MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES

INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS

As of March 31, 2023 and December 31, 2022 and for the three months ended March 31, 2023 and 2022

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES
INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS
(UNAUDITED)

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MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES
INTERIM CONSOLIDATED STATUTORY STATEMENTS OF OPERATIONS
(UNAUDITED)

	March 31, 2023	December 31, 2022
	(In Millions)	
Assets:		
Bonds	$ 142,620	$ 140,394
Preferred stocks	373	458
Common stocks – subsidiaries and affiliates	22,784	22,926
Common stocks – unaffiliated	1,623	1,479
Mortgage loans	25,721	25,892
Policy loans	17,646	17,294
Real estate	348	355
Partnerships and limited liability companies	12,882	12,468
Derivatives	19,814	22,756
Cash, cash equivalents and short-term investments	5,908	5,737
Other invested assets	2,330	2,199
Total invested assets	252,049	251,958
Investment income due and accrued	4,481	4,332
Federal income taxes	-	262
Net deferred income taxes	1,512	1,254
Other than invested assets	4,266	4,236
Total assets excluding separate accounts	262,308	262,042
Separate account assets	60,623	59,537
Total assets	$ 322,931	$ 321,579
Liabilities and Surplus:		
Policyholders' reserves	$ 160,358	$ 157,063
Liabilities for deposit-type contracts	18,841	18,170
Contract claims and other benefits	826	702
Policyholders' dividends	1,957	1,927
General expenses due or accrued	818	1,108
Federal income taxes	92	-
Asset valuation reserve	5,559	5,774
Repurchase agreements	3,017	3,042
Commercial paper	249	250
Collateral	2,927	4,268
Derivatives	11,985	14,483
Funds held under coinsurance	22,553	21,916
Other liabilities	5,600	5,528
Total liabilities excluding separate accounts	234,782	234,231
Separate account liabilities	60,490	59,407
Total liabilities	295,272	293,638
Surplus	27,659	27,941
Total liabilities and surplus	$ 322,931	$ 321,579

See accompanying notes to interim consolidated statutory financial statements

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES
INTERIM CONSOLIDATED STATUTORY STATEMENTS OF OPERATIONS
(UNAUDITED)

	Three Months Ended March 31, 2023	2022
	(In Millions)	
Revenue:		
Premium income	$ 5,524	$ 5,215
Net investment income	2,786	2,008
Fees and other income	258	262
Total revenue	8,568	7,485
Benefits, expenses and other deductions:		
Policyholders' benefits	3,739	3,839
Change in policyholders' reserves	2,864	2,196
General insurance expenses	517	511
Commissions	333	322
State taxes, licenses and fees	90	99
Other deductions	288	160
Total benefits and expenses	7,831	7,127
Net gain from operations before dividends and federal income taxes	737	358
Dividends to policyholders	443	419
Net gain (loss) from operations before federal income taxes	294	(61)
Federal income tax expense	173	40
Net gain (loss) from operations	121	(101)
Net realized capital losses	(360)	(118)
Net loss	$ (239)	$ (219)

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES
INTERIM CONSOLIDATED STATUTORY STATEMENTS OF CASH FLOWS
(UNAUDITED)

	Three Months Ended March 31, 2023	Three Months Ended March 31, 2022
	(In Millions)	
Surplus, beginning of year	$ 27,941	$ 26,979
Net (decrease)/increase due to:		
Net loss	(239)	(219)
Change in net unrealized capital (losses) gains, net of tax	(550)	547
Change in net unrealized foreign exchange capital gains (losses), net of taxes	133	(364)
Change in other net deferred income taxes	241	157
Change in nonadmitted assets	(106)	(9)
Change in asset valuation reserve	215	228
Change in surplus notes	(25)	(25)
Prior period adjustments	31	-
Other	18	(33)
Net (decrease)/increase	(282)	282
Surplus, end of period	$ 27,659	$ 27,261

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES
INTERIM CONSOLIDATED STATUTORY STATEMENTS OF CASH FLOWS
(UNAUDITED)

