.

During 2019 and 2018, the Company incurred approximately $18.8 million and $16.1 million for services that are provided by Arch Global Services Inc. and Arch Global Services (Cyprus) Ltd. (collectively, "Global Services"). Such fees were incurred pursuant to the terms of services agreements between Arch Re Bermuda and certain of its subsidiaries and entered into with Global Services, and are included in "Other operating expenses" in the consolidated statements of income.

During 2019 and 2018, the Company incurred approximately $27.7 million and $26.4 million, respectively, of investment service fees to Arch Investment Management Ltd. ("AIM"). Such fees are incurred pursuant to the terms of specific investment service agreements between Arch Re Bermuda and certain of its subsidiaries and AIM, and are included in "Net investment income" in the consolidated statements of income is net of these fees.

14. Leases

In the ordinary course of business, the Company renews and enters into new leases for office property and equipment. At the lease inception date, the Company determines whether a contract contains a lease and its classification as a finance or operating lease. Primarily all of the Company's leases are classified as operating leases. The Company's operating leases have remaining lease terms of up to 9 years, some of which include options to extend the lease term. The Company considers these options when determining the lease term and measuring its lease liability and right-of-use asset. In addition, the Company's lease agreements do not contain any material residual value guarantees or material restrictive covenants.

Short-term operating leases with an initial term of twelve months or less were excluded on the Company's consolidated balance sheet and represent an inconsequential amount of operating lease expense.

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

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

December 31, 2019		
Operating lease costs	$	25,343
Cash payments included in the measurement of lease liabilities reported in operating cash flows	$	24,528
Right-of-use assets obtained in exchange for new lease liabilities	$	3,691
Right-of-use assets (1)	$	84,556
Operating lease liability (1)	$	97,435
Weighted average discount rate		3.9%
Weighted average remaining lease term		5.1

(1) The right-of-use assets are included in 'other assets' while the operating lease liability is included in 'other liabilities.'

The following table presents the contractual maturities of the Company's operating lease liabilities at December 31, 2019:

Years Ending December 31,		
2020	$	24,861
2021		22,714
2022		19,426
2023		15,719
2024		11,403
Thereafter		13,095
Total undiscounted lease liability		107,218
Less: present value adjustment		(9,783)
Operating lease liability	$	97,435

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

Years Ending December 31,		
2019	$	27,121
2020		26,211
2021		24,062
2022		20,728
2023		16,183
Thereafter		22,655
Total	$	136,960

All of these leases are for the rental of office space, with expiration terms that range from 2019 to 2030. Rental expense was approximately $25.3 million and $25.0 million for 2019 and 2018, respectively.

At December 31, 2019, the Company has entered into financing lease agreements. The future lease payments for the Company's financing leases are expected to be $4.8 million and $2.1 million for 2020 and 2021, respectively.

15. Commitments and Contingencies

Concentrations of Credit Risk

The creditworthiness of a counterparty is evaluated by the Company, taking into account credit ratings assigned by independent agencies. The credit approval process involves an assessment of factors, including, among others, the counterparty, country and industry credit exposure limits. Collateral may be required, at the discretion of the Company, on certain transactions based on the creditworthiness of the counterparty.

The areas where significant concentrations of credit risk may exist include unpaid losses and loss adjustment expenses recoverable, contractholder receivables, ceded unearned premiums, paid losses and loss adjustment expenses recoverable net of reinsurance balances payable, investments and cash and cash equivalent balances. A credit exposure exists with respect to reinsurance recoverables as they may become uncollectible. The Company manages its credit risk in its reinsurance relationships by transacting with reinsurers that it considers financially sound and, if necessary, the Company may hold collateral in the form of funds, trust accounts and/or irrevocable letters of credit. This collateral can be drawn on for amounts that remain unpaid beyond specified time periods on an individual reinsurer basis. In addition, certain insurance policies written by the Company's insurance operations feature large deductibles, primarily in its construction and national accounts lines of business. Under such contracts, the Company is obligated to pay the claimant for the full amount of the claim. The Company is subsequently reimbursed by the policyholder for the deductible amount. These amounts are included on a gross basis in the consolidated balance sheets in contractholder payables and contractholder receivables, respectively. In the event that the Company is unable to collect from the policyholder, the Company would be liable for such defaulted amounts. Collateral, primarily in the form of letters of credit, cash and trusts, is obtained from the policyholder to mitigate the Company's credit risk. In the instances where the company receives collateral in the form of cash, the Company records a related liability in "Collateral held for insured obligations."

In addition, the Company underwrites a significant amount of its business through brokers and a credit risk exists should any of these brokers be unable to fulfill their contractual obligations with respect to the payments of insurance and reinsurance balances owed to the Company. The following table summarizes the percentage of the Company's gross premiums written generated from or placed by the largest brokers:

	Year Ended December 31,	
Broker	2019	2018
Aon Corporation and its subsidiaries	12.2%	11.4%
Marsh & McLennan Companies and its subsidiaries	9.6%	9.3%

No other broker and no one insured or reinsured accounted for more than 10% of gross premiums written for 2019 and 2018.

