

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY

CONDENSED STATUTORY FINANCIAL STATEMENTS

As of September 30, 2020 and December 31, 2019 and for the nine months ended
September 30, 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)

	September 30, 2020	December 31, 2019
	(\$ In Millions)	
Assets:		
Bonds	\$ 119,580	\$ 101,907
Preferred stocks	550	749
Common stocks – subsidiaries and affiliates	18,151	16,971
Common stocks – unaffiliated	981	1,185
Mortgage loans	28,095	27,473
Policy loans	15,499	14,725
Real estate	340	358
Partnerships and limited liability companies	9,183	9,012
Derivatives	25,348	12,064
Cash, cash equivalents and short-term investments	9,549	3,793
Other invested assets	897	2,036
Total invested assets	228,173	190,273
Investment income due and accrued	2,933	2,687
Net deferred income taxes	356	1,108
Other than invested assets	3,594	3,951
Total assets excluding separate accounts	235,056	198,019
Separate account assets	72,005	70,230
Total assets	\$ 307,061	\$ 268,249
Liabilities and Surplus:		
Policyholders' reserves	\$ 138,539	\$ 130,479
Liabilities for deposit-type contracts	17,932	15,297
Contract claims and other benefits	660	474
Policyholders' dividends	1,751	1,684
General expenses due or accrued	1,158	1,214
Federal income taxes	76	23
Asset valuation reserve	5,281	4,670
Repurchase agreements	5,143	3,834
Commercial paper	250	250
Collateral	6,436	3,285
Derivatives	19,313	9,608
Funds held under coinsurance	10,714	4,252
Other liabilities	5,190	4,056
Total liabilities excluding separate accounts	212,443	179,126
Separate account liabilities	72,005	70,230
Total liabilities	284,448	249,356
Surplus	22,613	18,893
Total liabilities and surplus	\$ 307,061	\$ 268,249

See notes to condensed statutory financial statements

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

	Nine Months Ended September 30,	
	2020	2019
	<u>(\$ In Millions)</u>	
Revenue:		
Premium income	\$ 19,999	\$ 16,472
Net investment income	5,500	5,369
Fees and other income	976	993
Total revenue	<u>26,475</u>	<u>22,834</u>
Benefits, expenses and other deductions:		
Policyholders' benefits	17,142	18,495
Change in policyholders' reserves	6,752	1,380
Change in group annuity reserves assumed	(696)	(1,004)
General insurance expenses	1,660	1,702
Commissions	811	771
State taxes, licenses and fees	201	204
Other deductions	270	213
Total benefits, expenses and other deductions	<u>26,140</u>	<u>21,761</u>
Net gain from operations before dividends and federal income taxes	335	1,073
Dividends to policyholders	<u>1,227</u>	<u>1,237</u>
Net loss from operations before federal income taxes	(892)	(164)
Federal income tax benefit	<u>(236)</u>	<u>(76)</u>
Net loss from operations	(656)	(88)
Net realized capital (losses) gains	<u>(394)</u>	<u>132</u>
Net (loss) income	<u>\$ (1,050)</u>	<u>\$ 44</u>

See notes to condensed statutory financial statements

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

	Nine Months Ended	
	September 30,	
	2020	2019
	(\$ In Millions)	
Surplus, beginning of year	\$ 18,893	\$ 15,610
Net increase/(decrease) due to:		
Net (loss) income	(1,050)	44
Change in net unrealized capital gains, net of tax	3,538	5,174
Change in net unrealized foreign exchange capital gains (losses), net of tax	200	(468)
Change in other net deferred income taxes	5	(47)
Change in nonadmitted assets	72	751
Change in asset valuation reserve	(611)	(1,760)
Change in reserve valuation basis	18	-
Change in surplus notes	1,537	-
Prior period adjustments	30	(57)
Other	(19)	(10)
Net increase	<u>3,720</u>	<u>3,627</u>
Surplus, end of period	<u>\$ 22,613</u>	<u>\$ 19,237</u>