	Three Months Ended March 31, 2023	Three Months Ended March 31, 2022
	($ In Millions)	
Cash from operations:		
Premium and other income collected	$ 6,048	$ 5,771
Net investment income	3,005	2,356
Benefit payments	(3,712)	(3,903)
Net transfers from separate accounts	298	423
Commissions and other expenses	(1,454)	(1,554)
Dividends paid to policyholders	(418)	(401)
Federal and foreign income taxes recovered	206	(2)
Net cash provided from operations	3,973	2,690
Cash from investments:		
Proceeds from investments sold, matured or repaid:		
Bonds	4,845	8,362
Preferred and common stocks – unaffiliated	21	90
Common stocks – affiliated	-	1
Mortgage loans	884	1,480
Real estate	-	97
Partnerships and limited liability companies	79	248
Derivatives	(63)	(307)
Other	(109)	(269)
Total investment proceeds	5,657	9,702
Cost of investments acquired:		
Bonds	(6,935)	(10,680)
Preferred and common stocks – unaffiliated	(71)	(128)
Common stocks – affiliated	(190)	(95)
Mortgage loans	(658)	(761)
Real estate	(1)	(14)
Partnerships and limited liability companies	(550)	(779)
Derivatives	(26)	(41)
Other	488	289
Total investments acquired	(7,943)	(12,209)
Net increase in policy loans	(352)	(74)
Net cash used in investing activities	(2,638)	(2,581)
Cash from financing and miscellaneous sources:		
Net deposits on deposit-type contracts	595	910
Cash provided by surplus note issuance	(25)	(25)
Change in repurchase agreements	(240)	(319)
Change in collateral	(1,469)	(2,314)
Other cash (used) provided	(25)	1,350
Net cash applied to financing and miscellaneous sources	(1,164)	(398)
Net change in cash, cash equivalents and short-term investments	171	(289)
Cash, cash equivalents and short-term investments:		
Beginning of year	5,737	6,210
End of period	$ 5,908	$ 5,921

See accompanying notes to interim consolidated statutory financial statements

1. Nature of operations

Massachusetts Mutual Life Insurance Company (MassMutual), a mutual life insurance company domiciled in the Commonwealth of Massachusetts, and its domestic life insurance subsidiaries domiciled in the State of Connecticut (collectively, the Company), provide individual and group life insurance, disability insurance (DI), 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), MassMutual Strategic Distributors (MMSD), Digital Distribution (DD), Institutional Solutions (IS) and Worksite distribution channels.

MMFA is a sales force of financial professionals that operate in the U.S. MMFA sells individual life, individual annuities, hybrid life and long term care (LTC) and DI. The Company's MMSD channel sells life insurance, disability, annuity, and hybrid life and LTC solutions through a network of third-party distribution partners. The Company's DD channel sells individual life and supplemental health insurance primarily through digital media, search engine optimization and search engine marketing. The Company's IS distribution channel places group annuities, life insurance and GIC primarily through retirement advisory firms, actuarial consulting firms, investment banks, insurance benefit advisors and investment management companies. The Company's Worksite channel works with advisors and employers across the country to provide American workers with voluntary and executive benefits such as group whole life, critical illness, accident insurance and DI, through the workplace.

2. Summary of significant accounting policies

a. Basis of presentation

These interim consolidated statutory financial statements include MassMutual and its wholly-owned U.S. domiciled life insurance subsidiary C.M. Life Insurance Company (C.M. Life), and C.M. Life's wholly-owned U.S. domiciled life insurance subsidiary, MML Bay State Life Insurance Company. All intercompany transactions and balances for these consolidated entities have been eliminated. Other subsidiaries and affiliates are accounted for under the equity method in accordance with statutory accounting practices. Statutory financial statements filed with regulatory authorities are not presented on a consolidated basis.

The interim consolidated 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; and for the wholly-owned U.S. domiciled life insurance subsidiaries, the State of Connecticut Insurance Department.

The interim consolidated statutory financial statements and notes as of March 31, 2023 and December 31, 2022 and for the three months ended March 31, 2023 and 2022 are unaudited. The Interim Consolidated Statutory Statement of Financial Position as of December 31, 2022 has been derived from the audited consolidated financial statements at that date, but do not include all of the information and footnotes required by statutory accounting practices for complete financial statements. These interim consolidated 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 interim consolidated statutory financial statements and notes should be read in conjunction with the consolidated statutory financial statements and notes thereto included in the Company's 2022 audited yearend financial statements as these interim consolidated statutory financial statements disclose only significant changes from yearend 2022. The results of operations for the interim periods should not be considered indicative of results to be expected for the full year.

