RGA Americas Reinsurance Company, Ltd.

Consolidated Financial Statements as of and for the
Years Ended December 31, 2018 and 2017, and
Independent Auditors' Report

RGA AMERICAS REINSURANCE COMPANY, LTD.

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INDEPENDENT AUDITORS' REPORT

To the Shareholder and Board of Directors of
RGA Americas Reinsurance Company, Ltd.:

We have audited the accompanying consolidated financial statements of RGA Americas Reinsurance Company, Ltd. and its subsidiaries (the "Company"), which comprise the consolidated balance sheets as of December 31, 2018 and 2017, and the related consolidated statements of income, comprehensive income, shareholder's equity, and cash flows for the years then ended, and the related notes to the consolidated financial statements.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these 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 these 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 the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers 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 the Company as of December 31, 2018 and 2017,

and the results of its operations and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Emphasis of Matter

As discussed in Note 1 to the consolidated financial statements, in 2017, Reinsurance Group of America, Incorporated contributed to the Company all the outstanding shares of its wholly-owned subsidiary, RGA Australian Holdings Pty Limited ("RGA Australia"). The Company recorded RGA Australia's assets and liabilities at their carrying values and has reflected the transaction on its consolidated financial statements. Our opinion is not modified with respect to this matter.

Other Matter

Results of the Company may not be indicative of those of a stand-alone entity, as the Company is a member of a controlled group of affiliated companies. Our opinion is not modified with respect to this matter.

Deloitte & Touche LLP

April 15, 2019

RGA AMERICAS REINSURANCE COMPANY, LTD.

CONSOLIDATED BALANCE SHEETS
AS OF DECEMBER 31, 2018 AND 2017
(Expressed in thousands of U.S. dollars, except share data)

	2018	2017
Assets		
Fixed maturity securities:		
Available-for-sale at fair value (amortized cost of $13,028,712 and $12,490,723)	$ 14,324,206	$ 14,434,096
Equity securities (amortized cost of $40,915 and $41,393)	34,622	39,511
Funds withheld at interest	9,313,058	4,887,867
Short-term investments	30,800	63,173
Other invested assets	983,128	683,561
Total investments	24,685,814	20,108,208
Cash and cash equivalents	831,906	508,225
Accrued investment income	148,409	150,873
Premiums receivable	801,595	551,063
Reinsurance ceded receivables	1,515,812	1,762,083
Deferred policy acquisition costs	1,299,786	1,168,453
Other reinsurance balances	2,040,294	181,307
Income tax recoverable	11,875	1,468
Affiliated note receivable	450,000	—
Receivable from parent and affiliates	7,540	13,151
Other assets	276,015	108,375
Total assets	$ 32,069,046	$ 24,553,206
Liabilities and Shareholder's Equity		
Future policy benefits	$ 15,966,547	$ 12,925,497
Interest-sensitive contract liabilities	6,445,505	2,667,988
Other policy claims and benefits	2,666,400	2,278,875
Other reinsurance balances	1,133,174	358,562
Securities lending obligation	95,138	94,757
Deferred income taxes	983,761	1,028,744
Affiliated note payable	63,190	46,854
Payable to parent and affiliates	25,317	168,118
Other liabilities	397,914	123,842
Total liabilities	27,776,946	19,693,237
Commitments and contingent liabilities (See Note 13)		
Shareholder's Equity:		
Common stock (par value $1.00 per share; unlimited shares authorized; shares issued: 75,500,000 at December 31, 2018 and 2017)	75,500	75,500
Additional paid-in-capital	893,518	889,117
Retained earnings	2,645,239	2,648,158
Accumulated other comprehensive income	677,843	1,247,194
Total shareholder's equity	4,292,100	4,859,969
Total liabilities and shareholder's equity	$ 32,069,046	$ 24,553,206

See accompanying notes to consolidated financial statements.

RGA AMERICAS REINSURANCE COMPANY, LTD.

CONSOLIDATED STATEMENTS OF INCOME
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017
(Expressed in thousands of U.S. dollars)

	2018	2017
Revenues		
Net premiums	$ 3,040,706	$ 2,756,612
Investment income, net of related expenses	776,575	554,363
Change in value of funds withheld embedded derivatives	(212,652)	41,386
Investment related gains (losses), net:		
Other-than-temporary impairments on fixed maturity securities	(539)	(2,481)
Other investment related gains (losses), net	(13,170)	6,023
Total investment related gains (losses), net	(13,709)	3,542
Other revenues	108,600	515,027
Total revenues	3,699,520	3,870,930
Benefits and expenses		
Claims and other policy benefits	2,655,358	2,153,892
Interest credited	68,272	39,711
Policy acquisition costs and other insurance expenses	527,219	991,391
Other operating expenses	241,552	207,437
Collateral finance expense	2,363	2,145
Total benefits and expenses	3,494,764	3,394,576
Income before income taxes	204,756	476,354
Provision for income taxes	26,166	(147,791)
Net income	$ 178,590	$ 624,145

See accompanying notes to consolidated financial statements.

RGA AMERICAS REINSURANCE COMPANY, LTD.

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017
(Expressed in thousands of U.S. dollars)

	2018	2017
Comprehensive income (loss)		
Net income	$ 178,590	$ 624,145
Other comprehensive income (loss), net of tax:		
Foreign currency translation adjustments	(97,073)	107,986
Net unrealized investment gains (losses)	(504,636)	345,036
Defined benefit pension and postretirement plan adjustments	849	(54)
Total other comprehensive income (loss), net of tax	(600,860)	452,968
Total comprehensive income (loss)	$ (422,270)	$ 1,077,113

See accompanying notes to consolidated financial statements.

RGA AMERICAS REINSURANCE COMPANY, LTD.

CONSOLIDATED STATEMENTS OF SHAREHOLDER'S EQUITY
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017
(Expressed in thousands of U.S. dollars)

	Common Stock	Additional Paid-In-Capital	Retained Earnings	Accumulated Other Comprehensive Income	Total
Balance, January 1, 2017	$ 75,500	$ 885,585	$ 2,045,857	$ 772,382	$ 3,779,324
Adoption of new accounting standard	—	—	(21,844)	21,844	—
Net income	—	—	624,145	—	624,145
Total other comprehensive income (loss)	—	—	—	452,968	452,968
Equity based compensation	—	3,418	—	—	3,418
Proforma relief of Subpart F	—	114	—	—	114
Balance, December 31, 2017	75,500	889,117	2,648,158	1,247,194	4,859,969
Adoption of new accounting standard	—	—	(31,509)	31,509	—
Net income	—	—	178,590	—	178,590
Total other comprehensive income (loss)	—	—	—	(600,860)	(600,860)
Equity based compensation	—	4,401	—	—	4,401
Dividends to shareholder	—	—	(150,000)	—	(150,000)
Balance, December 31, 2018	$ 75,500	$ 893,518	$ 2,645,239	$ 677,843	$ 4,292,100

See accompanying notes to consolidated financial statements.

RGA AMERICAS REINSURANCE COMPANY, LTD.

CONSOLIDATED STATEMENTS OF CASH FLOWS
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017
(Expressed in thousands of U.S. dollars)

	2018	2017
Cash flows from operating activities		
Net income	$ 178,590	$ 624,145
Adjustments to reconcile net income to net cash provided by operating activities:		
Change in operating assets and liabilities:		
Accrued investment income	(1,412)	(16,773)
Premiums receivable and other reinsurance balances	(409,465)	500,712
Reinsurance ceded receivables	233,435	51,211
Deferred policy acquisition costs	(168,891)	(28,130)
Future policy benefits, other policy claims and benefits, and other reinsurance balances	1,495,577	379,833
Deferred income taxes	84,553	(219,802)
Income tax liability	(12,272)	14,831
Receivable from parent and affiliates	5,622	(11,229)
Payable to parent and affiliates	(142,795)	159,747
Other assets	(181,946)	(32,497)
Other liabilities	8,339	5,601
Amortization of net investment premiums, discounts and other	(95,307)	(95,319)
Depreciation and amortization expense	7,170	5,596
Investment related (gains) losses, net	13,709	(3,542)
Change in value of funds withheld embedded derivatives	212,652	(41,386)
Equity based compensation	4,401	3,418
Net cash provided by operating activities	1,231,960	1,296,416
Cash flows from investing activities		
Sales of fixed maturity securities available-for-sale	1,575,821	1,892,742
Sales of equity securities	986	421
Maturities of fixed maturity securities available-for-sale	206,754	223,009
Purchases of fixed maturity securities available-for-sale	(2,276,029)	(2,957,473)
Purchases of equity securities	(73)	(10,243)
Cash invested in funds withheld at interest	1,207,599	(621,110)
Change in short-term investments	29,394	(9,432)
Change in other invested assets	(270,128)	(200,013)
Net cash used in investing activities	474,324	(1,682,099)
Cash flows from financing activities		
Dividends to shareholder	(150,000)	—
Purchase of affiliated note	(450,000)	—
Proceeds from affiliated notes	21,378	—
Change in securities lending obligation	387	150
Change in cash collateral for derivative positions and other arrangements	60,214	(26,159)
Deposits on variable annuity contracts	29,728	539,055
Withdrawals on variable annuity contracts	(865,412)	(63,921)
Net cash provided by (used in) financing activities	(1,353,705)	449,125
Effect of exchange rate changes on cash	(28,898)	29,309
Change in cash and cash equivalents	323,681	92,751
Cash and cash equivalents, beginning of period	508,225	415,474
Cash and cash equivalents, end of period	$ 831,906	$ 508,225
Supplemental disclosures of cash flow information:		
Interest paid	$ 1,885	$ 3,090
Income taxes paid (received), net of refunds	(43,102)	57,441
Non-cash transactions:		
Transfer of invested assets	$ 413,130	$ 3,764,940

See accompanying notes to consolidated financial statements.

Note 1 BUSINESS AND BASIS OF PRESENTATION

Business

RGA Americas Reinsurance Company, Ltd. ("RGA Americas") was incorporated pursuant to the laws of Barbados on July 2, 1998, and was continued to Bermuda on September 25, 2014, in accordance with the Companies Act 1981. RGA Americas is a wholly owned subsidiary of Reinsurance Group of America, Incorporated ("RGA"), a United States of America ("U.S.") insurance holding company, formed on December 31, 1992. As of December 31, 2018, all outstanding shares of RGA Americas were owned by RGA. The consolidated financial statements herein include the assets, liabilities, and results of operations of RGA Americas and its wholly owned subsidiaries, RGA Atlantic Reinsurance Company Ltd. ("RGA Atlantic"), RGA Life Reinsurance Company of Canada ("RGA Canada"), RGA South African Holdings (Pty) Ltd. ("RGA South Africa"), RGA International Reinsurance Company dac ("RGA International"), Leidsche Leven Holding B.V. ("Leidsche"), and RGA Australian Holdings Pty Limited ("RGA Australia") (collectively, the "Company"). Intercompany balances and transactions have been eliminated.

In 2017, RGA contributed to RGA Americas all of the outstanding shares of its wholly owned subsidiary, RGA Australia. RGA Americas recorded RGA Australia's assets and liabilities at their carrying values and has reflected the transaction on its consolidated financial statements.

The Company is engaged in providing traditional reinsurance, which includes individual and group life and health, disability, and critical illness reinsurance. The Company also provides financial solutions, which includes longevity reinsurance, asset-intensive products, primarily annuities, and financial reinsurance. In addition, the Company engages in direct insurance via its subsidiary, Leidsche.

Reinsurance is an arrangement under which an insurance company, the reinsurer, agrees to indemnify another insurance company, the ceding company, for all or a portion of the insurance risks underwritten by the ceding company. Reinsurance is designed to (i) reduce the net amount at risk on individual risks, thereby enabling the ceding company to increase the volume of business it can underwrite, as well as increase the maximum risk it can underwrite on a single risk; (ii) enhance the ceding company's financial strength and surplus position; (iii) stabilize operating results by leveling fluctuations in the ceding company's loss experience; and (iv) assist the ceding company in meeting applicable regulatory requirements.

Basis of Presentation

The consolidated financial statements of the Company have been prepared in accordance with U.S. generally accepted accounting principles ("GAAP"). 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 the disclosures of contingent assets and liabilities as of the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. The most significant estimates include those used in determining deferred policy acquisition costs, premiums receivable, future policy benefits, incurred but not reported claims, income taxes, valuation of investments and investment impairments, and valuation of embedded derivatives. Actual results could differ materially from the estimates and assumptions used by management.

The accompanying consolidated financial statements include the accounts of RGA Americas and its subsidiaries, all of which are wholly owned. Entities in which the Company has significant influence over the operating and financing decisions but are not required to be consolidated are reported under the equity method of accounting. Intercompany balances and transactions have been eliminated. A portion of the Company's reinsurance receivables and policy liabilities are associated with affiliated companies, and the Company relies on affiliated companies for services. See Note 12 - "Related-Party Transactions" for further details.

There were no subsequent events that would require disclosure or adjustments to the accompanying consolidated financial statements through the date the consolidated financial statements were issued.

Note 2 SIGNIFICANT ACCOUNTING POLICIES AND PRONOUNCEMENTS

Investments

Fixed Maturity Securities

Fixed maturity securities classified as available-for-sale are reported at fair value and are so classified based upon the possibility that such securities could be sold prior to maturity if that action enables the Company to execute its investment philosophy and appropriately match investment results to operating and liquidity needs.

Unrealized gains and losses on fixed maturity securities classified as available-for-sale, less applicable deferred income taxes as well as related adjustments to deferred acquisition costs, if applicable, are reflected as a direct charge or credit to accumulated other comprehensive income ("AOCI") in shareholder's equity on the consolidated balance sheets.

Investment income is recognized as it accrues or is legally due. Realized gains and losses on sales of investments are included in investment related gains (losses), net, as are credit impairments that are other-than-temporary in nature. The cost of investments sold is primarily determined based upon the specific identification method.

Equity Securities

Equity securities are carried at fair value. Realized and unrealized gains and losses associated with equity securities carried at fair value are included in investment related gains (losses), net.

Funds Withheld at Interest

Funds withheld at interest represent amounts contractually withheld by ceding companies in accordance with reinsurance agreements. For agreements written on a modified coinsurance ("modco") basis and agreements written on a coinsurance funds withheld basis, assets that support the net statutory reserves or as defined in the treaty, are withheld and legally owned by the ceding company. Interest, recorded in investment income, net of related expenses in the consolidated statements of income, accrues to these assets at calculated rates as defined by the treaty terms.

Short-term Investments

Short-term investments represent investments with remaining maturities of one year or less, but greater than three months, at the time of acquisition and are stated at estimated fair value or amortized cost, which approximates estimated fair value. Interest on short-term investments is recorded in investment income, net of related expenses in the consolidated statements of income.

Other Invested Assets

In addition to derivative contracts discussed below, other invested assets include contractholder-directed investments, mortgage loans on real estate, equity release mortgages, cash pledged as collateral, limited partnerships and a purchase agreement (carried at cost).

The fair value option ("FVO") was elected for contractholder-directed investments supporting unit-linked variable annuity type liabilities which do not qualify for presentation and reporting as separate accounts. Changes in estimated fair value of these securities are included in investment income, net of related expenses. Limited partnership interests are primarily carried at cost. Based on the nature and structure of these investments, they do not meet the characteristics of an equity security in accordance with applicable accounting standards. Equity release mortgages are carried at unpaid principal balances, net of any unamortized premium or discount and valuation allowances. Interest income is accrued on the principal amount of the equity release mortgages based on its contractual interest rate.

Mortgage loans on real estate are carried at unpaid principal balances, net of any unamortized premium or discount and valuation allowances. Interest income is accrued on the principal amount of the mortgage loan based on its contractual interest rate. Amortization of premiums and discounts is recorded using the effective yield method. The Company accrues interest on loans until it is probable the Company will not receive interest or the loan is 90 days past due. Interest income, amortization of premiums, accretion of discounts and prepayment fees are reported in investment income, net of related expenses in the consolidated statements of income.

A mortgage loan is considered to be impaired when, based on the current information and events, it is probable that the Company will be unable to collect all amounts due according to the contractual terms of the mortgage agreement. Although all available and applicable factors are considered in the Company's analysis, loan-to-value and debt service coverage ratios are the most critical factors in determining impairment.

Valuation allowances on mortgage loans are established based upon inherent losses expected by management to be realized in connection with future dispositions or settlement of mortgage loans, including foreclosures. The Company establishes valuation allowances for estimated impairments on an individual loan basis as of the balance sheet date. Such valuation allowances are based on the excess carrying value of the loan over the present value of expected future cash flows discounted at the loan's original effective interest rate, the value of the loan's collateral if the loan is in the process of foreclosure or is otherwise collateral-dependent, or the loan's market value if the loan is being sold. Non-specific valuation allowances are established for mortgage loans based upon several loan factors, including the Company's historical experience for loan losses, defaults and loss severity, loss expectations for loans with similar risk characteristics and industry statistics. These evaluations are revised as conditions change and new information becomes available. In addition to historical experience, management considers qualitative factors that include the impact of changing macro-economic conditions, which may not be currently reflected in the loan portfolio performance, and the quality of the loan portfolio.

Any interest accrued or received on the net carrying amount of the impaired loan will be included in investment income or applied to the principal of the loan, depending on the assessment of the collectability of the loan. Mortgage loans deemed to be uncollectible or that have been foreclosed are charged off against the valuation allowances and subsequent recoveries, if any, are credited to the valuation allowances. Changes in valuation allowances are reported in investment related gains (losses), net on the consolidated statements of income.

The Company evaluates whether a mortgage loan modification represents a troubled debt restructuring. In a troubled debt restructuring, the Company grants concessions related to the borrower's financial difficulties. Generally, the types of concessions include: reduction of the contractual interest rate, extension of the maturity date at an interest rate lower than current market interest rates and/or a reduction of accrued interest. The Company considers the amount, timing and extent of the concession granted in determining any impairment or changes in the specific valuation allowance recorded in connection with the troubled debt restructuring. Through the continuous monitoring process, the Company may have recorded a specific valuation allowance prior to when the mortgage loan is modified in a troubled debt restructuring. Accordingly, the carrying value (after specific valuation allowance) before and after modification through a troubled debt restructuring may not change significantly, or may increase if the expected recovery is higher than the pre-modification recovery assessment.

Other-Than-Temporary Impairment - Fixed Maturity Securities

The Company identifies fixed maturity securities that could potentially have credit impairments that are other-than-temporary by monitoring market events that could impact issuers' credit ratings, business climates, management changes, litigation, government actions and other similar factors. The Company also monitors late payments, pricing levels, rating agency actions, key financial ratios, financial statements, revenue forecasts and cash flow projections as indicators of credit issues.

The Company reviews all securities on a case-by-case basis to determine whether an other-than-temporary decline in value exists and whether losses should be recognized. The Company considers relevant facts and circumstances in evaluating whether a credit or interest rate-related impairment of a security is other-than-temporary. Relevant facts and circumstances considered include: (1) the extent and length of time the fair value has been below cost or amortized cost; (2) the reasons for the decline in fair value; (3) the issuer's financial position and access to capital; and (4) the Company's intent to sell a security or whether it is more likely than not it will be required to sell the security before the recovery of its amortized cost that, in some cases, may extend to maturity. To the extent the Company determines that a security is deemed to be other-than-temporarily impaired, an impairment loss is recognized.

