MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY

CONDENSED STATUTORY FINANCIAL STATEMENTS

As of March 31, 2020 and December 31, 2019 and for the three months ended
March 31, 2020 and 2019

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
CONDENSED STATUTORY FINANCIAL STATEMENTS
(UNAUDITED)

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MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
CONDENSED STATUTORY STATEMENTS OF FINANCIAL POSITION
(UNAUDITED)

	March 31, 2020	December 31, 2019
	($ In Millions)	
Assets:		
Bonds	$ 104,689	$ 101,907
Preferred stocks	739	749
Common stocks – subsidiaries and affiliates	17,124	16,971
Common stocks – unaffiliated	862	1,185
Mortgage loans	27,974	27,473
Policy loans	14,931	14,725
Real estate	347	358
Partnerships and limited liability companies	9,204	9,012
Derivatives	29,975	12,064
Cash, cash equivalents and short-term investments	12,094	3,793
Other invested assets	789	2,036
Total invested assets	218,728	190,273
Investment income due and accrued	2,567	2,687
Federal income taxes	185	-
Net deferred income taxes	40	1,108
Other than invested assets	3,368	3,951
Total assets excluding separate accounts	224,888	198,019
Separate account assets	61,597	70,230
Total assets	$ 286,485	$ 268,249
Liabilities and Surplus:		
Policyholders' reserves	$ 133,873	$ 130,479
Liabilities for deposit-type contracts	16,452	15,297
Contract claims and other benefits	514	474
Policyholders' dividends	1,695	1,684
General expenses due or accrued	928	1,214
Federal income taxes	-	23
Asset valuation reserve	4,622	4,670
Repurchase agreements	3,765	3,834
Commercial paper	250	250
Collateral	10,386	3,285
Derivatives	21,360	9,608
Funds held under coinsurance	4,298	4,252
Other liabilities	4,755	4,056
Total liabilities excluding separate accounts	202,898	179,126
Separate account liabilities	61,597	70,230
Total liabilities	264,495	249,356
Surplus	21,990	18,893
Total liabilities and surplus	$ 286,485	$ 268,249

See notes to condensed statutory financial statements

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
CONDENSED STATUTORY STATEMENTS OF OPERATIONS
(UNAUDITED)

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	($ In Millions)	
Revenue:		
Premium income	$ 7,354	$ 4,927
Net investment income	1,720	1,681
Fees and other income	218	336
Total revenue	9,292	6,944
Benefits, expenses and other deductions:		
Policyholders' benefits	6,615	5,522
Change in policyholders' reserves	3,464	242
Change in group annuity reserves assumed	(306)	(223)
General insurance expenses	506	559
Commissions	261	258
State taxes, licenses and fees	78	78
Other deductions	(29)	91
Total benefits, expenses and other deductions	10,589	6,527
Net (loss) gain from operations before dividends and federal income taxes	(1,297)	417
Dividends to policyholders	383	393
Net (loss) gain from operations before federal income taxes	(1,680)	24
Federal income tax (benefit) expense	(438)	69
Net loss from operations	(1,242)	(45)
Net realized capital gains	110	39
Net loss	$ (1,132)	$ (6)

See notes to condensed statutory financial statements

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
CONDENSED STATUTORY STATEMENTS OF CHANGES IN SURPLUS
(UNAUDITED)

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	($ In Millions)	
Surplus, beginning of year	$ 18,893	$ 15,610
Net increase/(decrease) due to:		
Net loss	(1,132)	(6)
Change in net unrealized capital gains (losses), net of tax	4,964	(108)
Change in net unrealized foreign exchange capital (losses) gains, net of tax	(775)	47
Change in other net deferred income taxes	(10)	12
Change in nonadmitted assets	2	245
Change in asset valuation reserve	48	(64)
Change in reserve valuation basis	13	-
Prior period adjustments	(6)	(34)
Other	(7)	(3)
Net increase	3,097	89
Surplus, end of period	$ 21,990	$ 15,699

See notes to condensed statutory financial statements

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
CONDENSED STATUTORY STATEMENTS OF CASH FLOWS
(UNAUDITED)

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	($ In Millions)	
Cash from operations:		
Premium and other income collected	$ 7,498	$ 5,317
Net investment income	1,997	2,378
Benefit payments	(6,557)	(5,421)
Net transfers from separate accounts	282	717
Net receipts from group annuity reserves assumed	278	223
Commissions and other expenses	(1,151)	(1,013)
Dividends paid to policyholders	(372)	(380)
Federal and foreign income taxes recovered	-	330
Net cash from operations	1,975	2,151
Cash from investments:		
Proceeds from investments sold, matured or repaid:		
Bonds	5,842	4,584
Preferred and common stocks – unaffiliated	133	94
Common stocks – affiliated	-	7
Mortgage loans	882	307
Real estate	-	28
Partnerships and limited liability companies	209	287
Derivatives	1,771	304
Other	1,199	(473)
Total investment proceeds	10,036	5,138
Cost of investments acquired:		
Bonds	(9,190)	(5,758)
Preferred and common stocks – unaffiliated	(60)	(68)
Common stocks – affiliated	(15)	(551)
Mortgage loans	(1,544)	(1,066)
Real estate	(10)	(24)
Partnerships and limited liability companies	(401)	(293)
Derivatives	(193)	(70)
Other	337	241
Total investments acquired	(11,076)	(7,589)
Net increase in policy loans	(206)	(111)
Net cash used in investing activities	(1,246)	(2,562)
Cash from financing and miscellaneous sources:		
Net deposits on deposit-type contracts	1,229	43
Change in repurchase agreements	(69)	(377)
Change in collateral	6,526	(483)
Other cash (used) provided	(114)	326
Net cash from financing and miscellaneous sources	7,572	(491)
Net change in cash, cash equivalents and short-term investments	8,301	(902)
Cash, cash equivalents and short-term investments:		
Beginning of year	3,793	4,318
End of period	$ 12,094	$ 3,416

See notes to condensed statutory financial statements

1. Nature of operations

Massachusetts Mutual Life Insurance Company (MassMutual or the Company), a mutual life insurance company domiciled in the Commonwealth of Massachusetts, and its domestic life insurance subsidiaries provide individual and group life insurance, disability insurance, individual and group annuities and guaranteed interest contracts (GIC) to individual and institutional customers in all 50 states of the United States of America (U.S.), the District of Columbia and Puerto Rico. Products and services are offered primarily through the Company's MassMutual Financial Advisors (MMFA), Digital Direct to Consumer and Business to Business (DTC&B2B), Institutional Solutions (IS) and Workplace Solutions (WS) distribution channels.

MMFA is a sales force that includes financial advisors that operate in the U.S. MMFA sells individual life, individual annuities and disability insurance. The Company's DTC&B2B distribution channel sells individual life and supplemental health insurance primarily through direct response television advertising, digital media, search engine optimization and search engine marketing. The Company's IS distribution channel sells group annuities, group life and GIC primarily through retirement advisory firms, actuarial consulting firms, investment banks, insurance benefit advisors and investment management companies. The Company's WS distribution channel sells group life insurance and annuity products as well as individual life insurance, critical illness and long term care (LTC) products distributed through investment advisors.

2. Summary of significant accounting policies

a. Basis of presentation

The condensed statutory financial statements have been prepared in conformity with the statutory accounting practices of the National Association of Insurance Commissioners (NAIC) and the accounting practices prescribed or permitted by the Commonwealth of Massachusetts Division of Insurance (the Division).

The condensed statutory financial statements and notes as of March 31, 2020 and December 31, 2019, and for the three months ended March 31, 2020 and 2019, are unaudited. These condensed statutory financial statements, in the opinion of management, reflect the fair presentation of the financial position, results of operations, changes in surplus and cash flows for the interim periods. These condensed statutory financial statements and notes should be read in conjunction with the statutory financial statements and notes thereto included in the Company's 2019 audited yearend financial statements as these condensed statutory financial statements disclose only significant changes from yearend 2019. The results of operations for the interim periods should not be considered indicative of results to be expected for the full year. The Condensed Statutory Statements of Financial Position as of December 31, 2019 have been derived from the audited financial statements at that date, but do not include all of the information and footnotes required by statutory accounting practices for complete financial statements.

For the full description of accounting policies, see *Note 2. "Summary of significant accounting policies"* of Notes to Statutory Financial Statements included in the Company's 2019 audited yearend financial statements.

b. Common stocks – subsidiaries and affiliates

Common stocks of unconsolidated subsidiaries, primarily C.M. Life Insurance Company (C.M. Life), MML Bay State Life Insurance Company (MML Bay State), and MassMutual Holding LLC (MMHLLC), are accounted for using the statutory equity method. The Company accounts for the value of MMHLLC at its underlying U.S. GAAP equity value less an adjustment of $796 million as of March 31, 2020 for a portion of its noncontrolling interests (NCI). Operating results, less dividends declared, for MMHLLC is reflected as net unrealized capital gains (losses) in the Statutory Statements of Changes in Surplus. Dividends declared from MMHLLC are recorded in net investment income when declared and are limited to MMHLLC's U.S. GAAP retained earnings. The cost basis of common stocks – subsidiaries and affiliates is adjusted for impairments deemed to be other than temporary.