For the full description of accounting policies, see *Note 2. "Summary of significant accounting policies"* of Notes to Consolidated Statutory Financial Statements included in the Company's 2022 audited consolidated yearend financial statements.

b. Common stocks - subsidiaries and affiliates

Common stocks of unconsolidated subsidiaries, primarily MassMutual Holding LLC (MMHLLC), Glidepath Holdings Inc. (Glidepath) and MM Investment Holding (MMIH), are accounted for using the statutory equity method. The Company accounts for the value of MMHLLC at its underlying U.S. generally accepted accounting principles (U.S. GAAP) equity value less adjustments for the limited statutory basis of accounting related to foreign insurance subsidiaries and controlled affiliates entities as well as an adjustment of $1,611 million as of March 31, 2023 for a portion of its noncontrolling interests. Glidepath is valued on its underlying GAAP equity with adjustment to recognize its investment in MassMutual Ascend Life Insurance Company (formerly known as Great American Life Insurance Company) and other subsidiaries and affiliated entities (MM Ascend) based on MM Ascend's underlying statutory surplus, adjusted for any unamortized goodwill that would have been recognized under the statutory purchase method. Operating results, less dividends declared, for MMHLLC, Glidepath and MMIH are reflected as net unrealized capital gains in the Statutory Statements of Changes in Surplus. Dividends declared from MMHLLC, Glidepath and MMIH are recorded in net investment income when declared and are limited to MMHLLC, Glidepath and MMIH'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.

3. New accounting standards

Adoption of new accounting standards

In June 2022, the NAIC adopted modifications to SSAP No. 25, Affiliates and Other Related Parties and SSAP No. 43R, Loan-Backed and Structured Securities, effective December 31, 2022. The modifications clarify application of the existing affiliate definition and incorporate disclosure requirements for all investments that involve related parties, regardless of whether they meet the affiliate definition. The revisions to SSAP No. 43R also included additional clarifications that the investments from any arrangements that results in direct or indirect control, which include but are not limited to control through a servicer, shall be reported as affiliated investments. The modifications did not have a material effect on the Company's financial statements.

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, 2023				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	$ 4,698	$ 4,523	$ -	$ 4,523	$ -
All other governments	1,615	1,394	-	1,335	59
States, territories and possessions	260	260	-	260	-
Political subdivisions	417	411	-	411	-
Special revenue	4,304	4,333	-	4,327	6
Industrial and miscellaneous	122,955	112,957	56	49,230	63,671
Parent, subsidiaries and affiliates	8,371	7,737	-	1,141	6,596
Preferred stocks	373	380	65	-	315
Common stocks - subsidiaries and affiliates	965	965	361	-	604
Common stocks - unaffiliated	1,623	1,623	675	1	947
Mortgage loans - commercial	21,115	19,747	-	-	19,747
Mortgage loans - residential	4,606	4,334	-	-	4,334
Derivatives:					
Interest rate swaps	15,903	16,027	-	16,027	-
Options	569	569	21	548	-
Currency swaps	3,107	3,109	-	3,109	-
Forward contracts	84	84	-	84	-
Credit default swaps	-	1	-	1	-
Financial futures	151	151	151	-	-
Cash, cash equivalents and short-term investments	5,908	5,908	399	5,509	-
Separate account assets	60,623	60,547	38,465	20,375	1,707
Financial liabilities:					
GICs	15,368	14,692	-	-	14,692
Group annuity contracts and other deposits	2,233	1,974	-	-	1,974
Individual annuity contracts	21,319	20,930	-	-	20,930
Supplementary contracts	1,130	1,131	-	-	1,131
Repurchase agreements	3,017	3,017	-	3,017	-
Commercial paper	249	249	-	249	-
Derivatives:					
Interest rate swaps	10,950	15,748	-	15,748	-
Options	12	12	5	7	-
Currency swaps	918	524	-	524	-
Forward contracts	63	63	-	63	-
Credit default swaps	18	18	-	18	-
Financial futures	24	24	24	-	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of $21,819 million.