Impairment losses on fixed maturity securities recognized in the consolidated financial statements are dependent on the facts and circumstances related to the specific security. If the Company intends to sell a security or it is more likely than not that it would be required to sell a security before the recovery of its amortized cost, less any recorded credit loss, it recognizes an other-than-temporary impairment ("OTTI") in investment related gains (losses), net on the consolidated statements of income for the difference between amortized cost and fair value. If neither of these two conditions exists then the recognition of the OTTI is bifurcated and the Company recognizes the credit loss portion in investment related gains (losses), net and the non-credit loss portion in AOCI.

The Company estimates the amount of the credit loss component of a fixed maturity security impairment as the difference between amortized cost and the present value of the expected cash flows of the security. The present value is determined using the best estimate cash flows discounted at the effective interest rate implicit to the security at the date of purchase or the current yield to accrete an asset-backed or floating rate security. The techniques and assumptions for establishing the best estimate cash flows vary depending on the type of security. For mortgage-backed securities and asset-backed securities, cash flow estimates are based on security-specific facts and circumstances that may include collateral characteristics, expectations of delinquency and default rates, loss severity and prepayment speeds and structural support, including subordination and guarantees. The corporate and government fixed maturity security cash flow estimates are derived from scenario-based outcomes of expected corporate restructurings or the disposition of assets using security-specific facts and circumstances including timing, security interests and loss severity.

In periods after an OTTI loss is recognized on a fixed maturity security, the Company will report the impaired security as if it had been purchased on the date it was impaired and will continue to estimate the present value of the estimated cash flows of the security. Accordingly, the discount (or reduced premium) based on the new cost basis is accreted into net investment income over the remaining term of the fixed maturity security in a prospective manner based on the amount and timing of estimated future cash flows.

The Company considers its cost method investments for OTTI when the carrying value of these investments exceeds the net asset value. The Company takes into consideration the severity and duration of this excess when deciding if the cost method investment is other-than-temporarily impaired. For equity method investments, the Company considers financial and other information provided by the investee, other known information and inherent risks in the underlying investments, as well as future capital commitments, in determining whether an impairment has occurred.

Derivative Instruments

Overview

The Company utilizes a variety of derivative instruments including swaps, options, forwards and futures, primarily to manage or hedge interest rate risk, credit risk, inflation risk, foreign currency risk, market volatility and various other market risks associated with its business. The Company does not invest in derivatives for speculative purposes. It is the Company's policy to enter into derivative contracts primarily with highly rated parties. See Note 4 - "Derivative Instruments" for additional detail on the Company's derivative positions.

Accounting and Financial Statement Presentation of Derivatives

Derivatives are carried on the Company's consolidated balance sheets primarily in other invested assets or other liabilities, at fair value. Certain derivatives are subject to master netting provisions and reported as a net asset or liability. On the date a derivative contract is executed, the Company designates the derivative as (1) a fair value hedge, (2) a cash flow hedge, (3) a net investment hedge in a foreign operation or (4) free-standing derivatives held for other risk management purposes, which primarily involve managing asset or liability risks associated with the Company's reinsurance treaties that do not qualify for hedge accounting.

Changes in the fair value of free-standing derivative instruments, which do not receive accounting hedge treatment, are primarily reflected in investment related gains (losses), net.

Changes in the fair value of non-investment free-standing derivative instruments (e.g. longevity swaps), which do not receive accounting hedge treatment, are reflected in other revenues.

Hedge Documentation and Hedge Effectiveness

To qualify for hedge accounting, at the inception of the hedging relationship, the Company formally documents its risk management objective and strategy for undertaking the hedging transaction, as well as its designation of the hedge as either (i) a fair value hedge; (ii) a cash flow hedge; or (iii) a hedge of a net investment in a foreign operation. In this documentation, the Company sets forth how the hedging instrument is expected to hedge the designated risks related to the hedged item and sets forth the method that will be used to retrospectively and prospectively assess the hedging instrument's effectiveness and the method that will be used to measure ineffectiveness. A derivative designated as a hedging instrument must be assessed as being highly effective in offsetting the designated risk of the hedged item. Hedge effectiveness is formally assessed at inception and periodically throughout the life of the designated hedging relationship.

Under a fair value hedge, changes in the fair value of the hedging derivative, including amounts measured as ineffective, and changes in the fair value of the hedged item related to the designated risk being hedged, are reported within investment related gains (losses), net. The fair values of the hedging derivatives are exclusive of any accruals that are separately reported in the consolidated statements of income within investment income, net of related expenses or other operating expenses to match the location of the hedged item.

Under a cash flow hedge, changes in the fair value of the hedging derivative measured as effective are reported within AOCI and the deferred gains or losses on the derivative are reclassified into the consolidated statements of income when the Company's earnings are affected by the variability in cash flows of the hedged item. Changes in the fair value of the hedging instrument measured as ineffective are reported within investment related gains (losses), net. The fair values of the hedging derivatives are exclusive of any accruals that are separately reported in the consolidated statements of income within investment income, net of related expenses or other operating expenses to match the location of the hedged item.

In a hedge of a net investment in a foreign operation, changes in the fair value of the hedging derivative that are measured as effective are reported within AOCI consistent with the translation adjustment for the hedged net investment in the foreign operation. Changes in the fair value of the hedging instrument measured as ineffective are reported within investment related gains (losses), net.

The Company discontinues hedge accounting prospectively when: (i) it is determined that the derivative is no longer highly effective in offsetting changes in the estimated fair value or cash flows of a hedged item; (ii) the derivative expires, is sold, terminated, or exercised; (iii) it is no longer probable that the hedged forecasted transaction will occur; or (iv) the derivative is de-designated as a hedging instrument.

When hedge accounting is discontinued because it is determined that the derivative is not highly effective, the derivative continues to be carried in the consolidated balance sheets at fair value, with changes in fair value recognized in investment related gains (losses), net. The carrying value of the hedged asset or liability under a fair value hedge is no longer adjusted for changes in its estimated fair value due to the hedged risk, and the cumulative adjustment to its carrying value is amortized into income over the remaining life of the hedged item. Provided the hedged forecasted transaction occurrence is still probable, the changes in estimated fair value of derivatives recorded in other comprehensive income (loss) ("OCI") related to discontinued cash flow hedges are

released into the consolidated statements of income when the Company's earnings are affected by the variability in cash flows of the hedged item.

When hedge accounting is discontinued because it is no longer probable that the forecasted transactions will occur on the anticipated date or within two months of that date, the derivative continues to be carried in the consolidated balance sheets at its estimated fair value, with changes in estimated fair value recognized currently in investment related gains (losses), net. Deferred gains and losses of a derivative recorded in OCI pursuant to the discontinued cash flow hedge of a forecasted transaction that is no longer probable are recognized immediately in investment related gains (losses), net.

In all other situations in which hedge accounting is discontinued, the derivative is carried at its estimated fair value in the consolidated balance sheets, with changes in its estimated fair value recognized in the current period as investment related gains (losses), net.

Embedded Derivatives

The Company reinsures certain annuity products that contain terms that are deemed to be embedded derivatives, primarily variable annuities with guaranteed minimum benefits. The Company assesses reinsurance contract terms to identify embedded derivatives, which are required to be bifurcated under the general accounting principles for *Derivatives and Hedging*. If the contract is not reported for in its entirety at fair value and it is determined that the terms of the embedded derivative are not clearly and closely related to the economic characteristics of the host contract, and that a separate instrument with the same terms would qualify as a derivative instrument, the embedded derivative is bifurcated from the host contract and accounted for separately.

Such embedded derivatives are carried on the consolidated balance sheets at fair value in the same line item as the host contract. Changes in the fair value of embedded derivatives associated with variable annuity guaranteed minimum benefits are reflected in investment related gains (losses), net on the consolidated statements of income. See "Interest-Sensitive Contract Liabilities" below for additional information on embedded derivatives related to variable annuities. The Company has implemented an economic hedging strategy to mitigate the volatility associated with its reinsurance of variable annuity guaranteed minimum benefits. The hedging strategy is designed such that changes in the fair value of the hedge contracts, primarily futures, swap contracts and options, move in the opposite direction of changes in the fair value of the embedded derivatives. While the Company actively manages its hedging program, the hedges that are in place may not be totally effective in offsetting the embedded derivative changes due to the many variables that must be managed and the Company may see a corresponding increase or decrease in the net liability. The Company has elected not to assess this hedging strategy for hedge accounting treatment.

Additionally, reinsurance treaties written on a modco or funds withheld basis are subject to the general accounting principles for *Derivatives and Hedging* related to embedded derivatives. Management believes the embedded derivative feature in each of these reinsurance treaties is similar to a total return swap on the assets held by the ceding companies. The valuation of embedded derivatives is sensitive to the investment credit spread environment. Changes in investment credit spreads are also affected by the application of a credit valuation adjustment ("CVA"). The fair value calculation of an embedded derivative in an asset position utilizes a CVA based on the ceding company's credit risk. Conversely, the fair value calculation of an embedded derivative in a liability position utilizes a CVA based on the Company's credit risk. Generally, an increase in investment credit spreads, ignoring changes in the CVA, will have a negative impact on the fair value of the embedded derivative (decrease in income). The fair value of the embedded derivatives is included in the funds withheld at interest line item on the consolidated balance sheets. The change in the fair value of the embedded derivatives is recorded in change in value of funds withheld embedded derivatives on the consolidated statements of income.

The Company has entered into various financial reinsurance treaties on a funds withheld and modco basis. These treaties do not transfer significant insurance risk and are recorded on a deposit method of accounting with the Company earning a net fee. As a result of the experience refund provisions contained in these treaties, the value of the embedded derivatives in these contracts is currently considered immaterial. The Company monitors the performance of these treaties on a quarterly basis. Significant adverse performance or losses on these treaties may result in a loss associated with the embedded derivative.

Fair Value Measurements

General accounting principles for *Fair Value Measurements and Disclosures* define fair value, establish a framework for measuring fair value, establish a fair value hierarchy based on the inputs used to measure fair value and enhance disclosure requirements for fair value measurements. In compliance with these principles, the Company has categorized its assets and liabilities, based on the priority of the inputs to the valuation technique, into a three level hierarchy or separately for assets measured using the net asset value ("NAV"). The fair value hierarchy gives the highest priority to quoted prices in active markets for identical assets or liabilities (Level 1), the second highest priority to quoted prices in markets that are not active or inputs that are observable either directly or indirectly (Level 2) and the lowest priority to unobservable inputs (Level 3).

If the inputs used to measure fair value fall within different levels of the hierarchy, the category level is based on the lowest priority level input that is significant to the fair value measurement of the asset or liability.

See Note 5 - "Fair Value of Assets and Liabilities" for further details on the Company's assets and liabilities recorded at fair value.

Cash and Cash Equivalents

Cash and cash equivalents include cash on deposit and highly liquid debt instruments purchased with an original maturity of three months or less.

Premiums Receivable

Premiums are accrued when due and in accordance with information received from the ceding company. When the Company enters into a new reinsurance agreement, it records accruals based on the terms of the reinsurance treaty. Similarly, when a ceding company fails to report information on a timely basis, the Company records accruals based on the terms of the reinsurance treaty as well as historical experience. Other management estimates include adjustments for increased in force on existing treaties, lapsed premiums given historical experience, the financial health of specific ceding companies, collateral value and the legal right of offset on related amounts (i.e. allowances and claims) owed to the ceding company. Under the legal right of offset provisions in its reinsurance treaties, the Company can withhold payments for allowances and claims from unpaid premiums. Based on its review of these factors and historical experience, the Company did not believe a provision for doubtful accounts was necessary as of December 31, 2018 or 2017.

Reinsurance Ceded Receivables

The Company generally reports retrocession activity on a gross basis. Amounts paid or deemed to have been paid for reinsurance are reflected in reinsurance ceded receivables. The cost of reinsurance related to long-duration contracts is recognized over the terms of the reinsured policies on a basis consistent with the reporting of those policies.

The Company mainly retrocedes business to affiliates, as well as utilizing the Company's third party retrocession pools. In addition, the Company performs annual financial reviews of its retrocessionaires to evaluate financial stability and performance. The Company has never experienced a material default in connection with retrocession arrangements, nor has it experienced any difficulty in collecting claims recoverable from retrocessionaires; however, no assurance can be given as to the future performance of such retrocessionaires or as to recoverability of any such claims.

Deferred Policy Acquisition Costs

Costs of acquiring new business, which vary with and are directly related to the production of new business, have been deferred to the extent that such costs are deemed recoverable from future premiums or gross profits. Such costs include commissions and allowances as well as certain costs of policy issuance and underwriting. Non-commission costs related to the acquisition of new and renewal insurance contracts may be deferred only if they meet the following criteria:

- Incremental direct costs of a successful contract acquisition
- Portions of employees' salaries and benefits directly related to time spent performing specified acquisition activities for a contract that has been acquired or renewed
- Other costs directly related to the specified acquisition or renewal activities that would not have been incurred had that acquisition contract transaction not occurred

The Company tests the recoverability for each year of business at issue before establishing additional deferred acquisition costs ("DAC"). The Company also performs annual tests to establish that DAC are expected to remain recoverable, and if financial performance significantly deteriorates to the point where a deficiency exists, a cumulative charge to current operations will be recorded. No such adjustments related to DAC recoverability were made in 2018 or 2017.

DAC related to traditional life insurance contracts are amortized with interest over the premium-paying period of the related policies in proportion to the ratio of individual period premium revenues to total anticipated premium revenues over the life of the policy. Such anticipated premium revenues are estimated using the same assumptions used for computing liabilities for future policy benefits.

DAC related to interest-sensitive life and investment-type policies are amortized over the lives of the policies, in proportion to the gross profits realized from mortality, investment income less interest credited, and expense margins.

Other Reinsurance Balances

The Company assumes and retrocedes financial reinsurance contracts that do not expose it to a reasonable possibility of loss from insurance risk. These contracts are reported as deposits and are included in other reinsurance assets/liabilities. The amount of revenue reported in other revenues on these contracts represents fees and the cost of insurance under the terms of the reinsurance agreement. Assets and liabilities are reported on a net or gross basis, depending on the specific details within each treaty. Reinsurance agreements reported on a net basis, where a legal right of offset exists, are generally included in other reinsurance balances on the consolidated balance sheets. Balances resulting from the assumption and/or subsequent transfer of benefits and obligations resulting from cash flows related to variable annuities have also been classified as other reinsurance balance assets and/or liabilities. Other reinsurance assets are included in other reinsurance balances within total assets, while other reinsurance liabilities are included in other reinsurance balances within total liabilities on the consolidated balance sheets.

Affiliated Note Receivable/Payable

Affiliated notes receivable/payable includes cash loaned/borrowed from affiliated companies. Refer to Note 12 - "Related-Party Transactions" for further details.

Receivable From/Payable To Parent and Affiliates

Receivable from/payable to parent and affiliates is primarily comprised of non-reinsurance related amounts receivable/payable. See Note 12 - "Related-Party Transactions" for further details about transactions with affiliated companies.

Operating Joint Ventures

The Company has made investments in certain joint ventures that are strategic in nature and made other than for the sole purpose of generating investment income. These investments are reported under the equity method of accounting and are included in other assets on the consolidated balance sheets. The Company's share of earnings from these joint ventures is reported in other revenues on the consolidated statements of income. The Company's investments in operating joint ventures do not have a material effect on the Company's results of operations and financial condition, and as a result no additional disclosures have been presented.

Other Assets

Other assets primarily includes surplus notes receivable and interest receivable on notes receivable, deferred tax assets, capitalized assets, derivative instruments as described above, and operating joint ventures. Capitalized assets are stated at cost, less accumulated depreciation and amortization. Carrying values are reviewed periodically for indicators of impairment in value.

Future Policy Benefits

Liabilities for future benefits on life policies are established in an amount adequate to meet the estimated future obligations on policies in force. Liabilities for future policy benefits under long-duration life insurance policies have been computed based upon expected investment yields, mortality and withdrawal ("lapse") rates, and other assumptions. These assumptions include a margin for adverse deviation and vary with the characteristics of the plan of insurance, year of issue, age of insured, and other appropriate factors. The mortality and withdrawal assumptions are based on the Company's experience as well as industry experience and standards. In establishing reserves for future policy benefits, the Company assigns policy liability assumptions to particular timeframes ("eras") in such a manner as to be consistent with the underlying assumptions and economic conditions at the time the risks are assumed. The Company maintains a consistent approach to setting the provision for adverse deviation between eras.

Liabilities for future benefits on longevity business, including annuities in the payout phase, are established in an amount adequate to meet the estimated future obligations on policies in force. Liabilities for future benefits related to the longevity business, including annuities in the payout phase, have been calculated using expected mortality, investment yields, and other assumptions. These assumptions include a margin for adverse deviation and vary with the characteristics of the plan of insurance, year of issue, age of insured, and other appropriate factors. The mortality assumptions are based on the Company's experience as well as industry experience and standards. A deferred profit liability is established when the gross premium exceeds the net premium.

The Company periodically reviews actual and anticipated experience compared to the assumptions used to establish policy benefits. The Company establishes premium deficiency reserves if actual and anticipated experience indicates that existing policy liabilities together with the present value of future gross premiums will not be sufficient to cover the present value of future benefits, settlement and maintenance costs and to recover unamortized acquisition costs. Anticipated investment income is considered in the calculation of premium deficiency losses for short-duration contracts. The premium deficiency reserve is established by a charge to income, as well as a reduction in unamortized acquisition costs and, to the extent there are no unamortized acquisition costs, an increase in future policy benefits.

The reserving process includes normal periodic reviews of assumptions used and adjustments of reserves to incorporate the refinement of the assumptions. Any such adjustments relate only to policies assumed in recent periods and the adjustments are reflected by a cumulative charge or credit to current operations.

The Company reinsures disability products in various markets. Liabilities for future benefits on disability policies' active lives are established in an amount adequate to meet the estimated future obligations on policies in force. These reserves are the amounts that, with the additional premiums to be received and interest thereon compounded annually at certain assumed rates, are calculated to be sufficient to meet the various policy and contract obligations as they mature.

The Company establishes future policy benefits for guaranteed minimum death benefits ("GMDB") relating to the reinsurance of certain variable annuity contracts by estimating the expected value of death benefits in excess of the projected account balance and recognizing the excess proportionally over the accumulation period based on total expected assessments. The Company regularly evaluates estimates used and adjusts the additional liability balance, with a related charge or credit to claims and other policy benefits, if actual experience or other evidence suggests that earlier assumptions should be revised. The assumptions used in estimating the GMDB liabilities are consistent with those used for amortizing DAC, and are thus subject to the same variability and risk. The Company’s GMDB liabilities at December 31, 2018 and 2017 were not material.

