

**MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY  
AND SUBSIDIARIES**

INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS

As of September 30, 2024 and December 31, 2023 and for the nine months ended  
September 30, 2024 and 2023

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

Table of Contents

	<u>Page</u>
Interim Consolidated Statutory Statements of Financial Position .....	3
Interim Consolidated Statutory Statements of Operations .....	4
Interim Consolidated Statutory Statements of Changes in Surplus.....	5
Interim Consolidated Statutory Statements of Cash Flows .....	6
Notes to Interim Consolidated Statutory Financial Statements:	
1. Nature of operations .....	7
2. Summary of significant accounting policies.....	7
3. New accounting standards.....	8
4. Fair value of financial instruments .....	11
5. Investments	
a. Bonds .....	16
b. Preferred Stock .....	17
c. Common stocks – subsidiaries and affiliates .....	17
d. Common stocks – unaffiliated.....	18
e. Mortgage loans .....	18
f. Real estate .....	19
g. Partnerships and limited liability companies .....	19
h. Derivatives .....	19
i. Repurchase agreements .....	22
j. Net investment income .....	26
k. Net realized capital losses .....	27
6. Federal income taxes.....	27
7. Other than invested assets .....	27
8. Policyholders’ liabilities .....	28
9. Reinsurance .....	30
10. Withdrawal characteristics .....	30
11. Debt .....	30
12. Employee benefit plans .....	30
13. Employee compensation plans .....	31
14. Surplus notes.....	31
15. Presentation of the Interim Consolidated Statutory Statements of Cash Flows .....	31
16. Business risks, commitments and contingencies .....	32
17. Related party transactions .....	34
18. Subsequent events .....	34
Glossary of Terms .....	35

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

	September 30, 2024	December 31, 2023
(In Millions)		
<b>Assets:</b>		
Bonds	\$ 166,570	\$ 147,300
Preferred stocks	596	451
Common stocks – subsidiaries and affiliates	24,210	23,597
Common stocks – unaffiliated	2,209	1,630
Mortgage loans	24,832	24,825
Policy loans	17,541	16,138
Real estate	310	329
Partnerships and limited liability companies	14,476	13,055
Derivatives	20,635	21,301
Cash, cash equivalents and short-term investments	7,337	11,941
Other invested assets	2,956	2,626
Total invested assets	281,672	263,193
Investment income due and accrued	4,801	5,324
Federal income taxes	557	319
Net deferred income taxes	1,784	1,685
Other than invested assets	6,010	5,806
Total assets excluding separate accounts	294,824	276,327
Separate account assets	58,384	58,997
Total assets	\$ 353,208	\$ 335,324
<b>Liabilities and Surplus:</b>		
Policyholders' reserves	\$ 178,859	\$ 170,570
Liabilities for deposit-type contracts	21,490	19,712
Contract claims and other benefits	655	732
Policyholders' dividends	2,250	2,150
General expenses due or accrued	984	1,049
Asset valuation reserve	6,816	6,071
Repurchase agreements	3,670	3,219
Debt	499	50
Collateral	1,563	2,160
Derivatives	13,958	14,013
Funds held under coinsurance	28,096	22,520
Other liabilities	7,705	5,342
Total liabilities excluding separate accounts	266,545	247,588
Separate account liabilities	58,240	58,859
Total liabilities	324,785	306,447
Surplus	28,423	28,877
Total liabilities and surplus	\$ 353,208	\$ 335,324

See accompanying notes to interim consolidated statutory financial statements

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

	Nine Months Ended	
	September 30,	
	2024	2023
	(In Millions)	
<b>Revenue:</b>		
Premium income	\$ 16,580	\$ 16,426
Net investment income	8,105	7,872
Fees and other income	991	790
Total revenue	25,676	25,088
<b>Benefits, expenses and other deductions:</b>		
Policyholders' benefits	13,482	14,552
Change in policyholders' reserves	6,608	5,035
General insurance expenses	1,790	1,711
Commissions	1,090	1,012
State taxes, licenses and fees	272	253
Other deductions	706	927
Total benefits and expenses	23,948	23,490
Net gain from operations before dividends and federal income taxes	1,728	1,598
Dividends to policyholders	1,554	1,408
Net gain from operations before federal income taxes	174	190
Federal income tax (benefit) expense	(21)	145
Net gain from operations	195	45
Net realized capital losses	(639)	(395)
Net loss	\$ (444)	\$ (350)

See accompanying notes to interim consolidated statutory financial statements

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
INTERIM CONSOLIDATED STATUTORY STATEMENTS OF CHANGE IN SURPLUS  
(UNAUDITED)