The Company's available for sale investment portfolio is managed in accordance with guidelines that have been tailored to meet specific investment strategies, including standards of diversification, which limit the allowable holdings of any single issue. There were no investments in any entity in excess of 10% of the Company's shareholder's equity at December 31, 2019 other than investments issued or guaranteed by the United States government or its agencies.

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 $1.69 billion and $1.77 billion at December 31, 2019 and 2018, respectively.

Contingent Consideration Liability

Pursuant to the Company's 2014 acquisition of the CMG Entities, the Company made a contingent consideration payment of $61.5 million in April 2019 and $71.7 million in April 2017. The maximum remaining amount of contingent consideration payments is $6.7 million over the remaining earn-out period. To the extent that the adjusted book value of the CMG Entities drops below the cumulative amount paid by the Company, no additional payments would be due.

Purchase Obligations

The Company has also entered into certain agreements which commit the Company to purchase goods or services, primarily related to software and computerized systems. Such purchase obligations were approximately $34.0 million and $16.0 million at December 31, 2019 and 2018, respectively.

Employment and Other Arrangements

At December 31, 2019, the Company has entered into employment agreements with certain of its executive officers. Such employment arrangements provide for compensation in the form of base salary, annual bonus, share-based awards, participation in the Company's employee benefit programs and the reimbursements of expenses.

Loans with Affiliates

Arch Capital depends on its available cash resources, liquid investments and dividends or other distributions from subsidiaries to make payments, including the payment of debt service obligations and operating expenses it may incur and any payments of dividends, redemption amounts or liquidation amounts with respect to preferred shares and common shares, and to fund the share repurchase program. During the course of 2019 and 2018, Arch Capital requested cash advances from Arch Re Bermuda. Arch Re Bermuda agreed to provide such cash advances to Arch Capital in the form of interest free loans which were repayable upon demand. Arch Re Bermuda advanced $116.9 million in 2019 and $398.7 million in 2018 to Arch Capital on such terms. The loan balances due to Arch Re Bermuda were subsequently forgiven and converted into dividend payments which reduced the outstanding loan balance due from Arch Capital at each balance sheet date to nil. In addition, Arch Capital Services Inc. issued demand notes to Arch-U.S during the course of 2014 and 2015. The total amount of demand notes outstanding was $35 million at December 31, 2019 and 2018.

16. Debt and Financing Arrangements

The Company's senior notes payable at December 31, 2019 and 2018 were as follows:

	Interest (Fixed)	Principal Amount	Carrying Amount at December 31, 2019	Carrying Amount at December 31, 2018
2043 notes (1)	5.144%	$ 500,000	$ 494,831	$ 494,723
2026 notes (2)	4.011%	500,000	496,806	496,417
2046 notes (3)	5.031%	450,000	445,317	445,238
Watford notes (4)	6.500%	140,000	137,418	—
		$ 1,590,000	$ 1,574,372	$ 1,436,378

(1) Senior notes of Arch-U.S., a wholly-owned subsidiary of Arch Re Bermuda, issued on December 13, 2013 and due November 1, 2043 ("2043 notes"), fully and unconditionally guaranteed by Arch Capital.

(2) Senior notes of Arch Capital Finance LLC ("Arch Finance"), a wholly-owned finance subsidiary of Arch Re Bermuda, issued on December 8, 2016 and due December 15, 2026 ("2026 notes"), fully and unconditionally guaranteed by Arch Capital.

(3) Senior notes of Arch Finance issued on December 8, 2016 and due December 15, 2046 ("2046 notes"), fully and unconditionally guaranteed by Arch Capital.

(4) Senior notes of Watford issued on July 2, 2019 and due July 2, 2029, reflecting the elimination of amounts owned by Arch-U.S.

During 2019 and 2018, the Company made interest payments of $103.9 million and $97.7 million, respectively, related to its senior notes and other financing arrangements.

Letter of Credit and Revolving Credit Facilities

In the normal course of its operations, the Company enters into agreements with financial institutions to obtain secured and unsecured credit facilities.