Interest-Sensitive Contract Liabilities

Liabilities for future benefits on interest-sensitive life and investment-type contract liabilities are carried at the accumulated contract holder values without reduction for potential surrender or withdrawal charges. The Company reinsures asset-intensive products, including annuities. The liabilities under asset-intensive insurance contracts or reinsurance contracts reinsured on a coinsurance basis are included in interest-sensitive contract liabilities on the consolidated balance sheets. Asset-intensive contracts principally include individual fixed annuities in the accumulation phase, individual variable annuities, and group fixed annuities. Interest-sensitive contract liabilities are equal to (i) policy account values, which consist of an accumulation of gross premium payments; (ii) credited interest less expenses, mortality charges, and withdrawals; and (iii) fair value adjustments relating to business combinations. Liabilities for immediate annuities are calculated as the present value of the expected cash flows, with the locked-in discount rate determined such that there is no gain or loss at inception. Additionally, certain annuity contracts the Company reinsures contain terms, such as guaranteed minimum benefits and equity participation options, which are deemed to be embedded derivatives and are accounted for based on the general accounting principles for *Derivatives and Hedging*.

The Company establishes liabilities for guaranteed minimum living benefits relating to certain variable annuity products as follows: Guaranteed minimum income benefits ("GMIB") provide the contract holder, after a specified period of time determined at the time of issuance of the variable annuity contract, with a minimum level of income (annuity) payments. Under the reinsurance treaty, the Company makes a payment to the ceding company equal to the GMIB net amount-at-risk at the time of annuitization and thus these contracts meet the net settlement criteria of the general accounting principles for *Derivatives and Hedging* and the Company assumes no mortality risk. Accordingly, the GMIB is considered an embedded derivative, which is measured at fair value separately from the host variable annuity product.

Guaranteed minimum withdrawal benefits ("GMWB") guarantee the contract holder a return of their purchase payment via partial withdrawals, even if the account value is reduced to zero, provided that the contract holder’s cumulative withdrawals in a contract year do not exceed a certain limit. The initial guaranteed withdrawal amount is equal to the initial benefit base as defined in the contract (typically, the initial purchase payments plus applicable bonus amounts). The GMWB is also an embedded derivative, which is measured at fair value separately from the host variable annuity product.

Guaranteed minimum accumulation benefits ("GMAB") provide the contract holder, after a specified period of time determined at the time of issuance of the variable annuity contract, with a minimum accumulation of their purchase payments even if the account value is reduced to zero. The initial guaranteed accumulation amount is equal to the initial benefit base as defined in the contract (typically, the initial purchase payments plus applicable bonus amounts). The GMAB is also an embedded derivative, which is measured at fair value separately from the host variable annuity product.

For GMIB, GMWB and GMAB, the initial benefit base is increased by additional purchase payments made within a certain time period and decreased by benefits paid and/or withdrawal amounts. After a specified period of time, the benefit base may also increase as a result of an optional reset as defined in the contract.

The fair values of the GMIB, GMWB and GMAB embedded derivative liabilities are reflected in interest-sensitive contract liabilities on the consolidated balance sheets and are calculated based on actuarial and capital market assumptions related to the projected cash flows, including benefits and related contract charges over the lives of the contracts. These projected cash flows incorporate expectations concerning policyholder behavior, such as lapses, withdrawals and benefit selections, and capital market assumptions such as interest rates and equity market volatilities. In measuring the fair value of GMIBs, GMWBs and GMABs, the Company attributes a portion of the fees collected from the policyholder equal to the present value of expected future guaranteed minimum income, withdrawal and accumulation benefits (at inception). The changes in fair value are reported in investment related gains (losses), net. Any additional fees represent "excess" fees and are reported in other revenues on the consolidated statements of income. These variable annuity guaranteed living benefits may be more costly than expected in volatile or declining equity markets or falling interest rate markets, causing an increase in interest-sensitive contract liabilities, negatively affecting net income.

The Company reviews its estimates of actuarial liabilities for interest-sensitive contract liabilities and compares them with its actual experience. Differences between actual experience and the assumptions used in pricing these guarantees and benefits and in the establishment of the related liabilities result in variances in profit and could result in losses. The effects of changes in such estimated liabilities are included in the results of operations in the period in which the changes occur.

Other Policy Claims and Benefits

Claims payable for incurred but not reported losses are determined using case-basis estimates and lag studies of past experience. The time lag from the date of the claim or death to when the ceding company reports the claim to the Company can vary significantly by ceding company, business segment and product type. Incurred but not reported claims are estimates on an undiscounted basis, using actuarial estimates of historical claims expense, adjusted for current trends and conditions. These estimates are continually reviewed and the ultimate liability may vary significantly from the amount recognized, which are reflected in claims and other policy benefits in the consolidated statements of income in the period in which they are determined.

Securities Lending Obligation

The Company occasionally enters into securities lending and securities borrowing arrangements with several affiliated companies. The Company's obligation to return the securities or cash collateral, if any, is recorded as a securities lending obligation in the consolidated balance sheets. See Note 3 - "Investments" and Note 12 - "Related-Party Transactions" for further details on the Company's securities lending and securities borrowing arrangements.

Other Liabilities

Other liabilities primarily include investments in transit, cash collateral received on derivative positions, derivative liabilities, reverse repo liabilities, and employee benefits.

Income Taxes

The Company provides for federal, state and foreign income taxes currently payable, as well as those deferred due to temporary differences between the tax basis of assets and liabilities and the reported amounts, and are recognized in net income or in certain cases in OCI. The Company's accounting for income taxes represents management's best estimate of various events and transactions considering the laws enacted as of the reporting date. The Tax Cuts and Jobs Act of 2017 ("U.S. Tax Reform") creates additional complexity due to various provisions that require management judgment and assumptions, which are subject to change.

Deferred tax assets and liabilities are measured by applying the relevant jurisdictions' enacted tax rate to the temporary difference in the period in which the temporary differences are expected to reverse. The Company will establish a valuation allowance if management determines, based on available information, that it is more likely than not that deferred income tax assets will not be realized. The Company has deferred tax assets including those related to net operating and capital losses. The Company has projected its ability to utilize its U.S. and foreign deferred tax assets and has determined that all of the U.S. assets including losses are expected to be utilized and established a valuation allowance on the portion of the foreign deferred tax assets the Company believes more likely than not will not be realized.

Significant judgment is required in determining whether valuation allowances should be established as well as the amount of such allowances. When making such a determination, consideration is given to, among other things, the following:

(i) future taxable income exclusive of reversing temporary differences and carryforwards;
(ii) future reversals of existing taxable temporary differences;
(iii) taxable income in prior carryback years; and
(iv) tax planning strategies.

Any such changes could significantly affect the amounts reported in the consolidated financial statements in the year these changes occur.

The Company reports uncertain tax positions in accordance with generally accepted accounting principles. In order to recognize the benefit of an uncertain tax position, the position must meet the more likely than not criteria of being sustained. Unrecognized tax benefits due to tax uncertainties that do not meet the more likely than not criteria are included within other liabilities and are charged to earnings in the period that such determination is made. The Company classifies interest related to tax uncertainties as interest expense whereas penalties related to tax uncertainties are classified as a component of income tax.

See Note 8 - "Income Tax" for further discussion including the impact of the December 22, 2017 enactment of U.S. Tax Reform.

Foreign Currency Translation

Assets, liabilities and results of foreign operations are recorded based on the functional currency of each foreign operation. The determination of the functional currency is based on economic facts and circumstances pertaining to each foreign operation. The Company's material functional currencies are the U.S. dollar, Canadian dollar, British pound, Australian dollar, Euro, and South African rand. The translation of the functional currency into U.S. dollars is performed for balance sheet accounts using current exchange rates in effect at the balance sheet date and for revenue and expense accounts using weighted-average exchange rates during each year. Gains or losses, net of applicable deferred income taxes, resulting from such translation are included in accumulated currency translation adjustments, in AOCI on the consolidated balance sheets until the underlying functional currency operation is sold or substantially liquidated.

Recognition of Revenues and Related Expenses

Life and health premiums are recognized as revenue when due from the insured, and are reported net of amounts retroceded. Benefits and expenses are reported net of amounts retroceded and are associated with earned premiums so that profits are recognized over the life of the related contract. This association is accomplished through the provision for future policy benefits and the amortization of deferred policy acquisition costs. Other revenues includes items such as treaty recapture fees, fees associated with financial reinsurance and policy changes on interest-sensitive, and investment-type products that the Company reinsures. Any fees that are collected in advance of the period benefited are deferred and recognized over the period benefited.

For certain reinsurance transactions involving in force blocks of business, the ceding company pays a premium equal to the initial required reserve (future policy benefit). In such transactions, for income statement presentation, the Company nets the expense associated with the establishment of the reserve on the consolidated balance sheets against the premiums from the transaction.

Revenues for interest-sensitive and investment-type products consist of investment income, policy charges for the cost of insurance, policy administration, and surrenders that have been assessed against policy account balances during the period. Interest-sensitive contract liabilities for these products represent policy account balances before applicable surrender charges. Policy benefits and claims that are charged to expenses include claims incurred in the period in excess of related policy account balances and interest credited to policy account balances. Interest is credited to policyholder account balances according to terms of the policies or contracts.

For each of its reinsurance contracts, the Company must determine if the contract provides indemnification against loss or liability relating to insurance risk, in accordance with GAAP. The Company must review all contractual features, particularly those that may limit the amount of insurance risk to which the Company is subject or features that delay the timely reimbursement of claims. If the Company determines that a contract does not expose it to a reasonable possibility of a significant loss from insurance risk, the Company records the contract on a deposit method of accounting with any net amount receivable reflected as an asset within other reinsurance balances, and any net amount payable reflected as a liability within other reinsurance balances on the consolidated balance sheets. Fees earned on the contracts are reflected as other revenues, rather than premiums, on the consolidated statements of income.

Equity Based Compensation

RGA issues stock awards included in its incentive compensation plans. As of the date stock awards are approved, the fair value of stock options is determined using a Black-Scholes options valuation methodology, and the fair value of other stock awards is based upon the market value of the stock on the grant date. The fair value of the awards is expensed over the performance or service period, which generally corresponds to the vesting period, and is recognized as an increase to additional paid-in-capital in shareholder's equity, and stock-based compensation expense is reflected in other operating expenses in the consolidated statements of income.

New Accounting Pronouncements

Changes to the general accounting principles are established by the Financial Accounting Standards Board ("FASB") in the form of accounting standards updates to the FASB Accounting Standards Codification™. Accounting standards updates not listed below were assessed and determined to be either not applicable or are expected to have minimal impact on the Company's consolidated financial statements.

Description	Date of Adoption	Effect on the financial statements or other significant matters
Standards adopted:		
Reporting Comprehensive Income		
This updated guidance requires reclassification from AOCI to retained earnings for the stranded tax effects resulting from the newly enacted U.S. federal corporate income tax rate. The amount of the reclassification would be the difference between the historical U.S. federal corporate income tax rate and the newly enacted 21 percent tax rate.	December 31, 2017	The Company adopted the new guidance by reclassifying certain income tax effects of items within AOCI to retained earnings as a result of U.S. Tax Reform. The impact of adopting this standard was an increase in AOCI and a reduction in retained earnings of approximately $21.8 million. The adjustments to the Company's deferred tax liabilities was a provisional amount as defined in Staff Accounting Bulletin 118 ("SAB 118"), issued in December 2017 to address complexities in completing the calculations resulting from U.S. Tax Reform. SAB 118 provides guidance on accounting for the effects of U.S. Tax Reform when the Company's process is incomplete, and permits a final determination to be made within a measurement period not to exceed one year from the enactment date. During 2018, the Company continued to evaluate and gather additional information to account for the effects of U.S. Tax Reform, including the preparation of and filing of its U.S. tax returns to more precisely compute the pretax deferred tax items and the impact of adopting the new guidance. As part of this process the Company recorded an additional adjustment in 2018 increasing AOCI and decreasing retained earnings of approximately $31.5 million.

Standard	Date of adoption	Effect on the financial statements or other significant matters
Financial Instruments - Recognition and Measurement		
This guidance requires equity investments that are not accounted for under the equity method of accounting to be measured at fair value with changes recognized in net income and also updates certain presentation and disclosure requirements.	January 1, 2018	This guidance required a cumulative-effect adjustment for certain items upon adoption. The adoption of the new guidance was not material to the Company's consolidated financial statements.
Standards not yet adopted:		
Leases		
This new standard, based on the principle that entities should recognize assets and liabilities arising from leases, does not significantly change the lessees' recognition, measurement and presentation of expenses and cash flows from the previous accounting standard. Leases are classified as finance or operating. The new standard's primary change is the requirement for entities to recognize a lease liability for payments and a right of use asset representing the right to use the leased asset during the term of operating lease arrangements. Lessees are permitted to make an accounting policy election to not recognize the asset and liability for leases with a term of twelve months or less. Lessors' accounting is largely unchanged from the previous accounting standard. In addition, the new standard expands the disclosure requirements of lease arrangements. Early adoption is permitted.	January 1, 2019	This new standard will be adopted by applying the optional transition method and record a right-of use asset and liability on the Company's balance sheet relating to existing operating leases. The Company does not expect the adoption of the new standard to have a material impact on its results of operations or balance sheet. The Company will recognize a lease liability and right-of-use asset of approximately $20.9 million related to its operating leases upon adoption of the new standard.
Derivatives and Hedging		
This updated guidance improves the financial reporting of hedging relationships to better portray the economic results of an entity's risk management activities in its financial statements and make certain targeted improvements to simplify the application of the hedge accounting in current GAAP related to the assessment of hedge effectiveness. Early adoption is permitted.	January 1, 2019	This new guidance will be adopted by applying a modified retrospective approach to existing hedging relationships as of the date of adoption. The Company does not expect the adoption of the new standard to have a material impact on its results of operations or balance sheet. Upon adoption of the new standard, the Company will record an immaterial adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is effective and will modify some disclosures.
Financial Instruments - Credit Losses		
This guidance adds to GAAP an impairment model, known as current expected credit loss ("CECL") model that is based on expected losses rather than incurred losses. For traditional and other receivables, held-to-maturity debt securities, loans and other instruments entities will be required to use the new forward-looking "expected loss" model that generally will result in earlier recognition of allowance for losses. For available-for-sale debt securities with unrealized losses, entities will measure credit losses similar to what they do today, except the losses will be recognized as allowances rather than reduction to the amortized cost of the securities. Early adoption is permitted.	January 1, 2020	This guidance will be adopted through a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is effective (that is, a modified-retrospective approach). The Company is currently evaluating the impact of this amendment on its consolidated financial statements.
Fair Value Measurement		
This guidance is part of the FASB's disclosure framework project and eliminates certain disclosure requirements for fair value measurement, requires entities to disclose new information and modifies existing disclosure requirements. Early adoption is permitted.	January 1, 2020	Certain disclosure changes in the new guidance will be applied prospectively in the year of adoption. The remaining changes in the new guidance will be applied retrospectively to all periods presented in the year of adoption. The Company is currently evaluating the impact of this amendment on its consolidated financial statements.

Financial Services - Insurance		
This guidance significantly changes how insurers account for long-duration insurance contracts. The new guidance will require insurers to review and update, if necessary, the assumptions used to measure insurance liabilities periodically, rather than retain assumptions used at contract inception. The updated guidance also changes the recognition and measurement of DAC and created a new category of benefit features called market risk benefits ("MRB") that will be measured at fair value. The guidance also significantly expands the disclosure requirements for long-duration contracts.	January 1, 2021	The guidance on measuring the liabilities for future policy benefits and DAC will likely be adopted on a modified retrospective basis as of the earliest period presented in the year of adoption. The guidance on MRB will be adopted on a retrospective basis as of the earliest period presented in the year of adoption. The Company is currently evaluating the impact of this amendment on its consolidated financial statements but anticipates the updated guidance will likely have a material impact on the measurement and recognition of its long-duration insurance contracts.

Note 3 INVESTMENTS

Fixed Maturity and Equity Securities Available-for-Sale

The Company holds various types of fixed maturity securities available-for-sale and classifies them as corporate securities ("Corporate"), Canadian and Canadian provincial government securities ("Canadian government"), residential mortgage-backed securities ("RMBS"), asset-backed securities ("ABS"), commercial mortgage-backed securities ("CMBS"), U.S. government and agencies ("U.S. government"), state and political subdivisions, and other foreign government, supranational and foreign government-sponsored enterprises ("Other foreign government").

The following table provides information relating to investments in fixed maturity securities by sector as of December 31, 2018 (dollars in thousands):

December 31, 2018:	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value	% of Total
Available-for-sale:					
Corporate	$ 7,780,146	$ 247,249	$ 128,393	$ 7,899,002	55.3%
Canadian government	2,620,312	1,125,933	631	3,745,614	26.1
RMBS	106,167	943	1,098	106,012	0.7
ABS	78,334	611	811	78,134	0.5
CMBS	113,450	586	1,454	112,582	0.8
U.S. government	291,329	5,489	75	296,743	2.1
State and political subdivisions	47,859	485	610	47,734	0.3
Other foreign government	1,991,115	62,323	15,053	2,038,385	14.2
Total fixed maturity securities	$ 13,028,712	$ 1,443,619	$ 148,125	$ 14,324,206	100.0%

The following table provides information relating to investments in fixed maturity and equity securities by sector as of December 31, 2017 (dollars in thousands):

December 31, 2017:	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value	% of Total
Available-for-sale:					
Corporate	$ 7,558,136	$ 496,709	$ 14,275	$ 8,040,570	55.7%
Canadian government	2,701,183	1,378,093	84	4,079,192	28.3
RMBS	114,695	1,684	537	115,842	0.8
ABS	76,818	830	150	77,498	0.5
CMBS	103,437	1,548	482	104,503	0.7
U.S. government	92,250	3,855	543	95,562	0.7
State and political subdivisions	45,031	1,538	238	46,331	0.3
Other foreign government	1,799,173	79,075	3,650	1,874,598	13.0
Total fixed maturity securities	$ 12,490,723	$ 1,963,332	$ 19,959	$ 14,434,096	100.0%
Non-redeemable preferred stock	$ 40,394	$ 358	$ 2,226	$ 38,526	97.5%
Other equity securities	999	—	14	985	2.5
Total equity securities	$ 41,393	$ 358	$ 2,240	$ 39,511	100.0%

The Company enters into various collateral arrangements with counterparties that require both the pledging and acceptance of fixed maturity securities as collateral. Pledged fixed maturity securities are included in fixed maturity securities, available-for-sale in the consolidated balance sheets. Fixed maturity securities received as collateral are held in separate custodial accounts and are not recorded on the Company's consolidated balance sheets. Subject to certain constraints, the Company is permitted by contract

to sell or repledge collateral it receives; however, as of December 31, 2018 and 2017, none of the collateral received had been sold or repledged. The Company also holds assets in trust to satisfy collateral requirements under derivative transactions and certain third-party reinsurance treaties. The following table includes fixed maturity securities pledged and received as collateral and assets in trust held to satisfy collateral requirements under derivative transactions and certain third-party reinsurance treaties as of December 31, 2018 and 2017 (dollars in thousands):

	2018		2017	
	Amortized Cost	Estimated Fair Value	Amortized Cost	Estimated Fair Value
Fixed maturity securities pledged as collateral	$ 35,869	$ 39,341	$ 27,559	$ 30,441
Fixed maturity securities received as collateral	n/a	276,021	n/a	281,719
Assets held in trust held to satisfy collateral requirements	5,619,449	5,949,670	5,971,025	6,624,335

Of the assets held in trust shown above, the Company had $1,321.3 million and $1,352.6 million in estimated fair values held for the benefit of a related party at December 31, 2018 and 2017, respectively.