	Nine Months Ended September 30,	
	2024	2023
	<u>(In Millions)</u>	
Surplus, beginning of year	\$ 28,877	\$ 27,941
Net (decrease) increase due to:		
Net loss	(444)	(350)
Change in net unrealized capital gains, net of tax	648	274
Change in net unrealized foreign exchange capital gains, net of taxes	316	(27)
Change in other net deferred income taxes	149	291
Change in nonadmitted assets	145	561
Change in asset valuation reserve	(745)	200
Change in reserve valuation basis	(5)	-
Change in surplus notes	(53)	(25)
Change in minimum pension liability	5	-
Prior period adjustments	(310)	77
Other	(160)	87
Net (decrease) increase	<u>(454)</u>	<u>1,088</u>
Surplus, end of period	<u>\$ 28,423</u>	<u>\$ 29,029</u>

See accompanying notes to interim consolidated statutory financial statements

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

	Nine Months Ended September 30,	
	2024	2023
	<u>(\$ In Millions)</u>	
<b>Cash from operations:</b>		
Premium and other income collected	\$ 18,405	\$ 17,538
Net investment income	8,116	9,103
Benefit payments	(13,350)	(14,425)
Net transfers from separate accounts	1,646	1,212
Commissions and other expenses	(3,644)	(3,789)
Dividends paid to policyholders	(1,461)	(1,315)
Federal and foreign income taxes recovered	15	40
Net cash provided from operations	<u>9,727</u>	<u>8,364</u>
<b>Cash from investments:</b>		
Proceeds from investments sold, matured or repaid:		
Bonds	29,568	18,280
Preferred and common stocks – unaffiliated	199	152
Common stocks – affiliated	80	1
Mortgage loans	2,663	2,551
Real estate	(2)	5
Partnerships and limited liability companies	970	1,241
Derivatives	(555)	(362)
Other	(309)	(864)
Total investment proceeds	<u>32,614</u>	<u>21,004</u>
Cost of investments acquired:		
Bonds	(47,246)	(22,566)
Preferred and common stocks – unaffiliated	(563)	(253)
Common stocks – affiliated	(290)	(211)
Mortgage loans	(2,861)	(1,751)
Real estate	(1)	(6)
Partnerships and limited liability companies	(2,228)	(2,057)
Derivatives	275	(85)
Other	776	195
Total investments acquired	<u>(52,138)</u>	<u>(26,734)</u>
Net (increase) decrease in policy loans	<u>(1,404)</u>	<u>1,633</u>
Net cash used in investing activities	<u>(20,928)</u>	<u>(4,097)</u>
<b>Cash from financing and miscellaneous sources:</b>		
Net deposits on deposit-type contracts	1,372	825
Change in surplus notes	(50)	(25)
Change in repurchase agreements	456	103
Change in collateral	(489)	(1,849)
Other cash (used in)	5,308	(1,716)
Net cash (used in) from financing and miscellaneous sources	<u>6,597</u>	<u>(2,662)</u>
Net change in cash, cash equivalents and short-term investments	(4,604)	1,605
Cash, cash equivalents and short-term investments:		
Beginning of year	11,941	5,737
End of period	<u>\$ 7,337</u>	<u>\$ 7,342</u>

See accompanying notes to interim consolidated statutory financial statements

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

**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 affiliated distribution channel, MassMutual Strategic Distributors (MMSD), Institutional Solutions (IS) and Worksite distribution channels.

The affiliated distribution channel is a sales force of financial professionals that operate in the U.S. The affiliated distribution channel 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 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 September 30, 2024 and December 31, 2023 and for nine months ended September 30, 2024 and 2023 are unaudited. The Interim Consolidated Statutory Statement of Financial Position as of December 31, 2023 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 2023 audited yearend financial statements as these interim consolidated statutory financial statements disclose only significant changes from yearend 2023. 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 2023 audited consolidated yearend financial statements.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

**b. Corrections of errors and reclassification**

For the nine months ended September 30, 2024, corrections of prior years' errors were recorded in surplus, net of

	Nine Months Ended September 30, 2024		
	Increase (Decrease) to:		
	Prior Years' Net Income	Current Year Surplus	Asset or Liability Balances
	(In Millions)		
Investment income due and accrued	\$ (128)	\$ (128)	(128)
Other Liabilities	(84)	(93)	93
Bonds	(77)	(77)	(77)
Common stocks	(1)	(1)	(1)
Cash, cash equivalents and short-term investments	(2)	(2)	(2)
Policyholders' reserves	(15)	(15)	(15)
Partnerships and limited liability companies	(3)	(3)	(3)
Total	\$ (310)	\$ (319)	

**c. 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 \$519 million as of September 30, 2024 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 August 2023, the NAIC adopted INT 23-01T — Disallowed Interest Maintenance Reserve (IMR) (“INT 23-01T”). INT 23-01T provides optional, limited-term guidance for the assessment of disallowed IMR for up to 10% of adjusted general account capital and surplus. An insurer's capital and surplus must first be adjusted to exclude certain “soft assets” including net positive goodwill, electronic data processing equipment and operating system software, net deferred tax assets and admitted disallowed IMR. An insurer will only be able to admit the negative IMR if the insurer's risk-based capital is over 300% authorized control level after adjusting to remove the assets described above.



MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

As adopted, negative IMR may be admitted first in the insurer's general account and then, if all disallowed IMR in the general account is admitted and the percentage limit is not reached, to the separate account proportionately between insulated and noninsulated accounts. If the insurer can demonstrate historical practice in which acquired gains from derivatives were also reversed to IMR (as liabilities) and amortized, there is no exclusion for derivatives losses. INT 23-01T was adopted by the Company as of September 30, 2023 and will be effective through December 31, 2025. To the extent the Company's IMR balance is a net negative, the effects of INT 23-01T will be reflected in the Company's financial position, results of operations, and financial statement disclosures. The Company has adopted this guidance and the adoption resulted in an admitted disallowed IMR of \$1,112 million for MassMutual and \$150 million for C.M. Life.

In March 2023, the NAIC adopted modifications to SSAP No. 34 – Investment Income Due and Accrued, effective December 31, 2023. The modifications require additional disclosures and data capture related to gross, non-admitted and admitted amounts for interest income due and accrued, deferred interest, and paid-in-kind (PIK) interest. In August 2023, the NAIC adopted revisions to further clarify the PIK interest disclosure in SSAP No. 34, effective December 31, 2023. The revisions clarify that decreasing amounts to principal balances are first applied to any PIK interest included in the principal balance. The original principal would not be reduced until the PIK interest had been fully eliminated from the balance. The revisions also provide a practical expedient for determining the PIK interest in the cumulative balance by subtracting the original principal/ par value from the current principal/ par value, with the resulting PIK interest not to go less than zero. The modifications did not have a material effect on the Company's financial statements.

In December 2023, the NAIC adopted revisions, effective January 1, 2024, to avoid allocating realized gains or losses from bond sales to the IMR when sold before a rating downgrade. Revisions were also made to avoid allocating realized gains or losses from mortgage loan sales when there is a credit loss allowance, where payments are not 90 days past due. Revisions were also made to update guidance on changes in credit ratings used to allocate credit or interest rate related gains or losses, requiring identification of realized losses from acute credit events to be allocated to AVR. The modifications did not have a material effect on the Company's financial statements.

In March 2024, the NAIC adopted revisions to the requirements of audit and admissibility in SSAP No. 97 – Investments in Subsidiary, Controlled and Affiliated Entities, effective March 16, 2024, to better align with the guidance on the look-through methodology. The revisions allow for admitting audited investments in entities owned by unaudited downstream noninsurance holding company SCA entity. The modifications did not have a material effect on the Company's financial statements.

***Future adoption of new accounting standards***

In August 2023, the NAIC adopted revisions to clarify and incorporate a new bond definition within disclosures SSAP No. 26 – Bonds, SSAP No. 43 – Asset-Backed Securities, and other related SSAPs, which will become effective January 1, 2025. The revisions were issued in connection with its principle-based bond definition project, “the Bond Project”.

The Bond Project began in October 2020 through the development of a principle-based bond definition to be used for all securities in determining whether they qualify for reporting on the statutory annual statement Schedule D. Within the new bond definition, bonds are classified as an “issuer credit obligation” or an “asset-backed security.”

An “issuer credit obligation” is defined as a bond where repayment is supported by the general creditworthiness of an operating entity, and an “asset-backed security” is defined as a bond issued by an entity created for the primary purpose of raising capital through debt backed by financial assets. The revisions to SSAP No. 26 reflect the principle-based bond definition, and SSAP No. 43 provides accounting and reporting guidance for investments that qualify as asset-backed securities under the new bond definition. Upon adoption, investments that do not qualify as bonds will not be permitted to be reported as bonds on Schedule D, Part 1 thereafter as there will be no grandfathering for existing investments that do not qualify under the revised SSAPs. The Company is currently assessing the impacts of the adopted SSAP No. 26, SSAP No. 43 and other related SSAPs in relation to the financial statements.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

In March 2024, the NAIC adopted revisions to SSAP No. 21 - Other Admitted Assets, effective January 1, 2025, clarifying that residuals follow the effective yield approach with a cap and providing an election for the cost recovery method. The modifications are not expected to have a material effect on the Company's consolidated financial statements. The Company is assessing the potential impact on the Company's consolidated financial statements.

Effective January 1, 2025, revisions will be made to short-term investments, which include excluding additional investment types from being reported as cash equivalents or short-term investments regardless of maturity date of the investment at the date of acquisition. Investments will be eliminated from being reported as cash equivalents or short-term investments unless they would qualify under SSAP No. 26 – Bonds as an issuer credit obligation. Such investments will then only qualify as a cash equivalent or short-term investment if they have a maturity date within 3-months (cash equivalents) or 12-months (short-term) from the date of acquisition or meet the specific requirements for money market mutual funds or cash pooling arrangement. The Company is assessing the potential impact on the Company's consolidated financial statements.