See notes to condensed statutory financial statements

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

	Nine Months Ended September 30,	
	2020	2019
	<u>(\$ In Millions)</u>	
Cash from operations:		
Premium and other income collected	\$ 16,884	\$ 16,825
Net investment income	5,491	6,391
Benefit payments	(17,533)	(18,609)
Net transfers from separate accounts	1,706	3,692
Net receipts from group annuity reserves assumed	696	1,004
Commissions and other expenses	(2,766)	(2,743)
Dividends paid to policyholders	(1,163)	(1,183)
Federal and foreign income taxes recovered	101	328
Net cash from operations	<u>3,416</u>	<u>5,705</u>
Cash from investments:		
Proceeds from investments sold, matured or repaid:		
Bonds	15,073	16,608
Preferred and common stocks – unaffiliated	473	757
Common stocks – affiliated	8	5
Mortgage loans	2,335	1,774
Real estate	1	191
Partnerships and limited liability companies	830	667
Derivatives	1,828	1,181
Other	1,105	(301)
Total investment proceeds	<u>21,653</u>	<u>20,882</u>
Cost of investments acquired:		
Bonds	(27,945)	(19,637)
Preferred and common stocks – unaffiliated	(176)	(1,427)
Common stocks – affiliated	(120)	(148)
Mortgage loans	(3,334)	(4,213)
Real estate	(75)	(78)
Partnerships and limited liability companies	(1,056)	(902)
Derivatives	(345)	(259)
Other	690	121
Total investments acquired	<u>(32,361)</u>	<u>(26,543)</u>
Net increase in policy loans	(774)	(683)
Net cash used in investing activities	<u>(11,482)</u>	<u>(6,344)</u>
Cash from financing and miscellaneous sources:		
Net deposits (withdrawals) on deposit-type contracts	2,670	(358)
Net cash provided by surplus notes	697	-
Change in repurchase agreements	268	(856)
Change in collateral	3,153	931
Other cash provided	7,034	1,718
Net cash provided from financing and miscellaneous sources	<u>13,822</u>	<u>1,435</u>
Net change in cash, cash equivalents and short-term investments	5,756	796
Cash, cash equivalents and short-term investments:		
Beginning of year	3,793	4,318
End of period	<u>\$ 9,549</u>	<u>\$ 5,114</u>

See notes to condensed statutory financial statements

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

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 condensed statutory financial statements and notes as of September 30, 2020 and December 31, 2019, and for the nine months ended September 30, 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 \$137 million as of September 30, 2020 for a portion of its noncontrolling interests. 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.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
NOTES TO CONDENSED STATUTORY FINANCIAL STATEMENTS, continued
(UNAUDITED)

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 in force 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 London Inter-Bank Offered Rate (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, 51R 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. 51R for life premiums and SSAP No. 65 for high deductible policies. It was applicable only for the first and second quarters of 2020 and expired on September 29, 2020. 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 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 (TDR). 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

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the National Emergency or December 31, 2020. 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. 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, second and third quarters of 2020 and will expire in the fourth quarter of 2020. The Company has adopted this guidance and the adoption did not have a material impact on its financial statements.

In May 2020, the NAIC adopted modifications to SSAP No. 34. This guidance notes if investments have been impacted by forbearance or other modification provisions, a reporting entity shall assess whether the investment income has been earned in accordance with the modified terms. This guidance was applicable for the second quarter of 2020 and it expired on September 29, 2020. The Company has adopted this guidance and the adoption did not have a material impact on its financial statements.

In May 2020, the NAIC adopted modifications to SSAP Nos. 26R, 36, 43R and 103R. This guidance clarifies how to determine when restructuring or modification of certain debt investments due to COVID-19 are a TDR. The guidance also clarifies whether a modification that is not a TDR needs to be assessed as an exchange under SSAP No. 103R. This guidance has the same end date as the Coronavirus Aid, Relief, and Economic Security (CARES) Act and is effective for the specific purpose to provide practical expedients in assessing whether modifications in response to COVID-19 are insignificant under SSAP No. 36 and in assessing whether a change is substantive under SSAP No. 103R. The Company has adopted this guidance and the adoption did not have a material impact on its financial statements.

Future adoption of new accounting standards

In July 2020, the NAIC adopted modifications to SSAP No. 26R, *Accounting for Bond Tender Offers*, effective January 1, 2021. The modifications apply similar reporting for gains or losses due to a tender offer as previously adopted for calls. The difference between consideration and par is recognized as net investment income, while any difference between book value and par is recognized as realized gain or loss. The modifications are not expected to have a material effect on the Company's consolidated financial statements.