The Company monitors its concentrations of financial instruments on an ongoing basis and mitigates credit risk by maintaining a diversified investment portfolio that limits exposure to any one issuer. The Company's exposure to concentrations of credit risk from single issuers greater than 10% of the Company's shareholder's equity as of December 31, 2018 and 2017 is as follows (dollars in thousands):

	2018		2017	
	Amortized Cost	Estimated Fair Value	Amortized Cost	Estimated Fair Value
Fixed maturity securities guaranteed or issued by:				
Canadian province of Quebec	$ 1,044,901	$ 1,711,011	$ 1,071,891	$ 1,871,328
Canadian province of Ontario	906,939	1,181,501	933,133	1,276,352

The amortized cost and estimated fair value of fixed maturity securities classified as available-for-sale as of December 31, 2018 are shown by contractual maturity in the table below (dollars in thousands). Actual maturities can differ from contractual maturities because borrowers may have the right to call or prepay obligations with or without call or prepayment penalties. Asset and mortgage-backed securities are shown separately in the table below, as they are not due at a single maturity date.

	Amortized Cost	Estimated Fair Value
Available-for-sale:		
Due in one year or less	$ 263,977	$ 265,575
Due after one year through five years	3,463,695	3,529,318
Due after five years through ten years	3,306,989	3,457,249
Due after ten years	5,696,100	6,775,336
Asset and mortgage-backed securities	297,951	296,728
Total	$ 13,028,712	$ 14,324,206

Corporate Fixed Maturity Securities

The tables below show the major industry types of the Company's corporate fixed maturity holdings as of December 31, 2018 and 2017 (dollars in thousands):

December 31, 2018:	Amortized Cost	Estimated Fair Value	% of Total
Finance	$ 3,360,525	$ 3,366,426	42.7%
Industrial	3,431,071	3,511,703	44.4
Utility	988,550	1,020,873	12.9
Total	$ 7,780,146	$ 7,899,002	100.0%

December 31, 2017:	Amortized Cost	Estimated Fair Value	% of Total
Finance	$ 3,140,238	$ 3,302,847	41.1%
Industrial	3,419,474	3,651,616	45.4
Utility	998,424	1,086,107	13.5
Total	$ 7,558,136	$ 8,040,570	100.0%

Other-Than-Temporary Impairments - Fixed Maturity Securities

As discussed in Note 2 - "Significant Accounting Policies and Pronouncements," a portion of certain OTTI losses on fixed maturity securities is recognized in AOCI. For these securities, the net amount recognized in the consolidated statements of income ("credit loss impairments") represents the difference between the amortized cost of the security and the net present value of its projected future cash flows discounted at the effective interest rate implicit in the debt security prior to impairment. Any remaining difference between the fair value and amortized cost is recognized in AOCI.

For the years ended December 31, 2018 and 2017, there were no credit loss impairments on fixed maturity securities, for which a portion of the OTTI loss was recognized in AOCI.

Unrealized Losses for Fixed Maturity and Equity Securities Available-for-Sale

The following table presents the total gross unrealized losses for the 1,029 fixed maturity securities as of December 31, 2018, where the estimated fair value had declined and remained below amortized cost by the indicated amount (dollars in thousands):

	2018	
	Gross Unrealized Losses	% of Total
Less than 20%	$ 148,125	100.0%
Total	$ 148,125	100.0%

The following table presents the total gross unrealized losses for the 384 fixed maturity and equity securities at December 31, 2017, where the estimated fair value had declined and remained below amortized cost by the indicated amount (dollars in thousands):

	2017	
	Gross Unrealized Losses	% of Total
Less than 20%	$ 21,510	96.9%
20% or more for less than six months	689	3.1
Total	$ 22,199	100.0%

The Company's determination of whether a decline in value is other-than-temporary includes an analysis of the underlying credit and the extent and duration of a decline in value. The Company's credit analysis of an investment includes determining whether the issuer is current on its contractual payments, evaluating whether it is probable that the Company will be able to collect all amounts due according to the contractual terms of the security and analyzing the overall ability of the Company to recover the amortized cost of the investment.

The following table presents the estimated fair values and gross unrealized losses, including OTTI losses reported in AOCI, for the 1,029 fixed maturity securities that have estimated fair values below amortized cost as of December 31, 2018 (dollars in thousands). These investments are presented by class and grade of security, as well as the length of time the related fair value has remained below amortized cost.

December 31, 2018:	Less than 12 months		12 months or greater		Total	
	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses
Investment grade securities:						
Corporate	$ 1,993,060	$ 60,794	$ 1,485,814	$ 65,410	$ 3,478,874	$ 126,204
Canadian government	15,240	373	12,375	258	27,615	631
RMBS	26,312	222	44,963	876	71,275	1,098
ABS	26,550	659	8,602	152	35,152	811
CMBS	27,455	305	35,870	1,149	63,325	1,454
U.S. government	2,060	72	487	3	2,547	75
State and political subdivisions	9,074	44	20,284	566	29,358	610
Other foreign government	378,320	5,875	248,495	7,865	626,815	13,740
Total investment grade securities	$ 2,478,071	$ 68,344	$ 1,856,890	$ 76,279	$ 4,334,961	$ 144,623
Below investment grade securities:						
Corporate	$ 57,890	$ 1,506	$ 3,816	$ 683	$ 61,706	$ 2,189
Other foreign government	39,650	1,021	6,324	292	45,974	1,313
Total below investment grade securities	$ 97,540	$ 2,527	$ 10,140	$ 975	$ 107,680	$ 3,502
Total fixed maturity securities	$ 2,575,611	$ 70,871	$ 1,867,030	$ 77,254	$ 4,442,641	$ 148,125

The following table presents the estimated fair values and gross unrealized losses, including OTTI losses reported in AOCI, for 384 fixed maturity and equity securities that have estimated fair values below amortized cost as of December 31, 2017 (dollars in thousands).

December 31, 2017:	Less than 12 months		12 months or greater		Total	
	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses
Investment grade securities:						
Corporate	$ 574,531	$ 5,303	$ 308,514	$ 8,230	$ 883,045	$ 13,533
Canadian government	8,766	84	—	—	8,766	84
RMBS	10,989	88	47,418	449	58,407	537
ABS	20,147	88	9,236	62	29,383	150
CMBS	22,303	226	7,054	256	29,357	482
U.S. government	19,595	444	999	99	20,594	543
State and political subdivisions	—	—	12,974	238	12,974	238
Other foreign government	188,397	1,333	56,321	1,704	244,718	3,037
Total investment grade securities	$ 844,728	$ 7,566	$ 442,516	$ 11,038	$ 1,287,244	$ 18,604
Below investment grade securities:						
Corporate	$ 17,990	$ 646	$ 771	$ 96	$ 18,761	$ 742
Other foreign government	17,079	71	14,132	542	31,211	613
Total below investment grade securities	$ 35,069	$ 717	$ 14,903	$ 638	$ 49,972	$ 1,355
Total fixed maturity securities	$ 879,797	$ 8,283	$ 457,419	$ 11,676	$ 1,337,216	$ 19,959
Non-redeemable preferred stock	$ 82	$ 1	$ 26,471	$ 2,225	$ 26,553	$ 2,226
Other equity securities	—	—	985	14	985	14
Total equity securities	$ 82	$ 1	$ 27,456	$ 2,239	$ 27,538	$ 2,240

The Company has no intention to sell, nor does it expect to be required to sell, the securities outlined in the table above, as of the dates indicated. However, unforeseen facts and circumstances may cause the Company to sell fixed maturity securities in the ordinary course of managing its portfolio to meet certain diversification, credit quality and liquidity guidelines. Changes in unrealized losses are primarily driven by changes in interest rates.

Investment Income, Net of Related Expenses

Major categories of investment income, net of related expenses, for the years ended December 31, 2018 and 2017, consist of the following (dollars in thousands):

	2018	2017
Fixed maturity securities available-for-sale	$ 503,468	$ 441,951
Equity securities	2,192	1,575
Funds withheld at interest	270,845	106,645
Short-term investments and cash and cash equivalents	5,441	4,448
Other invested assets	20,160	23,819
Investment income	802,106	578,438
Investment expense	(25,531)	(24,075)
Investment income, net of related expenses	$ 776,575	$ 554,363

Investment Related Gains (Losses), Net

Investment related gains (losses), net for the years ended December 31, 2018 and 2017, consist of the following (dollars in thousands):

	2018	2017
Fixed maturity securities available for sale:		
OTTI losses	$ (539)	$ (2,481)
Gain on investment activity	28,694	23,034
Loss on investment activity	(29,670)	(8,581)
Equity securities:		
Gain on investment activity	1	3
Loss on investment activity	(89)	(1)
Change in unrealized gains (losses) recognized in earnings	(4,761)	—
Change in mortgage loan provision	(712)	(75)
Derivatives and other, net	(6,633)	(8,357)
Total investment related gains (losses), net	$ (13,709)	$ 3,542

The OTTI losses on fixed maturity securities for 2018 and 2017 are primarily due to emerging market exposures. The fluctuations in investment related gains (losses), net for derivatives and other are primarily due to changes in the fair value of embedded derivatives related to modco and funds withheld treaties, as a result of changes in interest rates, driven primarily by credit spreads.

As of December 31, 2018 and 2017, the Company held non-income producing securities with amortized costs of $0.5 million and $1.0 million, and estimated fair values of $0.5 million and $1.0 million, respectively. Generally, securities are non-income producing when principal or interest is not paid primarily as a result of bankruptcies or credit defaults, but also include securities where amortization has been discontinued. During 2018 and 2017, the Company sold fixed maturity securities with fair values of $672.6 million and $855.0 million, at losses of $29.7 million and $8.6 million, respectively. During 2018 and 2017, the Company sold equity securities with fair values of $0.9 million and $0.2 million, at losses of $0.1 million and $1.0 thousand, respectively. The Company generally does not engage in short-term buying and selling of securities.

For the years ended December 31, 2018 and 2017, there were security purchases from affiliates with estimated fair values of $448.7 million and $26.5 million, respectively, at the time of transfer. For the year ended December 31, 2018, there were security sales to affiliates with amortized costs and estimated fair values of $17.5 million and $17.7 million, respectively. For the year ended December 31, 2017, there were no sales to affiliates.

Securities Lending and Other

The Company participates in securities lending programs whereby securities, reflected as investments on the Company's consolidated balance sheets, are loaned to an affiliated party. The Company receives cash and securities as collateral, in an amount equal to a minimum of 102% of the fair value of the securities lent. The securities received as collateral are not reflected on the Company's consolidated balance sheets. The cash received is reflected in the Company's consolidated balance sheets, offset by a payable, included in securities lending obligation on the consolidated balance sheets.

The Company participates in a repurchase/reverse repurchase program in which securities, reflected as investments on the Company's consolidated balance sheets, are pledged to a third party. In return, the Company received a security, which is not included on the Company's consolidated balance sheets. The Company is required to pledge securities with a minimum fair value that is 105% of the market value of the security received.

The Company participates in a repurchase program in which securities, reflected as investments on the Company's consolidated balance sheets, are pledged to a third party. In return, the Company receives cash from the third party, which is reflected in the Company's consolidated balance sheets, offset by a payable, included in other liabilities on the consolidated balance sheets. The Company is required to maintain a minimum collateral balance with a fair value of 105% of the cash received.

The following table includes the amount of securities lent and received as part of the securities lending program and repurchased/ reverse repurchased securities pledged and received and cash received as of December 31, 2018 and 2017 (dollars in thousands):

	2018		2017	
	Amortized Cost	Estimated Fair Value	Amortized Cost	Estimated Fair Value
Securities lending:				
Securities loaned	$ 87,859	$ 87,788	$ 87,857	$ 89,866
Securities received	—	566,202	n/a	94,000
Repurchase program/reverse repurchase program:				
Securities pledged	349,653	349,095	193,992	206,447
Securities received	n/a	316,538	n/a	150,000
Cash received	28,196	28,196	31,236	31,236

The following tables present information on the Company's securities lending and repurchase transactions as of December 31, 2018 and 2017, respectively (dollars in thousands):

	December 31, 2018				
	Remaining Contractual Maturity of the Agreements				
	Overnight and Continuous	Up to 30 Days	30-90 Days	Greater than 90 Days	Total
Securities lending transaction:					
Corporate	$ —	$ —	$ —	$ 87,788	$ 87,788
Total	—	—	—	87,788	$ 87,788
Repurchase transaction:					
Corporate	—	—	—	257,945	257,945
Foreign government	—	—	—	89,684	89,684
Other	—	—	—	1,466	1,466
Total	—	—	—	349,095	349,095
Total transactions	$ —	$ —	$ —	$ 436,883	$ 436,883

Gross amount of recognized liabilities for securities lending and repurchase transactions in preceding table	$ 910,936
Amounts related to agreements not included in offsetting disclosure	$ 474,053

	December 31, 2017				
	Remaining Contractual Maturity of the Agreements				
	Overnight and Continuous	Up to 30 Days	30-90 Days	Greater than 90 Days	Total
Securities lending transaction:					
Corporate	$ —	$ —	$ —	$ 89,866	$ 89,866
Total	—	—	—	89,866	89,866
Repurchase transaction:					
Corporate	—	—	312	184,333	184,645
Foreign government	—	—	—	21,802	21,802
Total	—	—	312	206,135	206,447
Total transactions	$ —	$ —	$ 312	$ 296,001	$ 296,313

Gross amount of recognized liabilities for securities lending transactions in preceding table	$ 275,236
Amounts related to agreements not included in offsetting disclosure	$ (21,077)

Funds Withheld at Interest

Funds withheld at interest comprised approximately 37.7% and 24.3% of the Company's total investments as of December 31, 2018 and 2017, respectively. Of the $9.3 billion funds withheld at interest balance, net of embedded derivatives, as of December 31, 2018, $8.8 billion of the balance is associated with one affiiliated client. See Note 12 - "Related-Party Transactions" for further details. In the event of a ceding company's insolvency, the Company would need to assert a claim on the assets supporting its reserve liabilities. However, the risk of loss to the Company is mitigated by its ability to offset amounts it owes the ceding company for claims or allowances against amounts owed to the Company from the ceding company.

Other Invested Assets

Other invested assets include equity release mortgages, derivative contracts, FVO contractholder-directed unit-linked investments, and mortgage loans on real estate. Other invested assets also include cash pledged as collateral, limited partnerships, and a purchase agreement, all of which are included in Other in the table below. Other invested assets represented approximately 4.0% and 3.4% of the Company's total investments as of December 31, 2018 and 2017, respectively. Carrying values of these assets as of December 31, 2018 and 2017 are as follows (dollars in thousands):

	2018	2017
Equity release mortgages	$ 475,905	$ 219,940
Derivatives	147,055	94,541
FVO contractholder-directed unit-linked investments	197,770	218,541
Mortgage loans on real estate	141,761	99,831
Other	20,637	50,708
Total other invested assets	$ 983,128	$ 683,561

Note 4 DERIVATIVE INSTRUMENTS

Accounting for Derivative Instruments and Hedging Activities

See Note 2 - "Significant Accounting Policies and Pronouncements" for a detailed discussion of the accounting treatment for derivative instruments, including embedded derivatives and Note 5 - "Fair Value of Assets and Liabilities" for additional disclosures related to the fair value hierarchy for derivative instruments, including embedded derivatives.

Types of Derivatives Used by the Company

Credit Derivatives

The Company sells protection under single name credit default swaps and credit default swap index tranches to diversify its credit risk exposure in certain portfolios and, in combination with purchasing securities, to replicate characteristics of similar investments based on the credit quality and term of the credit default swap. Credit default triggers for indexed reference entities and single name reference entities are defined in the contracts. The Company's maximum exposure to credit loss equals the notional value for credit default swaps. In the event of default of a referencing entity, the Company is typically required to pay the protection holder the full notional value less a recovery amount determined at auction.

Equity Derivatives

Exchange-traded equity futures are used primarily to economically hedge liabilities embedded in certain variable annuity products. With exchange-traded equity futures transactions, the Company agrees to purchase or sell a specified number of contracts, the value of which is determined by the relevant stock indices, and to post variation margin on a daily basis in an amount equal to the difference between the daily estimated fair values of those contracts. The Company enters into exchange-traded equity futures with regulated futures commission merchants that are members of the exchange.

Equity index options are used by the Company primarily to hedge minimum guarantees embedded in certain variable annuity products. To hedge against adverse changes in equity indices volatility, the Company buys put options. The contracts are net settled in cash based on differentials in the indices at the time of exercise and the strike price. Equity warrants have also been used by the Company to economically hedge the variability in anticipated cash flows for the acquisition of investment securities.

Foreign Currency Derivatives

Foreign currency swaps are used by the Company to reduce the risk from fluctuations in foreign currency exchange rates associated with its assets and liabilities denominated in foreign currencies. With a foreign currency swap transaction, the Company agrees with another party to exchange, at specified intervals, the difference between one currency and another at a forward exchange rate calculated by reference to an agreed upon principal amount. The principal amount of each currency is exchanged at the termination of the currency swap by each party. The Company uses foreign currency swaps in hedges of net investments in foreign operations and non-qualifying hedge relationships.

Foreign currency forwards are used by the Company to reduce the risk from fluctuations in foreign currency exchange rates associated with its assets and liabilities denominated in foreign currencies. With a foreign currency forward transaction, the Company agrees with another party to deliver a specified amount of an identified currency at a specified future date. The price is agreed upon at the time of the contract and payment for such a contract is made in a different currency at the specified future date. The Company uses foreign currency forwards in hedges of net investments in foreign operations and non-qualifying hedge relationships.

Interest Rate Derivatives

Interest rate swaps are used by the Company primarily to reduce market risks from changes in interest rates, to alter interest rate exposure arising from mismatches between assets and liabilities (duration mismatches) and to manage the risk of cash flows of liabilities that are variable based on a benchmark rate. With an interest rate swap, the Company agrees with another party to exchange, at specified intervals, the difference between two rates, which can be either fixed-rate or floating-rate interest amounts, tied to an agreed-upon notional principal amount. These transactions are executed pursuant to master agreements that provide for a single net payment or individual gross payments at each due date.

Other Derivatives

Consumer price index ("CPI") swaps are used by the Company primarily to economically hedge liabilities embedded in certain insurance products where value is directly affected by changes in a designated benchmark consumer price index. With a CPI swap transaction, the Company agrees with another party to exchange the actual amount of inflation realized over a specified period of time for a fixed amount of inflation determined at inception. These transactions are executed pursuant to master agreements that provide for a single net payment or individual gross payments to be made by the counterparty at each due date. Most of these swaps will require a single payment to be made by one counterparty at the maturity date of the swap.

The Company enters into longevity swaps in the form of out-of-the-money options, which provide protection against changes in mortality improvement to retirement plans and insurers of such plans. With a longevity swap transaction, the Company agrees with another party to exchange a proportion of a notional value. The proportion is determined by the difference between a predefined benefit, and the realized benefit plus the future expected benefit, calculated by reference to a population index for a fixed premium.

The Company has certain embedded derivatives which are required to be separated from their host contracts and reported as derivatives. Host contracts include reinsurance treaties structured on a modco or funds withheld basis. Additionally, the Company reinsures variable annuity contracts with benefits that are considered embedded derivatives, including GMWB, GMAB, and GMIB treaties.