On December 17, 2019, Arch Capital and certain of its subsidiaries entered into a $750.0 million five-year credit facility (the "Credit Facility") with a syndication of lenders. The Credit Facility consists of a $250.0 million secured facility for letters of credit (the "Secured Facility") and a $500.0 million unsecured facility for revolving loans and letters of credit (the "Unsecured Facility"). Obligations of each borrower under the Secured Facility for letters of credit are secured by cash and eligible securities of such borrower held in collateral accounts. Commitments under the Credit Facility may be increased up to, but not exceeding, an aggregate of $1.25 billion. Arch Capital has a one-time option to convert any or all outstanding revolving loans of Arch Capital and/or Arch-U.S. to term loans with the same terms as the revolving loans except that any prepayments may not be re-borrowed. Arch-U.S. guarantees the obligations of Arch Capital, and Arch Capital guarantees the obligations of Arch-U.S. Borrowings of revolving loans may be made at a variable rate based on LIBOR or an alternative base rate at the option of Arch Capital. Arch Capital and its lenders may agree on a LIBOR successor rate at the appropriate time to address the replacement of LIBOR. Secured letters of credit are available for issuance on behalf of certain Arch Capital subsidiaries. The Credit Facility is structured such that each party that requests a letter of credit or borrowing does so only for itself and its own obligations.

The Credit Facility contains certain restrictive covenants customary for facilities of this type, including restrictions on indebtedness, consolidated tangible net worth, minimum shareholders' equity levels and minimum financial strength ratings. Arch Capital and its subsidiaries which are party to the agreement were in compliance with all covenants contained therein at December 31, 2019.

Commitments under the Credit Facility will expire on December 17, 2024, and all loans then outstanding must be repaid. Letters of credit issued under the Unsecured Facility will not have an expiration date later than December 17, 2025. Under the $250.0 million secured letter of credit facility, Arch Capital's subsidiaries had $225.4 million of letters of credit outstanding and remaining capacity of $24.6 million at December 31, 2019. In addition, certain of Arch Capital's subsidiaries had outstanding secured and unsecured letters of credit of $18.1 million and $195.0 million respectively, which were issued in the normal course of business.

When issued, all secured letters of credit are secured by a portion of the investment portfolio. At December 31, 2019, these letters of credit were secured by investments with a fair value of $255.4 million.

Watford has access to a $100 million secured letter of credit facility expiring on May 16, 2020, a $100 million unsecured letter of credit facility which auto extends on September 20, 2020 and an $800 million secured credit facility expiring on November 30, 2021 that provides for borrowings and the issuance of letters of credit not to exceed $400 million. Borrowings of revolving loans may be made by Watford at a variable rate based on LIBOR or an alternative base rate at the option of Watford. At December 31, 2019, Watford had $122.9 million in outstanding letters of credit under the two facilities and $484.3 million of borrowings outstanding under the secured credit facility, backed by Watford's investment portfolio. Watford was in compliance with all covenants contained in these credit facilities at December 31, 2019. The Company does not guarantee or provide credit support for Watford, and the Company's financial exposure to Watford is limited to its investment in Watford's senior notes, common and preferred shares and counterparty credit risk (mitigated by collateral) arising from the reinsurance transactions.

The Company's outstanding revolving credit agreement borrowings were as follows:

	Year Ended December 31, 2019	Year Ended December 31, 2018
Watford	$ 484,287	$ 455,682
Total revolving credit agreement borrowings	$ 484,287	$ 455,682

17. Goodwill and Intangible Assets

The following table shows an analysis of goodwill and intangible assets:

	Goodwill	Intangible assets with an indefinite life	Intangible assets with finite life	Total
Net balance at December 31, 2017	$ 198,236	$ 68,174	$ 385,805	$ 652,215
Acquisitions	51,476	—	43,000	94,476
Amortization	—	—	(105,285)	(105,285)
Impairments (1)	—	(6,300)	—	(6,300)
Foreign currency movements and other adjustment	(92)	—	(94)	(186)
Net balance at December 31, 2018	249,620	61,874	323,426	634,920
Acquisitions (2)	74,780	24,431	82,482	181,693
Amortization	—	—	(82,104)	(82,104)
Impairments (1)	—	(1,000)	—	(1,000)
Foreign currency movements and other adjustment	2,151	605	1,818	4,574
Net balance at December 31, 2019	$ 326,551	$ 85,910	$ 325,622	$ 738,083
Gross balance at December 31, 2019	$ 331,448	$ 85,305	$ 743,569	$ 1,160,322
Accumulated amortization	—	—	(418,350)	(418,350)
Foreign currency movements and other adjustment	(4,897)	605	403	(3,889)
Net balance at December 31, 2019	$ 326,551	$ 85,910	$ 325,622	$ 738,083

(1) The impairment to the indefinite-lived intangible assets during the year ended December 31, 2019 and 2018 of $1.0 million and $6.3 million related to insurance licenses from the acquisition of UGC.

(2) Certain amounts for the Company'2019 acquisitions are considered provisional.