	December 31, 2022				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	$ 4,772	$ 4,435	$ -	$ 4,435	$ -
All other governments	1,636	1,385	-	1,323	62
States, territories and possessions	261	254	-	254	-
Political subdivisions	418	402	-	402	-
Special revenue	4,263	4,187	-	4,178	9
Industrial and miscellaneous	120,641	109,053	-	47,235	61,818
Parent, subsidiaries and affiliates	8,403	8,151	-	1,052	7,099
Preferred stocks	458	453	46	-	407
Common stocks - subsidiaries and affiliates	483	483	128	-	355
Common stocks - unaffiliated	1,479	1,479	507	1	971
Mortgage loans - commercial	21,484	19,832	-	-	19,832
Mortgage loans - residential	4,408	4,066	-	-	4,066
Derivatives:					
Interest rate swaps	18,889	19,066	-	19,066	-
Options	654	654	30	624	-
Currency swaps	3,175	3,175	-	3,175	-
Forward contracts	16	16	-	16	-
Credit default swaps	-	1	-	1	-
Financial futures	22	22	22	-	-
Cash, cash equivalents and short-term investments	5,737	5,737	442	5,295	-
Separate account assets	59,537	59,440	37,498	20,242	1,700
Financial liabilities:					
GICs	14,701	13,803	-	-	13,803
Group annuity contracts and other deposits	2,162	1,890	-	-	1,890
Individual annuity contracts	19,874	18,986	-	-	18,986
Supplementary contracts	1,211	1,213	-	-	1,213
Repurchase agreements	3,042	3,042	-	3,042	-
Commercial paper	250	250	-	250	-
Derivatives:					
Interest rate swaps	13,506	18,870	-	18,870	-
Options	12	12	7	5	-
Currency swaps	710	362	-	362	-
Forward contracts	239	239	-	239	-
Credit default swaps	13	13	-	13	-
Financial futures	3	3	3	-	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of $22,443 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, 2023			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
All other governments	$ -	$ 5	$ -	$ 5
Special revenue	-	1	-	1
Industrial and miscellaneous	65	93	121	279
Hybrid securities	-	1	-	1
Preferred stocks	24	-	59	83
Common stocks - subsidiaries and affiliates	361	-	604	965
Common stocks - unaffiliated	675	1	947	1,623
Derivatives:				
Interest rate swaps	-	15,903	-	15,903
Options	21	548	-	569
Currency swaps	-	3,106	-	3,106
Forward contracts	-	84	-	84
Financial futures	151	-	-	151
Separate account assets	38,465	19,240	1,700	59,405
Total financial assets carried at fair value	$ 39,762	$ 38,982	$ 3,431	$ 82,175
Financial liabilities:				
Derivatives:				
Interest rate swaps	$ -	$ 10,950	$ -	$ 10,950
Options	5	7	-	12
Currency swaps	-	136	-	136
Forward contracts	-	63	-	63
Credit default swaps	-	18	-	18
Financial futures	24	-	-	24
Total financial liabilities carried at fair value	$ 29	$ 11,174	$ -	$ 11,203

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, 2022			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
All other governments	$ -	$ 6	$ -	$ 6
Special revenue	$ -	$ 1	$ -	$ 1
Industrial and miscellaneous	-	85	230	315
Preferred stocks	21	-	51	72
Common stocks - subsidiaries and affiliates	128	-	355	483
Common stocks - unaffiliated	507	1	971	1,479
Derivatives:				
Interest rate swaps	-	18,889	-	18,889
Options	30	624	-	654
Currency swaps	-	3,175	-	3,175
Forward contracts	-	16	-	16
Financial futures	22	-	-	22
Separate account assets	37,498	19,130	1,693	58,321
Total financial assets carried at fair value	$ 38,206	$ 41,927	$ 3,300	$ 83,433
Financial liabilities:				
Derivatives:				
Interest rate swaps	$ -	$ 13,506	$ -	$ 13,506
Options	7	5	-	12
Currency swaps	-	122	-	122
Forward contracts	-	239	-	239
Credit default swaps	-	13	-	13
Financial futures	3	-	-	3
Total financial liabilities carried at fair value	$ 10	$ 13,885	$ -	$ 13,895

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.