In July 2020, the NAIC adopted modifications to SSAP No. 32, *Preferred Stock*, effective January 1, 2021. The modifications define carrying value of redeemable preferred stock as a mortgized cost for NAIC 1-3 designations, the lower of a mortgized cost or fair value for NAIC 4-6 designations, and new fair value measurement for perpetual and mandatorily convertible preferred stock. They clarify when failure to meet certain dividends or redemption payments could trigger an impairment assessment, that preferred shares issued by joint ventures are included in the scope of this guidance, and clarifies scope related to sinking fund schedules, mandatory conversions, and various other features. They also clarify fair value would be capped by any currently effective call price. The revisions would impact the Company's current unaffiliated and affiliated perpetual preferred stock investments. The modifications are not expected to have a material effect on the Company's consolidated financial statements.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
NOTES TO CONDENSED STATUTORY FINANCIAL STATEMENTS, continued
(UNAUDITED)

4. Fair value of financial instruments

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

	September 30, 2020				
	Carrying Value	Fair Value	Level1	Level2	Level3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	\$ 4,273	\$ 5,302	\$ -	\$ 5,302	\$ -
All other governments	1,819	2,010	-	1,886	124
States, territories and possessions	466	541	-	541	-
Political subdivisions	457	534	-	534	-
Special revenue	6,780	7,863	-	7,853	10
Industrial and miscellaneous	99,857	107,213	110	61,593	45,510
Parent, subsidiaries and affiliates	5,928	6,168	-	-	6,168
Preferred stocks	550	575	1	-	574
Common stocks - subsidiaries and affiliates	333	333	158	-	175
Common stocks - unaffiliated	981	981	633	-	348
Mortgage loans - commercial	24,642	25,451	-	-	25,451
Mortgage loans - residential	3,453	3,450	-	-	3,450
Derivatives:					
Interest rate swaps	23,323	27,630	-	27,630	-
Options	543	543	78	465	-
Currency swaps	1,407	1,407	-	1,407	-
Forward contracts	68	68	-	68	-
Financial futures	7	7	7	-	-
Cash, cash equivalents and short-term investments	9,549	9,549	485	9,064	-
Separate account assets	72,005	72,005	47,655	23,139	1,211
Financial liabilities:					
Guaranteed interest contracts	12,579	13,159	-	-	13,159
Group annuity contracts and other deposits	19,575	21,888	-	-	21,888
Individual annuity contracts	10,290	12,601	-	-	12,601
Supplementary contracts	1,117	1,119	-	-	1,119
Repurchase agreements	5,143	5,143	-	5,143	-
Commercial paper	250	250	-	250	-
Derivatives:					
Interest rate swaps	19,020	20,624	-	20,624	-
Options	13	13	13	-	-
Currency swaps	165	165	-	165	-
Forward contracts	73	73	-	73	-
Credit default swaps	1	2	-	2	-
Financial futures	41	41	41	-	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of \$17,818 million.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
NOTES TO CONDENSED STATUTORY FINANCIAL STATEMENTS, continued
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	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.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
NOTES TO CONDENSED STATUTORY FINANCIAL STATEMENTS, continued
(UNAUDITED)

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

	September 30, 2020			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
Special revenue	\$ -	\$ 1	\$ -	\$ 1
Industrial and miscellaneous	110	172	99	381
Preferred stocks	-	-	18	18
Common stocks - subsidiaries and affiliates	158	-	175	333
Common stocks - unaffiliated	633	-	348	981
Derivatives:				
Interest rate swaps	-	23,323	-	23,323
Options	78	465	-	543
Currency swaps	-	1,407	-	1,407
Forward contracts	-	68	-	68
Financial futures	7	-	-	7
Separate account assets	47,655	23,139	1,211	72,005
Total financial assets carried at fair value	\$ 48,641	\$ 48,575	\$ 1,851	\$ 99,067
Financial liabilities:				
Derivatives:				
Interest rate swaps	\$ -	\$ 19,020	\$ -	\$ 19,020
Options	13	-	-	13
Currency swaps	-	165	-	165
Forward contracts	-	73	-	73
Financial futures	41	-	-	41
Total financial liabilities carried at fair value	\$ 54	\$ 19,258	\$ -	\$ 19,312

For the nine months ended September 30, 2020 and the year ended December 31, 2019, the Company did not have any financial instruments that were carried at net asset value as a practical expedient.

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NOTES TO CONDENSED STATUTORY FINANCIAL STATEMENTS, continued
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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 in the beginning fair value for the reporting period in which the changes occur.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
NOTES TO CONDENSED STATUTORY FINANCIAL STATEMENTS, continued
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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			Balance as of 09/30/20
								In	Out	Other	
(In Millions)											
Financial assets:											
Bonds:											
Industrial and miscellaneous	\$ 111	\$ -	\$ (15)	\$ 4	\$ 5	\$ -	\$ (3)	\$ 2	\$ (28)	\$ 23	\$ 99
Preferred stocks	13	-	(12)	7	-	-	-	-	-	10	18
Common stocks - subsidiaries and affiliates	120	-	(62)	40	78	-	(3)	-	-	2	175
Common stocks - unaffiliated	268	-	12	76	1	(6)	(3)	-	-	-	348
Separate account assets	966	20	1	232	-	(8)	-	-	-	-	1,211
Total financial assets	<u>\$ 1,478</u>	<u>\$ 20</u>	<u>\$ (76)</u>	<u>\$ 359</u>	<u>\$ 84</u>	<u>\$ (14)</u>	<u>\$ (9)</u>	<u>\$ 2</u>	<u>\$ (28)</u>	<u>\$ 35</u>	<u>\$ 1,851</u>

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

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.