The NAIC adopted revisions to various SSAPs at the Spring 2024 National Meeting for investments in tax credits and acquired tax credits in response to the comments received, as well as updated annual statement reporting categories for tax credit investment risk-based capital. These revisions are in addition to the previous ones, which include broad criteria to scope in various tax credit programs, including solar programs and state specific programs. Proportional amortization will be the measurement approach as with existing low-income housing tax credits, which means recording amortization of the investment in the partnership through net investment income and use of the tax credits in the appropriate tax line. The adopted revisions will be effective on January 1, 2025. The Company is assessing the potential impact on the Company's consolidated financial statements.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED 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, 2024				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	\$ 5,350	\$ 5,040	\$ -	\$ 5,040	\$ -
All other governments	997	871	-	863	8
States, territories and possessions	170	167	-	167	-
Political subdivisions	331	334	-	334	-
Special revenue	3,905	3,959	-	3,921	38
Industrial and miscellaneous	142,842	136,646	757	69,463	66,426
Parent, subsidiaries and affiliates	12,975	12,771	-	3,152	9,619
Preferred stocks	596	625	189	94	342
Common stocks - subsidiaries and affiliates	645	645	361	-	284
Common stocks - unaffiliated	2,209	2,209	856	-	1,353
Mortgage loans - commercial	18,586	17,343	-	-	17,343
Mortgage loans - residential	6,246	6,154	-	-	6,154
Derivatives:					
Interest rate swaps	17,209	12,003	-	12,003	-
Options	607	607	73	534	-
Currency swaps	2,793	2,792	-	2,792	-
Forward contracts	25	25	-	25	-
Credit default swaps	1	1	-	1	-
Cash, cash equivalents and short-term investments	7,337	7,337	857	6,480	-
Separate account assets	58,384	58,363	37,775	18,669	1,919
Financial liabilities:					
GICs	18,069	17,668	-	-	17,668
Group annuity contracts and other deposits	1,817	1,712	-	-	1,712
Individual annuity contracts	31,456	32,530	-	-	32,530
Supplementary contracts	913	914	-	-	914
Repurchase agreements	3,670	3,670	-	3,670	-
Debt	499	499	-	499	-
Derivatives:					
Interest rate swaps	11,692	11,958	-	11,958	-
Options	74	74	41	33	-
Currency swaps	1,683	1,362	-	1,362	-
Forward contracts	318	320	-	320	-
Credit default swaps	176	176	-	176	-
Financial futures	15	15	15	-	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of \$23,565 million.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

	December 31, 2023				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	\$ 5,067	\$ 4,752	\$ -	\$ 4,752	\$ -
All other governments	1,242	1,092	-	1,062	30
States, territories and possessions	242	240	-	240	-
Political subdivisions	377	367	-	367	-
Special revenue	5,081	5,071	-	5,034	37
Industrial and miscellaneous	125,196	116,839	66	51,891	64,881
Parent, subsidiaries and affiliates	10,095	9,659	-	1,442	8,217
Preferred stocks	451	475	96	-	379
Common stocks - subsidiaries and affiliates	436	436	253	-	183
Common stocks - unaffiliated	1,630	1,630	666	-	964
Mortgage loans - commercial	19,941	18,486	-	-	18,486
Mortgage loans - residential	4,884	4,596	-	-	4,596
Derivatives:					
Interest rate swaps	17,712	12,458	-	12,458	-
Options	575	575	68	507	-
Currency swaps	2,893	2,893	-	2,893	-
Forward contracts	15	15	-	15	-
Credit default swaps	1	1	-	1	-
Financial futures	105	105	105	-	-
Cash, cash equivalents and					
short-term investments	11,941	11,941	818	11,123	-
Separate account assets	58,997	58,944	37,886	19,138	1,920
Financial liabilities:					
GICs	16,207	15,550	-	-	15,550
Group annuity contracts and other deposits	2,053	1,841	-	-	1,841
Individual annuity contracts	28,236	26,803	-	-	26,803
Supplementary contracts	1,001	1,003	-	-	1,003
Repurchase agreements	3,219	3,219	-	3,219	-
Debt	50	50	-	50	-
Derivatives:					
Interest rate swaps	12,178	12,544	-	12,544	-
Options	50	50	35	15	-
Currency swaps	1,298	1,313	-	1,313	-
Forward contracts	305	307	-	307	-
Credit default swaps	153	152	-	152	-
Financial futures	29	29	29	-	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of \$23,161 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 AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED 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, 2024			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
Special revenue	\$ -	\$ 1	\$ -	\$ 1
Industrial and miscellaneous	756	99	289	1,144
Parent, subsidiaries and affiliates	-	65	-	65
Preferred stocks	39	-	58	97
Common stocks - subsidiaries and affiliates	361	-	284	645
Common stocks - unaffiliated	856	-	1,353	2,209
Derivatives:				
Interest rate swaps	-	17,204	-	17,204
Options	73	534	-	607
Currency swaps	-	2,791	-	2,791
Forward contracts	-	25	-	25
Separate account assets	37,775	17,457	1,911	57,143
Total financial assets carried at fair value	\$ 39,860	\$ 38,176	\$ 3,895	\$ 81,931
Financial liabilities:				
Derivatives:				
Interest rate swaps	\$ -	\$ 11,692	\$ -	\$ 11,692
Options	41	33	-	74
Currency swaps	-	282	-	282
Forward contracts	-	318	-	318
Credit default swaps	-	176	-	176
Financial futures	15	-	-	15
Total financial liabilities carried at fair value	\$ 56	\$ 12,501	\$ -	\$ 12,557