Summary of Derivative Positions

Derivatives, except for embedded derivatives and longevity swaps, are carried on the Company’s consolidated balance sheets in other invested assets or other liabilities, at fair value. Longevity swaps are included on the consolidated balance sheets in other assets or other liabilities, at fair value. Embedded derivative liabilities on modco or funds withheld arrangements are included on the consolidated balance sheets with the host contract in funds withheld at interest, at fair value. Embedded derivative liabilities on variable annuity products are included on the consolidated balance sheets with the host contract in interest-sensitive contract liabilities, at fair value. The following table presents the notional amounts and gross fair value of derivative instruments prior to taking into account the netting effects of master netting agreements as of December 31, 2018 and 2017 (dollars in thousands):

	Primary Underlying Risk	December 31, 2018 Notional Amount	December 31, 2018 Carrying Value/ Fair Value Assets	December 31, 2018 Carrying Value/ Fair Value Liabilities	December 31, 2017 Notional Amount	December 31, 2017 Carrying Value/ Fair Value Assets	December 31, 2017 Carrying Value/ Fair Value Liabilities
Derivatives not designated as hedging instruments:							
Interest rate swaps	Interest rate	$ 926,729	$ 52,236	$ 13,391	$ 870,070	$ 73,350	$ 4,167
Financial futures	Equity	325,620	—	—	412,438	—	—
Foreign currency swaps	Foreign currency	149,698	504	4,659	—	—	—
Foreign currency forwards	Foreign currency	25,000	—	234	—	—	—
CPI swaps	CPI	255,174	—	6,536	62,472	—	435
Credit default swaps	Credit	1,035,600	2,576	1,055	635,500	3,080	1,191
Equity options	Equity	439,158	42,683	—	632,251	23,201	—
Longevity swaps	Longevity	401,345	9,449	—	420,175	7,751	—
Embedded derivatives in:							
Modified coinsurance or funds withheld arrangements		—	—	185,211	—	59,448	—
Variable annuity products		—	—	167,925	—	—	152,470
Total non-hedging derivatives		3,558,324	107,448	379,011	3,032,906	166,830	158,263
Derivatives designated as hedging instruments:							
Foreign currency swaps	Foreign currency	215,604	13,093	—	271,222	2,302	8,295
Foreign currency forwards	Foreign currency	911,197	50,974	—	553,175	1,265	7,720
Total hedging derivatives		1,126,801	64,067	—	824,397	3,567	16,015
Total derivatives		$4,685,125	$ 171,515	$ 379,011	$3,857,303	$ 170,397	$ 174,278

Hedges of Net Investments in Foreign Operations

The Company uses foreign currency swaps and foreign currency forwards to hedge a portion of its net investment in certain foreign operations against adverse movements in exchange rates. The following table illustrates the Company's net investments in foreign operations ("NIFO") hedges for the years ended December 31, 2018 and 2017 (dollars in thousands):

Type of NIFO Hedge[1] [2]	Derivative Gains (Losses) Deferred in AOCI For the years ended 2018	2017
Foreign currency swaps	$ 18,500	$ (22,473)
Foreign currency forwards	55,913	(10,386)

(1) There were no sales or substantial liquidations of net investments in foreign operations that would have required the reclassification of gains or losses from AOCI into investment income, net of related expenses during the periods presented.
(2) There was no ineffectiveness recognized for the Company's hedges of net investments in foreign operations.

The cumulative foreign currency translation gain (loss) recorded in AOCI related to these hedges was $57.9 million and $(16.5) million as of December 31, 2018 and 2017, respectively. If a hedged foreign operation was sold or substantially liquidated, the amounts in AOCI would be reclassified to the consolidated statements of income. A pro rata portion would be reclassified upon partial sale of a hedged foreign operation.

Non-qualifying Derivatives and Derivatives for Purposes Other Than Hedging

The Company uses various other derivative instruments for risk management purposes that either do not qualify or have not been qualified for hedge accounting treatment. The gain or loss related to the change in fair value for these derivative instruments is recognized in investment related gains (losses), net in the consolidated statements of income, except where otherwise noted.

A summary of the effect of non-hedging derivatives, including embedded derivatives, on the Company's consolidated statements of income for the years ended December 31, 2018 and 2017 is as follows (dollars in thousands):

Type of Non-hedging Derivative	Consolidated Statements of Income Location of Gains (Losses)	Gains (Losses) for the Years Ended December 31, 2018	2017
Interest rate swaps	Investment related gains (losses), net	$ (23,921)	$ 9,373
Financial futures	Investment related gains (losses), net	21,174	(36,160)
Foreign currency swaps	Investment related gains (losses), net	(3,695)	—
Foreign currency forwards	Investment related gains (losses), net	(237)	—
Consumer price index swaps	Investment related gains (losses), net	(5,681)	(419)
Credit default swaps	Investment related gains (losses), net	(3,049)	10,918
Equity options	Investment related gains (losses), net	7,235	(42,882)
Longevity swaps	Other revenues	2,099	2,487
Subtotal		(6,075)	(56,683)
Embedded derivatives in:			
Modified coinsurance or funds withheld arrangements	Change in value of funds withheld embedded derivatives	(212,652)	41,386
Variable annuity products	Investment related gains (losses), net	(15,455)	32,166
Total non-hedging derivatives		$ (234,182)	$ 16,869

Credit Derivatives

The following table presents the estimated fair value, maximum amount of future payments and weighted average years to maturity of credit default swaps sold by the Company at December 31, 2018 and 2017 (dollars in thousands):

	2018			2017		
Rating Agency Designation of Referenced Credit Obligations[1]	Estimated Fair Value of Credit Default Swaps	Maximum Amount of Future Payments under Credit Default Swaps[2]	Weighted Average Years to Maturity[3]	Estimated Fair Value of Credit Default Swaps	Maximum Amount of Future Payments under Credit Default Swaps[2]	Weighted Average Years to Maturity[3]
AAA/AA+/AA/AA-/A+/A/A-						
Single name credit default swaps	$ 655	$ 66,000	1.3	$ 1,205	$ 66,000	2.3
Subtotal	655	66,000	1.3	1,205	66,000	2.3
BBB+/BBB/BBB-						
Single name credit default swaps	929	147,000	1.7	1,642	137,000	2.2
Credit default swaps referencing indices	(76)	817,600	6.4	(55)	422,600	4.0
Subtotal	853	964,600	5.6	1,587	559,600	3.5
BB+/BB						
Single name credit default swaps	13	5,000	1.0	—	—	—
Subtotal	13	5,000	1.0	—	—	—
Total	$ 1,521	$ 1,035,600	5.3	$ 2,792	$ 625,600	3.4

(1) The rating agency designations are based on ratings from Standard and Poor's ("S&P").
(2) Assumes the value of the referenced credit obligation is zero.
(3) The weighted average years to maturity of the credit default swaps is calculated based on weighted average notional amounts.

Netting Arrangements and Credit Risk

Certain of the Company’s derivatives are subject to enforceable master netting arrangements and reported as a net asset or liability in the consolidated balance sheets. The Company nets all derivatives that are subject to such arrangements.

The Company has elected to include all derivatives, except embedded derivatives, in the tables below, irrespective of whether they are subject to an enforceable master netting arrangement or a similar agreement. See Note 3 - "Investments" for information regarding the Company’s securities lending, repurchase and repurchase/reverse repurchase programs. See "Embedded Derivatives" above for information regarding the Company’s bifurcated embedded derivatives.

The following table provides information relating to the netting of the Company's derivative instruments as of December 31, 2018 and 2017 (dollars in thousands):

	Gross Amounts Recognized	Gross Amounts Offset in the Consolidated Balance Sheet	Net Amounts Presented in the Consolidated Balance Sheet	Gross Amounts Not Offset in the Consolidated Balance Sheets: Financial Instruments	Gross Amounts Not Offset in the Consolidated Balance Sheets: Cash Collateral (Pledged)/ Received	Net Amount
December 31, 2018:						
Derivative assets	$ 171,515	$ (15,011)	$ 156,504	$ —	$ (80,764)	$ 75,740
Derivative liabilities	25,875	(15,011)	10,864	(26,767)	(8,830)	(24,733)
December 31, 2017:						
Derivative assets	$ 110,949	$ (8,657)	$ 102,292	$ —	$ (19,166)	$ 83,126
Derivative liabilities	21,808	(8,657)	13,151	—	(12,440)	711

The Company may be exposed to credit-related losses in the event of non-performance by counterparties to derivative financial instruments with a positive fair value. Generally, the credit exposure of the Company's derivative contracts is limited to the fair value at the reporting date plus or minus any collateral posted or held by the Company. The Company had credit exposure related to its derivative contracts, at December 31, 2018 and 2017, as the net amount of collateral pledged to the Company from counterparties was less than the fair value of the derivative contracts.

Derivatives may be exchange-traded or they may be privately negotiated contracts, which are referred to as over-the-counter ("OTC") derivatives. Certain of the Company's OTC derivatives are cleared and settled through central clearing counterparties ("OTC cleared") and others are bilateral contracts between two counterparties. The Company manages its credit risk related to OTC derivatives by entering into transactions with creditworthy counterparties, maintaining collateral arrangements and through the use of master netting agreements that provide for a single net payment to be made by one counterparty to another at each due date and upon termination. The Company is only exposed to the default of the central clearing counterparties for OTC cleared derivatives, and these transactions require initial and daily variation margin collateral postings. Exchange-traded derivatives are settled on a daily basis, thereby reducing the credit risk exposure in the event of non-performance by counterparties to such financial instruments.

Note 5 FAIR VALUE OF ASSETS AND LIABILITIES

Fair Value Measurement

General accounting principles for *Fair Value Measurements and Disclosures* define fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. These principles also establish a fair value hierarchy that requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value and describes three levels of inputs that may be used to measure fair value:

Level 1 - Unadjusted quoted prices in active markets for identical assets or liabilities. Active markets are defined as having the following characteristics for the measured asset/liability: (i) many transactions, (ii) current prices, (iii) price quotes not varying substantially among market makers, (iv) narrow bid/ask spreads and (v) most information publicly available. The Company's Level 1 assets and liabilities are traded in active exchange markets.

Level 2 - Observable inputs other than Level 1 prices such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or market standard valuation techniques and assumptions that use significant inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities. Such observable inputs include benchmarking prices for similar assets in active, liquid markets, quoted prices in markets that are not active and observable yields and spreads in the market. The Company's Level 2 assets and liabilities include investment securities with quoted prices that are traded less frequently than exchange-traded instruments and derivative contracts whose values are determined using market standard valuation techniques. Level 2 valuations are generally obtained from third party pricing services for identical or comparable assets or liabilities or through the use of valuation methodologies using observable market inputs. Prices from servicers are validated through analytical reviews and assessment of current market activity.

Level 3 - Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the related assets or liabilities. Level 3 assets and liabilities include those whose value is determined using market standard valuation techniques described above. When observable inputs are not available, the market standard techniques for determining the estimated fair value of certain securities that trade infrequently, and therefore have little transparency, rely on inputs that are significant to the estimated fair value and that are not observable in the market or cannot be derived principally from or corroborated by observable market data. These unobservable inputs can be based in large part on management judgment or estimation and cannot be supported by reference to market activity. Even though unobservable, management believes these inputs are based on assumptions deemed appropriate given the circumstances and consistent with what other market participants would use when pricing similar assets and

liabilities. Prices are determined using valuation methodologies such as discounted cash flow models and other similar techniques that require management's judgment or estimation in developing inputs that are consistent with those other market participants would use when pricing similar assets and liabilities. Non-binding broker quotes, which are utilized when pricing service information is not available, are reviewed for reasonableness based on the Company's understanding of the market, and are generally considered Level 3. Under certain circumstances, based on its observations of transactions in active markets, the Company may conclude the prices received from independent third party pricing services or brokers are not reasonable or reflective of market activity. In those instances, the Company would apply internally developed valuation techniques to the related assets or liabilities. Additionally, the Company's embedded derivatives, all of which are associated with reinsurance treaties, and longevity swaps are classified in Level 3 since their values include significant unobservable inputs.

When inputs used to measure the fair value of an asset or liability fall within different levels of the hierarchy, the level within which the fair value measurement is categorized is based on the lowest level input that is significant to the fair value measurement in its entirety, except for fair value measurements using NAV. For example, a Level 3 fair value measurement may include inputs that are observable (Levels 1 and 2) and unobservable (Level 3). Therefore, gains and losses for such assets and liabilities categorized within Level 3 may include changes in fair value that are attributable to both observable inputs (Levels 1 and 2) and unobservable inputs (Level 3).

Assets and Liabilities by Hierarchy Level

Assets and liabilities measured at fair value on a recurring basis as of December 31, 2018 and 2017 are summarized below (dollars in thousands):

December 31, 2018:		Fair Value Measurements Using:		
	Total	Level 1	Level 2	Level 3
Assets:				
Fixed maturity securities - available-for-sale:				
Corporate	$ 7,899,002	$ —	$ 7,733,014	$ 165,988
Canadian government	3,745,614	—	3,217,490	528,124
RMBS	106,012	—	106,012	—
ABS	78,134	—	77,147	987
CMBS	112,582	—	112,582	—
U.S. government	296,743	290,883	5,860	—
State and political subdivisions	47,734	—	47,734	—
Other foreign government	2,038,385	—	2,038,385	—
Total fixed maturity securities - available-for-sale	14,324,206	290,883	13,338,224	695,099
Equity securities	34,622	30,921	—	3,701
Funds withheld at interest - embedded derivatives	(185,211)	—	—	(185,211)
Cash equivalents	184,154	184,154	—	—
Short-term investments	10,605	4,989	5,616	—
Other invested assets:				
Derivatives:				
Interest rate swaps	38,845	—	38,845	—
Forward currency forwards	50,740	—	50,740	—
Credit default swaps	1,694	—	1,694	—
Equity options	42,683	—	42,683	—
Foreign currency swaps	13,093	—	13,093	—
FVO contractholder-directed unit-linked investments	197,770	196,781	989	—
Total other invested assets	344,825	196,781	148,044	—
Other assets - longevity swaps	9,449	—	—	9,449
Total	$ 14,722,650	$ 707,728	$ 13,491,884	$ 523,038
Liabilities:				
Interest-sensitive contract liabilities - embedded derivatives	$ 167,925	$ —	$ —	$ 167,925
Other liabilities:				
Derivatives:				
Foreign currency swaps - non-hedged	4,155	—	4,155	—
CPI swaps	6,536	—	6,536	—
Credit default swaps	173	—	173	—
Foreign currency swaps	—	—	—	—
Total	$ 178,789	$ —	$ 10,864	$ 167,925

December 31, 2017:

	Total	Fair Value Measurements Using: Level 1	Level 2	Level 3
Assets:				
Fixed maturity securities - available-for-sale:				
Corporate	$ 8,040,570	$ —	$ 7,881,161	$ 159,409
Canadian government	4,079,192	—	3,485,250	593,942
RMBS	115,842	—	111,097	4,745
ABS	77,498	—	76,503	995
CMBS	104,503	—	104,503	—
U.S. government	95,562	89,379	6,183	—
State and political subdivisions	46,331	—	44,189	2,142
Other foreign government	1,874,598	—	1,874,598	—
Total fixed maturity securities - available-for-sale	14,434,096	89,379	13,583,484	761,233
Equity securities:				
Non-redeemable preferred stock	38,526	38,526	—	—
Other equity securities	985	985	—	—
Funds withheld at interest - embedded derivatives	59,448	—	—	59,448
Cash equivalents	95,756	93,039	2,717	—
Short-term investments	47,557	—	47,557	—
Other invested assets:				
Derivatives:				
Interest rate swaps	69,183	—	69,183	—
CPI swaps	(435)	—	(435)	—
Credit default swaps	1,862	—	1,862	—
Equity options	23,201	—	23,201	—
Foreign currency swaps	730	—	730	—
FVO contractholder-directed unit-linked investments	218,541	217,618	923	—
Total other invested assets	313,082	217,618	95,464	—
Other assets - longevity swaps	7,751	—	—	7,751
Total	$ 14,997,201	$ 439,547	$ 13,729,222	$ 828,432
Liabilities:				
Interest-sensitive contract liabilities - embedded derivatives	$ 152,470	$ —	$ —	$ 152,470
Other liabilities:				
Derivatives:				
Credit default swaps	27	—	27	—
Foreign currency swaps	(6,723)	—	(6,723)	—
Foreign currency forwards	(6,455)	—	(6,455)	—
Total	$ 139,319	$ —	$ (13,151)	$ 152,470

The Company may utilize information from third parties, such as pricing services and brokers, to assist in determining the fair value for certain assets and liabilities; however, management is ultimately responsible for all fair values presented in the Company's consolidated financial statements. This includes responsibility for monitoring the fair value process, ensuring objective and reliable valuation practices and pricing of assets and liabilities, and approving changes to valuation methodologies and pricing sources. The selection of the valuation technique(s) to apply considers the definition of an exit price and the nature of the asset or liability being valued and significant expertise and judgment is required.

The Company performs initial and ongoing analysis and review of the various techniques utilized in determining fair value to ensure that they are appropriate and consistently applied, and that the various assumptions are reasonable. The Company analyzes and reviews the information and prices received from third parties to ensure that the prices represent a reasonable estimate of the fair value and to monitor controls around pricing, which includes quantitative and qualitative analysis and is overseen by the Company's investment and accounting personnel. Examples of procedures performed include, but are not limited to, review of pricing trends, comparison of a sample of executed prices of securities sold to the fair value estimates, comparison of fair value estimates to management's knowledge of the current market, and ongoing confirmation that third party pricing services use, wherever possible, market-based parameters for valuation. In addition, the Company utilizes both internal and external cash flow models to analyze the reasonableness of fair values utilizing credit spread and other market assumptions, where appropriate. As a result of the analysis, if the Company determines there is a more appropriate fair value based upon the available market data, the price received from the third party is adjusted accordingly. The Company also determines if the inputs used in estimated fair values received from pricing services are observable by assessing whether these inputs can be corroborated by observable market data.

For assets and liabilities reported at fair value, the Company utilizes when available, fair values based on quoted prices in active markets that are regularly and readily obtainable. Generally, these are very liquid investments and the valuation does not require management judgment. When quoted prices in active markets are not available, fair value is based on market valuation techniques, market comparable pricing and the income approach. The use of different techniques, assumptions and inputs may have a material effect on the estimated fair values of the Company's securities holdings. For the periods presented, the application of market standard valuation techniques applied to similar assets and liabilities has been consistent.

The methods and assumptions the Company uses to estimate the fair value of assets and liabilities measured at fair value on a recurring basis are summarized below. See "Valuation Process for Fair Value Measurements Categorized within Level 3" for additional information on Level 3 valuations.

Fixed Maturity Securities - The fair values of the Company's publicly-traded fixed maturity securities are generally based on prices obtained from independent pricing services. Prices from pricing services are sourced from multiple vendors, and a vendor hierarchy is maintained by asset type based on historical pricing experience and vendor expertise. The Company generally receives prices from multiple pricing services for each security, but ultimately uses the price from the vendor that is highest in the hierarchy for the respective asset type. To validate reasonableness, prices are periodically reviewed as explained above. Consistent with the fair value hierarchy described above, securities with quotes from pricing services are generally reflected within Level 2, as they are primarily based on observable pricing for similar assets and/or other market observable inputs. If the pricing information received from third party pricing services is not reflective of market activity or other inputs observable in the market, the Company may challenge the price through a formal process with the pricing service.