Refer to *Note 5b. "Common stocks – subsidiaries and affiliates"* for further information on the valuation of MMHLLC.

3. New accounting standards

Adoption of new accounting standards

In June 2016, the NAIC adopted modifications to Statements of Statutory Accounting Principles (SSAP) No. 51R, *Life Contracts*, to incorporate references to the Valuation Manual and to facilitate the implementation of principles-based reserving (PBR), which were effective on January 1, 2017. The adoption of PBR only applies to new life insurance policies issued after January 1, 2017, however the Company adopted these revisions to SSAP No. 51R using the 3-year phased in approach as of January 1, 2020. Prior to adoption, the Company used formulas and assumptions to determine reserves as prescribed by state laws and regulations. Under PBR, the Company is required to hold the higher of (a) the reserve using prescribed factors and (b) the PBR reserve which considers a wide range of future economic conditions, computed using justified company experience factors, such as mortality, policyholder behavior and expenses. At the time of adoption, the modifications did not have a material effect on the Company's total life reserves and surplus in the financial statements.

In April 2019, the NAIC adopted modifications to SSAP No. 16R, *Electronic Data Processing Equipment and Software*, effective January 1, 2020, the Company elected to early adopt effective April 1, 2019. This guidance aligns and clarifies the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract, with the requirement for capitalizing implementation costs incurred to develop or obtain internal-use software. Costs for implementation activities in the application development stage is capitalized, depending on the nature of the costs and would be nonadmitted, while costs incurred during preliminary project or post implementation stages are expensed as incurred. The amendments also require the entity to expense the capitalized implementation costs of a hosting arrangement that is a service contract over the lesser of the expected term of the hosting arrangement or five years. The Company adopted this guidance on a prospective basis and the adoption did not have a material impact to its financial statements.

In August 2019, the NAIC adopted modifications to SSAP No. 51R, *Life Contracts*, to incorporate references to the Valuation Manual and to facilitate the implementation of PBR. The adoption, effective January 1, 2020, only applies to certain annuity products and includes inforce policies issued after 1980. Prior to adoption, the Company used formulas and assumptions to determine reserves as prescribed by state laws and regulations. Under PBR, the aggregate reserve for contracts falling within the scope of these requirements shall equal the stochastic reserve plus the additional standard projection amount less the projected interest maintenance reserve (IMR) included in the starting assets. These requirements constitute the Commissioners Annuity Reserve Valuation Method for all contracts encompassed by the scope. The modifications did not have a material effect on the Company's total annuity reserves and surplus in the financial statements.

In April 2020, the NAIC adopted modifications to SSAP Nos. 15, 22R and 86. These revisions adopt Financial Accounting Standards Board Accounting Standard Update No. 2020-04 *Reference Rate Reform*, which applies only to contracts, hedging relationships, and other transactions that reference LIBOR or another reference rate expected to be discontinued because of reference rate reform. Optional expedients allow entities (under certain circumstances) to avoid having to remeasure contracts or reassess a previous accounting determination for hedged items. The guidance is effective through December 31, 2022. The Company has adopted this guidance and the adoption did not have a material impact on its financial statements.

In April 2020, the NAIC adopted modifications to SSAP Nos. 6, 47, 51 and 65. This guidance extends the 90-Day Rule due to the impacts of COVID-19 and provides exception to the 90-day past due rule for nonadmittance required in SSAP No. 6 for premiums, SSAP No. 47 for uncollected uninsured plan receivables, SSAP No. 51 for life premiums and SSAP No. 65 for high deductible policies. It is applicable only for the first and second quarters of 2020 and expires on September 29, 2020. The Company has adopted this guidance.

In April 2020, the NAIC adopted modifications to SSAP No. 36. This guidance notes a mortgage loan or bank loan modification due to the impacts of COVID-19 on the borrower will not automatically be categorized as a troubled debt restructuring. To qualify for relief, the borrower must have been in good standing as of December 31, 2019 (not more than 30 days past due). This guidance expires at the earlier of 60 days after the date of termination of the National Emergency or December 31, 2020. The Company has adopted this guidance.

In April 2020, the NAIC adopted modifications to SSAP Nos. 26R, 30R, 37, 43R and 48. This guidance provides limited time exceptions for impairment assessments related to mortgage loans, bank loans and other investments that predominantly invest in mortgage loans and does not require an impairment classification under SSAP No. 37 for mortgage loans or SSAP No. 26R for bank loans that are deferred/modified in response to the impacts of COVID-19. It also provides limited-scope provisions for assessing impairment for other investments (e.g., mutual funds, limited liability companies) that predominantly invest in mortgage loans impacted due to fair value declines if the entity does not intend to sell. This guidance only defers the assessment of impairment due to situations caused by the forbearance or modification of mortgage loan or bank loan payments for borrowers who are or may be unable to meet their contractual payment obligations because they are experiencing short-term financial or operational problems due to the effects of COVID-19. This guidance is only applicable for the first and second quarters of 2020 as it expires on September 29, 2020. The Company has adopted this guidance.

4. *Fair value of financial instruments*

The following presents a summary of the carrying values and fair values of the Company's financial instruments:

	March 31, 2020				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	$ 4,223	$ 5,294	$ -	$ 5,294	$ -
All other governments	1,502	1,506	-	1,439	67
States, territories and possessions	494	549	-	549	-
Political subdivisions	471	514	-	514	-
Special revenue	5,856	6,747	-	6,737	10
Industrial and miscellaneous	84,881	84,848	10	47,065	37,773
Parent, subsidiaries and affiliates	7,262	7,451	-	183	7,268
Preferred stocks	739	745	11	-	734
Common stocks - subsidiaries and affiliates	239	239	92	-	147
Common stocks - unaffiliated	862	862	593	-	269
Mortgage loans - commercial	24,332	25,688	-	-	25,688
Mortgage loans - residential	3,642	3,626	-	-	3,626
Derivatives:					
Interest rate swaps	25,452	30,764	-	30,764	-
Options	746	746	134	612	-
Currency swaps	2,922	2,922	-	2,922	-
Forward contracts	273	273	-	273	-
Financial futures	582	582	582	-	-
Cash, cash equivalents and short-term investments	12,094	12,094	97	11,997	-
Separate account assets	61,597	61,597	39,309	21,262	1,026
Financial liabilities:					
Guaranteed interest contracts	11,041	11,532	-	-	11,532
Group annuity contracts and other deposits	18,204	19,307	-	-	19,307
Individual annuity contracts	10,370	12,159	-	-	12,159
Supplementary contracts	1,154	1,155	-	-	1,155
Repurchase agreements	3,765	3,765	-	3,765	-
Commercial paper	250	250	-	250	-
Derivatives:					
Interest rate swaps	21,145	22,922	-	22,922	-
Options	21	21	21	-	-
Currency swaps	16	16	-	16	-
Forward contracts	93	93	-	93	-
Credit default swaps	9	6	-	6	-
Financial futures	76	76	76	-	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of $16,885 million.

	December 31, 2019				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	$ 4,361	$ 4,944	$ -	$ 4,944	$ -
All other governments	1,589	1,762	-	1,693	69
States, territories and possessions	547	603	-	603	-
Political subdivisions	517	569	-	569	-
Special revenue	5,807	6,594	-	6,584	10
Industrial and miscellaneous	82,586	88,206	10	48,715	39,481
	6,500	6,658	-	381	6,277
Preferred stocks	749	787	11	-	776
Common stocks - subsidiaries and affiliates	282	282	162	-	120
Common stocks - unaffiliated	1,185	1,185	917	-	268
Mortgage loans - commercial	24,163	25,090	-	-	25,090
Mortgage loans - residential	3,310	3,304	-	-	3,304
Derivatives:					
Interest rate swaps	10,571	11,983	-	11,983	-
Options	575	575	40	535	-
Currency swaps	880	880	-	880	-
Forward contracts	11	11	-	11	-
Credit default swaps	22	31	-	31	-
Financial futures	5	5	5	-	-
Cash, cash equivalents and short-term investments	3,793	3,793	206	3,587	-
Separate account assets	70,230	70,230	48,151	21,113	966
Financial liabilities:					
Guaranteed interest contracts	9,815	9,909	-	-	9,909
Group annuity contracts and other deposits	17,963	18,600	-	-	18,600
Individual annuity contracts	8,338	10,317	-	-	10,317
Supplementary contracts	1,185	1,186	-	-	1,186
Repurchase agreements	3,834	3,834	-	3,834	-
Commercial paper	250	250	-	250	-
Derivatives:					
Interest rate swaps	9,124	9,972	-	9,972	-
Options	2	2	2	-	-
Currency swaps	212	212	-	212	-
Forward contracts	158	158	-	158	-
Financial futures	112	112	112	-	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of $16,689 million.

The use of different assumptions or valuation methodologies may have a material impact on the estimated fair value amounts.