The following table presents the components of goodwill and intangible assets:

	Gross Balance	Accumulated Amortization	Foreign Currency Translation Adjustment and Other	Net Balance
December 31, 2019				
Acquired insurance contracts	$ 452,470	$ (336,559)	$ 310	$ 116,221
Operating platform	52,674	(39,571)	(259)	12,844
Distribution relationships	242,824	(49,598)	282	193,508
Goodwill	331,448	—	(4,897)	326,551
Insurance licenses	63,390	—	—	63,390
Syndicate capacity	21,915	—	605	22,520
Unfavorable service contract	(9,533)	8,657	—	(876)
Other	5,134	(1,279)	70	3,925
Total	$ 1,160,322	$ (418,350)	$ (3,889)	$ 738,083
December 31, 2018				
Acquired insurance contracts	$ 435,067	$ (271,981)	$ (150)	$ 162,936
Operating platform	47,400	(35,402)	—	11,998
Distribution relationships	185,597	(35,774)	(1,266)	148,557
Goodwill	256,668	—	(7,047)	249,621
Insurance licenses	61,874	—	—	61,874
Syndicate capacity	—	—	—	—
Unfavorable service contract	(9,533)	7,949	—	(1,584)
Other	2,556	(1,038)	—	1,518
Total	$ 979,629	$ (336,246)	$ (8,463)	$ 634,920

The estimated remaining amortization expense for the Company’s intangible assets with finite lives is as follows:

2020	$ 65,958
2021	48,063
2022	33,972
2023	31,731
2024	27,566
Thereafter	118,331
Total	$ 325,621

The estimated remaining useful lives of these assets range from one to seventeen years at December 31, 2019.

Other than the impairment described above, the Company’s annual impairment reviews for goodwill and intangible assets did not result in the recognition of impairment losses for 2019 and 2018.

18. Shareholder’s Equity

Authorized and Issued

The authorized share capital of the Company consists of 2,625,000 common shares, par value of $1.00 per share, at December 31, 2019 and 2018. The issued share capital of the Company consists of 2,560,423 common shares, par value of $1.00 per share at December 31, 2019 and 2018.

19. Share-Based Compensation

Long Term Incentive and Share Award Plans

Arch Capital utilizes share-based compensation plans for officers, other employees and directors of Arch Capital and its subsidiaries, including Arch Re Bermuda, to provide competitive compensation opportunities, to encourage long-term service, to recognize individual contributions and reward achievement of performance goals and to promote the creation of long-term value for Arch Capital shareholders by aligning the interests of such persons with those of shareholders.

In 2018, the shareholders of Arch Capital approved a three-for-one stock split of the Arch Capital’s common shares. All historical share and per share amounts reflect the effect of the stock split.

The 2018 Long-Term Incentive and Share Award Plan (the “2018 Plan”) became effective as of May 9, 2018 following approval by shareholders of Arch Capital. The 2018 Plan provides for the issuance of restricted stock units, performance units, restricted shares, performance shares, stock options and stock appreciation rights (“SAR”) and other equity-based awards to employees and directors of Arch Capital and subsidiaries. The 2018 Plan authorizes the issuance of 34,500,000 common shares and will terminate as to future awards on February 28, 2028. At December 31, 2019, 25,201,143 shares are available for future issuance.

The 2015 Long Term Incentive and Share Award Plan (the (“2015 Plan”) authorizes the issuance of 12,900,000 common shares and became effective as of May 7, 2015 following approval by shareholders of Arch Capital. The 2015 Plan provides for the issuance of share-based awards to employees and directors of Arch Capital and subsidiaries and will terminate as to future awards on February 26, 2025. At December 31, 2019, 390,156 shares are available for future issuance.

The 2012 Long Term Incentive and Share Award Plan (the “2012 Plan”) became effective as of May 9, 2012 following approval by shareholders of Arch Capital. The 2012 Plan authorizes the issuance of 22,301,772 common shares and will terminate as to future awards on February 28, 2022. At December 31, 2019, 606,589 shares are available for grant under the 2012 Plan.

Upon Arch Capital shareholder approval on May 6, 2016, the Amended and Restated Arch Capital Group Ltd. 2007 Employee Share Purchase Plan (the “ESPP”) became effective and a total of 4,689,777 common shares were reserved for issuance. The purpose of the ESPP is to give employees of Arch Capital and its subsidiaries an opportunity to purchase common shares through payroll deductions, thereby encouraging employees to share in the economic growth and success of Arch Capital and its subsidiaries. The ESPP is designed to qualify as an "employee share purchase plan" under Section 423 of the Code. At December 31, 2019, approximately 2,729,721 shares remain available for issuance.

Stock Options and Stock Appreciation Rights

Arch Capital generally issues stock options and SARs to eligible employees, with exercise prices equal to the fair market values of Arch Capital's Common Shares on the grant dates. Such grants generally vest over a three year period with one-third vesting on the first, second and third anniversaries of the grant date.

The grant date fair value is determined using the Black-Scholes option valuation model. The expected life assumption was based on an expected term analysis, which incorporated Arch Capital's historical exercise experience. Expected volatility is based on the Arch Capital's daily historical trading data of its common shares. The table below summarizes the assumptions used.