If the Company ultimately concludes that pricing information received from the independent pricing service is not reflective of fair value, non-binding broker quotes are used, if available. If the Company concludes that the values from both pricing services and brokers are not reflective of fair value, an internally developed valuation may be prepared; however, this occurs infrequently. Internally developed valuations or non-binding broker quotes are also used to determine fair value in circumstances where vendor pricing is not available. These valuations may use significant unobservable inputs, which reflect the Company's assumptions about the inputs that market participants would use in pricing the asset. Observable market data may not be available in certain circumstances such as market illiquidity and credit events related to the security. Pricing service overrides, internally developed valuations and non-binding broker quotes are generally based on significant unobservable inputs and are reflected as Level 3 in the valuation hierarchy.

The inputs used in the valuation of corporate and government securities include, but are not limited to standard market observable inputs that are derived from, or corroborated by, market observable data including market yield curve, duration, call provisions, observable prices and spreads for similar publicly traded or privately placed issues that incorporate the credit quality and industry sector of the issuer. For private placements and structured securities, valuation is based primarily on matrix pricing or other similar techniques using standard market inputs including spreads for actively traded securities, spreads off benchmark yields, expected prepayment speeds and volumes, current and forecasted loss severity, rating, weighted average coupon, weighted average maturity, average delinquency rates, geographic region, debt service coverage ratios and issuance-specific information including, but not limited to: collateral type, payment terms of the underlying assets, payment priority within the tranche, structure of the security, deal performance and vintage of loans.

When observable inputs are not available, the market standard valuation techniques for determining the estimated fair value of certain types of securities that trade infrequently, and therefore have little or no price transparency, rely on inputs that are significant to the estimated fair value that are not observable in the market or cannot be derived principally from or corroborated by observable market data, such as market illiquidity. These unobservable inputs can be based in large part on management judgment or estimation, and cannot be supported by reference to market activity. Even though unobservable, these inputs are based on assumptions deemed appropriate given the circumstances and are believed to be consistent with what other market participants would use when pricing such securities.

Embedded Derivatives - The fair value of embedded derivative liabilities, including those calculated by third parties, are monitored through the use of attribution reports to quantify the effect of underlying sources of fair value change, including capital market inputs based on policyholder account values, interest rates and short-term and long-term implied volatilities, from period to period. Actuarial assumptions are based on experience studies performed internally in combination with available industry information and are reviewed on a periodic basis, at least annually.

For embedded derivative liabilities associated with the underlying products in reinsurance treaties, primarily variable annuity treaties, the Company utilizes a discounted cash flow model, which includes an adjustment for a CVA. The variable annuity embedded derivative calculations are performed by third parties based on methodology and input assumptions provided by the Company. To validate the reasonableness of the resulting fair value, the Company's internal actuaries perform reviews and analytical procedures on the results. The capital market inputs to the model, such as equity indexes, short-term equity volatility and interest rates, are generally observable. The valuation also requires certain significant inputs, which are generally not observable and accordingly, the valuation is considered Level 3 in the fair value hierarchy.

The fair value of embedded derivatives associated with funds withheld reinsurance treaties is determined based upon a total return swap technique with reference to the fair value of the investments held by the ceding company that support the Company's funds withheld at interest asset with an adjustment for a CVA. The fair value of the underlying assets is generally based on market observable inputs using industry standard valuation techniques. The valuation also requires certain significant inputs, which are generally not observable and accordingly, the valuation is considered Level 3 in the fair value hierarchy.

Equity Securities - Equity securities consist principally of exchange-traded funds and preferred stock of publicly and privately traded companies. The fair values of publicly traded equity securities are primarily based on quoted market prices in active markets and are classified within Level 1 in the fair value hierarchy. Non-binding broker quotes and internally developed evaluations for equity securities are generally based on significant unobservable inputs and are reflected as Level 3 in the fair value hierarchy.

Credit Valuation Adjustment - The Company uses a structural default risk model to estimate a CVA. The input assumptions are a combination of externally derived and published values (default threshold and uncertainty), market inputs (interest rate, RGA equity price per share, RGA debt per share, RGA equity price volatility) and insurance industry data (loss given default), adjusted for market recoverability.

Cash Equivalents and Short-Term Investments - Cash equivalents and short-term investments include money market instruments, commercial paper and other highly liquid debt instruments. Money market instruments are generally valued using unadjusted quoted prices in active markets that are accessible for identical assets and are primarily classified as Level 1. The fair value of certain other cash equivalents and short-term investments, such as bonds with original maturities twelve months or less, are based upon other market observable data and are typically classified as Level 2. Various time deposits, certificates of deposit and sweeps carried as cash equivalents or short-term investments are not measured at estimated fair value and therefore are excluded from the tables presented.

FVO Contractholder-Directed Unit-Linked Investments - FVO contractholder-directed investments supporting unit-linked variable annuity type liabilities primarily consist of exchange-traded funds and, to a lesser extent, fixed maturity securities and cash and cash equivalents. The fair values of the exchange-traded securities are primarily based on quoted market prices in active markets and are classified within Level 1 of the hierarchy. The fair value of the fixed maturity contractholder-directed securities is determined on a basis consistent with the methodologies described above for fixed maturity securities and are classified within Level 2 of the hierarchy.

Derivative Assets and Derivative Liabilities - All of the derivative instruments utilized by the Company, except for longevity swaps, are classified within Level 2 on the fair value hierarchy. These derivatives are principally valued using an income approach. Valuations of interest rate contracts are based on present value techniques, which utilize significant inputs that may include the swap yield curve, London Interbank Offered Rate ("LIBOR") basis curves, and repurchase rates. Valuations of foreign currency contracts are based on present value techniques, which utilize significant inputs that may include the swap yield curve, LIBOR basis curves, currency spot rates, and cross currency basis curves. Valuations of credit contracts are based on present value techniques, which utilize significant inputs that may include the swap yield curve, credit curves, and recovery rates. Valuations of equity market contracts are based on present value techniques, which utilize significant inputs that may include the swap yield curve, spot equity index levels, and dividend yield curves. Valuations of equity market contracts, option-based, are based on option pricing models, which utilize significant inputs that may include the swap yield curve, spot equity index levels, dividend yield curves, and equity volatility.

Longevity Swaps - The Company utilizes a discounted cash flow model to estimate the fair value of longevity swaps. The fair value of these swaps includes an accrual for premiums payable and receivable. Some inputs to the valuation model are generally observable, such as interest rates and actual population mortality experience. The valuation also requires significant inputs that are generally not observable and, accordingly, the valuation is considered Level 3 in the fair value hierarchy.

Transfers between Level 1 and 2

Transfers between Levels 1 and 2 are made to reflect changes in observability of inputs and market activity. The Company recognizes transfers of assets and liabilities into and out of levels within the fair value hierarchy at the beginning of the quarter in which the actual event or change in circumstances that caused the transfer occurs. There were no transfers between Level 1 and Level 2 for the year ended December 31, 2018. The following table presents the transfers between Level 1 and Level 2 during the year ended December 31, 2017 (dollars in thousands):

	2017	
	Transfers from Level 1 to Level 2	Transfers from Level 2 to Level 1
Fixed maturity securities - available-for-sale:		
Corporate	$ 132,945	$ —

Quantitative Information Regarding Internally-Priced Assets and Liabilities

The following table presents quantitative information about significant unobservable inputs used in Level 3 fair value measurements that are developed internally by the Company as of December 31, 2018 and 2017 (dollars in thousands):

	Fair Value		Valuation	Unobservable	Range (Weighted Average)	
Assets:	2018	2017	Technique	Input	2018	2017
Corporate	$ 6,835	$ 1,976	Market comparable securities	Liquidity premium	0-2% (1%)	0-1% (1%)
Equity securities	3,701	—	Market comparable securities	Liquidity premium	4%	—
Funds withheld at interest - embedded derivatives	(185,211)	59,448	Total return swap	Mortality	0-100% (2%)	0-100% (2%)
				Lapse	0-35% (10%)	0-35% (9%)
				Withdrawal	0-5% (3%)	0-5% (3%)
				CVA	0-5% (1%)	0-5% (1%)
				Crediting rate	2-4% (2%)	2-4% (2%)
Other assets - longevity swaps	9,449	7,751	Discounted cash flow	Mortality	0-100% (2%)	0-100% (2%)
				Mortality improvement	(10%)-10% (3%)	(10%)-10% (3%)
Liabilities:						
Interest-sensitive contract liabilities - embedded derivatives - variable annuities	$ 167,925	$ 152,470	Discounted cash flow	Mortality	0-100% (1%)	0-100% (1%)
				Lapse	0-25% (5%)	0-25% (5%)
				Withdrawal	0-7% (5%)	0-7% (3%)
				CVA	0-5% (1%)	0-5% (1%)
				Long-term volatility	0-27% (13%)	0-27% (8%)

Valuation Process for Fair Value Measurements Categorized within Level 3

As of December 31, 2018 and 2017, respectively, the Company classified approximately 4.9% and 5.3% of its fixed maturity securities in the Level 3 category. These securities primarily consist of Canadian government securities and private placement corporate securities with inactive trading markets.

The significant unobservable inputs used in the fair value measurement of the Company's corporate, government-backed and equity security investments include probability of default, liquidity premium and subordination premium. Significant increases (decreases) in any of those inputs in isolation would result in a significantly lower (higher) fair value measurement. Generally, a change in the assumption used for the probability of default is accompanied by a directionally similar change in the assumptions used for the liquidity premium and subordination premium. For securities with a fair value derived using the market comparable pricing valuation technique, liquidity premium is the only significant unobservable input.

The significant unobservable inputs used in the fair value measurement of the Company's asset and mortgage-backed securities are prepayment rates, probability of default, liquidity premium and loss severity in the event of default. Significant increases (decreases) in any of those inputs in isolation would result in a significantly lower (higher) fair value measurement. Generally, a change in the assumption used for the probability of default is accompanied by a directionally similar change in the assumption used for the liquidity premium and loss severity and a directionally opposite change in the assumption used for prepayment rates.

The actuarial assumptions used in the fair value of embedded derivatives, which include assumptions related to lapses, withdrawals, and mortality, are based on experience studies performed by the Company in combination with available industry information and are reviewed on a periodic basis, at least annually. The significant unobservable inputs used in the fair value measurement of embedded derivatives are assumptions associated with policyholder experience and selected capital market assumptions for variable annuities. The selected capital market assumptions, which include long-term implied volatilities, are projections based on short-term historical information. Changes in interest rates, equity indices, equity volatility, CVA, and actuarial assumptions regarding policyholder experience may result in significant fluctuations in the value of embedded derivatives.

Fair value measurements associated with funds withheld reinsurance treaties are generally not materially sensitive to changes in unobservable inputs associated with policyholder experience. The primary drivers of change in these fair values are related to movements of credit spreads, which are generally observable. Increases (decreases) in market credit spreads tend to decrease (increase) the fair value of embedded derivatives. Increases (decreases) in the CVA assumption tend to decrease (increase) the magnitude of the fair value of embedded derivatives.

Fair value measurements associated with variable annuity treaties are sensitive to both capital markets inputs and policyholder experience inputs. Increases (decreases) in lapse rates tend to decrease (increase) the value of the embedded derivatives associated with variable annuity treaties. Increases (decreases) in the long-term volatility assumption tend to increase (decrease) the fair value of embedded derivatives. Increases (decreases) in the CVA assumption tend to decrease (increase) the magnitude of the fair value of embedded derivatives.

The actuarial assumptions used in the fair value of longevity swaps include assumptions related to the level and volatility of mortality. The assumptions are based on studies performed by the Company in combination with available industry information and are reviewed on a periodic basis, at least annually.

Changes in Level 3 Assets and Liabilities

Assets and liabilities transferred into Level 3 are due to a lack of observable market transactions and price information. Assets and liabilities are transferred out of Level 3 when circumstances change such that significant inputs can be corroborated with market observable data. This may be due to a significant increase in market activity for the asset or liability, a specific event, or one or more significant input(s) becoming observable. Transfers out of Level 3 were primarily the result of the Company obtaining observable pricing information or a third party pricing quotation that appropriately reflects the fair value of those assets and liabilities. The Company also transferred equity securities with a fair value of approximately $4.0 million into Level 3 as a result of the adoption of the new accounting guidance for the recognition and measurement of equity securities.

The reconciliations for all assets and liabilities measured at fair value on a recurring basis using significant unobservable inputs (Level 3) are as follows (dollars in thousands):

	Fixed maturity securities - available-for-sale				
For the year ended December 31, 2018:	Corporate	Canadian government	RMBS	ABS	State and political subdivisions
Fair value, beginning of period	$ 159,409	$ 593,942	$ 4,745	$ 995	$ 2,142
Total gains/losses (realized/unrealized)					
Included in earnings, net:					
Investment income, net of related expenses	172	13,965	—	—	—
Investment related gains (losses), net	896	—	—	—	—
Included in other comprehensive income	(1,044)	(79,783)	—	(8)	—
Purchases[1]	52,779	—	—	—	—
Sales[1]	(5,366)	—	—	—	—
Settlements[1]	(10,053)	—	—	—	—
Transfers out of Level 3	(30,805)	—	(4,745)	—	(2,142)
Fair value, end of period	$ 165,988	$ 528,124	$ —	$ 987	$ —
Unrealized gains and losses recorded in earnings for the period relating to those Level 3 assets and liabilities that were still held at the end of the period					
Included in earnings, net:					
Investment income, net of related expenses	$ 153	$ 13,965	$ —	$ —	$ —

For the year ended December 31, 2018 (continued):	Equity securities	Funds withheld at interest - embedded derivatives	Other assets - longevity swaps	Interest-sensitive contract liabilities embedded derivatives
Fair value, beginning of period	$ —	$ 59,448	$ 7,751	$ (152,470)
Total gains/losses (realized/unrealized)				
Included in earnings, net:				
Change in value of funds withheld embedded derivatives	—	(212,652)	—	—
Investment related gains (losses), net	(341)	—	—	(15,455)
Included in other comprehensive income	—	(32,007)	(401)	—
Other revenues	—	—	2,099	—
Transfers into Level 3	4,042	—	—	—
Fair value, end of period	$ 3,701	$ (185,211)	$ 9,449	$ (167,925)
Unrealized gains and losses recorded in earnings for the period relating to those Level 3 assets and liabilities that were still held at the end of the period				
Included in earnings, net:				
Change in value of funds withheld embedded derivatives	$ —	$ (212,652)	$ —	$ —
Investment related gains (losses), net	(341)	—	—	(15,455)
Other revenues	—	—	2,099	—

	Fixed maturity securities - available-for-sale				
For the year ended December 31, 2017:	Corporate	Canadian government	RMBS	ABS	State and political subdivisions
Fair value, beginning of period	$ 139,230	$ 475,965	$ 14,200	$ 6,020	$ 1,968
Total gains/losses (realized/unrealized)					
Included in earnings, net:					
Investment income, net of related expenses	51	13,069	6	—	—
Included in other comprehensive income	3,173	104,908	84	(17)	192
Purchases[(1)]	48,566	—	—	—	—
Sales[(1)]	(31,611)	—	—	—	—
Settlements[(1)]	—	—	(844)	(6,000)	(18)
Transfers into Level 3	—	—	407	992	—
Transfers out of Level 3	—	—	(9,108)	—	—
Fair value, end of period	$ 159,409	$ 593,942	$ 4,745	$ 995	$ 2,142
Unrealized gains and losses recorded in earnings for the period relating to those Level 3 assets and liabilities that were still held at the end of the period					
Included in earnings, net:					
Investment income (loss), net of related expenses	$ 50	$ 13,069	$ 4	$ —	$ —

For the year ended December 31, 2017 (continued):	Funds withheld at interest - embedded derivatives	Other assets - longevity swaps	Interest-sensitive contract liabilities embedded derivatives
Fair value, beginning of period	$ 15,903	$ 4,519	$ (184,636)
Total gains/losses (realized/unrealized)			
Included in earnings, net:			
Change in value of funds withheld embedded derivatives	41,386	—	—
Investment related gains (losses), net	—	—	32,166
Included in other comprehensive income	2,159	745	—
Other revenues	—	2,487	—
Fair value, end of period	$ 59,448	$ 7,751	$ (152,470)
Unrealized gains and losses recorded in earnings for the period relating to those Level 3 assets and liabilities that were still held at the end of the period			
Included in earnings, net:			
Change in value of funds withheld embedded derivatives	$ 41,386	$ —	$ —
Investment related gains (losses), net	—	—	32,166
Other revenues	—	2,487	—

(1) The amount reported within purchases, sales and settlements is the purchase price (for purchases) and the sales/settlement proceeds (for sales and settlements) based upon the actual date purchased or sold/settled. Items purchased and sold/settled in the same period are excluded from the rollforward. The Company had no issuances during the period.

Nonrecurring Fair Value Measurements

The Company did not have any assets measured at estimated fair value on a nonrecurring basis at December 31, 2018 or 2017.

Fair Value of Financial Instruments

The Company is required by general accounting principles for *Fair Value Measurements and Disclosures* to disclose the fair value of certain financial instruments including those that are not carried at fair value. The following table presents the carrying amounts and estimated fair values of the Company's financial instruments, which were not measured at fair value on a recurring basis, as of December 31, 2018 and 2017 (dollars in thousands). This table excludes any payables or receivables for collateral under repurchase agreements and other transactions. The estimated fair value of the excluded amount approximates carrying value as they equal the amount of cash collateral received/paid.

December 31, 2018:	Carrying Value [(1)]	Estimated Fair Value	Fair Value Measurement Using: Level 1	Level 2	Level 3	NAV
Assets:						
Funds withheld at interest	$ 9,498,269	$ 9,498,269	$ —	$ —	$ 9,498,269	$ —
Cash and cash equivalents	647,752	647,752	647,752	—	—	—
Short-term investments	20,195	20,195	20,195	—	—	—
Other invested assets	638,303	612,957	4,640	—	594,664	13,653
Accrued investment income	148,409	148,409	—	148,409	—	—
Liabilities:						
Interest-sensitive contract liabilities	$ 5,411,977	$ 5,598,590	$ —	$ —	$ 5,598,590	$ —
December 31, 2017:						
Assets:						
Funds withheld at interest	$ 4,828,419	$ 4,828,419	$ —	$ —	$ 4,828,419	$ —
Cash and cash equivalents	412,469	412,469	412,469	—	—	—
Short-term investments	15,616	15,616	15,616	—	—	—
Other invested assets	370,479	365,804	28,553	—	323,183	14,068
Accrued investment income	150,873	150,873	—	150,873	—	—
Liabilities:						
Interest-sensitive contract liabilities	$ 1,829,003	$ 1,857,892	$ —	$ —	$ 1,857,892	$ —

(1) Carrying values presented herein may differ from those in the Company's consolidated balance sheets because certain items within the respective financial statement captions may be measured at fair value on a recurring basis.