The Company does not have any financial instruments that were carried at net asset value as a practical expedient.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

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

	December 31, 2023			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
Special revenue	\$ -	\$ 2	\$ -	\$ 2
Industrial and miscellaneous	66	109	176	351
Preferred stocks	24	-	67	91
Common stocks - subsidiaries and affiliates	253	-	183	436
Common stocks - unaffiliated	670	1	960	1,631
Derivatives:				
Interest rate swaps	-	17,708	-	17,708
Options	68	507	-	575
Currency swaps	-	2,893	-	2,893
Forward contracts	-	15	-	15
Financial futures	105	-	-	105
Separate account assets	37,886	17,964	1,914	57,764
Total financial assets carried at fair value	\$ 39,072	\$ 39,199	\$ 3,300	\$ 81,571
Financial liabilities:				
Derivatives:				
Interest rate swaps	\$ -	\$ 12,178	\$ -	\$ 12,178
Options	35	16	-	51
Currency swaps	-	196	-	196
Forward contracts	-	305	-	305
Credit default swaps	-	153	-	153
Financial futures	29	-	-	29
Total financial liabilities carried at fair value	\$ 64	\$ 12,848	\$ -	\$ 12,912

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 AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

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

	Balance as of 1/1/24	Gains (Losses) in Net Income	Losses (Gains) in Surplus	Purchases	Issuances	Sales	Settlements	Transfers			Balance as of 09/30/24
								In	Out	Other	
(In Millions)											
Financial assets:											
Bonds:											
Industrial and miscellaneous	\$ 176	\$ (48)	\$ (19)	\$ 3	\$ 3	\$ -	\$ (5)	\$ -	\$ -	\$ 179	\$ 289
Preferred stocks	67	-	7	-	-	-	-	-	-	(16)	58
Common Stocks:											
Subsidiaries and affiliates	183	-	8	-	34	-	(65)	-	(155)	279	284
Unaffiliated	960	10	109	257	29	(13)	(16)	25	-	(8)	1,353
Separate account assets	1,914	102	-	22	-	(124)	(3)	-	-	-	1,911
Total financial assets	<u>\$ 3,300</u>	<u>\$ 64</u>	<u>\$ 105</u>	<u>\$ 282</u>	<u>\$ 66</u>	<u>\$ (137)</u>	<u>\$ (89)</u>	<u>\$ 25</u>	<u>\$ (155)</u>	<u>\$ 434</u>	<u>\$ 3,895</u>

	Balance as of 1/1/23	Gains (Losses) in Net Income	Losses (Gains) in Surplus	Purchases	Issuances	Sales	Settlements	Transfers			Balance as of 12/31/23
								In	Out	Other	
(In Millions)											
Financial assets:											
Bonds:											
Industrial and miscellaneous	\$ 230	\$ (4)	\$ (10)	\$ 37	\$ 1	\$ (2)	\$ (13)	\$ -	\$ -	\$ (62)	\$ 176
Preferred stocks	51	-	11	3	-	-	-	-	-	2	67
Common Stocks:											
Subsidiaries and affiliates	355	7	(189)	21	(6)	(47)	-	48	-	(6)	183
Unaffiliated	971	24	(54)	60	28	(29)	(38)	-	-	(2)	960
Separate account assets	1,693	271	-	134	-	(182)	(2)	-	-	-	1,914
Total financial assets	<u>\$ 3,300</u>	<u>\$ 297</u>	<u>\$ (242)</u>	<u>\$ 255</u>	<u>\$ 23</u>	<u>\$ (260)</u>	<u>\$ (53)</u>	<u>\$ 48</u>	<u>\$ -</u>	<u>\$ (68)</u>	<u>\$ 3,300</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.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

**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, 2024			
	Carrying	Gross	Gross	Fair
	Value	Unrealized Gains	Unrealized Losses	Value
(In Millions)				
U.S. government and agencies	\$ 5,350	\$ 71	\$ 381	\$ 5,040
All other governments	997	14	140	871
States, territories and possessions	170	2	5	167
Political subdivisions	331	13	10	334
Special revenue	3,905	144	90	3,959
Industrial and miscellaneous	142,842	1,548	7,744	136,646
Parent, subsidiaries and affiliates	12,975	60	264	12,771
Total	\$ 166,570	\$ 1,852	\$ 8,634	\$ 159,788

The September 30, 2024 gross unrealized losses exclude \$195 million of losses included in the carrying value. These losses include \$192 million from NAIC Class 6 bonds and \$3 million from RMBS and 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, 2023			
	Carrying	Gross	Gross	Fair
	Value	Unrealized Gains	Unrealized Losses	Value
(In Millions)				
U.S. government and agencies	\$ 5,067	\$ 70	\$ 385	\$ 4,752
All other governments	1,242	13	163	1,092
States, territories and possessions	242	4	6	240
Political subdivisions	377	8	18	367
Special revenue	5,081	117	127	5,071
Industrial and miscellaneous	125,196	849	9,207	116,839
Parent, subsidiaries and affiliates	10,095	20	455	9,659
Total	\$ 147,300	\$ 1,081	\$ 10,361	\$ 138,020

The December 31, 2023 gross unrealized losses exclude \$128 million of losses included in the carrying value. These losses include \$127 million from NAIC Class 6 bonds and \$1 million from RMBS and CMBS whose ratings were obtained from third-party modelers. These losses were primarily included in industrial and miscellaneous or parent, subsidiaries and affiliates.



MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

As of September 30, 2024, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of \$73,546 million. Securities in an unrealized loss position for less than 12 months had a fair value of \$5,334 million and unrealized losses of \$79 million. Securities in an unrealized loss position for greater than 12 months had a fair value of \$68,212 million and unrealized losses of \$8,750 million. These securities were primarily categorized as industrial and miscellaneous or parent, subsidiaries and affiliates.

As of December 31, 2023, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of \$17,621 million. Securities in an unrealized loss position for less than 12 months had a fair value of \$2,169 million and unrealized losses of \$49 million. Securities in an unrealized loss position for greater than 12 months had a fair value of \$15,452 million and unrealized losses of \$1,298 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, 2024 or 2023 that were reacquired within 30 days of the sale date.

On April 24, 2024, the Company announced it became a minority equity owner in ATLAS SP Partners (ATLAS) and a capital partner to the ATLAS platform. As part of the multi-billion-dollar commitment, the Company also agreed to invest \$500 million in Apollo's Asset Backed Finance investment vehicle, which was finalized in May 2024.

***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, 2024, RMBS had a total carrying value of \$3,995 million and a fair value of \$4,062 million of which approximately 2%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of \$2,227 million and a fair value of \$2,276 million. As of December 31, 2023, RMBS had a total carrying value of \$3,831 million and a fair value of \$3,809 million of which approximately 4%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of \$1,351 million and a fair value of \$1,334 million.

***b. Preferred stocks***

No significant changes.

***c. Common stocks – subsidiaries and affiliates***

MMHLLC paid \$785 million in dividends to MassMutual for the nine months ended September 30, 2024, \$630 million of which were declared in 2023, and paid \$730 million in dividends to MassMutual for the nine months ended September 30, 2023, \$450 million of which were declared in 2022.

MassMutual contributed capital of \$9 million to MMHLLC for the nine months ended September 30, 2024, and \$53 million for the nine months ended September 30, 2023.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

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.

**d. Common stocks – unaffiliated**

No significant changes.

**e. 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, 2024		December 31, 2023	
	Carrying Value	Fair Value	Carrying Value	Fair Value
	(In Millions)			
Commercial mortgage loans:				
Primary lender	\$ 18,465	\$ 17,239	\$ 19,799	\$ 18,361
Mezzanine loans	121	104	142	125
Total commercial mortgage loans	18,586	17,343	19,941	18,486
Residential mortgage loans:				
FHA insured and VA guaranteed	1,791	1,699	1,962	1,818
Other residential loans	4,455	4,455	2,922	2,778
Total residential mortgage loans	6,246	6,154	4,884	4,596
Total mortgage loans	\$ 24,832	\$ 23,497	\$ 24,825	\$ 23,082

As of September 30, 2024, 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.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

The following presents a summary of the Company's impaired mortgage loans as of September 30, 2024 and December 31, 2023:

September 30, 2024					
Carrying Value	Average Carrying Value	Unpaid Principal Balance	Valuation Allowance	Interest Income	
(In Millions)					
With allowance recorded:					
Commercial mortgage loans:					
Primary lender	\$ 59	\$ 64	\$ 77	\$ (18)	\$ 2
Total	59	64	77	(18)	2
With no allowance recorded:					
Commercial mortgage loans:					
Primary lender	\$ 488	\$ 516	\$ 718	\$ -	\$ 8
Total	488	516	718	-	8
Total impaired commercial mortgage loans	\$ 547	\$ 580	\$ 795	\$ (18)	\$ 10

December 31, 2023					
Carrying Value	Average Carrying Value	Unpaid Principal Balance	Valuation Allowance	Interest Income	
(In Millions)					
With allowance recorded:					
Commercial mortgage loans:					
Primary lender	\$ 481	\$ 555	\$ 644	\$ (161)	\$ 25
Total impaired commercial mortgage loans	\$ 481	\$ 555	\$ 644	\$ (161)	\$ 25

**f. Real estate**

No significant changes.

**g. Partnerships and limited liability companies**

No significant changes.

**h. 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 \$32,582 million as of September 30, 2024 and \$32,507 million as of December 31, 2023, as defined under statutory accounting practices as the result of pairing of a long derivative contract with cash instruments.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

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 to the counterparties was \$284 million as of September 30, 2024, and net collateral pledged by the counterparties was \$334 million as of December 31, 2023. In the event of default, the full market value exposure at risk, net of offsets and collateral, was \$42 million as of September 30, 2024, and \$321 million as of December 31, 2023. The statutory net amount at risk, defined as net collateral pledged and statement values excluding accrued interest, was \$5,084 million as of September 30, 2024, and \$5,292 million as of December 31, 2023.