The following presents the Company's fair value hierarchy for assets and liabilities that are carried at fair value:

	March 31, 2020			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
Industrial and miscellaneous	$ 10	$ 236	$ 105	$ 351
Preferred stocks	-	-	11	11
Common stocks - subsidiaries and affiliates	92	-	147	239
Common stocks - unaffiliated	593	-	269	862
Derivatives:				
Interest rate swaps	-	25,452	-	25,452
Options	134	612	-	746
Currency swaps	-	2,922	-	2,922
Forward contracts	-	273	-	273
Financial futures	582	-	-	582
Separate account assets	39,309	21,262	1,026	61,597
Total financial assets carried at fair value	$ 40,720	$ 50,757	$ 1,558	$ 93,035
Financial liabilities:				
Derivatives:				
Interest rate swaps	$ -	$ 21,145	$ -	$ 21,145
Options	21	-	-	21
Currency swaps	-	16	-	16
Forward contracts	-	93	-	93
Financial futures	76	-	-	76
Total financial liabilities carried at fair value	$ 97	$ 21,254	$ -	$ 21,351

For the three months ended March 31, 2020 and the year ended December 31, 2019, the Company does not have any financial instruments that were carried at net asset value as a practical expedient.

The following presents the Company's fair value hierarchy for assets and liabilities that are carried at fair value:

	December 31, 2019			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
Industrial and miscellaneous	$ 10	$ 143	$ 111	$ 264
Preferred stocks	-	-	13	13
Common stocks - subsidiaries and affiliates	162	-	120	282
Common stocks - unaffiliated	917	-	268	1,185
Derivatives:				
Interest rate swaps	-	10,571	-	10,571
Options	40	535	-	575
Currency swaps	-	880	-	880
Forward contracts	-	11	-	11
Financial futures	5	-	-	5
Separate account assets	48,151	21,113	966	70,230
Total financial assets carried at fair value	$ 49,285	$ 33,253	$ 1,478	$ 84,016
Financial liabilities:				
Derivatives:				
Interest rate swaps	$ -	$ 9,124	$ -	$ 9,124
Options	2	-	-	2
Currency swaps	-	212	-	212
Forward contracts	-	158	-	158
Financial futures	112	-	-	112
Total financial liabilities carried at fair value	$ 114	$ 9,494	$ -	$ 9,608

The Company reviews the fair value hierarchy classifications each reporting period. Changes in the observability of the valuation attributes and the level of market activity may result in a reclassification of certain financial assets or liabilities between fair value hierarchy classifications. Such reclassifications are reported as transfers between levels at the beginning fair value for the reporting period in which the changes occur.

The following presents changes in the Company's Level 3 assets carried at fair value:

	Balance as of 1/1/20	Gains (Losses) in Net Income	Losses (Gains) in Surplus	Purchases	Issuances	Sales	Settlements	Transfers In	Transfers Out	Other	Balance as of 03/31/20
	(In Millions)										
Financial assets:											
Bonds:											
Industrial and miscellaneous	$ 111	$ -	$ (11)	$ -	$ -	$ -	$ -	$ 2	$ (28)	$ 31	$ 105
Preferred stocks	13	-	(2)	-	-	-	-	-	-	-	11
Common stocks - subsidiaries and affiliates	120	-	(38)	2	12	-	(1)	52	-	-	147
Common stocks - unaffiliated	268	1	-	2	-	-	(2)	-	-	-	269
Separate account assets	966	(8)	-	56	-	12	-	-	-	-	1,026
Total financial assets	$ 1,478	$ (7)	$ (51)	$ 60	$ 12	$ 12	$ (3)	$ 54	$ (28)	$ 31	$ 1,558

	Balance as of 1/1/19	Gains (Losses) in Net Income	Losses (Gains) in Surplus	Purchases	Issuances	Sales	Settlements	Transfers In	Transfers Out	Other	Balance as of 12/31/19
	(In Millions)										
Financial assets:											
Bonds:											
Industrial and miscellaneous	$ 64	$ (1)	$ (2)	$ 28	$ 1	$ -	$ (5)	$ 2	$ -	$ 24	$ 111
Parent, subsidiaries, and affiliates	66	-	-	-	-	-	-	-	(8)	(58)	-
Preferred stocks	-	-	(1)	2	-	-	-	-	-	12	13
Common stocks - subsidiaries and affiliates	165	1	(41)	1	-	-	(6)	-	-	-	120
Common stocks - unaffiliated	306	18	9	4	-	(60)	(9)	-	-	-	268
Separate account assets	551	42	(1)	797	-	(423)	-	-	-	-	966
Total financial assets	$ 1,152	$ 60	$ (36)	$ 832	$ 1	$ (483)	$ (20)	$ 2	$ (8)	$ (22)	$ 1,478

Other transfers include assets that are either no longer carried at fair value, or have just begun to be carried at fair value, such as assets with no level changes but a change in the lower of cost or market carrying basis. Industrial and miscellaneous bonds in other contain assets that are now carried at fair value due to ratings changes and assets are no longer carried at fair value where the fair value is now higher than the book value.

Level 3 transfers in are assets that are consistently carried at fair value but have had a level change. Common stocks unaffiliated assets were transferred from Level 2 to Level 3 due to a change in the observability of pricing inputs, at the beginning fair value for the reporting period.

5. *Investments*

The Company maintains a diversified investment portfolio. Investment policies limit concentration in any asset class, geographic region, industry group, economic characteristic, investment quality or individual investment.

a. Bonds

The carrying value and fair value of bonds were as follows:

	March 31, 2020			
	Carrying Value	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(In Millions)			
U.S. government and agencies	$ 4,223	$ 1,071	$ -	$ 5,294
All other governments	1,502	56	52	1,506
States, territories and possessions	494	56	1	549
Political subdivisions	471	46	3	514
Special revenue	5,856	900	9	6,747
Industrial and miscellaneous	84,881	3,628	3,661	84,848
Parent, subsidiaries and affiliates	7,262	237	48	7,451
Total	$ 104,689	$ 5,994	$ 3,774	$ 106,909

The March 31, 2020 gross unrealized losses exclude $79 million of losses included in the carrying value. These losses include $71 million from NAIC Class 6 bonds and $8 million from RMBS and CMBS whose ratings were obtained from outside modelers. These losses were primarily included in industrial and miscellaneous or parent, subsidiaries and affiliates.

	December 31, 2019			
	Carrying Value	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(In Millions)			
U.S. government and agencies	$ 4,361	$ 585	$ 2	$ 4,944
All other governments	1,589	174	1	1,762
States, territories and possessions	547	56	-	603
Political subdivisions	517	52	-	569
Special revenue	5,807	789	2	6,594
Industrial and miscellaneous	82,586	5,900	280	88,206
Parent, subsidiaries and affiliates	6,500	158	-	6,658
Total	$ 101,907	$ 7,714	$ 285	$ 109,336

The December 31, 2019 gross unrealized losses exclude $26 million of losses included in the carrying value. These losses include $25 million from NAIC Class 6 bonds and $1 million from RMBS and CMBS whose ratings were obtained from outside modelers. These losses were primarily included in industrial and miscellaneous or parent, subsidiaries and affiliates.

As of March 31, 2020, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of $12,465 million. Securities in an unrealized loss position for less than 12 months had a fair value of $9,337 million and unrealized losses of $1,049 million. Securities in an unrealized loss position for greater than 12 months had a fair value of $3,128 million and unrealized losses of $345 million. These securities were primarily categorized as industrial and miscellaneous or parent, subsidiaries and affiliates.

As of December 31, 2019, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of $7,496 million. Securities in an unrealized loss position for less than 12 months had a fair value of $2,268 million and unrealized losses of $24 million. Securities in an unrealized loss position for greater than 12 months had a fair value of $5,228 million and unrealized losses of $92 million. These securities were primarily categorized as industrial and miscellaneous or parent, subsidiaries and affiliates.

In the course of the Company's investment management activities, securities may be sold and reacquired within 30 days to enhance the Company's yield on its investment portfolio. The Company did not sell any securities with the NAIC Designation 3 or below for the three months ended March 31, 2020 or 2019, that were reacquired within 30 days of the sale date.

Residential mortgage-backed exposure

Residential mortgage-backed securities (RMBS) are included in the U.S. government and agencies, special revenue, and industrial and miscellaneous bond categories. The Alt-A category includes option adjustable-rate mortgages and the subprime category includes 'scratch and dent' or reperforming pools, high loan-to-value pools, and pools where the borrowers have very impaired credit but the average loan-to-value is low, typically 70% or below. In identifying Alt-A and subprime exposure, management used a combination of qualitative and quantitative factors, including FICO scores and loan-to-value ratios.

As of March 31, 2020, RMBS had a total carrying value of $1,370 million and a fair value of $1,434 million, of which approximately 25%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of $511 million and a fair value of $514 million. As of December 31, 2019, RMBS had a total carrying value of $1,780 million and a fair value of $1,892 million, of which approximately 18%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of $883 million and a fair value of $945 million.

b. Common stocks – subsidiaries and affiliates

MMHLLC paid $200 million in dividends to MassMutual for the three months ended March 31, 2020, which were declared in 2019, and paid $650 million in dividends for the three months ended March 31, 2019, which were declared in 2018.