	Year Ended December 31,	
	2019	2018
Dividend yield	—%	—%
Expected volatility	18.1%	21.3%
Risk free interest rate	2.5%	2.8%
Expected option life	6.0 years	6.0 years

A summary of stock option and SAR activity under Arch Capital's Long Term Incentive and Share Award Plans during 2019 is presented below:

	Year Ended December 31, 2019			
	Number of Options / SARs	Weighted Average Exercise Price	Weighted Average Contractual Term	Aggregate Intrinsic Value
Outstanding, beginning of year	7,790,108	$ 19.25		
Granted	570,645	$ 32.97		
Exercised	(1,385,604)	$ 14.26		
Forfeited or expired	(95,489)	$ 28.17		
Outstanding, end of year	6,879,660	$ 21.27	$ 5.16	$ 148,751
Exercisable, end of year	5,246,795	$ 18.58	$ 4.13	$ 127,546

The aggregate intrinsic value of stock options and SARs exercised represents the difference between the exercise price of the stock options and SARs and the closing market price of the Company's common shares on the exercise dates. During 2019, the Company received proceeds of $8.8 million from the exercise of stock options and recognized a tax benefit of $4.9 million from the exercise of stock options and SARs.

	Year Ended December 31,	
	2019	2018
Weighted average grant date fair value	$ 7.92	$ 7.60
Aggregate intrinsic value of Options/SARs exercised	$ 29,800	$ 23,758

Restricted Common Shares and Restricted Units

Arch Capital also issues restricted share and unit awards to eligible employees, for which the fair value is equal to the fair market values of Arch Capital's common shares on the grant dates. Restricted share and unit awards generally vest over a three year period with one-third vesting on the first, second and third anniversaries of the grant date.

A summary of restricted share and restricted unit activity under Arch Capital's Long Term Incentive and Share Award Plans for 2019 is presented below:

	Year Ended December 31, 2019	
	Restricted Common Shares	Restricted Unit Awards
Unvested Shares:		
Unvested balance, beginning of year	909,952	997,307
Granted	157,568	674,148
Vested	(502,840)	(323,196)
Forfeited	(16,805)	(69,914)
Unvested balance, end of year	547,875	1,278,345
Weighted Average Grant Date Fair Value:		
Unvested balance, beginning of year	$ 29.12	$ 27.29
Granted	$ 33.75	$ 32.63
Vested	$ 28.44	$ 27.28
Forfeited	$ 31.67	$ 29.05
Unvested balance, end of year	$ 31.00	$ 30.01

The following table presents the weighted average grant date fair value of restricted shares and restricted unit awards granted and the aggregate fair value of restricted shares and unit awards vesting in each year.

	Year Ended December 31,	
	2019	2018
Restricted shares and restricted unit awards granted	831,716	1,121,457
Weighted average grant date fair value	$ 32.84	$ 26.95
Aggregate fair value of vested restricted shares and units awards	$ 28,243	$ 27,910

The aggregate intrinsic value of restricted units outstanding at December 31, 2019 was $54.8 million.

Performance Awards

Arch Capital also issues performance share and unit awards ("performance awards") to eligible employees, which are earned based on the achievement of pre-established threshold, target and maximum goals over three-year performance periods. Final payouts depend on the level of achievement along with each employees continued service through the vest date. The grant date fair value of the performance awards is measured using a Monte Carlo simulation model, which incorporated the assumptions summarized in the table below. Expected volatility is based on Arch Capital's daily historical trading data of its common shares. The cumulative compensation expense recognized and unrecognized as of any reporting period date represents the adjusted estimate of performance shares and units that will ultimately be awarded, valued at their original grant date fair values.

	Year Ended December 31,	
	2019	2018
Expected volatility	17.1%	16.2%
Risk free interest rate	2.5%	2.6%

	Performance Shares	Performance Units
Unvested Shares:		
Unvested balance, beginning of year	146,490	12,993
Granted	172,684	10,774
Vested	—	—
Forfeited	—	—
Unvested balance, end of year	319,174	23,767
Weighted Average Grant Date Fair Value:		
Unvested balance, beginning of year	$ 24.65	$ 24.71
Granted	$ 36.71	$ 35.83
Vested	$ —	$ —
Forfeited	$ —	$ —
Unvested balance, end of year	$ 31.18	$ 29.75

The following table presents the weighted average grant date fair values of performance awards granted.

	Year Ended December 31,	
	2019	2018
Performance awards	183,458	174,675
Weighted average grant date fair value	$ 36.66	24.66

The issuance of share-based awards and amortization thereon has no effect on the Company's consolidated shareholder's equity.

Share-Based Compensation Expense

The following tables present pre-tax and after-tax share-based compensation expense recognized as well as the unrecognized compensation cost associated with unvested awards and the weighted average period over which it is expected to be recognized.