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

	Balance as of 1/1/23	Gains (Losses) in Net Income	Losses (Gains) in Surplus	Purchases	Issuances	Sales	Settlements	Transfers In	Transfers Out	Other	Balance as of 03/31/23
	(In Millions)										
Financial assets:											
Bonds:											
Industrial and miscellaneous	$ 230	$ (2)	$ 2	$ 3	$ -	$ (6)	$ -	$ -	$ -	$ (106)	$ 121
Preferred stocks	51	-	6	2	-	-	-	-	-	-	59
Common stocks - subsidiaries and affiliates	355	-	239	-	15	-	-	-	-	(5)	604
Common stocks - unaffiliated	971	-	(66)	21	19	-	(1)	-	-	3	947
Separate account assets	1,693	31	-	18	-	(33)	-	5	(14)	-	1,700
Total financial assets	$ 3,300	$ 29	$ 181	$ 44	$ 34	$ (39)	$ (1)	$ 5	$ (14)	$ (108)	$ 3,431

	Balance as of 1/1/22	Gains (Losses) in Net Income	Losses (Gains) in Surplus	Purchases	Issuances	Sales	Settlements	Transfers In	Transfers Out	Other	Balance as of 12/31/22
	(In Millions)										
Financial assets:											
Bonds:											
Industrial and miscellaneous	$ 206	$ 2	$ (10)	$ 19	$ 10	$ -	$ (52)	$ -	$ -	$ 55	$ 230
Preferred stocks	18	-	(19)	-	-	-	-	-	-	52	51
Common stocks - subsidiaries and affiliates	258	(13)	128	(792)	963	(65)	(6)	-	-	(118)	355
Common stocks - unaffiliated	758	29	-	327	3	(27)	(114)	-	(4)	(1)	971
Separate account assets	1,894	(174)	-	282	-	(296)	-	-	(13)	-	1,693
Total financial assets	$ 3,134	$ (156)	$ 99	$ (164)	$ 976	$ (388)	$ (172)	$ -	$ (17)	$ (12)	$ 3,300

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, 2023			
	Carrying Value	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(In Millions)			
U.S. government and agencies	$ 4,698	$ 97	$ 272	$ 4,523
All other governments	1,615	17	238	1,394
States, territories and possessions	260	5	5	260
Political subdivisions	417	9	15	411
Special revenue	4,304	160	131	4,333
Industrial and miscellaneous	122,955	506	10,504	112,957
Parent, subsidiaries and affiliates	8,371	2	636	7,737
Total	$ 142,620	$ 796	$ 11,801	$ 131,615

The March 31, 2023 gross unrealized losses exclude $92 million of losses included in the carrying value. These losses include $84 million from NAIC Class 6 bonds and $8 million from residential mortgage-backed securities (RMBS) and commercial mortgage-backed securities (CMBS) whose ratings were obtained from third-party modelers. These losses were primarily included in industrial and miscellaneous or parent, subsidiaries and affiliates.

	December 31, 2022			
	Carrying Value	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
	(In Millions)			
U.S. government and agencies	$ 4,772	$ 58	$ 395	$ 4,435
All other governments	1,636	15	266	1,385
States, territories and possessions	261	2	9	254
Political subdivisions	418	7	23	402
Special revenue	4,263	109	185	4,187
Industrial and miscellaneous	120,641	406	11,994	109,053
Parent, subsidiaries and affiliates	8,403	1	253	8,151
Total	$ 140,394	$ 598	$ 13,125	$ 127,867

The December 31, 2022 gross unrealized losses exclude $108 million of losses included in the carrying value. These losses include $106 million from NAIC Class 6 bonds and $2 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, 2023, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of $20,456 million. Securities in an unrealized loss position for less than 12 months had a fair value of $19,177 million and unrealized losses of $1,520 million. Securities in an unrealized loss position for greater than 12 months had a fair value of $1,277 million and unrealized losses of $117 million. These securities were primarily categorized as industrial and miscellaneous or parent, subsidiaries and affiliates.

As of December 31, 2022, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of $20,895 million. Securities in an unrealized loss position for less than 12 months had a fair value of $15,107 million and unrealized losses of $918 million. Securities in an unrealized loss position for greater than 12 months had a fair value of $5,786 million and unrealized losses of $918 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, 2023 or 2022 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 March 31, 2023, RMBS had a total carrying value of $2,412 million and a fair value of $2,377 million, of which approximately 8%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of $1,112 million and a fair value of $1,108 million. As of December 31, 2022, RMBS had a total carrying value of $2,337 million and a fair value of $2,292 million, of which approximately 8%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of $1,018 million and a fair value of $1,010 million.

b. Common stocks – subsidiaries and affiliates

MMHLLC paid $450 million in dividends to MassMutual for the three months ended March 31, 2023, which were declared in 2022, and paid $344 million in dividends to MassMutual for the three months ended March 31, 2022, which were declared in 2021.