Funds Withheld at Interest - The carrying value of funds withheld at interest approximates fair value. Ceding companies use a variety of sources and pricing methodologies, which are not transparent to the Company and may include significant unobservable

inputs, to value the securities that are held in distinct portfolios, therefore the valuation of these funds withheld assets are considered Level 3 in the fair value hierarchy.

Cash and Cash Equivalents and Short-term Investments - The carrying values of cash and cash equivalents and short-term investments approximates fair values due to the short-term maturities of these instruments and are considered Level 1 in the fair value hierarchy.

Other Invested Assets - This primarily includes limited partnership interests accounted for using the cost method, a purchase agreement, cash collateral, equity release mortgages, and mortgage loans on real estate. The fair value of limited partnership interests and other investments accounted for using the cost method is determined using the NAV of the Company's ownership interest as provided in the financial statements of the investees. The fair value of the Company's purchase agreement is considered to be the carrying value and considered to be Level 3 in the fair value hierarchy. The fair value of the Company's cash collateral is considered to be the carrying value and considered to be Level 1 in the fair value hierarchy. The fair value of the Company's equity release mortgage loan portfolio, considered Level 3 in the fair value hierarchy, is estimated by discounting cash flows, both principal and interest, using a risk free rate plus an illiquidity premium. The cash flow analysis considers future expenses, changes in property prices, and actuarial analysis of borrower behavior, mortality and morbidity. The fair value of mortgage loans on real estate is estimated by discounting cash flows, both principal and interest, using current interest rates for mortgage loans with similar credit ratings and similar remaining maturities. As such, inputs include current treasury yields and spreads, which are based on the credit rating and average life of the loan, corresponding to the market spreads. The valuation of mortgage loans on real estate is considered Level 3 in the fair value hierarchy.

Accrued Investment Income - The carrying value for accrued investment income approximates fair value as there are no adjustments made to the carrying value. This is considered Level 2 in the fair value hierarchy.

Interest-Sensitive Contract Liabilities - The carrying and fair values of interest-sensitive contract liabilities reflected in the table above exclude contracts with significant mortality risk. The fair value of the Company's interest-sensitive contract liabilities utilizes a market standard technique with both capital market inputs and policyholder behavior assumptions, as well as cash values adjusted for recapture fees. The capital market inputs to the model, such as interest rates, are generally observable. Policyholder behavior assumptions are generally not observable and may require use of significant management judgment. The valuation of interest-sensitive contract liabilities is considered Level 3 in the fair value hierarchy.

Note 6 REINSURANCE

Retrocession reinsurance treaties do not relieve the Company from its obligations to direct writing companies. Failure of retrocessionaires to honor their obligations could result in losses to the Company. Consequently, allowances would be established for amounts deemed uncollectible. At December 31, 2018 and 2017, no allowances were deemed necessary. The Company regularly evaluates the financial condition of the insurance companies from which it assumes and to which it cedes reinsurance.

Retrocessions are arranged through the Company's retrocession pools for amounts in excess of the Company's retention limit. As of December 31, 2018 and 2017, all rated retrocession pool participants followed by the A.M. Best Company were rated "A- (excellent)" or better except one pool member that was rated "B+".

At December 31, 2018, the Company had $1,515.8 million of reinsurance ceded receivables. Included in the December 31, 2018 total reinsurance ceded receivables balance were $309.9 million of claims recoverable, of which $176.6 million were with related parties. At December 31, 2017, the Company had $1,762.1 million of reinsurance ceded receivables. Included in the December 31, 2017 total reinsurance ceded receivables balance were $310.8 million of claims recoverable, of which $181.4 million were with related parties.

For the years ended December 31, 2018 and 2017, the effect of reinsurance on net premiums is as follows (dollars in thousands):

	2018	2017
Reinsurance assumed:		
Affiliated	$ 1,022,523	$ 1,083,005
Non-affiliated	3,260,307	3,004,780
Total reinsurance assumed	4,282,830	4,087,785
Direct insurance issued:		
Non-affiliated	26,220	26,826
Total direct insurance issued	26,220	26,826
Reinsurance retroceded:		
Affiliated	(615,571)	(744,705)
Non-affiliated	(652,773)	(613,294)
Total reinsurance retroceded	(1,268,344)	(1,357,999)
Net premiums	$ 3,040,706	$ 2,756,612

For the years ended December 31, 2018 and 2017, the effect of reinsurance on claims and other policy benefits is as follows (dollars in thousands):

	2018	2017
Reinsurance assumed:		
Affiliated	$ 762,796	$ 167,980
Non-affiliated	2,864,998	2,580,905
Total reinsurance assumed	3,627,794	2,748,885
Direct insurance issued:		
Non-affiliated	19,489	20,255
Total direct insurance issued	19,489	20,255
Reinsurance retroceded:		
Affiliated	(412,597)	(83,574)
Non-affiliated	(579,328)	(531,674)
Total reinsurance retroceded	(991,925)	(615,248)
Claims and other policy benefits	$ 2,655,358	$ 2,153,892

As of December 31, 2018 and 2017, the effect of reinsurance on life insurance in force is shown in the following schedule (dollars in millions):

	2018	2017
Life insurance in force assumed:		
Affiliated	$ 195,221	$ 155,178
Non-affiliated	1,369,435	1,366,062
Total life insurance in force assumed	1,564,656	1,521,240
Direct life insurance in force:		
Non-affiliated	10,957	10,649
Total direct life insurance in force	10,957	10,649
Life insurance in force retroceded:		
Affiliated	(218,440)	(220,740)
Non-affiliated	(139,031)	(167,722)
Total life insurance in force retroceded	(357,471)	(388,462)
Life insurance in force net:		
Affiliated	(23,219)	(65,562)
Non-affiliated	1,241,361	1,208,989
Total life insurance in force net	$ 1,218,142	$ 1,143,427
Assumed/net percentage	128.45%	133.04%

At December 31, 2018 and 2017, respectively, the Company provided approximately $1,285.0 million and $1,430.5 million of financial reinsurance, as measured by pre-tax statutory surplus, risk based capital and other financial reinsurance structures, to other insurance companies under financial reinsurance transactions to assist ceding companies in meeting applicable regulatory requirements. Generally, such financial reinsurance is provided by the Company committing cash or assuming insurance liabilities, which are collateralized by future profits on the reinsured business. The Company earns a fee based on the amount of net outstanding financial reinsurance.

Note 7 DEFERRED POLICY ACQUISITION COSTS

The following reflects the amounts of policy acquisition costs deferred and amortized as of December 31, 2018 and 2017 (dollars in thousands):

	2018	2017
Balance, beginning of year	$ 1,168,453	$ 564,096
Capitalization	337,387	678,867
Amortization (including interest)	(251,920)	(117,167)
Foreign currency translation	45,866	42,657
Balance, end of year	$ 1,299,786	$ 1,168,453

Some reinsurance agreements involve reimbursing the ceding company for allowances and commissions in excess of first-year premiums. These amounts represent acquisition costs and are capitalized to the extent deemed recoverable from the future premiums and amortized against future profits of the business. This type of agreement presents a risk to the extent that the business lapses faster than originally anticipated, resulting in future profits being insufficient to recover the Company's investment.

Note 8 INCOME TAX

U.S. Tax Reform was signed into law on December 22, 2017. U.S. Tax Reform made broad changes to the U.S. tax code, including (1) reducing the U.S. federal corporate tax rate from 35 percent to 21 percent; (2) imposed a one-time transition tax on certain unrepatriated earnings of foreign subsidiaries; (3) generally eliminated U.S. federal income taxes on dividends from foreign subsidiaries; (4) eliminated the corporate alternative minimum tax ("AMT") and changed how existing AMT credits can be realized; (5) created the base erosion anti-abuse tax ("BEAT"); (6) established a new provision designed to tax global intangible low-taxed income ("GILTI"), which allows for the possibility of using foreign tax credits and a deduction of up to 50% to offset the income tax liability (subject to some limitations); and (7) modified the rules related to uses and limitations of net operating loss carryforwards created in tax years beginning after December 31, 2017.

In connection with the Company's initial analysis of the impact of U.S. Tax Reform, it recorded a discrete provisional net tax benefit of $287.8 million in the period ending December 31, 2017. This estimated net benefit primarily consisted of the U.S. federal rate reduction from 35% to 21% applied to the net deferred tax liability. The Company provisionally estimated there would be no one-time transition tax on unrepatriated earnings of foreign subsidiaries. Further, as a result of U.S. Tax Reform, the Company

established a valuation allowance of $1.1 million related to U.S. foreign tax credit carryforwards. The valuation allowance related to the Company's interpretation of the changes in the ability to use existing foreign tax credit carryforwards against future foreign branch profits.

The U.S. Securities and Exchange Commission ("SEC") issued SAB 118, which provides guidance on accounting for the tax effects of U.S. Tax Reform. SAB 118 provides a measurement period that should not extend beyond one year from U.S. Tax Reform enactment date for companies to complete the accounting under Accounting Standards Codification 740. The company completed its accounting for the effects of U.S. Tax reform within the measurement period during the fourth quarter of 2018.

The Company's refinement of the provisional estimates for the impact of U.S. Tax Reform resulted in a $24.6 million benefit. The additional benefit recorded was a result of filing the U.S. tax return and applying the U.S. federal rate reduction to finalized tax balances. Upon review of the Proposed Treasury Regulations issued during the year and completion of the accumulated and current earnings and profits calculations of the Company's foreign subsidiaries, no adjustment to the provisional estimate of the transition tax on unrepatriated earnings was necessary.

The federal valuation allowance established on the U.S. foreign tax credit carryforward with U.S. Tax Reform was released in 2018. The Company anticipates using these credits to offset the 2018 U.S. consolidated federal income tax liability, therefore the valuation allowance is no longer necessary.

Under GAAP, the Company is allowed to make an accounting policy choice of either (1) treating taxes due on future U.S. inclusions in taxable income related to the GILTI as a current-period expense when incurred ("the period cost method") or (2) factoring such amounts into a Company's measurement of its deferred taxes ("the deferred method"). The Company made a policy election to account for GILTI as a period cost.

For the year ended December 31, 2018 the Company is not subject to the BEAT. The Company continues to monitor guidance as it is issued; however it does not expect changes in guidance to result in a BEAT liability.

The U.S. consolidated tax return includes the operations of RGA Americas and all eligible subsidiaries. The Company's foreign subsidiaries are taxed under applicable local statutes.

Under current Bermuda law, the Company is not required to pay taxes in Bermuda on either income or capital gains. The Company has received an undertaking from the Minister of Finance in Bermuda that in the event of income or capital gains taxes being imposed, the Company will be exempted from such taxes until March 31, 2035. RGA Americas has made the Internal Revenue Code Section 953(d) election to be taxed as a United States domestic corporation for purposes of United States corporate tax. As of December 31, 2018, RGA Atlantic was licensed to conduct business as an Exempt Insurance Company. RGA Atlantic was subject to taxation in accordance with section 29 under the provisions of the Exempt Insurance Act of Barbados and is liable to tax at zero percent for 2018. During 2018 Barbados amended legislation to comply with the Organisation for Economic Co-operating and Development Base Erosion Profit Shifting Action 5 so as to not be considered a jurisdiction with harmful tax practices. The amendment included the abolishment of the Exempt Insurance Company status but allowed for a grandfathering of the status until June 2021 if current exempt insurance companies submitted a notification of grandfathering by December 31, 2018. RGA Atlantic submitted the notification to the Financial Services Commission in order to continue to be treated as an Exempt Insurance Company through June 2021. The Company has not booked any provision for income taxes related to the legislation. The Company will continue to monitor guidance which may result in an income tax accrual in future periods. RGA Atlantic, RGA Canada, RGA South Africa, RGA International, Leidsche, and RGA Australia are Controlled Foreign Corporations ("CFC") for U.S. federal income tax purposes and file Form 5471 - Information Return of U.S. Persons With Respect to Certain Foreign Corporations. These CFCs are not subject to U.S. income taxes directly but are subject to tax as a CFC under subchapter N, Subpart F of the U.S. Internal Revenue Code. Further RGA Canada, RGA South Africa, RGA International, Leidsche, and RGA Australia are subject to GILTI in the U.S. Any U.S. tax liability generated under Subpart F or GILTI would be borne by its parent company, RGA Americas and therefore could be considered a current or deferred tax liability of RGA Americas.

The provision for income tax expense for the years ended December 31, 2018 and 2017 consists of the following (dollars in thousands):

	2018	2017
Current income tax expense (benefit)	$ (58,387)	$ 72,011
Deferred income tax expense (benefit)	84,553	(219,802)
Total provision for income taxes	$ 26,166	$ (147,791)

The Company's effective tax rate differed from the amounts computed by applying the U.S. federal income tax statutory rate of 21% and 35% to pre-tax income as a result of the following for the years ended December 31, 2018 and 2017 (dollars in thousands):

	2018	2017
Tax provision at U.S. statutory rate	$ 42,999	$ 166,724
Increase (decrease) in income taxes resulting from:		
U.S. Tax Reform	(24,658)	(286,679)
Subpart F	333	1,528
Foreign tax credits	(1,418)	(832)
GILTI, net of credits	9,508	
Foreign tax rate differing from U.S. tax rate	2,981	(11,791)
Equity compensation	768	856
Return to provision adjustments	(1,254)	(3,062)
Valuation allowance	25,464	20,298
Difference in tax basis in foreign jurisdictions	(23,250)	(23,325)
Amended returns	—	(5,428)
Amounted related to audit contingencies	(771)	(301)
Corporate rate changes	(885)	(6,091)
Other, net	(3,651)	312
Total provision for income taxes	$ 26,166	$ (147,791)
Effective tax rate	12.9%	(31.0)%

Total income taxes for the years ended December 31, 2018 and 2017 were as follows (dollars in thousands):

	2018	2017
Income tax attributed to continuing operations	$ 26,166	$ (147,791)
Income tax attributed to shareholder's equity:		
Net unrealized holding gains (losses) on fixed maturity and equity securities recognized for financial reporting purposes	(141,355)	119,658
Unrealized pension and post retirement	316	(16)
Foreign currency translation	22,075	(22,285)
Total income tax provided	$ (92,798)	$ (50,434)

The tax effects of temporary differences that give rise to significant portions of the deferred income tax assets and liabilities at December 31, 2018 and 2017 are presented in the following tables (dollars in thousands):

	2018	2017
Deferred income tax assets:		
Deferred acquisition costs capitalized for tax	$ 30,402	$ 21,543
Net operating loss	325,508	487,704
Capital loss and tax credit carryforwards	31,188	32,464
Investment income differences	2,818	4,814
Differences in certain reinsurance transactions	—	45,885
Other	8,590	5,906
Subtotal	398,506	598,316
Valuation allowance	(134,044)	(120,723)
Total deferred income tax assets	264,462	477,593
Deferred income tax liabilities:		
Deferred acquisition costs capitalized for financial reporting	216,089	73,806
Differences in foreign currency translation	32,122	15,728
Unrealized gain, net	336,315	477,064
Investment income differences	—	1,747
Differences in certain reinsurance transactions	621,614	903,426
Total deferred income tax liabilities	1,206,140	1,471,771
Net deferred income tax liabilities	$ 941,678	$ 994,178
Balance sheet presentation of net deferred income tax liabilities:		
Included in other assets	$ 42,083	$ 34,566
Included in deferred income taxes	983,761	1,028,744
Net deferred income tax liabilities	$ 941,678	$ 994,178

As of December 31, 2018, the valuation allowance against deferred tax assets was approximately $134.0 million. During 2018, a valuation allowance of $24.5 million was established related to the net operating losses of RGA Australia. This increase was partially offset by the release of a valuation allowance on U.S. Foreign Tax credits along with fluctuations in foreign currency translation and reclassifications with other deferred tax assets of ($1.1) million and ($11.1) million, respectively. Further movement in the valuation allowance relates to increases and decreases to the valuation allowance in jurisdictions where the Company does not have a history of earnings.

As of December 31, 2017, the valuation allowance against deferred tax assets was approximately $120.7 million. During 2017, a valuation allowance was established on the U.S. Foreign tax credit carryforwards of $1.1 million, RGA Australia's net operating losses of $20.1 million, as well as on the deferred tax assets of other jurisdictions for which the Company does not have a history of earnings in recent years of $0.6 million. Further movement in the valuation allowance included foreign currency translation and reclassifications with other deferred tax assets of $9.8 million and $(2.5) million, respectively.

The following table presents consolidated net operation losses ("NOL") as of December 31, 2018:

	Gross	Expiration Period
NOL Carryforward with no expiration date and no Valuation Allowance	$ 8,799	N/A
NOL with a full Valuation Allowance	23,845	N/A
NOL with a partial Valuation Allowance	395,879	N/A
NOL with expiration dates and no Valuation Allowance	941,942	2029-2032
Total NOL Carryforwards	$ 1,370,465	

These net operating losses, other than the net operating losses for which there is a valuation allowance, are expected to be utilized in the normal course of business during the period allowed for carryforwards and in any event, are not expected to be lost, due to the application of tax planning strategies that management would utilize.

As of December 31, 2018 the Company had foreign tax credit carryforwards of $27.8 million in Ireland and as of December 31, 2017 the Company had $152.0 million of foreign tax credit carryforwards in the U.S. and Ireland. The Ireland foreign tax credit carryforward has a full valuation allowance.

The earnings of substantially all of the Company's foreign subsidiaries have been permanently reinvested in foreign operations. No provision has been made for U.S. tax or foreign withholding taxes that may be applicable upon any repatriation or sale. At December 31, 2018 and 2017, the financial reporting basis in excess of the tax basis for which no deferred taxes have been recognized was approximately $1,358.0 million and $1,438.0 million, respectively. As U.S. Tax Reform generally eliminates U.S. federal income taxes on dividends from foreign subsidiaries, the Company does not expect to incur material income taxes if these funds are repatriated.

The Company files income tax returns in the U.S. federal jurisdiction and various provincial and foreign jurisdictions. The Company is under continuous examination by the Internal Revenue Service and is subject to audit by taxing authorities in other foreign jurisdictions in which the Company has significant business operations. The income tax years under examination vary by jurisdiction. The Company is no longer subject to U.S. federal income tax examinations by tax authorities for years prior to 2015, Canadian tax authorities for years prior to 2013, and with a few exceptions, the Company is no longer subject to state and foreign income tax examinations by tax authorities for years prior to 2013.

A reconciliation of the beginning and ending amount of unrecognized tax benefits for the years ended December 31, 2018 and 2017 is as follows (dollars in thousands):

	Total Unrecognized Tax Benefits	
	2018	2017
Beginning balance, January 1	$ 2,597	$ 2,989
Additions for tax positions of prior years	1,294	158
Reductions for tax positions of prior years	(2,445)	—
Payments on Deposit	(185)	(550)
Ending balance, December 31	$ 1,261	$ 2,597

The Company recognized interest expense (benefit) associated with uncertain tax provisions in 2018 and 2017 of $(1.3) million and $0.3 million, respectively. As of December 31, 2018 and 2017, the Company had $0.7 million and $2.1 million, respectively, of accrued interest related to unrecognized tax benefits. There are no penalties accrued as of December 31, 2018 and 2017.