	Year Ended December 31,	
	2019	2018
Pre-Tax		
Stock options and SARs	$ 6,362	$ 6,449
Restricted share and unit awards	28,036	24,001
Performance awards	2,082	936
ESPP	2,610	979
Total	$ 39,090	$ 32,365
After-Tax		
Stock options and SARs	$ 5,228	$ 5,306
Restricted share and unit awards	23,011	19,757
Performance awards	1,717	764
ESPP	2,372	885
Total	$ 32,328	$ 26,712

	December 31, 2019		
	Stock Options and SARs	Restricted Common Shares and Units	Performance Share and Units
Unrecognized compensation cost related to unvested awards	$ 6,846	$ 29,456	3,169
Weighted average recognition period (years)	1.39	1.41	1.34

20. Retirement Plans

For purposes of providing employees with retirement benefits, the Company maintains defined contribution retirement plans. Contributions are based on the participants' eligible compensation. For 2019 and 2018, the Company expensed approximately $39.2 million and $35.9 million, respectively, related to these retirement plans.

21. 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 December 31, 2019, the Company was not a party to any litigation or arbitration which is expected by management to have a material adverse effect on the Company's results of operations and financial condition and liquidity.

22. Statutory Information

Arch Re Bermuda and its insurance and reinsurance subsidiaries are subject to insurance and/or reinsurance laws and regulations in the jurisdictions in which they operate. These regulations include certain restrictions on the amount of dividends or other distributions available to shareholders without prior approval of the insurance regulatory authorities. During 2019 and 2018, Arch Re Bermuda paid dividends to Arch Capital of $116.9 million and $398.7 million, respectively.

The actual and required statutory capital and surplus for Arch Re Bermuda and its principal operating subsidiaries at December 31, 2019 and 2018 was as follows:

	December 31,	
	2019	2018
Actual capital and surplus (1):		
Bermuda	$ 13,511,729	$ 11,605,652
Ireland	721,439	653,055
United States	4,440,848	4,195,477
United Kingdom	748,276	386,892
Canada	61,351	59,096
Required capital and surplus:		
Bermuda	$ 5,492,968	$ 4,718,345
Ireland	542,703	429,117
United States	1,697,640	1,783,268
United Kingdom	349,328	271,864
Canada	32,763	33,189

(1) Such amounts include ownership interests in affiliated insurance and reinsurance subsidiaries.

There were no state-prescribed or permitted regulatory accounting practices for any of the Company's insurance or reinsurance entities that resulted in reported statutory surplus that differed from that which would have been reported under the prescribed practices of the respective regulatory authorities, including the National Association of Insurance Commissioners. The differences between statutory financial statements and statements prepared in accordance with GAAP vary by jurisdiction, however, with the primary differences being that statutory financial statements may not reflect deferred acquisition costs, certain net deferred tax assets, goodwill and intangible assets, unrealized appreciation or depreciation on debt securities and certain unauthorized reinsurance recoverables and include contingency reserves.

The statutory net income (loss) for the Company's principal operating subsidiaries for 2019 and 2018 was as follows:

	Year Ended December 31,	
	2019	2018
Statutory net income (loss):		
Bermuda	$ 1,876,416	$ 919,554
Ireland	26,367	29,223
United States	481,188	292,831
United Kingdom	(17,423)	(18,467)
Canada	(1,023)	2,525

Bermuda

The Company has two Bermuda based subsidiaries: Arch Re Bermuda, a Class 4 insurer and long-term insurer, and Watford Re Ltd., a Class 4 insurer. Under the Bermuda Insurance Act 1978 (the "Insurance Act"), these subsidiaries are required to maintain minimum statutory capital and surplus equal to the greater of a minimum solvency margin and the enhanced capital requirement as determined by the Bermuda Monetary Authority ("BMA"). The enhanced capital requirement is calculated based on the Bermuda Solvency Capital Requirement model, a risk-based model that takes into account the risk characteristics of different aspects of the company's business. At December 31, 2019 and 2018, all such requirements were met.

The ability of these subsidiaries to pay dividends is limited under Bermuda law and regulations. Under the Insurance Act, Arch Re Bermuda is restricted with respect to the payment of dividends. 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 an affidavit stating that it will continue to meet the required margins following the declaration of those dividends. Accordingly, Arch Re Bermuda can pay approximately $3.10 billion to Arch Capital during 2020 without providing an affidavit to the BMA.

Ireland

The Company has two Irish subsidiaries: Arch Re Europe, an authorized life and non-life reinsurer, and Arch Insurance (EU), an authorized non-life insurer. Irish authorized reinsurers and insurers, such as Arch Re Europe and Arch Insurance (EU), are also subject to the general body of Irish laws and regulations including the provisions of the Companies Act 2014. Arch Re Europe and Arch Insurance (EU) are subject to the supervision of the Central Bank of Ireland ("CBOI") and must comply with Irish insurance acts and regulations as well as with directions and guidance issued by the CBOI. These subsidiaries are required to maintain a minimum level of capital. At December 31, 2019 and 2018, these requirements were met.