MMHLLC declared an additional $280 million in dividends to MassMutual for the three months ended March 31, 2023.

MassMutual contributed capital of $44 million to MMHLLC for the three months ended March 31, 2023 and $65 million for the three months ended March 31, 2022.

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 Interim Consolidated 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:

	March 31, 2023		December 31, 2022	
	Carrying Value	Fair Value	Carrying Value	Fair Value
	(In Millions)			
Commercial mortgage loans:				
Primary lender	$ 21,022	$ 19,663	$ 21,390	$ 19,745
Mezzanine loans	93	84	94	87
Total commercial mortgage loans	21,115	19,747	21,484	19,832
Residential mortgage loans:				
FHA insured and VA guaranteed	2,311	2,162	2,461	2,273
Other residential loans	2,295	2,172	1,947	1,793
Total residential mortgage loans	4,606	4,334	4,408	4,066
Total mortgage loans	$ 25,721	$ 24,081	$ 25,892	$ 23,898

As of March 31, 2023, 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 March 31, 2023 and as of December 31, 2022:

	March 31, 2023				
	Carrying Value	Average Carrying Value	Unpaid Principal Balance	Valuation Allowance	Interest Income
	(In Millions)				
With no allowance recorded:					
Commercial mortgage loans:					
Primary lender	$ 14	$ 14	$ 17	$ -	$ -
Total	14	14	17	-	-
Total impaired commercial mortgage loans	$ 14	$ 14	$ 17	$ -	$ -

	December 31, 2022				
	Carrying Value	Average Carrying Value	Unpaid Principal Balance	Valuation Allowance	Interest Income
	(In Millions)				
With no allowance recorded:					
Commercial mortgage loans:					
Primary lender	$ 14	$ 15	$ 17	$ -	$ 1
Total	14	15	17	-	1
Total impaired commercial mortgage loans	$ 14	$ 15	$ 17	$ -	$ 1

d. Partnerships and limited liability companies

No significant changes.

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 $32,295 million as of March 31, 2023 and $32,084 million as of December 31, 2022, 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 $2,177 million as of March 31, 2023 and $2,336 million as of December 31, 2022. In the event of default, the full market value exposure at risk in a net gain position, net of offsets and collateral, was $643 million as of March 31, 2023 and $659 million as of December 31, 2022. The statutory net amount at risk, defined as net collateral pledged and statement values excluding accrued interest, was $5,404 million as of March 31, 2023 and $5,702 million as of December 31, 2022.

The Company had the right to rehypothecate or repledge securities totaling $2,095 million of the $2,177 million as of March 31, 2023 and $771 million of the $2,336 million as of December 31, 2022 of net collateral pledged by counterparties. There were no securities rehypothecated to other counterparties as of March 31, 2023 or December 31, 2022.

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

	March 31, 2023			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	$ 15,903	$ 142,839	$ 10,950	$ 133,910
Options	569	13,654	12	373
Currency swaps	3,107	28,735	918	14,959
Forward contracts	84	4,645	63	5,146
Credit default swaps	-	-	18	1,580
Financial futures	151	2,885	24	257
Total	$ 19,814	$ 192,758	$ 11,985	$ 156,225

	December 31, 2022			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	$ 18,889	$ 139,716	$ 13,506	$ 143,074
Options	654	14,944	12	359
Currency swaps	3,175	28,282	710	14,841
Forward contracts	16	1,289	239	7,457
Credit default swaps	-	-	13	1,580
Financial futures	22	2,784	3	369
Total	$ 22,756	$ 187,015	$ 14,483	$ 167,680

The average fair value of outstanding derivative assets was $20,909 million for the three months ended March 31, 2023 and $15,640 million for the three months ended March 31, 2022. The average fair value of outstanding derivative liabilities was $12,903 million for the three months ended March 31, 2023 and $9,564 million for the three months ended March 31, 2022.