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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:

	September 30, 2020			
	Carrying Value	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
(In Millions)				
U.S. government and agencies	\$ 4,273	\$ 1,030	\$ 1	\$ 5,302
All other governments	1,819	204	13	2,010
States, territories and possessions	466	75	-	541
Political subdivisions	457	77	-	534
Special revenue	6,780	1,092	9	7,863
Industrial and miscellaneous	99,857	8,453	1,097	107,213
Parent, subsidiaries and affiliates	5,928	241	1	6,168
Total	\$ 119,580	\$ 11,172	\$ 1,121	\$ 129,631

The September 30, 2020 gross unrealized losses exclude \$91 million of losses included in the carrying value. These losses include \$90 million from NAIC Class 6 bonds and \$1 million from residential mortgage-backed securities (RMBS) and commercial mortgage-backed securities (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.

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As of September 30, 2020, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of \$10,694 million. Securities in an unrealized loss position for less than 12 months had a fair value of \$7,302 million and unrealized losses of \$414 million. Securities in an unrealized loss position for greater than 12 months had a fair value of \$3,392 million and unrealized losses of \$154 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 nine months ended September 30, 2020 or 2019, that were reacquired within 30 days of the sale date.

Residential mortgage-backed exposure

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 September 30, 2020, RMBS had a total carrying value of \$2,779 million and a fair value of \$2,874 million, of which approximately 13%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of \$1,037 million and a fair value of \$1,072 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 nine months ended September 30, 2020, which were declared in 2019, and declared and paid \$300 million in dividends for the nine months ended September 30, 2019. MMHLLC declared \$66 million in dividends to MassMutual for the nine months ended September 30, 2020.

MassMutual contributed capital of \$64 million to MMHLLC for the nine months ended September 30, 2020 and \$282 million for the nine months ended September 30, 2019.

On September 30, 2020, MassMutual announced it will purchase, through an indirect, wholly owned subsidiary, an additional investment in Rothesay Holdco UK Limited (RHUK) for £1.39 billion. RHUK wholly owns Rothesay Life. The purchase will increase MassMutual's indirect ownership in Rothesay Life from 24.9% to 48.9% and is expected to close in the fourth quarter of 2020 subject to regulatory approvals.

C.M. Life, a wholly owned subsidiary, declared \$173 million of dividends to MassMutual for the six months ended June 30, 2020, which was paid in August 2020.

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

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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. Mass Mutual'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 are comprised of 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 are primarily 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:

	September 30, 2020		December 31, 2019	
	Carrying Value	Fair Value	Carrying Value	Fair Value
	(In Millions)			
Commercial mortgage loans:				
Primary lender	\$ 24,552	\$ 25,360	\$ 24,163	\$ 25,090
Mezzanine loans	90	91	-	-
Total commercial mortgage loans	24,642	25,451	24,163	25,090
Residential mortgage loans:				
FHA insured and VA guaranteed	2,657	2,683	2,590	2,581
Other residential loans	796	767	720	723
Total residential mortgage loans	3,453	3,450	3,310	3,304
Total mortgage loans	\$ 28,095	\$ 28,901	\$ 27,473	\$ 28,394

As of September 30, 2020 and December 31, 2019, the loan-to-value ratios of 99% of the Company's commercial mortgage loans were less than 81%.

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As of September 30, 2020, the Company had 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.

The following presents a summary of the Company's impaired mortgage loans as of September 30, 2020:

	September 30, 2020				
	Average	Unpaid	Valuation	Interest	
	Carrying	Carrying	Principal	Allowanc	Income
	Value	Value	Balance	e	Income
	(In Millions)				
With allowance recorded:					
Commercial mortgage loans:					
Primary lender	\$ 27	\$ 41	\$ 55	\$ (28)	\$ 1
Total	27	41	55	(28)	1
With no allowance recorded:					
Commercial mortgage loans:					
Primary lender	33	39	45	-	1
Total	33	39	45	-	1
Total impaired commercial mortgage loans	\$ 60	\$ 80	\$ 100	\$ (28)	\$ 2

The Company did not hold any impaired mortgage loans subject to a participant or co-lender mortgage loan agreement with a unilateral mortgage loan foreclosure restriction as of September 30, 2019.