The amount of dividends these subsidiaries are permitted to declare is limited to accumulated, realized profits, so far as not previously utilized by distribution or capitalization, less its accumulated, realized losses, so far as not previously written off in a reduction or reorganization of capital duly made. The solvency and capital requirements must still be met following any distribution. Dividends or distributions, if any, made by Arch Re Europe would result in an increase in available capital at Arch Re Bermuda.

United States

The Company's U.S. insurance and reinsurance subsidiaries are subject to insurance laws and regulations in the jurisdictions in which they operate. The ability of the Company's 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-U.S., the Company's U.S. holding company. Arch Re U.S. can declare a maximum of approximately $130.2 million of dividends during 2020 subject to the approval of the Commissioner of the Delaware Department of Insurance.

Arch Mortgage Insurance Company and United Guaranty Residential Insurance Company have each been approved as an eligible mortgage insurer by Fannie Mae and Freddie Mac, subject to maintaining certain ongoing requirements ("eligible mortgage insurers"). In April 2015, the GSEs published comprehensive, revised requirements, known as the Private Mortgage Insurer Eligibility Requirements or "PMIERs." As clarified and revised by the Guidance Letters issued by the GSEs in December 2016 and March 2017, the PMIERs apply to the Company's eligible mortgage insurers, but do not apply to Arch Mortgage Guaranty Company, which is not GSE-approved.

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 our eligible mortgage insurers' mortgage insurance portfolio at the point in time, and the amount of risk ceded to reinsurers that may be deducted in our calculation of "minimum required assets."

The Company's U.S. mortgage insurance subsidiaries are subject to detailed regulation by their domiciliary and primary regulators, the Wisconsin Office of the Commissioner of Insurance ("Wisconsin OCI") for Arch Mortgage Insurance Company and Arch Mortgage Guaranty Company, the North Carolina Department of Insurance ("NC DOI") for United Guaranty Residential Insurance Company, and by state insurance departments in each state in which they are licensed. As mandated by state insurance laws, mortgage insurers are generally mono-line companies restricted to writing a single type of insurance business, such as mortgage insurance business. Each company is subject to either Wisconsin or North Carolina statutory requirements as to payment of dividends. Generally, both Wisconsin and North Carolina law precludes any dividend before giving at least 30 days' notice to the Wisconsin OCI or NC DOI, as applicable, and prohibits paying any dividend unless it is fair and reasonable to do so. In addition, the state regulators and the GSEs limit or restrict our eligible mortgage insurers' ability to pay stockholder dividends or otherwise return capital to shareholders. Under respective states law, our U.S. mortgage subsidiaries can declare a maximum of approximately $338.9 million of ordinary dividends in 2020, however, dividend capacity is limited by the respective companies unassigned surplus amounts. As of December 31, 2019, the combined unassigned surplus amount of our U.S. mortgage insurance entities would limit the dividend capacity to $177.8 million. In certain instances, approval by the GSEs would be required for dividends or other forms of return of capital to shareholders due to the requirements under PMIERs, including the minimum required assets imposed on our eligible mortgage insurers by the GSEs. Such dividend would result in an increase in available capital at Arch U.S. MI Holdings Inc., a subsidiary of Arch-U.S.

Mortgage insurance companies licensed in Wisconsin or North Carolina are required to establish contingency loss reserves for purposes of statutory accounting in an amount equal to at least 50% of net earned premiums. These amounts generally cannot be withdrawn for a period of 10 years and are separate liabilities for statutory accounting purposes, which affects the ability to pay dividends. However, with prior regulatory approval, a mortgage insurance company may make early withdrawals from the contingency reserve when incurred losses exceed 35% of net premiums earned in a calendar year.

Under Wisconsin and North Carolina law, as well as that of 14 other states, a mortgage insurer must maintain a minimum amount of statutory capital relative to its risk in force in order for the mortgage insurer to continue to write new business. While formulations of minimum capital vary in certain jurisdictions, the most common measure applied allows for a maximum risk-to-capital ratio of 25 to 1. Wisconsin and North Carolina both require a mortgage insurer to maintain a "minimum policyholder position" calculated in accordance with their respective regulations. Policyholders' position consists primarily of statutory policyholders' surplus plus the statutory contingency reserve, less ceded reinsurance. While the statutory contingency reserve is reported as a liability on the statutory balance sheet, for risk-to-capital ratio calculations, it is included as capital for purposes of statutory capital.