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

	March 31, 2023	December 31, 2022
	(In Millions)	
Due after one year through five years	$ 20	$ 1,580
Due after five years through ten years	1,560	-
Total	$ 1,580	$ 1,580

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

	Three Months Ended March 31,			
	2023		2022	
	Net Realized (Losses) Gains on Closed Contracts	Change In Net Unrealized (Losses) Gains on Open Contracts	Net Realized (Losses) Gains on Closed Contracts	Change In Net Unrealized (Losses) Gains on Open Contracts
	(In Millions)			
Interest rate swaps	$ (13)	$ (432)	$ 24	$ 472
Currency swaps	37	(82)	12	344
Options	-	(56)	(4)	131
Credit default swaps	(18)	12	(10)	-
Forward contracts	(243)	245	48	26
Financial futures	(6)	107	(193)	(192)
Total	$ (243)	$ (206)	$ (123)	$ 781

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

	March 31, 2023			December 31, 2022		
	Derivative Assets	Derivative Liabilities	Net	Derivative Assets	Derivative Liabilities	Net
	(In Millions)					
Gross	$ 19,813	$ 11,985	$ 7,828	$ 22,756	$ 14,483	$ 8,273
Due and accrued	843	2,024	(1,181)	757	1,822	(1,065)
Gross amounts offset	(14,396)	(14,396)	-	(15,793)	(15,793)	-
Net asset	6,260	(387)	6,647	7,720	512	7,208
Collateral posted	(5,009)	(2,833)	(2,176)	(5,025)	(2,689)	(2,336)
Net	$ 1,251	$ (3,220)	$ 4,471	$ 2,695	$ (2,177)	$ 4,872

f. Net investment income

Net investment income, including interest maintenance reserve (IMR) amortization, comprised the following:

	Three Months Ended March 31,	
	2023	2022
	(In Millions)	
Bonds	$ 1,837	$ 1,171
Preferred stocks	7	11
Common stocks - subsidiaries and affiliates	280	-
Common stocks - unaffiliated	28	30
Mortgage loans	265	312
Policy loans	310	285
Real estate	18	56
Partnerships and limited liability companies	95	156
Derivatives	95	123
Cash, cash equivalents and short-term investments	78	11
Other	43	35
Subtotal investment income	3,056	2,190
Amortization of the IMR	(8)	24
Investment expenses	(262)	(206)
Net investment income	$ 2,786	$ 2,008

g. Net realized capital gains (losses)

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

	Three Months Ended March 31, 2023	Three Months Ended March 31, 2022
	(In Millions)	
Bonds	$ (151)	$ (367)
Preferred stocks	-	(6)
Common stocks - unaffiliated	6	31
Mortgage loans	(37)	(1)
Real estate	-	55
Partnerships and limited liability companies	(74)	(3)
Derivatives	(243)	(123)
Other	5	(19)
Net realized capital losses before federal and state taxes and deferral to the IMR	(494)	(433)
Net federal and state tax benefit	35	15
Net realized capital losses before deferral to the IMR	(459)	(418)
Net after tax losses deferred to the IMR	99	300
Net realized capital losses	$ (360)	$ (118)

The IMR liability balance was $1 million as of March 31, 2023 and $1 million as of December 31, 2022 and was included in other liabilities on the Interim Consolidated Statutory Statements of Financial Position.

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

	Three Months Ended March 31, 2023	Three Months Ended March 31, 2022
	(In Millions)	
Bonds	$ (42)	$ (236)
Preferred stocks	-	(6)
Partnerships and limited liability companies	(75)	(7)
Total OTTI	$ (117)	$ (249)

The Company recognized OTTI of $14 million for the three months ended March 31, 2023 and $8 million for the three months ended March 31, 2022 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

No significant changes.

7. *Other than invested assets*

No significant changes.

8. *Policyholders' liabilities*

a. Liabilities for deposit-type contracts

On January 19, 2023, MassMutual issued a €500 million funding agreement with a 3.75% fixed rate and a 7-year maturity.

On February 3, 2023, MassMutual issued a NOK 1,000 million funding agreement with a 4.01% fixed rate and an 8-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 lifetime withdrawal benefits (GLWB). 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 GLWB (in millions):

Liability as of January 1, 2022	$ 44
Incurred guarantee benefits	18
Paid guarantee benefits	(6)
Liability as of December 31, 2022	56
Incurred guarantee benefits	1
Paid guarantee benefits	(1)
Liability as of March 31, 2023	$ 56

The following summarizes the account values, net amount at risk and weighted average attained age for variable annuity contracts with GMDB, GMIB, GMAB and GLWB 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, 2023			December 31, 2022		
	Account Value	Net Amount at Risk	Weighted Average Attained Age	Account Value	Net Amount at Risk	Weighted Average Attained Age
	($ In Millions)					
GMDB	$ 10,115	$ 190	66	$ 10,035	$ 242	66
GMIB Basic	466	14	72	466	21	72
GMIB Plus	1,228	475	68	1,198	505	68
GMAB	1,539	59	62	1,553	84	62
GLWB	97	19	74	97	22	74

9. Reinsurance

No significant changes.