MassMutual contributed capital of $14 million to MMHLLC for the three months ended March 31, 2020 and $10 million for the three months ended March 31, 2019.

On May 24, 2019, an indirectly wholly owned subsidiary of MassMutual, MM Asset Management Holding LLC (MMAMH) executed the sale of its retail asset management affiliate, Oppenheimer Acquisition Corp. (OAC), to Invesco Ltd (Invesco), a global asset manager. Under the terms of the sale, MMAMH and OAC employee shareholders received 81.8 million of Invesco common shares and $4.0 billion in perpetual, non-cumulative preference shares with a fixed cash dividend rate of 5.9%. MMAMH is a directly wholly owned subsidiary of MMHLLC. In turn, at the time of the transaction, MMAMH received a 15.7% common equity interest in post transaction Invesco and MMAMH entered into a shareholder agreement pursuant to which MMAMH has customary minority shareholder rights, including the appointment of a director to Invesco's board of directors. MassMutual's investment in MMHLLC was increased from the impact of this sale through change in unrealized capital gains of $3,361 million, with an approximate net increase to surplus of $2,500 million.

Subsidiaries of MMHLLC are involved in litigation and investigations arising in the ordinary course of their business, which seek compensatory damages, punitive damages and equitable remedies. Although the Company is not aware of any actions or allegations that reasonably could give rise to a material adverse impact to the Company’s financial position or liquidity, the outcome of litigation cannot be foreseen with certainty. It is the opinion of management that the ultimate resolution of these matters will not materially impact the Company’s financial position or liquidity. However, the outcome of a particular proceeding may be material to the Company’s Condensed Statutory Statements of Changes in Surplus for a particular period depending upon, among other factors, the size of the loss and the level of the Company’s changes in surplus for the period.

c. Mortgage loans

Mortgage loans comprised commercial mortgage loans and residential mortgage loans. The Company’s commercial mortgage loans primarily finance various types of real estate properties throughout the U.S., the United Kingdom and Canada. The Company holds commercial mortgage loans for which it is the primary lender or a participant or co-lender in a mortgage loan agreement and mezzanine loans that are subordinate to senior secured first liens. Residential mortgage loans include seasoned pools of homogeneous residential mortgage loans substantially backed by Federal Housing Administration (FHA) and Veterans Administration (VA) guarantees.

The carrying value and fair value of the Company's mortgage loans were as follows:

	March 31, 2020		December 31, 2019	
	Carrying Value	Fair Value	Carrying Value	Fair Value
	(In Millions)			
Commercial mortgage loans:				
Primary lender	$ 24,332	$ 25,688	$ 24,163	$ 25,090
Total commercial mortgage loans	24,332	25,688	24,163	25,090
Residential mortgage loans:				
FHA insured and VA guaranteed	2,775	2,796	2,590	2,581
Other residential loans	867	830	720	723
Total residential mortgage loans	3,642	3,626	3,310	3,304
Total mortgage loans	$ 27,974	$ 29,314	$ 27,473	$ 28,394

As of March 31, 2020 and December 31, 2019, the loan-to-value ratios of 99% of the Company's commercial mortgage loans were less than 81%.

As of March 31, 2020 and December 31, 2019, the Company had no impaired mortgage loans with or without a valuation allowance or mortgage loans derecognized as a result of foreclosure, including mortgage loans subject to a participant or co-lender mortgage loan agreement with a unilateral mortgage loan foreclosure restriction or mortgage loan derecognized as a result of a foreclosure.

As of and for the three months ended March 31, 2020 and 2019, the Company had no valuation allowance recorded for commercial mortgage loans.

d. Derivatives

The Company uses derivative financial instruments in the normal course of business to manage risks, primarily to reduce currency, interest rate and duration imbalances determined in asset/liability analyses. The Company also uses a combination of derivatives and fixed income investments to create synthetic investments. These synthetic investments are created when they are economically more attractive than the actual instrument or when similar instruments are unavailable. Synthetic investments are created either to hedge and reduce the Company's credit and foreign currency exposure or to create an investment in a particular asset. The Company held synthetic investments with a notional amount of $19,713 million as of March 31, 2020 and $17,979 million as of December 31, 2019. These notional amounts included replicated asset transaction values of $17,773 million as of March 31, 2020 and $16,039 million as of December 31, 2019, as defined under statutory accounting practices as the result of pairing of a long derivative contract with cash instruments.

The Company's principal derivative exposures to market risk are interest rate risk, which includes inflation and credit risk. Interest rate risk pertains to the change in fair value of the derivative instruments as a result of changes in market interest rates. The Company is exposed to credit-related losses in the event of nonperformance by counterparties to derivative financial instruments. The Company regularly monitors counterparty credit ratings, derivative positions, valuations and the value of collateral posted to ensure counterparties are credit-worthy and the concentration of exposure is minimized, and monitors its derivative credit exposure as part of its overall risk management program.

The Company enters derivative transactions through bilateral derivative agreements with counterparties, or through over the counter cleared derivatives with a counterparty and the use of a clearinghouse. To minimize credit risk for bilateral transactions, the Company and its counterparties generally enter into master netting agreements based on agreed upon requirements that outline the framework for how collateral is to be posted in the amount owed under each transaction, subject to certain minimums. For over the counter cleared derivative transactions between the Company and a counterparty, the parties enter into a series of master netting and other agreements that govern, among other things, clearing and collateral requirements. These transactions are cleared through a clearinghouse and each derivative counterparty is only exposed to the default risk of the clearinghouse. Certain interest rate swaps and credit default swaps are considered cleared transactions. These cleared transactions require initial and daily variation margin collateral postings. These agreements allow for contracts in a positive position, in which amounts are due to the Company, to be offset by contracts in a negative position. This right of offset, combined with collateral obtained from counterparties, reduces the Company's credit exposure.

Net collateral pledged by the counterparties was $11,397 million as of March 31, 2020 and $2,270 million as of December 31, 2019. In the event of default, the full market value exposure at risk in a net gain position, net of offsets and collateral, was $147 million as of March 31, 2020 and $51 million as of December 31, 2019. The statutory net amount at risk, defined as net collateral pledged and statement values excluding accrued interest, was $797 million as of March 31, 2020 and $412 million as of December 31, 2019.

The Company had the right to rehypothecate or repledge securities totaling $2,118 million of the $11,397 million as of March 31, 2020 and $1,126 million of the $2,270 million as of December 31, 2019 of net collateral pledged by counterparties. There were no securities rehypothecated to other counterparties as of March 31, 2020 or December 31, 2019.

The following summarizes the carrying values and notional amounts of the Company's derivative financial instruments:

	March 31, 2020			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	$ 25,452	$ 104,377	$ 21,145	$ 113,375
Options	746	18,762	21	3
Currency swaps	2,922	16,154	16	501
Forward contracts	273	7,659	93	3,151
Credit default swaps	-	-	9	119
Financial futures	582	3,049	76	349
Total	$ 29,975	$ 150,001	$ 21,360	$ 117,498

	December 31, 2019			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	$ 10,571	$ 88,850	$ 9,124	$ 113,150
Options	575	19,360	2	3
Currency swaps	880	10,727	212	5,511
Forward contracts	11	2,220	158	8,055
Credit default swaps	22	1,185	-	34
Financial futures	5	291	112	2,974
Total	$ 12,064	$ 122,633	$ 9,608	$ 129,727

The average fair value of outstanding derivative assets was $23,206 million for the year ended March 31, 2020 and $8,528 million for the three months ended March 31, 2019. The average fair value of outstanding derivative liabilities was $16,797 million for the year ended March 31, 2020 and $5,361 million for the three months ended March 31, 2019.