The following presents changes in the valuation allowance recorded for the Company's commercial mortgage loans:

	Nine Months Ended	
	September 30,	
	2020	2019
	Primary Lender	
	(In Millions)	
Beginning balance	\$ -	\$ -
Additions	(37)	-
Decreases	-	-
Write-downs	9	-
Ending balance	\$ (28)	\$ -

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d. Partnerships and limited liability companies

The carrying value of partnership and LLC holdings by annual statement category were:

	September 30, 2020	December 31, 2019
	(In Millions)	
Joint venture interests:		
Common stocks - subsidiaries and affiliates	\$ 2,735	\$ 3,130
Common stocks - unaffiliated	2,432	2,098
Real estate	1,248	1,183
Bonds/preferred stock	1,066	1,064
Other	315	274
LIHTCs	210	242
Mortgage loans	786	673
Surplus notes	391	348
Total	\$ 9,183	\$ 9,012

In the third quarter of 2020, there was a decrease in carrying value of an affiliated partnership and LLC of \$245 million, which included an other-than-temporary impairment (OTTI) of \$257 million from one investment.

e. 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 replicated synthetic investments. These replicated synthetic investments are created when they are economically more attractive than the actual instrument or when similar instruments are unavailable. Replicated synthetic investments are created either to hedge and reduce the Company's credit exposure or to create an investment in a particular asset. The Company held replicated synthetic investments with a notional amount of \$20,339 million as of September 30, 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

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from counterparties, reduces the Company's credit exposure.

Net collateral pledged by the counterparties was \$7,874 million as of September 30, 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 \$104 million as of September 30, 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 \$558 million as of September 30, 2020 and \$412 million as of December 31, 2019.

The Company had the right to rehypothecate or repledge securities totaling \$2,387 million of the \$7,874 million as of September 30, 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 September 30, 2020 or December 31, 2019.

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

	September 30, 2020			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	\$ 23,323	\$ 115,905	\$ 19,020	\$ 114,650
Options	543	18,626	13	6
Currency swaps	1,407	12,268	165	4,165
Forward contracts	68	6,057	73	5,267
Credit default swaps	-	5	1	95
Financial futures	7	445	41	2,649
Total	\$ 25,348	\$ 153,306	\$ 19,313	\$ 126,832
	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 \$26,823 million for the nine months ended September 30, 2020 and \$11,765 million for the nine months ended September 30, 2019. The average fair value of outstanding derivative liabilities was \$19,916 million for the nine months ended September 30, 2020 and \$7,976 million for the nine months ended September 30, 2019.

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

	September 30, 2020	December 31, 2019
(In Millions)		
Due in one year or less	\$ -	\$ 9
Due after one year through five years	-	1,210
Due after five years through ten years	100	-
Total	<u>\$ 100</u>	<u>\$ 1,219</u>

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:

	Nine Months Ended September 30,			
	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	\$ 318	\$ 2,857	\$ 17	\$ 318
Currency swaps	137	574	23	788
Options	500	(61)	(13)	(104)
Credit default swaps	8	-	13	-
Interest rate caps and floors	-	-	-	(6)
Forward contracts	(101)	142	340	(20)
Financial futures	539	74	735	(264)
Total	<u>\$ 1,401</u>	<u>\$ 3,586</u>	<u>\$ 1,115</u>	<u>\$ 712</u>

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

	September 30, 2020			December 31, 2019		
	Derivative Assets	Derivative Liabilities	Net	Derivative Assets	Derivative Liabilities	Net
(In Millions)						
Gross	\$ 25,348	\$ 19,313	\$ 6,035	\$ 12,064	\$ 9,608	\$ 2,456
Due and accrued	949	1,957	(1,008)	807	1,894	(1,087)
Gross amounts offset	(20,682)	(20,682)	-	(9,458)	(9,458)	-
Net asset	5,615	588	5,027	3,413	2,044	1,369
Collateral posted	(8,822)	(948)	(7,874)	(4,407)	(2,137)	(2,270)
Net	<u>\$ (3,207)</u>	<u>\$ (360)</u>	<u>\$ (2,847)</u>	<u>\$ (994)</u>	<u>\$ (93)</u>	<u>\$ (901)</u>

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f. Net investment income

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

	Nine Months Ended September 30,	
	2020	2019
	(In Millions)	
Bonds	\$ 3,302	\$ 3,304
Preferred stocks	14	18
Common stocks - subsidiaries and affiliates	238	300
Common stocks - unaffiliated	29	29
Mortgage loans	910	796
Policy loans	710	687
Real estate	65	96
Partnerships and limited liability companies	249	338
Derivatives	344	260
Cash, cash equivalents and short-term investments	88	59
Other	36	40
Subtotal investment income	5,985	5,927
Amortization of the IMR	40	16
Investment expenses	(525)	(574)
Net investment income	\$ 5,500	\$ 5,369