10. Withdrawal characteristics

No significant changes.

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 Interim Consolidated Statutory Statements of Operations. The net periodic cost recognized is as follows:

	Three Months Ended March 31,			
	2023	2022	2023	2022
	Pension Benefits		Other Postretirement Benefits	
	(In Millions)			
Service cost	$ 22	$ 24	$ 2	$ 2
Interest cost	31	21	3	3
Expected return on plan assets	(42)	(48)	-	-
Amortization of unrecognized net actuarial and other losses	7	2	(2)	-
Amortization of unrecognized prior service cost	-	-	(1)	(1)
Total net periodic cost	$ 18	$ (1)	$ 2	$ 4

13. Employee compensation plans

No significant changes.

14. Surplus notes

No significant changes.

15. Presentation of the Interim Consolidated 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, 2023 and 2022. Accordingly, the Company has excluded these non-cash activities from the Interim Consolidated Statutory Statements of Cash Flows for the three months ended March 31, 2023 and 2022.

	Three Months Ended March 31,	
	2023	2022
	(In Millions)	
Stock conversion	$ 168	$ 52
Bond conversions and refinancing	68	127
Transfer of bonds to partnerships and LLCs	64	-
Change in market value of corporate owned life insurance asset	38	(19)
Net investment income payment-in-kind bonds	3	5
Transfer of stocks to partnerships	-	5

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 interim risks and uncertainties disclosure should be read in conjunction with the consolidated statutory disclosure in the Company's 2022 audited year-end 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 LTC 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 had caused increased cases of COVID-19 and 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 further 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 geopolitics 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 consolidated statement of financial position. However, an adverse outcome in certain matters could have a material adverse effect on the consolidated results of operations for the period in which such matter is resolved, or an accrual is determined to be required, on the consolidated 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 offset by related insurance recoveries or other contributions, if any. An accrual may be subject to subsequent adjustment as a result of additional information and other developments. The resolution of matters is 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

In February 2023, MassMutual made capital contributions of $45 million to ITPS Holdings LLC.

In March 2023, MassMutual made capital contributions of $88 million to MassMutual Mortgage Lending LLC, $50 million to MMIH Bond Holdings LLC, and $13 million to MML CM LLC.

18. Subsequent events

Management of the Company has evaluated subsequent events through May 16, 2023, 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 12, 2023, MassMutual issued a $750 million funding agreement with a 4.50% fixed rate and a 3-year maturity.

On May 3, 2023, MassMutual issued a CHF 215 million funding agreement with 2.65% fixed rate and a 5-year maturity.

Glossary of Terms

Term	Description
CMBS	Commercial mortgage-backed securities
C.M. Life	C.M. Life Insurance Company
DD	Digital Distribution
DI	Disability Insurance
FHA	Federal Housing Administration
MM Ascend	MassMutual Ascend Life Insurance Company and other subsidiaries and affiliated entities
GIC	Guaranteed interest contracts
GMAB	Guaranteed minimum accumulation benefits
GMDB	Guaranteed minimum death benefits
GMIB	Guaranteed minimum income benefits
Glidepath	Glidepath Holdings Inc.
GLWB	Guaranteed lifetime withdrawal benefits
IMR	Interest maintenance reserve
Invesco	Invesco Ltd
IS	Institutional Solutions
LLC	Limited liability companies
LTC	Long-term care
MassMutual	Massachusetts Mutual Life Insurance Company
MMFA	MassMutual Financial Advisors
MMHLLC	MassMutual Holding LLC
MMIH	MM Investment Holding
MMSD	MassMutual Strategic Distributors
NAIC	National Association of Insurance Commissioners
OAC	Oppenheimer Acquisition Corporation
OTTI	Other-than-temporary impairment(s)
RMBS	Residential mortgage-backed securities
SSAP	Statements of Statutory Accounting Principles
The Company	Massachusetts Mutual Life Insurance Company, a mutual life insurance company domiciled in the Commonwealth of Massachusetts, and its domestic life insurance subsidiaries domiciled in the State of Connecticut
U.S.	United States of America
U.S. GAAP	U.S. generally accepted accounting principles
VA	Veterans Administration