The following summarizes the notional amounts of the Company's credit default swaps by contractual maturity:

	March 31, 2020	December 31, 2019
	(In Millions)	
Due in one year or less	$ 9	$ 9
Due after one year through five years	-	1,210
Due after five years through ten years	110	-
Total	$ 119	$ 1,219

The following summarizes the Company's net realized gains (losses) on closed contracts and change in net unrealized gains (losses) related to market fluctuations on open contracts by derivative type:

	Three Months Ended March 31,			
	2020		2019	
	Net Realized Gains (Losses) on Closed Contracts	Change In Net Unrealized Gains (Losses) on Open Contracts	Net Realized Gains (Losses) on Closed Contracts	Change In Net Unrealized Gains (Losses) on Open Contracts
	(In Millions)			
Interest rate swaps	$ 31	$ 2,859	$ (26)	$ (133)
Currency swaps	3	2,239	2	(132)
Options	448	141	(26)	(135)
Credit default swaps	2	-	5	-
Interest rate caps and floors	-	-	-	(6)
Forward contracts	140	326	76	(63)
Financial futures	320	614	142	(91)
Total	$ 944	$ 6,179	$ 173	$ (560)

The following summarizes gross and net information of derivative assets and liabilities, along with collateral posted in connection with master netting agreements:

	March 31, 2020			December 31, 2019		
	Derivative Assets	Derivative Liabilities	Net	Derivative Assets	Derivative Liabilities	Net
	(In Millions)					
Gross	$ 29,975	$ 21,360	$ 8,615	$ 12,064	$ 9,608	$ 2,456
Due and accrued	752	2,080	(1,328)	807	1,894	(1,087)
Gross amounts offset	(22,557)	(22,557)	-	(9,458)	(9,458)	-
Net asset	8,170	883	7,287	3,413	2,044	1,369
Collateral posted	(12,377)	(980)	(11,397)	(4,407)	(2,137)	(2,270)
Net	$ (4,207)	$ (97)	$ (4,110)	$ (994)	$ (93)	$ (901)

e. Net investment income

Net investment income, including IMR amortization, comprised the following:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	(In Millions)	
Bonds	$ 1,145	$ 1,086
Preferred stocks	5	6
Common stocks - subsidiaries and affiliates	-	2
Common stocks - unaffiliated	19	7
Mortgage loans	302	265
Policy loans	235	221
Real estate	34	40
Partnerships and limited liability companies	63	103
Derivatives	93	92
Cash, cash equivalents and short-term investments	35	25
Other	(47)	17
Subtotal investment income	1,884	1,864
Amortization of the IMR	17	4
Investment expenses	(181)	(187)
Net investment income	$ 1,720	$ 1,681

f. Net realized capital gains

Net realized capital losses, which include other-than-temporary impairments (OTTI) and are net of deferral to the IMR, comprised the following:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	(In Millions)	
Bonds	$ (12)	$ (11)
Common stocks - unaffiliated	(95)	10
Mortgage loans	1	1
Real estate	-	8
Partnerships and LLCs	(37)	(5)
Derivatives	944	173
Other	(9)	2
Net realized capital gains before federal and state taxes and deferral to the IMR	792	178
Net federal and state tax (expense) benefit	(232)	17
Net realized capital gains before deferral to the IMR	560	195
Net after tax (gains) deferred to the IMR	(450)	(156)
Net realized capital gains	$ 110	$ 39

IMR had a liability balance of $863 million as of March 31, 2020 and a liability balance of $438 million as of December 31, 2019.

OTTI, included in the realized capital losses, consisted of the following:

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	(In Millions)	
Bonds	$ (50)	$ (10)
Common stocks - unaffiliated	(76)	(7)
Partnerships and LLCs	(41)	(11)
Total OTTI	$ (167)	$ (28)

The Company recognized OTTI of $5 million for the three months ended March 31, 2020 and less than $1 million for the three months ended March 31, 2019 on structured and loan-backed securities, which are included in bonds, primarily due to the present value of expected cash flows being less than the amortized cost.

6. Federal income taxes

In response to the COVID-19 pandemic, the Coronavirus Aid, Relief, and Economic Security (CARES) Act was signed into law on March 27, 2020. The CARES Act, among other things, permits net operating loss (NOL) carryovers and carrybacks to offset 100% of taxable income for taxable years beginning before 2021. In addition, the CARES Act allows NOLs incurred in 2018, 2019, and 2020 to be carried back to each of the five preceding taxable years to generate a refund of previously paid income taxes. The Company is currently evaluating the impact of the CARES Act, but does not expect that the business tax provisions of the CARES Act to have a material impact on the financial statements.

7. Other than invested assets

No significant changes.

8. Policyholders' liabilities

a. Liabilities for deposit-type contracts

On January 14, 2020, MassMutual issued a $550 million funding agreement with a 2.35% fixed rate and a 7-year maturity.

On January 15, 2020, MassMutual issued a $540 million funding agreement with a 3-month LIBOR rate and a 2-year maturity.

b. Additional liability for annuity contracts

Certain variable annuity contracts include additional death or other insurance benefit features, such as guaranteed minimum death benefits (GMDB), guaranteed minimum income benefits (GMIB), guaranteed minimum accumulation benefits (GMAB) and guaranteed minimum withdrawal benefits (GMWB). In general, living benefit guarantees require the contract holder or policyholder to adhere to a company approved asset allocation strategy. Election of these benefit guarantees is generally only available at contract issue.

The following shows the changes in the liabilities for GMDB, GMIB, GMAB and GMWB (in millions):

Liability as of January 1, 2019	$ 756
Incurred guarantee benefits	(164)
Paid guarantee benefits	(8)
Liability as of December 31, 2019	584
Incurred guarantee benefits	1,476
Paid guarantee benefits	(2)
Liability as of March 31, 2020	$ 2,058

The following summarizes the account values, net amount at risk and weighted average attained age for variable annuity contracts with GMDB, GMIB, GMAB and GMWB classified as policyholders' reserves and separate account liabilities. The net amount at risk is defined as the minimum guarantee less the account value calculated on a policy-by-policy basis, but not less than zero.

	March 31, 2020			December 31, 2019		
	Account Value	Net Amount at Risk	Weighted Average Attained Age	Account Value	Net Amount at Risk	Weighted Average Attained Age
	($ In Millions)					
GMDB	$ 15,640	$ 236	65	$ 18,345	$ 40	65
GMIB Basic	562	113	70	718	28	69
GMIB Plus	2,343	1,058	68	2,906	532	68
GMAB	2,042	132	60	2,544	2	60
GMWB	121	28	71	151	10	71

As of March 31, 2020, the GMDB account value above consists of $3,798 million within the general account and $11,843 million within separate accounts that includes $3,359 million of modified coinsurance assumed. As of December 31, 2019, the GMDB account value above consists of $3,760 million within the general account and $14,585 million within separate accounts that includes $4,088 million of modified coinsurance assumed.

9. Reinsurance

For the three months ended March 31, 2020, the Company increased its gross LTC policyholders' reserves by $94 million through various assumption changes to reflect the risk inherent in the cash flows of this business. This risk is ceded to an unaffiliated reinsurer, therefore the ceded policyholders' reserves have also been increased by an additional $94 million.

10. Withdrawal characteristics

Separate accounts

The Company has guaranteed separate accounts classified as the following: nonindexed, which have multiple concurrent guarantees, including a guarantee that applies for as long as the contract is in effect and does not exceed a 4% rate of return. The Company has nonguaranteed separate accounts which are variable accounts where the benefit is determined by the performance and/or market value of the investments held in the separate account with incidental risk, notional expense and minimum death benefit guarantees.

Information regarding the separate accounts of the Company as of and for the three months ended March 31, 2020 is as follows:

	Guaranteed Indexed	Guaranteed Nonindexed Less Than/ Equal to 4%	Non Guaranteed	Total
	(In Millions)			
Net premium, considerations or deposits for the three months ended March 31, 2020	$ -	$ -	$ 6,250	$ 6,250
Reserves at March 31, 2020:				
For accounts with assets at:				
Fair value	$ -	$ 18,283	$ 41,123	$ 59,406
Nonpolicy liabilities	-	-	611	611
Amortized cost/book value	-	1,581	-	1,581
Total separate account liabilities	$ -	$ 19,864	$ 41,734	$ 61,598
Reserves by withdrawal characteristics:				
Subject to discretionary withdrawal:				
At fair value	$ -	$ 17,741	$ 41,123	$ 58,864
At book value without market value adjustment and current surrender charge of less than 5%	-	$ 2,123	$ -	$ 2,123
Subtotal	-	$ 19,864	$ 41,123	$ 60,987
Nonpolicy liabilities	-	-	611	611
Total separate account liabilities	$ -	$ 19,864	$ 41,734	$ 61,598

Information regarding the separate accounts of the Company as of and for the year ended December 31, 2019 is as follows:

	Guaranteed			
	Indexed	Nonindexed Less Than/ Equal to 4%	Non Guaranteed	Total
	(In Millions)			
Net premium, considerations or deposits for the year ended December 31, 2019	$ -	$ -	$ 7,423	$ 7,423
Reserves at December 31, 2019:				
For accounts with assets at:				
Fair value	$ -	$ 17,691	$ 50,239	$ 67,930
Nonpolicy liabilities	-	-	734	734
Amortized cost/book value	-	1,566	-	1,566
Total separate account liabilities	$ -	$ 19,257	$ 50,973	$ 70,230
Reserves by withdrawal characteristics:				
Subject to discretionary withdrawal:				
At fair value	$ -	$ 17,136	$ 50,239	$ 67,375
At book value without market value adjustment and current surrender charge of less than 5%	-	$ 2,121	$ -	$ 2,121
Subtotal	-	$ 19,257	$ 50,239	$ 69,496
Nonpolicy liabilities	-	-	734	734
Total separate account liabilities	$ -	$ 19,257	$ 50,973	$ 70,230

11. Debt

No significant changes.

12. Employee benefit plans

The Company sponsors multiple employee benefit plans, providing retirement, life, health and other benefits to employees, certain employees of unconsolidated subsidiaries, agents, general agents and retirees who meet plan eligibility requirements.