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g. Net realized capital (losses) gains

Net realized capital (losses) gains, which include OTTI and are net of deferral to the IMR, comprised the following:

	Nine Months Ended September 30,	
	2020	2019
	<u>(In Millions)</u>	
Bonds	\$ (55)	\$ 11
Preferred stocks	(20)	-
Common stocks - subsidiaries and affiliates	1	1
Common stocks - unaffiliated	(112)	24
Mortgage loans	(58)	1
Real estate	(30)	33
Partnerships and limited liability companies	(74)	(41)
Derivatives	1,401	1,115
Other	37	(14)
Net realized capital gains before federal and state taxes and deferral to the IMR	<u>1,090</u>	<u>1,130</u>
Net federal and state tax expense	(178)	(109)
Net realized capital gains before deferral to the IMR	912	1,021
Net after tax (gains) deferred to the IMR	<u>(1,306)</u>	<u>(889)</u>
Net realized capital (losses) gains	<u>\$ (394)</u>	<u>\$ 132</u>

The IMR liability balance was \$1,727 million as of September 30, 2020 and \$438 million as of December 31, 2019 and was included in other liabilities on the Condensed Statutory Statements of Financial Position.

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

	Nine Months Ended September 30,	
	2020	2019
	<u>(In Millions)</u>	
Bonds	\$ (121)	\$ (85)
Common stocks - unaffiliated	(80)	(8)
Mortgage loans	(12)	-
Partnerships and limited liability companies	(78)	(47)
Total OTTI	<u>\$ (291)</u>	<u>\$ (140)</u>

The Company recognized OTTI of \$8 million for the nine months ended September 30, 2020 and \$3 million for the nine months ended September 30, 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.

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6. Federal income taxes

In response to the COVID-19 pandemic, the 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.

On June 9, 2020, MassMutual issued a \$1,000 million funding agreement with a 0.85% fixed rate and a 3-year maturity.

On August 17, 2020, MassMutual issued a \$580 million funding agreement with a 0.76% fixed rate and a 5-year maturity.

On August 28, 2020, MassMutual issued a \$400 million funding agreement with a 0.48% fixed rate and a 3-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		347
Paid guarantee benefits		(6)
Liability as of September 30, 2020	\$	925

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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.

	September 30, 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	\$ 18,067	\$ 54	65	\$ 18,345	\$ 40	65
GMIB Basic	656	34	70	718	28	69
GMIB Plus	2,489	583	68	2,906	532	68
GMAB	2,285	7	61	2,544	2	60
GMWB	137	13	72	151	10	71

As of September 30, 2020, the GMDB account value above consists of \$3,910 million within the general account and \$14,157 million within separate accounts that includes \$4,146 million of modified coinurance (MODCO) 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 MODCO assumed.

9. Reinsurance

For the nine months ended September 30, 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.

On July 1, 2020, MassMutual recaptured a coinsurance agreement and ceded the recaptured in force business to a subsidiary of the initial reinsurer through a coinsurance funds withheld agreement. This resulted in an increase of invested assets of \$4,986 million with an offsetting funds withheld liability in the Condensed Statutory Statements of Financial Position and a decrease in premium and other income collected with an offset in other cash provided from financing and miscellaneous sources in the Condensed Statutory Statements of Cash Flows.

On September 8, 2020, the Company entered into a definitive agreement in which the Company's retirement plan business will be ceded to Empower Retirement through a series of reinsurance agreements for a ceding commission of \$2,350 million, subject to adjustments at closing. Pending regulatory approval, the transaction is expected to close during the fourth quarter of 2020.

10. Withdrawal characteristics

No significant changes.

11. Debt

No significant changes.

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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:

	Nine Months Ended September 30,			
	2020	2019	2020	2019
	Pension Benefits		Other Postretirement Benefits	
	(In Millions)			
Service cost	\$ 86	\$ 83	\$ 11	\$ 10
Interest cost	73	88	8	10
Expected return on plan assets	(132)	(120)	-	-
Amortization of unrecognized net actuarial and other losses	38	42	1	(1)
Amortization of unrecognized prior service cost	-	-	(4)	(4)
Total net periodic cost	<u>\$ 65</u>	<u>\$ 93</u>	<u>\$ 16</u>	<u>\$ 15</u>

13. Employee compensation plans

No significant changes.