Note 9 EMPLOYEE BENEFIT PLANS

RGA Canada sponsors an unfunded non-contributory defined benefit pension plan ("Pension Plan") for certain eligible employees. The benefits under the Pension Plan, which is a non-qualified plan, are generally based on years of service and compensation levels. For non-qualified plans, there are no required funding levels.

A December 31 measurement date is used for the Pension Plan. The status of the Pension Plan as of December 31, 2018 and 2017 is summarized below (dollars in thousands):

	Pension Benefits	
	2018	2017
Change in benefit obligation:		
Benefit obligation at beginning of year	$ 12,806	$ 10,997
Service cost	848	802
Interest cost	442	442
Actuarial (gains) losses	(396)	294
Benefits paid	(526)	(521)
Foreign exchange translations and other adjustments	(1,020)	792
Benefit obligation at end of year	$ 12,154	$ 12,806

	Pension Benefits	
	2018	2017
Change in plan assets:		
Fair value of plan assets at beginning of year	$ —	$ —
Employer contributions	526	521
Benefits paid and expenses	(526)	(521)
Fair value of plan assets at end of year	$ —	$ —
Funded status at end of year	$ (12,154)	$ (12,806)

	2018	2017
Aggregate fair value of plan assets	$ —	$ —
Aggregate projected benefit obligations	12,154	12,806
Under funded	$ (12,154)	$ (12,806)

	Pension Benefits	
	2018	2017
Amounts recognized in accumulated other comprehensive income:		
Net actuarial loss	$ 3,263	$ 4,343
Net prior service cost	—	85
Total	$ 3,263	$ 4,428

The following table presents information for the Pension Plan with a projected benefit obligation in excess of plan assets as of December 31, 2018 and 2017 (dollars in thousands):

	2018	2017
Projected benefit obligation	$ 12,154	$ 12,806
Fair value of plan assets	—	—

The following table presents information for the Pension Plan with an accumulated benefit obligation in excess of plan assets as of December 31, 2018 and 2017 (dollars in thousands):

	2018	2017
Accumulated benefit obligation	$ 10,310	$ 12,806
Fair value of plan assets	—	—

The components of net periodic benefit cost, included in other operating expenses on the consolidated statements of income, and other changes in plan assets and benefit obligations recognized in other comprehensive income were as follows (dollars in thousands):

	Pension Benefits	
	2018	2017
Net periodic benefit cost:		
Service cost	$ 848	$ 802
Interest cost	442	442
Amortization of prior actuarial losses	383	435
Amortization of prior service cost	82	82
Net periodic benefit cost	1,755	1,761
Other changes in plan assets and benefit obligations recognized in other comprehensive income:		
Net actuarial (gains) losses	(396)	294
Amortization of actuarial (losses)	(383)	(435)
Amortization of prior service (cost)	(82)	(82)
Foreign exchange translations and other adjustments	(304)	294
Total recognized in other comprehensive income	(1,165)	71
Total recognized in net periodic benefit cost and other comprehensive income	$ 590	$ 1,832

During 2019, RGA Canada expects to contribute $0.5 million to the Pension Plan.

The following benefit payments, which reflect expected future service as appropriate, are expected to be paid (dollars in thousands):

	Pension Benefits
2019	$ 499
2020	562
2021	497
2022	496
2023	468
2024-2028	4,602

Assumptions

Weighted average assumptions used to determine the accumulated benefit obligation and net benefit cost or income for the years ended December 31, 2018 and 2017 were as follows:

	Pension Benefits	
	2018	2017
Discount rate used to determine benefit obligation	3.80%	3.40%
Discount rate used to determine net benefit cost or income	3.40%	3.70%
Rate of compensation increases	3.75%	3.75%

Savings and Investment Plans

Certain subsidiaries of RGA Americas also sponsor savings and investment plans under which a portion of employee contributions are matched. Subsidiary contributions to these plans were $3.2 million and $3.5 million in 2018 and 2017, respectively.

Note 10 FINANCIAL CONDITION AND NET INCOME ON A STATUTORY BASIS

The foreign insurance subsidiaries of the Company prepare their statutory financial statements in conformity with statutory accounting practices prescribed or permitted by the local regulatory authority, which vary materially from statements prepared in accordance with GAAP. The differences between statutory financial statements and financial statements prepared in accordance with GAAP vary between jurisdictions.

Statutory net income (loss) and capital and surplus of the Company's insurance subsidiaries, determined in accordance with statutory accounting practices prescribed by the local regulatory authority are as follows (dollars in thousands):

	Statutory Capital & Surplus		Statutory Net Income (Loss)	
	2018	2017	2018	2017
RGA Atlantic	$ 1,083,181	$ 812,306	$ 256,080	$ 213,510
RGA Canada	896,760	1,006,190	(37,922)	25,971
RGA South Africa	83,221	17,270	8,325	(4,174)
RGA International	691,076	826,874	21,172	22,650
Leidsche	34,970	38,083	(1,449)	218
RGA Australia	433,406	476,528	(37,208)	78,497

The Company's foreign insurance subsidiaries prepare financial statements in accordance with local regulatory requirements. The regulatory authorities in these foreign jurisdictions establish some form of minimum regulatory capital and surplus requirements. All of the Company's foreign insurance subsidiaries have regulatory capital and surplus that exceed the local minimum requirements. These requirements do not represent a significant constraint for the payment of dividends by the Company's foreign insurance companies.

Note 11 SHAREHOLDER'S EQUITY

The Company is authorized to issue an unlimited number of $1.00 par value common shares. The Company had issued 75.5 million common shares with a stated value of $75.5 million as of December 31, 2018 and 2017.

The Company is registered under the Bermuda Insurance Act 1978 (the "Act") and amendments thereto and related regulations, which require that the Company maintain a minimum solvency margin. The minimum solvency margin required at December 31, 2018 and 2017 is the greater of $8.0 million or 2% of the first $500 million of statutory assets of the Company plus 1.5% of statutory assets of the Company above $500 million. The Company is required to calculate an enhanced capital requirement ("ECR") and target capital level ("TCL") as prescribed by or under rules made under Section 6A of the Act, which are additional capital and surplus requirements to the minimum solvency margin. The Company's ECR is the higher of the Bermuda Solvency Capital Requirement ("BSCR") model and the minimum margin of solvency. The TCL is calculated as 120% of the ECR. As of December 31, 2018 and 2017, the Company has met the requirements. As of December 31, 2018 and 2017, statutory capital and surplus of the Company was $4,268.0 million and $4,833.9 million, respectively.

The Bermuda Monetary Authority considers prepaid and fixed assets non-admitted assets. As non-admitted assets, such balances were reflected as a reduction of statutory surplus, and reinsurance assets and liabilities were presented net of reinsurance.

In 2018, the Company paid a $150 million dividend to RGA. The Company did not pay any dividends in 2017.

Note 12 RELATED-PARTY TRANSACTIONS

The Company transacts business with affiliated companies on a regular basis. These transactions primarily consist of reinsurance agreements, notes with affiliates, securities lending agreements, administrative service agreements, and investment management agreements. In addition, the Company may purchase or sell securities with affiliated companies. The Company had the following activity with affiliated companies under reinsurance agreements, notes to affiliates, securities lending agreements, administrative service agreements, and investment management agreements as of and for the years ended December 31, 2018 and 2017 (dollars in thousands):

	2018	2017
Consolidated Balance Sheets		
Funds withheld at interest	$ 8,576,697	$ 4,157,394
Premiums receivable	170,731	(2,605)
Reinsurance ceded receivables	1,131,373	1,356,572
Deferred policy acquisition costs	797,573	638,469
Affiliated note receivable	450,000	—
Receivable from parent and affiliates	7,540	13,151
Future policy benefits	6,653,222	3,340,754
Interest-sensitive contract liabilities	5,716,953	1,932,416
Other policy claims and benefits	636,967	268,067
Securities lending obligation	95,138	94,757
Affiliated notes payable	63,190	46,854
Payable to parent and affiliates	25,317	168,118
Consolidated Statements of Income		
Net premiums	$ 406,952	$ 338,300
Change in value of funds withheld embedded derivatives	(212,652)	41,386
Other revenues	78,480	426,057
Claims and other policy benefits	350,199	84,406
Interest credited	59,263	17,952
Policy acquisition costs and other insurance expenses	172,990	514,671

The Company incurred expenses of $149.6 million and $99.3 million, and received income of $19.5 million and $16.6 million in 2018 and 2017, respectively, relating to administrative service agreements, securities lending agreements and investment management agreements.

The Company purchased a note payable from RGA Reinsurance Company on December 17, 2018 for $450 million. For the year ended December 31, 2018, the Company accrued an insignificant amount of interest. Interest is calculated at a rate of 3.267% per annum. The affiliated note is due on the maturity date of December 15, 2019. The outstanding balance at December 31, 2018 was $450 million.

The Company issued a note payable to RGA Capital LLC on June 22, 2016 for AUD$60 million. For the years ended December 31, 2018 and 2017, the Company accrued an insignificant amount of interest. Interest is calculated at a rate equal to 3.07% per annum. The affiliated note is payable on the maturity date of June 30, 2019. The outstanding note balances at December 31, 2018 and 2017 were $42.3 million and $46.9 million, respectively.

RGA established an intercompany revolving credit facility where certain subsidiaries, including the Company, can lend to or borrow from each other and from RGA in order to manage capital and liquidity more efficiently. The intercompany revolving credit facility, which is a series of demand loans among RGA and its affiliates, is permitted under applicable insurance laws. This facility reduces overall borrowing costs by allowing RGA and its affiliates to access internal cash resources instead of incurring third-party transaction costs. The borrowings outstanding under the intercompany revolving credit facility include the following two notes:

The Company issued a note payable to RGA Reinsurance Company (Barbados) Ltd. ("RGA Barbados") on December 14, 2018 for CAD$14 million. For the years ended December 31, 2018, the Company accrued an insignificant amount of interest. Interest is calculated at a rate equal to 2.66375% per annum. Principal and interest were repaid on January 10, 2019.

The Company issued a note payable to RGA Barbados on December 20, 2018 for CAD$14.5 million. For the years ended December 31, 2018, the Company accrued an insignificant amount of interest. Interest is calculated at a rate equal to 2.695% per annum. Principal and interest were repaid on January 10, 2019. The outstanding balance of both notes with RGA Barbados at December 31, 2018 was $20.9 million.

See Note 3 - "Investments" for information on security purchases and sales with affiliated companies.

Since the Company is a member of a controlled group of affiliated companies, its results may not be indicative of those of a stand-alone entity.

Note 13 COMMITMENTS, CONTINGENCIES AND GUARANTEES

Commitments

Funding of Investments

The Company's commitments to fund investments as of December 31, 2018 and 2017 are presented in the following table (dollars in thousands):

	2018	2017
Limited partnership interests and joint ventures	$ 153,880	$ 159,300
Equity release mortgages	264,858	153,937

The Company anticipates that the majority of its current commitments will be invested over the next five years; however, these commitments could become due at any time at the request of the counterparties.

Leases

The Company leases office space and furniture and equipment under non-cancelable operating lease agreements, which expire at various dates. Future minimum office space annual rentals under non-cancelable operating leases at December 31, 2018 are as follows (dollars in thousands):

	Operating Leases
2019	$ 4,036
2020	3,845
2021	3,496
2022	3,237
2023	3,245
Thereafter	7,519

Rent expenses amounted to approximately $5.0 million and $4.5 million for the years ended December 31, 2018 and 2017, respectively.

Letters of Credit

In the ordinary course of business, the Company provides letters of credit as security to cover liabilities relating to reinsurance agreements. The total amount of letters of credit outstanding at December 31, 2018 and 2017, was $88.3 million and $95.0 million, respectively, of which $23.0 million and $6.2 million, respectively, was for the benefit of Reinsurance Company of Missouri and Rockwood Reinsurance Company. RGA is the guarantor to these letters of credit as of December 31, 2018 and 2017.

Contingencies

Litigation

The Company is subject to litigation in the normal course of its business. The Company currently has no material litigation. A legal reserve is established when the Company is notified of an arbitration demand or litigation or is notified that an arbitration demand or litigation is imminent, it is probable that the Company will incur a loss as a result and the amount of the probable loss is reasonably capable of being estimated.

Guarantees

Other Guarantees

The Company has issued guarantees to third parties on behalf of its subsidiaries for the payment of amounts due under certain reinsurance treaties, securities borrowing and repurchase arrangements, financing arrangements and office lease obligations, whereby if a subsidiary fails to meet an obligation, the Company or one of its other subsidiaries will make a payment to fulfill the obligation. In limited circumstances, treaty guarantees are granted to ceding companies in order to provide them additional security, particularly in cases where the Company's subsidiary is relatively new, unrated, or not of a significant size, relative to the ceding company. Liabilities supported by the treaty guarantees, before consideration for any legally offsetting amounts due from the guaranteed party are reflected on the Company’s consolidated balance sheets in a policy related liability. Potential guaranteed amounts of future payments will vary depending on production levels and underwriting results. Guarantees related to securities borrowing and repurchase arrangements provide additional security to third parties should a subsidiary fail to provide securities when due. The Company's guarantees issued as of December 31, 2018 and 2017 are reflected in the following table (dollars in thousands):

	2018	2017
Treaty guarantees	$ 157.5	$ 44.5
Treaty guarantees, net of assets in trust	157.5	44.5
Financing arrangements	61.3	86.2

Note 14 EQUITY BASED COMPENSATION

Certain eligible employees of the Company participate in the RGA Flexible Stock Plan (the "Plan") of the parent company, RGA. Equity-based compensation expense of $4.4 million and $3.4 million related to grants or awards under the Plan was recognized in 2018 and 2017, respectively. Equity-based compensation expense is principally related to the issuance of performance contingent restricted units, restricted stock and stock appreciation rights.

Performance Shares

Performance shares, also referred to as performance contingent units ("PCUs"), are units that, if they vest, are multiplied by a performance factor to produce a number of final PCUs which are payable in RGA's common stock. Each PCU represents the right to receive up to two shares of RGA common stock, depending on the results of certain performance measures over a three-year period. The compensation expense related to the PCUs is recognized ratably over the requisite performance period. Performance shares are accounted for as equity awards, but are not credited with dividend-equivalents for actual dividends paid on RGA's common stock during the performance period.

As of December 31, 2018, the total compensation cost of non-vested awards not yet recognized in the financial statements was $5.6 million. It is estimated that these costs will vest over a weighted average period of 1.6 years.

Restricted Stock Units

In general, restricted stock units ("RSUs") become payable at the end of a three- or ten-year vesting period. Each RSU, if they vest, represents the right to receive one share of Company common stock. RSUs awarded under the plan generally have no strike price and are included in the Company's shares outstanding.

Stock Options

In general, options granted under the Plan become exercisable over vesting periods ranging from one to five years. Options are generally granted with an exercise price equal to the stock's fair value at the date of the grant and expire 10 years after the date of grant.

The Black-Scholes model was used to determine the fair value recognized in the financial statements of stock options that have been granted. The Company used daily historical volatility when calculating stock option values. The benchmark rate is based on observed interest rates for instruments with maturities similar to the expected term of the stock options. Dividend yield is determined based on historical dividend distributions compared to the price of the underlying common stock as of the valuation date and held constant over the life of the stock options. The Company estimated expected life using the historical average years to exercise or cancellation.

Note 15 COMPREHENSIVE INCOME

The following tables present the components of the Company's other comprehensive income (loss) for the years ended December 31, 2018 and 2017 (dollars in thousands):

For the year ended December 31, 2018:	Before-Tax Amount	Tax (Expense) Benefit	After-Tax Amount
Foreign currency translation adjustments:			
Change arising during year	$ (74,998)	$ (22,075)	$ (97,073)
Unrealized gains (losses) on investments:			
Unrealized net holding gains (losses) arising during the year	(652,325)	142,992	(509,333)
Less: Reclassification adjustment for net gains (losses) realized in net income	(6,334)	1,637	(4,697)
Net unrealized gains (losses)	(645,991)	141,355	(504,636)
Unrealized pension and postretirement benefits:			
Net prior service credit arising during the year	85	(23)	62
Net gain (loss) arising during the year	1,080	(293)	787
Unrealized pension and postretirement benefits, net	1,165	(316)	849
Other comprehensive income (loss)	$ (719,824)	$ 118,964	$ (600,860)

For the year ended December 31, 2017:	Before-Tax Amount	Tax (Expense) Benefit	After-Tax Amount
Foreign currency translation adjustments:			
Change arising during year	$ 85,701	$ 22,285	$ 107,986
Unrealized gains (losses) on investments:			
Unrealized net holding gains (losses) arising during the year	476,672	(121,593)	355,079
Less: Reclassification adjustment for net gains (losses) realized in net income	11,978	(1,935)	10,043
Net unrealized gains (losses)	464,694	(119,658)	345,036
Unrealized pension and postretirement benefits:			
Net prior service credit arising during the year	74	(21)	53
Net gain (loss) arising during the year	(144)	37	(107)
Unrealized pension and postretirement benefits, net	(70)	16	(54)
Other comprehensive income (loss)	$ 550,325	$ (97,357)	$ 452,968

The balances of and changes in each component of AOCI for the years ended December 31, 2018 and 2017 were as follows (dollars in thousands):

	Accumulated Currency Translation Adjustments	Unrealized Appreciation of Investments	Pension and Postretirement Benefits	Accumulated Other Comprehensive Income
Balance, January 1, 2017	$ (318,889)	$ 1,094,459	$ (3,188)	$ 772,382
Changes in foreign currency translation adjustments	107,986	—	—	107,986
Unrealized gains (losses) on investments	—	355,079	—	355,079
Changes in pension and other postretirement plan adjustments	—	—	(434)	(434)
Amounts reclassified from AOCI	—	(10,043)	380	(9,663)
Adoption of new accounting standard	5,683	16,161	—	21,844
Balance, December 31, 2017	(205,220)	1,455,656	(3,242)	1,247,194
Changes in foreign currency translation adjustments	(97,073)	—	—	(97,073)
Unrealized gains (losses) on investments	—	(509,333)	—	(509,333)
Changes in pension and other postretirement plan adjustments	—	—	508	508
Amounts reclassified from AOCI	—	4,697	341	5,038
Adoption of new accounting standard	30,127	1,382	—	31,509
Balance, December 31, 2018	$ (272,166)	$ 952,402	$ (2,393)	$ 677,843

The following table presents the amounts of AOCI reclassifications for the years ended December 31, 2018 and 2017 (dollars in thousands):

	Amount Reclassified from AOCI		
Details about AOCI Components	2018	2017	Affected Line Item in Statement of Operations
Net unrealized investment gains (losses):			
Net unrealized gains and losses on available-for-sale securities	$ (6,334)	$ 11,978	Investment related gains (losses), net
Provision for income taxes	1,637	(1,935)	
Net unrealized gains (losses), net of tax	$ (4,697)	$ 10,043	
Amortization of defined benefit plan items:			
Prior service cost (credit)	$ (82)	$ (82)	(1)
Actuarial gains (losses)	(383)	(435)	(1)
Total	(465)	(517)	
Provision for income taxes	124	137	
Amortization of defined benefit plans, net of tax	$ (341)	$ (380)	
Total reclassifications for the period	$ (5,038)	$ 9,663	

(1) See Note 9 for information on employee benefit plans.