Net periodic cost

The net periodic cost represents the annual accounting income or expense recognized by the Company and is included in general insurance expenses in the Condensed Statutory Statements of Operations. The net periodic cost recognized is as follows:

	Three Months Ended March 31,			
	2020	2019	2020	2019
	Pension Benefits		Other Postretirement Benefits	
	(In Millions)			
Service cost	$ 29	$ 28	$ 4	$ 3
Interest cost	24	29	3	3
Expected return on plan assets	(44)	(40)	-	-
Amortization of unrecognized net actuarial and other losses	13	14	1	-
Amortization of unrecognized prior service cost	-	-	(2)	(1)
Total net periodic cost	$ 22	$ 31	$ 6	$ 5

13. Employee compensation plans

No significant changes.

14. Surplus notes

No significant changes.

15. Presentation of the Condensed Statutory Statements of Cash Flows

The following table presents those transactions that have affected the Company's recognized assets or liabilities but have not resulted in cash receipts or payments during the three months ended March 31, 2020 and 2019. Accordingly, the Company has excluded these non-cash activities from the Statutory Statements of Cash Flows for the three months ended March 31, 2020 and 2019.

	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
	(In Millions)	
Bonds received as consideration for group annuity contracts	$ (197)	$ -
Premium income recognized for group annuity contracts	197	-
Bond conversions and refinancing	90	215
Change in market value of COLI	71	66
Stock conversion	10	34
Net investment income payment in-kind bonds	3	-
Transfer of mortgage loans to partnerships and LLCs	-	39

16. Business risks, commitments and contingencies

a. Risks and uncertainties

The Company operates in a business environment subject to various risks and uncertainties. The principal risks include insurance and underwriting risks, investment and interest rate risks, currency exchange risk and credit risk. The combined impact of these risks could have a material, adverse effect on the Company’s financial statements or result in operating losses in future periods. The Company employs the use of reinsurance, portfolio diversification, asset/liability management processes and other risk management techniques to mitigate the impact of these risks. This condensed risks and uncertainties disclosure should be read in conjunction with the statutory disclosure in the Company’s 2019 audited yearend financial statements.

Insurance and underwriting risks

The Company prices its products based on estimated benefit payments reflecting assumptions with respect to mortality, morbidity, longevity, persistency, interest rates and other factors. If actual policy experience emerges that is significantly and adversely different from assumptions used in product pricing, the effect could be material to the profitability of the Company. For participating whole life products, the Company’s dividends to policyholders primarily reflect the difference between actual investment, mortality, expense and persistency experience and the experience embedded in the whole life premiums and guaranteed elements. The Company also reinsures certain life insurance and other long-term care insurance policies to mitigate the impact of its underwriting risk.

Investment and interest rate risks

The fair value, cash flows and earnings of investments can be influenced by a variety of factors including changes in interest rates, credit spreads, equity markets, portfolio asset allocation and general economic conditions. The Company employs a rigorous asset/liability management process to help mitigate the economic impacts of various investment risks, in particular, interest rate risk. By effectively matching the market sensitivity of assets with the liabilities they support, the impact of interest rate changes is addressed, on an economic basis, as the change in the value of the asset is offset by a corresponding change in the value of the supported liability. The Company uses derivatives, such as interest rate swaps and swaptions, as well as synthetic assets to reduce interest rate and duration imbalances determined in asset/liability analyses.

The levels of U.S. interest rates are influenced by U.S. monetary policies and by the relative attractiveness of U.S. markets to investors versus other global markets. As interest rates increase, certain debt securities may experience amortization or prepayment speeds that are slower than those assumed at purchase, impacting the expected maturity of these securities and the ability to reinvest the proceeds at the higher yields. Rising interest rates may also result in a decrease in the fair value of the investment portfolio. As interest rates decline, certain debt securities may experience accelerated amortization and prepayment speeds than what was assumed at purchase. During such periods, the Company is at risk of lower net investment income as it may not be able to reinvest the proceeds at comparable yields. Declining interest rates may also increase the fair value of the investment portfolio.

Interest rates also have an impact on the Company's products with guaranteed minimum payouts and on interest credited to account holders. As interest rates decrease, investment spreads may contract as crediting rates approach minimum guarantees, resulting in an increased liability.

In periods of increasing interest rates, policy loans, surrenders and withdrawals may increase as policyholders seek investments with higher perceived returns. This could result in cash outflows requiring the Company to sell invested assets at a time when the prices of those assets are adversely affected by the increase in market interest rates, which could cause the Company to realize investment losses.

Currency exchange risk

The Company has currency risk due to its non-U.S. dollar denominated investments and medium-term notes along with its indirect international operations. The Company mitigates a portion of its currency risk through the use of cross-currency swaps and forward contracts. Cross-currency swaps are used to minimize currency risk for certain non-U.S. dollar assets and liabilities through a pre-specified exchange of interest and principal. Forward contracts are used to hedge movements in exchange rates.

Credit and other market risks

The Company manages its investments to limit credit and other market risks by diversifying its portfolio among various security types and industry sectors as well as purchasing credit default swaps to transfer some of the risk.

Stressed conditions, volatility and disruptions in global capital markets or in particular markets or financial asset classes can have an adverse effect on the Company, in part because the Company has a large investment portfolio and assets supporting the Company's insurance liabilities are sensitive to changing market factors. Global market factors, including interest rates, credit spread, equity prices, real estate markets, foreign currency exchange rates, consumer spending, business investment, government spending, the volatility and strength of the capital markets, deflation and inflation, all affect the business and economic environment and, ultimately, the profitability of the Company's business. Disruptions in one market or asset class can also spread to other markets or asset classes. Upheavals in the financial markets can also affect the Company's business through their effects on general levels of economic activity, employment and customer behavior.

Asset-based fees calculated as a percentage of the separate account assets are a source of revenue to the Company. Gains and losses in the investment markets may result in corresponding increases and decreases in the Company's separate account assets and related revenue.

The spread of the coronavirus, causing increased cases of COVID-19, around the world in the first quarter of 2020 has caused significant volatility in U.S. and international markets. There is significant uncertainty around the breadth and duration of business disruptions related to COVID-19, as well as its impact on the U.S. and international economies. At this time, the Company is not able to reliably estimate the length and severity of the COVID-19 public health crises and, as such, cannot quantify its impact on the financial results, liquidity and capital resources and its operations in future periods.

b. Litigation and regulatory matters

In the normal course of business, the Company is involved in disputes, litigation and governmental or regulatory inquiries, administrative proceedings, examinations and investigations, both pending and threatened. These matters, if resolved adversely against the Company or settled, may result in monetary damages, fines and penalties or require changes in the Company's business practices. The resolution or settlement of these matters is inherently difficult to predict. Based upon the Company's assessment of these pending matters, the Company does not believe that the amount of any judgment, settlement or other action arising from any pending matter is likely to have a material adverse effect on the statement of financial position. However, an adverse outcome in certain matters could have a material adverse effect on the results of operations for the period in which such matter is resolved, or an accrual is determined to be required, on the financial statement financial position, or on our reputation.

The Company evaluates the need for accruals of loss contingencies for each matter. When a liability for a matter is probable and can be estimated, the Company accrues an estimate of the loss and any related insurance recoveries, if any. An accrual is subject to subsequent adjustment as a result of additional information and other developments. The resolution of matters are inherently difficult to predict, especially in the early stages of matter. Even if a loss is probable, due to many complex factors, such as speed of discovery and the timing of court decisions or rulings, a loss or range of loss may not be reasonably estimated until the later stages of the matter. For matters where a loss is material and it is either probable or reasonably possible then it is disclosed. For matters where a loss may be reasonably possible, but not probable, or is probable but not reasonably estimated, no accrual is established, but the matter, if material, is disclosed.

17. Related party transactions

No significant changes.

18. Subsequent events

Management of the Company has evaluated subsequent events through May 15, 2020, the date the financial statements were available to be issued to state regulators and subsequently on the Company's website. No events have occurred subsequent to the date of the financial statements, except for:

On April 16, 2020, MassMutual issued approximately $700 million of surplus notes at a fixed 3.375% coupon rate maturing in 2050.