As of September 30, 2024, the company had the right to rehypothecate or repledge securities totaling \$1,777 million, pledged by the counterparties, of the \$284 million of the net collateral pledged to counterparties. As of December 31, 2023, the company had the right to rehypothecate or repledge securities totaling \$1,476 million, pledged by the counterparties, of the \$334 million of the net collateral pledged to counterparties. There were no securities rehypothecated to other counterparties as of September 30, 2024 or December 31, 2023.

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

	September 30, 2024			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	\$ 17,209	\$ 210,257	\$ 11,692	\$ 131,290
Options	607	11,410	74	637
Currency swaps	2,793	30,274	1,683	17,160
Forward contracts	25	1,995	318	11,521
Credit default swaps	1	160	176	7,903
Financial futures	-	280	15	1,263
Total	\$ 20,635	\$ 254,376	\$ 13,958	\$ 169,774

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

	December 31, 2023			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	\$ 17,712	\$ 181,119	\$ 12,178	\$ 133,793
Options	575	12,132	50	641
Currency swaps	2,893	29,187	1,298	14,742
Forward contracts	15	1,032	305	9,335
Credit default swaps	1	81	153	7,902
Financial futures	105	1,124	29	257
Total	\$ 21,301	\$ 224,675	\$ 14,013	\$ 166,670

The average fair value of outstanding derivative assets was \$23,130 million for the nine months ended September 30, 2024 and \$21,984 million for the nine months ended September 30, 2023. The average fair value of outstanding derivative liabilities was \$15,902 million for the nine months ended September 30, 2024 and \$14,128 million for the nine months ended September 30, 2023.

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

	September 30, 2024	December 31, 2023
	(In Millions)	
	Due after one year through five years	\$ 173
Due after five years through ten years	7,890	-
Total	\$ 8,063	\$ 7,983

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:

	Nine Months Ended September 30,			
	2024		2023	
	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 Gains (Losses) on Open Contracts
	(In Millions)			
	Interest rate swaps	\$ (124)	\$ (18)	\$ (115)
Currency swaps	66	(186)	82	(297)
Options	1	27	(10)	(56)
Credit default swaps	(68)	40	(39)	24
Forward contracts	(177)	(3)	(201)	434
Financial futures	30	(91)	(100)	(65)
Total	\$ (272)	\$ (231)	\$ (383)	\$ 364

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

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

	September 30, 2024			December 31, 2023		
	Derivative Assets	Derivative Liabilities	Net	Derivative Assets	Derivative Liabilities	Net
	(In Millions)					
Gross	\$ 20,635	\$ 13,959	\$ 6,676	\$ 21,301	\$ 14,013	\$ 7,288
Due and accrued	1,377	3,221	(1,844)	1,396	2,532	(1,137)
Gross amounts offset	<u>(19,345)</u>	<u>(19,345)</u>	<u>-</u>	<u>(19,524)</u>	<u>(19,524)</u>	<u>-</u>
Net asset	2,667	(2,165)	4,832	3,173	(2,978)	6,151
Collateral posted	<u>(3,333)</u>	<u>(3,616)</u>	<u>283</u>	<u>(3,557)</u>	<u>(3,223)</u>	<u>(334)</u>
Net	<u>\$ (666)</u>	<u>\$ (5,781)</u>	<u>\$ 5,115</u>	<u>\$ (384)</u>	<u>\$ (6,202)</u>	<u>\$ 5,817</u>

**i. Repurchase agreements**

The Company has entered into repurchase agreements whereby the Company sells securities and simultaneously agrees to repurchase the same or substantially the same securities. These repurchase agreements are accounted for as collateralized borrowings with the proceeds from the sale of the securities recorded as a liability and the underlying securities continue to be recorded as an investment by the Company. Earnings on these investments are recorded as investment income and the difference between the proceeds and the amount at which the securities will be subsequently reacquired is amortized as interest expense. Repurchase agreements are used as a tool for overall portfolio management to help ensure the Company maintains adequate assets in order to provide yield, spread and duration to support liabilities and other corporate needs.

The Company provides collateral, as dictated by the repurchase agreements, to the counterparty in exchange for a loan. If the fair value of the securities sold becomes less than the loan, the counterparty may require additional collateral.

The carrying value, which is at cost, reported in the Company's liabilities as repurchase agreements approximates the fair value.