United Kingdom

The Prudential Regulation Authority ("PRA") and the Financial Conduct Authority ("FCA") regulate insurance and reinsurance companies and the FCA regulates firms carrying on insurance mediation activities operating in the U.K., both under the Financial Services and Markets Act 2000. The Company's European insurance operations are conducted on two platforms: Arch Insurance (U.K), Arch Syndicate 2012 and Barbican Syndicate 1955. Arch Syndicate 2012 has one corporate member, Arch Syndicate Investments Ltd. ("ASIL"), and is managed by Arch Underwriting at Lloyd's Ltd ("AUAL"). The syndicates managed by BMAL have 11 corporate members. BMAL is the managing agent of Barbican Syndicate 1955. Arch Syndicate 2012 and Barbican Syndicate 1955 provide access to Lloyd's extensive distribution network and worldwide licenses. All U.K. companies are also subject to a range of statutory provisions, including the laws and regulations of the Companies Acts 2006 (as amended) (the "U.K. Companies Acts").

Arch Insurance (U.K), AUAL (on behalf of itself, Arch Syndicate 2012 and ASIL) and BMAL must maintain a margin of solvency at all times under the Solvency II Directive from the European Insurance and Occupational Pensions Authority. The regulations stipulate that insurers are required to maintain the minimum capital requirement and solvency capital requirement at all times. The capital requirements are calculated by reference to standard formulae defined in Solvency II. At December 31, 2019 and 2018, the Company's subsidiaries were in compliance with these requirements.

As a corporate member of Lloyd's, ASIL and others are subject to the oversight of the Council of Lloyd's. The capital required to support a Syndicate's underwriting capacity, or funds at Lloyd's, is assessed annually and is determined by Lloyd's in accordance with the capital adequacy rules established by the PRA. The Company has provided capital to support the underwriting of Arch Syndicate 2012 and Barbican Syndicate 1955 in the form of pledged assets provided by Arch Re Bermuda. The amount which the Company provides as funds at Lloyd's is not available for distribution to the Company for the payment of dividends. Lloyd's is supervised by the PRA and required to implement certain rules prescribed by the PRA under the Lloyd's Act of 1982 regarding the operation of the Lloyd's market. With respect to managing agents and corporate members, Lloyd's prescribes certain minimum standards relating to management and control, solvency and other requirements and monitors managing agents' compliance with such standards.

Under U.K. law, all U.K. companies are restricted from declaring a dividend to their shareholders unless they have "profits available for distribution." The calculation as to whether a company has sufficient profits is based on its accumulated realized profits minus its accumulated realized losses. U.K. insurance regulatory laws do not prohibit the payment of dividends, but the PRA or FCA, as applicable, requires that insurance companies and insurance intermediaries maintain certain solvency margins and may restrict the payment of a dividend by Arch Insurance (U.K.), AUAL, ASIL and BMAL.

Canada

Arch Insurance Canada and the Canadian branch of Arch Re U.S. ("Arch Re Canada") are subject to federal, as well as provincial and territorial, regulation in Canada. The Office of the Superintendent of Financial Institutions ("OSFI") is the federal regulatory body that, under the Insurance Companies Act (Canada), regulates federal Canadian and non-Canadian insurance companies operating in Canada. Arch Insurance Canada and Arch Re Canada are subject to regulation in the provinces and territories in which they underwrite insurance/reinsurance, and the primary goal of insurance/reinsurance regulation at the provincial and territorial levels is to govern the market conduct of insurance/reinsurance companies. Arch Insurance Canada is licensed to carry on insurance business by OSFI and in each province and territory. Arch Re Canada is licensed to carry-on reinsurance business by OSFI and in the provinces of Ontario and Quebec.

Under the Insurance Companies Act (Canada), Arch Insurance Canada is required to maintain an adequate amount of capital in Canada, calculated in accordance with a test promulgated by OSFI called the Minimum Capital Test ("MCT"), and Arch Re Canada is required to maintain an adequate margin of assets over liabilities in Canada, calculated in accordance with a test promulgated by OSFI called the Branch Adequacy of Assets Test. Dividends or distributions, if any, made by Arch Insurance Canada would result in an increase in available capital at Arch Insurance Company (see "United States" section).

23. Subsequent Event

On March 11, 2020, the World Health Organization declared a pandemic in relation to the outbreak of the COVID-19 virus. The outbreak is causing unprecedented social disruption, global economic and financial markets volatility, reduced liquidity of capital markets and intervention by various governments around the world. The Company, in the first instance, has taken all necessary steps to protect its employees with the introduction of mandatory working from home and the implementation of its business continuity plans. At the point of issuing of the financial statement the COVID-19 pandemic continues to develop. While the impact on the business remains uncertain, the Company is actively monitoring the impact COVID-19 is having with particular focus on the valuation of the Company's investments, incurred losses, the recoverability of the Company's reinsurance assets, and premium volume, all of which are impacted by the increased volatility and uncertainty in the markets. Due to the recentness of these events, the Company is unable to estimate the effects of these matters on the Company's prospective results of operations or financial condition.