19. *Impairment listing for loan-backed and structured securities*

The following are the total cumulative adjustments and impairments for loan-backed and structured securities since July 1, 2009:

Period Ended	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
March 31, 2020	$ 24,799,788	$ -	$ 24,799,788	$ 20,197,344	$ (4,602,443)	$ 20,197,344	$ 24,683,947
December 31, 2019	3,992,400	-	3,992,400	3,539,281	(453,119)	3,539,281	3,439,138
September 30, 2019	16,909,029	-	16,909,029	15,191,932	(1,717,097)	15,191,932	14,639,756
June 30, 2019	6,980,030	-	6,980,030	6,187,029	(793,001)	6,187,029	7,133,620
March 31, 2019	7,791,000	-	7,791,000	7,634,637	(156,363)	7,634,637	7,683,021
December 31, 2018	4,550,173	-	4,550,173	3,815,559	(734,614)	3,815,559	4,014,514
September 30, 2018	4,320,826	-	4,320,826	3,663,181	(657,645)	3,663,181	3,687,297
June 30, 2018	634,235	-	634,235	279,221	(355,014)	279,221	386,752
March 31, 2018	645,690	-	645,690	488,181	(157,509)	488,181	448,494
December 31, 2017	3,949,513	-	3,949,513	1,958,759	(1,990,754)	1,958,759	2,023,952
September 30, 2017	4,436,542	-	4,436,542	876,942	(3,559,600)	876,942	4,647,683
June 30, 2017	40,538,551	-	40,538,551	39,808,956	(729,595)	39,808,956	60,990,732
March 31, 2017	41,788,380	-	41,788,380	41,391,889	(396,491)	41,391,889	56,156,936
December 31, 2016	42,175,938	-	42,175,938	42,045,721	(130,217)	42,045,721	54,619,477
September 30, 2016	44,266,478	-	44,266,478	41,890,535	(2,375,942)	41,890,535	61,300,066
June 30, 2016	49,097,217	-	49,097,217	48,202,703	(894,514)	48,202,703	63,207,410
March 31, 2016	57,985,071	-	57,985,071	55,783,979	(2,201,092)	55,783,979	70,578,397
December 31, 2015	4,881,394	-	4,881,394	4,783,194	(98,200)	4,783,194	4,728,736
September 30, 2015	50,531,382	-	50,531,382	45,665,859	(4,865,524)	45,665,859	58,523,652
June 30, 2015	66,924,927	-	66,924,927	65,240,585	(1,684,341)	65,240,585	72,953,475
March 31, 2015	17,856,447	-	17,856,447	17,681,510	(174,937)	17,681,510	17,553,999
December 31, 2014	69,225,743	-	69,225,743	68,301,291	(924,452)	68,301,291	79,410,553
September 30, 2014	645,721	-	645,721	604,437	(41,284)	604,437	627,381
June 30, 2014	57,012,606	-	57,012,606	55,422,168	(1,590,438)	55,422,168	75,253,388
March 31, 2014	91,702,041	-	91,702,041	80,744,074	(10,957,967)	80,744,074	97,672,071
December 31, 2013	113,707,951	-	113,707,951	108,815,640	(4,892,311)	108,815,640	111,783,052
September 30, 2013	81,945,730	-	81,945,730	80,589,482	(1,356,248)	80,589,482	77,049,314
June 30, 2013	147,215,936	-	147,215,936	142,140,572	(5,075,365)	142,140,572	130,973,023
March 31, 2013	194,772,025	-	194,772,025	188,372,089	(6,399,936)	188,372,089	176,678,910
December 31, 2012	378,096,660	-	378,096,660	366,323,110	(11,773,550)	366,323,110	333,086,073
September 30, 2012	816,573,456	-	816,573,456	788,350,823	(28,222,633)	788,350,823	697,683,289
June 30, 2012	912,025,937	-	912,025,937	890,494,221	(21,531,716)	890,494,221	708,872,106
March 31, 2012	1,095,018,529	-	1,095,018,529	1,058,132,041	(36,886,488)	1,058,132,041	841,095,013
December 31, 2011	1,090,904,993	-	1,090,904,993	1,056,761,288	(34,143,705)	1,056,761,288	754,310,838
September 30, 2011	762,320,632	-	762,320,632	738,510,048	(23,810,584)	738,510,048	546,494,232
June 30, 2011	1,130,732,656	-	1,130,732,656	1,078,535,670	(52,196,986)	1,078,535,670	839,143,290
March 31, 2011	1,097,705,351	-	1,097,705,351	1,068,852,204	(28,853,147)	1,068,852,204	816,688,348
December 31, 2010	968,742,508	-	968,742,508	950,111,417	(18,631,091)	950,111,417	708,895,637
September 30, 2010	915,728,030	-	915,728,030	889,896,058	(25,831,972)	889,896,058	673,462,493
June 30, 2010	1,362,887,892	-	1,362,887,892	1,335,628,212	(27,259,681)	1,335,628,212	975,241,506
March 31, 2010	1,471,905,696	-	1,471,905,696	1,391,337,543	(80,568,153)	1,391,337,543	1,015,645,802
December 31, 2009	1,349,124,214	-	1,349,124,214	1,290,817,168	(58,307,047)	1,290,817,168	852,088,739
September 30, 2009	2,953,442,689	(106,853,708)	2,846,588,981	2,700,948,264	(145,640,717)	2,700,948,264	1,692,409,640
Totals		$ (106,853,708)			$ (653,623,481)		

The following is the impairment listing for loan-backed and structured securities for the three months ended March 31, 2020:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
05535DCF9	$ 3,012,907	$ -	$ 3,012,907	$ 2,862,429	$ (150,478)	$ 2,862,429	$ 2,528,432
24763LFY1	147,758	-	147,758	146,827	(931)	146,827	180,454

45071KDD3	575,329	-	575,329	510,787	(64,542)	510,787	491,576
07384YPP5	33,493	-	33,493	28,061	(5,431)	28,061	46,723
12667GKG7	93,290	-	93,290	83,622	(9,668)	83,622	98,905
17307GRU4	114,325	-	114,325	112,699	(1,625)	112,699	157,144
362290AC2	316,883	-	316,883	225,907	(90,976)	225,907	322,987
59020UW43	214,183	-	214,183	182,719	(31,463)	182,719	200,181
65535VRK6	716,497	-	716,497	699,498	(16,998)	699,498	646,333
75115DAH8	6,842	-	6,842	6,564	(279)	6,564	6,397
76112BUE8	181,578	-	181,578	148,845	(32,733)	148,845	129,998
79548KXQ6	187,063	-	187,063	182,973	(4,090)	182,973	137,728
92926UAC5	136,220	-	136,220	130,734	(5,486)	130,734	130,957
23332UBW3	46,195	-	46,195	32,143	(14,052)	32,143	24,852
12669GWN7	889,281	-	889,281	871,126	(18,155)	871,126	863,235
32051DCK6	88,205	-	88,205	86,848	(1,358)	86,848	89,678
362334CN2	14,634	-	14,634	11,177	(3,457)	11,177	13,996
466247K93	7,584	-	7,584	6,335	(1,249)	6,335	7,318
57645LAA2	18,017,521	-	18,017,521	13,868,050	(4,149,471)	13,868,050	18,607,055
Totals	$ 24,799,788	$ -	$ 24,799,788	$ 20,197,344	$ (4,602,443)	$ 20,197,344	$ 24,683,947

The following is the impairment listing for loan-backed and structured securities for the three months ended December 31, 2019:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
24763LFY1	$ 182,113	$ -	$ 182,113	$ 160,832	$ (21,281)	$ 160,832	$ 200,613
05535DAN4	1,930,918	-	1,930,918	1,855,207	(75,711)	1,855,207	1,598,238
07384YPP5	187,700	-	187,700	39,691	(148,009)	39,691	71,760
17307GRU4	164,558	-	164,558	133,524	(31,034)	133,524	229,670
18974BAN9	134,619	-	134,619	125,398	(9,221)	125,398	126,170
65535VRK6	797,949	-	797,949	712,007	(85,942)	712,007	774,700
79548KXQ6	207,254	-	207,254	192,282	(14,972)	192,282	113,588
85554NAG5	194,730	-	194,730	158,214	(36,515)	158,214	187,575
12669FXR9	117,999	-	117,999	114,307	(3,692)	114,307	101,165
23332UBW3	74,561	-	74,561	47,819	(26,742)	47,819	35,659
Totals	$ 3,992,400	$ -	$ 3,992,400	$ 3,539,281	$ (453,119)	$ 3,539,281	$ 3,439,138

The following is the impairment listing for loan-backed and structured securities for the three months ended September 30, 2019:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
12667F2A2	$ 642,800	$ -	$ 642,800	$ 484,346	$ (158,455)	$ 484,346	$ 68,241
32053LAA0	47,447	-	47,447	40,280	(7,167)	40,280	47,846
761118FM5	2,843,393	-	2,843,393	2,789,133	(54,260)	2,789,133	2,918,992
79548KXQ6	297,379	-	297,379	277,239	(20,140)	277,239	60,979
23332UBW3	78,084	-	78,084	76,934	(1,151)	76,934	43,636
576433H33	1,579,401	-	1,579,401	1,448,247	(131,155)	1,448,247	1,448,863
12669GWN7	1,037,688	-	1,037,688	957,205	(80,484)	957,205	936,853
17309FAE8	161,243	-	161,243	129,536	(31,707)	129,536	159,357
36298XAA0	10,097,887	-	10,097,887	8,887,246	(1,210,641)	8,887,246	8,841,272
92990GAE3	86,314	-	86,314	85,680	(634)	85,680	87,117
US74951PBV94	37,392	-	37,392	16,087	(21,305)	16,087	26,602
Totals	$ 16,909,029	$ -	$ 16,909,029	$ 15,191,932	$ (1,717,097)	$ 15,191,932	$ 14,639,756