14. Surplus notes

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

On June 26, 2020, MassMutual executed a drawdown of \$600 million from its pre-capitalized surplus notes (P-Caps) facility and received \$837 million in market value proceeds, at a fixed 5.077% coupon rate, maturing in 2069 and callable beginning in 2049. As of September 30, 2020, there was a remaining capacity of raising \$200 million of capital through the P-Caps facility.

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The following table summarizes the surplus notes issued and outstanding as of September 30, 2020:

Issue Date	Face Amount	Carrying Value	Interest Rate	Maturity Date	Scheduled Interest Payment Dates
	(\$ In Millions)				
11/15/1993	\$ 250	\$ 250	7.625%	11/15/2023	May 15 & Nov 15
03/01/1994	100	100	7.500%	03/01/2024	Mar 1 & Sept 1
05/12/2003	193	193	5.625%	05/15/2033	May 15 & Nov 15
06/01/2009	130	128	8.875%	06/01/2039	Jun 1 & Dec 1
01/17/2012	263	263	5.375%	12/01/2041	Jun 1 & Dec 1
04/15/2015	258	254	4.500%	04/15/2065	Apr 15 & Oct 15
03/23/2017	475	471	4.900%	04/01/2077	Apr 1 & Oct 1
10/11/2019	838	582	3.729%	10/15/2070	Apr 15 & Oct 15
04/16/2020	700	697	3.375%	04/15/2050	Apr 15 & Oct 15
06/26/2020	600	835	5.077%	02/15/2069	Apr 15 & Oct 15
Total	<u>\$ 3,807</u>	<u>\$ 3,773</u>			

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 nine months ended September 30, 2020 and 2019. Accordingly, the Company has excluded these non-cash activities from the Condensed Statutory Statements of Cash Flows for the nine months ended September 30, 2020 and 2019.

	Nine Months Ended September 30,	
	2020	2019
	(In Millions)	
Premium income recognized for individual annuity contracts	\$ 3,736	\$ -
Bonds received as consideration for individual annuity contracts	(3,720)	-
Premium income recognized for group annuity contracts	924	599
Bonds received as consideration for group annuity contracts	(924)	(642)
Surplus notes issued in exchange for bonds	837	-
Bonds received as consideration for surplus notes	(837)	-
Bond conversions and refinancing	584	673
Transfer of mortgage loans to partnerships and LLCs	353	95
Stock conversion	62	64
Assets received in-kind for bond maturity	57	-
Change in market value of COLI	40	128
Net investment income payment in-kind bonds	8	5
Preferred stock received as consideration for individual annuity contracts	(1)	-
Partnerships and LLCs received as consideration for individual annuity contracts	(15)	-
Dividend reinvestment	-	3

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. The 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.

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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 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.

Political Uncertainties

Political events, domestically or internationally, may directly or indirectly trigger or exacerbate risks related to product offerings, profitability, or any of the risk factors described above. Whether those underlying risk factors are driven by politics or not, the Company's dynamic approach to managing risks enables management to identify risks, internally and externally, develop mitigation plans, and respond to risks in an attempt to proactively reduce the potential impact of each underlying risk factor on the Company.

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

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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.

In connection with the May 24, 2019 sale of OAC to Invesco, Invesco has identified an accounting matter related to four Master Limited Partnership funds managed by a subsidiary of OAC prior to the sale that Invesco has stated may result in an indemnification claim against MassMutual under the terms of the acquisition agreement. Under the terms of the agreement, MassMutual may be liable to Invesco under the acquisition agreement for a portion of any actual losses incurred by Invesco in excess of \$173 million and up to a cap of \$575 million. There are currently considerable uncertainties as to the nature, scope and amount of the potential losses for which Invesco may seek indemnity. In addition to the \$173 million deductible, it is uncertain whether the indemnification obligations set forth in the acquisition agreement would apply to this situation and MassMutual believes it has a number of defenses available that may mitigate its exposure to any losses claimed by Invesco should such obligations apply. However, the outcome of any indemnification dispute (including any resulting litigation), should Invesco assert such a claim, and its potential impact on MassMutual's financial position cannot be foreseen with certainty at this time.

17. Related party transactions

In March 2020, MassMutual contributed capital of \$37 million to MassMutual Mortgage Lending LLC.

In April 2020, MassMutual contributed capital of \$15 million to MassMutual MCAM Insurance Company, Inc.

In May 2020, MassMutual transferred \$335 million of mortgage loans to Barings Multifamily TEBS 2020 LLC. Subsequently, MassMutual received a \$288 million return of capital distribution.

In June 2020, Insurance Road LLC issued a return of capital of \$90 million to MassMutual for the six months ended June 30, 2020, which was paid in August 2020.