The following is the impairment listing for loan-backed and structured securities for the three months ended June 30, 2019:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
61750MAB1	$ 4,942	$ -	$ 4,942	$ 4,899	$ (42)	$ 4,899	$ 4,344
18974BAN9	143,913	-	143,913	143,911	(2)	143,911	141,999

761118FM5	3,338,972	-	3,338,972	3,276,460	(62,512)	3,276,460	3,468,889
79548KXQ6	335,309	-	335,309	321,864	(13,445)	321,864	218,663
55274SAM3	114,173	-	114,173	79,608	(34,565)	79,608	119,029
57643QAE5	3,042,722	-	3,042,722	2,360,287	(682,436)	2,360,287	3,180,695
Totals	$ 6,980,030	$ -	$ 6,980,030	$ 6,187,029	$ (793,001)	$ 6,187,029	$ 7,133,620

The following is the impairment listing for loan-backed and structured securities for the three months ended March 31, 2019:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
61750MAB1	$ 5,275	$ -	$ 5,275	$ 4,933	$ (341)	$ 4,933	$ 4,989
65106FAG7	232,843	-	232,843	215,726	(17,118)	215,726	6,316
18974BAA7	285,889	-	285,889	270,801	(15,088)	270,801	278,616
18974BAN9	149,774	-	149,774	139,333	(10,441)	139,333	148,234
22541QQR6	1,569	-	1,569	-	(1,569)	-	1
32051GCF0	22,786	-	22,786	(6,720)	(29,507)	(6,720)	17,553
761118FM5	3,259,303	-	3,259,303	3,218,368	(40,935)	3,218,368	3,244,154
17309FAE8	200,512	-	200,512	200,501	(11)	200,501	208,828
466247UG6	467,713	-	467,713	452,359	(15,354)	452,359	459,812
57643QAE5	3,114,325	-	3,114,325	3,109,376	(4,949)	3,109,376	3,256,107
US74951PBV94	51,011	-	51,011	29,960	(21,051)	29,960	58,411
Totals	$ 7,791,000	$ -	$ 7,791,000	$ 7,634,637	$ (156,362)	$ 7,634,637	$ 7,683,021

The following is the impairment listing for loan-backed and structured securities for the three months ended December 31, 2018:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
65106FAG7	$ 205,885	$ -	$ 205,885	$ 17,668	$ (188,218)	$ 17,668	$ 21,031
18974BAA7	306,428	-	306,428	295,291	(11,137)	295,291	294,986
22541QQR6	28,742	-	28,742	(9,704)	(38,446)	(9,704)	1
32051GCF0	32,493	-	32,493	20,481	(12,012)	20,481	20,063
17309FAE8	203,743	-	203,743	202,326	(1,417)	202,326	201,875
57643QAE5	3,657,695	-	3,657,695	3,177,611	(480,084)	3,177,611	3,365,017
92990GAE3	115,186	-	115,186	111,886	(3,300)	111,886	111,541
Totals	$ 4,550,173	$ -	$ 4,550,173	$ 3,815,559	$ (734,614)	$ 3,815,559	$ 4,014,514

The following is the impairment listing for loan-backed and structured securities for the three months ended September 30, 2018:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
05535DCF9	$ 3,454,425	$ -	$ 3,454,425	$ 3,141,048	$ (313,377)	$ 3,141,048	$ 3,134,409
07384YPP5	321,829	-	321,829	148,884	(172,945)	148,884	132,968
07386HCP4	2,164	-	2,164	(6,255)	(8,418)	(6,255)	320
76110H4M8	1,715	-	1,715	(3,719)	(5,434)	(3,719)	641
79548KXQ6	423,086	-	423,086	383,222	(39,864)	383,222	292,015
939336Z48	117,607	-	117,607	-	(117,607)	-	126,945
Totals	$ 4,320,826	$ -	$ 4,320,826	$ 3,663,181	$ (657,645)	$ 3,663,181	$ 3,687,297

The following is the impairment listing for loan-backed and structured securities for the three months ended June 30, 2018:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
59020UW43	$ 337,732	$ -	$ 337,732	$ 271,686	$ (66,046)	$ 271,686	$ 354,508
76110H4M8	6,848	-	6,848	1,969	(4,879)	1,969	1,713
863579DV7	289,655	-	289,655	5,567	(284,089)	5,567	30,531
Totals	$ 634,235	$ -	$ 634,235	$ 279,221	$ (355,014)	$ 279,221	$ 386,752

The following is the impairment listing for loan-backed and structured securities for the three months ended March 31, 2018:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
07386HEN7	$ 43,711	$ -	$ 43,711	$ 2,334	$ (41,377)	$ 2,334	$ 1,609
79548KXQ6	520,764	-	520,764	476,293	(44,471)	476,293	365,994
45660NZY4	81,215	-	81,215	9,554	(71,661)	9,554	80,891
Totals	$ 645,690	$ -	$ 645,690	$ 488,181	$ (157,509)	$ 488,181	$ 448,494

The following is the impairment listing for loan-backed and structured securities for the three months ended December 31, 2017:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
03927RAA2	$ 2,886,563	$ -	$ 2,886,563	$ 1,464,907	$ (1,421,656)	$ 1,464,907	$ 1,481,241
03927RAB0	910,639	-	910,639	363,543	(547,096)	363,543	362,176
07386HCP4	7,995	-	7,995	1,386	(6,609)	1,386	2,673
12669GMS7	25,101	-	25,101	21,923	(3,177)	21,923	21,921
22541QQR6	21,202	-	21,202	12,504	(8,698)	12,504	16,106
2254W0NK7	97,695	-	97,695	94,495	(3,200)	94,495	139,833
86359ACG6	318	-	318	-	(318)	-	2
Totals	$ 3,949,513	$ -	$ 3,949,513	$ 1,958,759	$ (1,990,754)	$ 1,958,759	$ 2,023,952

The following is the impairment listing for loan-backed and structured securities for the three months ended September 30, 2017:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
22541NMA4	$ 42,273	$ -	$ 42,273	$ 41,434	$ (839)	$ 41,434	$ 41,095
22541NMB2	11,869	-	11,869	11,634	(234)	11,634	11,535
22541SSD1	12,232	-	12,232	20	(12,213)	20	5,978
52108MDP5	3,497,947	-	3,497,947	-	(3,497,947)	-	1,925,413
55274SAM3	167,196	-	167,196	153,991	(13,206)	153,991	179,429
76110W4J2	1,131	-	1,131	229	(902)	229	556
88157QAL2	686,945	-	686,945	660,921	(26,024)	660,921	2,125,943
89789KAC9	16,949	-	16,949	8,714	(8,235)	8,714	357,735
Totals	$ 4,436,542	$ -	$ 4,436,542	$ 876,942	$ (3,559,600)	$ 876,942	$ 4,647,683

The following is the impairment listing for loan-backed and structured securities for the three months ended June 30, 2017:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
76110H4M8	$ 4,413	$ -	$ 4,413	$ 2,326	$ (2,087)	$ 2,326	$ 4,073
86358RLG0	3,485	-	3,485	2,670	(815)	2,670	30,171
86359ACG6	16,324	-	16,324	2	(16,322)	2	2
88157QAL2	774,182	-	774,182	675,599	(98,583)	675,599	1,947,675
89789KAC9	17,294	-	17,294	8,920	(8,374)	8,920	356,047
77277LAF4	22,514,590	-	22,514,590	22,167,493	(347,097)	22,167,493	34,318,674
77277LAH0	1,135,088	-	1,135,088	1,118,159	(16,929)	1,118,159	2,738,435
77277LAJ6	16,073,175	-	16,073,175	15,833,787	(239,388)	15,833,787	21,595,653
Totals	$ 40,538,551	$ -	$ 40,538,551	$ 39,808,956	$ (729,595)	$ 39,808,956	$ 60,990,732

The following is the impairment listing for loan-backed and structured securities for the three months ended March 31, 2017:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
17307GH76	$ 274,894	$ -	$ 274,894	$ 44,730	$ (230,163)	$ 44,730	$ 152,777
22541QJR4	11,175	-	11,175	54	(11,122)	54	6,866
32051DCK6	182,177	-	182,177	160,728	(21,449)	160,728	179,180
55274SAM3	225,790	-	225,790	209,839	(15,951)	209,839	218,832
86358RA23	1,326,199	-	1,326,199	1,253,636	(72,563)	1,253,636	1,289,099
86359ACG6	6,287	-	6,287	49	(6,239)	49	2

US77277LAF40	22,537,014	-	22,537,014	22,514,590	(22,424)	22,514,590	31,699,907
US77277LAH06	1,136,182	-	1,136,182	1,135,088	(1,094)	1,135,088	2,662,526
US77277LAJ61	16,088,661	-	16,088,661	16,073,175	(15,486)	16,073,175	19,947,746
Totals	$ 41,788,380	$ -	$ 41,788,380	$ 41,391,889	$ (396,491)	$ 41,391,889	$ 56,156,936