In September 2020, MassMutual Retirement Services LLC paid a \$50 million dividend to MassMutual.

18. Subsequent events

Management of the Company has evaluated subsequent events through November 13, 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 October 9, 2020, MassMutual issued a \$750 million funding agreement with a 1.55% fixed rate and a 10-year maturity.

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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
September 30, 2020	\$ 21,375,383	\$ -	\$ 21,375,383	\$ 19,160,250	\$ (2,215,134)	\$ 19,160,250	\$ 18,862,027
June 30, 2020	10,180,123	-	10,180,123	8,992,610	(1,187,513)	8,992,610	9,249,851
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)			\$ (657,026,128)		

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The following is the impairment listing for loan-backed and structured securities for the three months ended September 30, 2020:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
US05618HAE53	\$ 555,162	\$ -	\$ 555,162	\$ 387,040	\$ (168,122)	\$ 387,040	\$ 162,575
00442FAB8	144,957	-	144,957	79,275	(65,682)	79,275	112,060
05535DCF9	2,755,413	-	2,755,413	2,649,186	(106,228)	2,649,186	2,553,142
46630KAA4	191,718	-	191,718	184,342	(7,376)	184,342	179,699
61749BAB9	105,432	-	105,432	91,620	(13,812)	91,620	88,204
61750MAB1	4,837	-	4,837	4,672	(165)	4,672	3,421
92926SAB2	604	-	604	588	(16)	588	438
07384YPP5	12,990	-	12,990	9,466	(3,524)	9,466	35,174
073879QF8	45,111	-	45,111	43,889	(1,222)	43,889	39,772
17307GRU4	104,250	-	104,250	55,590	(48,659)	55,590	91,680
18974BAA7	215,833	-	215,833	212,231	(3,602)	212,231	183,053
18974BAN9	106,359	-	106,359	104,851	(1,507)	104,851	97,631
9393365V1	399,194	-	399,194	394,263	(4,932)	394,263	364,935
23332UBW3	31,650	-	31,650	29,218	(2,432)	29,218	22,244
12669GWN7	849,557	-	849,557	799,224	(50,333)	799,224	782,638
12669GXW6	244,251	-	244,251	233,647	(10,604)	233,647	223,233
32051DCK6	79,208	-	79,208	61,819	(17,389)	61,819	82,998
36298XAA0	7,738,893	-	7,738,893	7,511,130	(227,763)	7,511,130	7,120,125
36298XAB8	7,666,120	-	7,666,120	6,250,751	(1,415,369)	6,250,751	6,539,292
45660LY94	13,115	-	13,115	6,394	(6,721)	6,394	26,528
74951PBT4	110,729	-	110,729	51,052	(59,676)	51,052	153,185
Totals	\$ 21,375,383	\$ -	\$ 21,375,383	\$ 19,160,250	\$ (2,215,134)	\$ 19,160,250	\$ 18,862,027

The following is the impairment listing for loan-backed and structured securities for the three months ended June 30, 2020:

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
17307GRU4	\$ 107,326	\$ -	\$ 107,326	\$ 77,392	\$ (29,934)	\$ 77,392	\$ 160,449
18974BAA7	245,427	-	245,427	235,230	(10,197)	235,230	201,416
18974BAN9	119,509	-	119,509	114,571	(4,938)	114,571	107,924
362290AC2	220,776	-	220,776	219,541	(1,235)	219,541	307,360
79548KXQ6	172,175	-	172,175	170,007	(2,168)	170,007	130,248
855541AC2	508,940	-	508,940	384,558	(124,383)	384,558	460,800
9393365V1	433,313	-	433,313	415,261	(18,053)	415,261	356,247
45660LY94	28,987	-	28,987	13,258	(15,729)	13,258	21,174
57643QAE5	2,203,118	-	2,203,118	1,819,560	(383,558)	1,819,560	2,367,000
74951PBT4	260,811	-	260,811	143,231	(117,579)	143,231	157,616
86359DMC8	5,799,490	-	5,799,490	5,333,524	(465,966)	5,333,524	4,907,737
92990GAE3	80,251	-	80,251	66,477	(13,773)	66,477	71,880
Totals	\$ 10,180,123	\$ -	\$ 10,180,123	\$ 8,992,610	\$ (1,187,513)	\$ 8,992,610	\$ 9,249,851

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

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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

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
NOTES TO CONDENSED STATUTORY FINANCIAL STATEMENTS, continued
(UNAUDITED)

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	\$ 279,222	\$ (355,014)	\$ 279,222	\$ 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

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY
NOTES TO CONDENSED STATUTORY FINANCIAL STATEMENTS, continued
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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