The following table provides contractual maturity, maximum balance during the year, and ending balance for bilateral repurchase agreements:

	September 30,			
	2024		2023	
	Maximum Balance	Ending Balance	Maximum Balance	Ending Balance
	(In Millions)			
From 1 Week to 1 Month	\$ 2,096	\$ 1,359	\$ -	\$ -
Greater than 1 Month to 3 Months	\$ 3,562	\$ 2,311	\$ 3,563	\$ 3,563
Greater than 3 Months to 1 Year	\$ 722	\$ -	\$ -	\$ -
Greater than 1 Year	\$ 359	\$ -	\$ -	\$ -

The company did not have any repurchase agreements where securities sold and/or acquired resulted in default as of September 30, 2024 and December 31, 2023.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

The following table presents the fair value and amortized cost of securities sold under bilateral repurchase agreement transactions, which were all NAIC rating of 1, for the periods ending September 30, 2024 and 2023:

	Maximum Balance		Ending Balance	
	(In Millions)			
March 31, 2024				
Fair Value	\$	4,473	\$	3,466
BACV	\$	-	\$	3,466
June 30, 2024				
Fair Value	\$	3,532	\$	3,449
BACV	\$	-	\$	3,799
September 30, 2024				
Fair Value	\$	3,710	\$	3,671
BACV	\$	-	\$	3,816
March 31, 2023				
Fair Value	\$	3,054	\$	3,019
BACV	\$	-	\$	3,019
June 30, 2023				
Fair Value	\$	3,615	\$	2,910
BACV	\$	-	\$	2,910
September 30, 2023				
Fair Value	\$	3,563	\$	3,563
BACV	\$	-	\$	2,910

The following table presents the cash collateral and the fair value of security collateral, which were all NAIC rating of 1, received in the bilateral repurchase agreement transactions for the periods ending September 30, 2024 and 2023:

	Maximum Balance		Ending Balance	
	Cash	Securities	Cash	Securities
(In Millions)				
March 31, 2024	\$ 96	\$ 3,530	\$ 16	\$ 3,487
June 30, 2024	\$ 3,741	\$ 14	\$ 3,431	\$ -
September 30, 2024	\$ 5,658	\$ 13	\$ 3,622	\$ -
March 31, 2023	\$ 130	\$ 3,066	\$ 19	\$ 3,022
June 30, 2023	\$ 89	\$ 3,031	\$ 4	\$ 2,918
September 30, 2023	\$ 110	\$ 3,247	\$ 110	\$ 2,717

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

The following table presents collateral received, aggregate allocation of the collateral by the remaining contractual maturity of the repurchase agreements for the periods ending September 30, 2024 and 2023:

	Overnight and Continuous	30 Days or Less	31 to 90 Days	>90days
	(In Millions)			
<b>Maximum Balance</b>				
March 31, 2024	\$ -	\$ -	\$ 1,626	\$ 1,880
June 30, 2024	\$ -	\$ 14	\$ 1,551	\$ 1,927
September 30, 2024	\$ -	\$ 789	\$ 2,164	\$ 213
March 31, 2023	\$ -	\$ 259	\$ 2,787	\$ -
June 30, 2023	\$ -	\$ 92	\$ 2,925	\$ -
September 30, 2023	\$ -	\$ -	\$ 3,086	\$ -
<b>Ending Balance</b>				
March 31, 2024	\$ -	\$ -	\$ 1,626	\$ 1,880
June 30, 2024	\$ -	\$ 14	\$ 1,551	\$ 1,927
September 30, 2024	\$ -	\$ 789	\$ 2,164	\$ 213
March 31, 2023	\$ -	\$ 259	\$ 2,787	\$ -
June 30, 2023	\$ -	\$ 92	\$ 2,925	\$ -
September 30, 2023	\$ -	\$ -	\$ 3,086	\$ -



MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

The following table presents cash collateral received that has been reinvested, the total reinvested cash and the aggregate amortized cost and fair value of the invest asset acquired with the cash collateral for the periods ending September 30, 2024 and 2023:

	1 to 2 Years		2 to 3 Years		> 3 Years	
	Amortized	Fair	Amortized	Fair	Amortized	Fair
	Cost	Value	Cost	Value	Cost	Value
Maximum Balance						
March 31, 2024	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
June 30, 2024	\$ -	\$ -	\$ 1,125	\$ 1,139	\$ 2,674	\$ 2,310
September 30, 2024	\$ -	\$ -	\$ 1,142	\$ 1,183	\$ 2,674	\$ 2,467
March 31, 2023	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
June 30, 2023	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
September 30, 2023	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Ending Balance						
March 31, 2024	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
June 30, 2024	\$ -	\$ -	\$ 1,125	\$ 1,139	\$ 2,674	\$ 2,310
September 30, 2024	\$ -	\$ -	\$ 1,142	\$ 1,183	\$ 2,674	\$ 2,467
March 31, 2023	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
June 30, 2023	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
September 30, 2023	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

To help manage the mismatch of maturity dates between the security lending transactions and the related reinvestment of the collateral received, the Company invests in highly liquid assets.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

The following table presents liability recognized to return cash collateral, and the liability recognized to return securities received as collateral as required pursuant to the terms of the secured borrowing transactions for the periods ending September 30, 2024 and 2023:

	Maximum Balance		Ending Balance	
	Cash	Securities	Cash	Securities
	(In Millions)			
March 31, 2024	\$ 96	\$ 3,530	\$ 16	\$ 3,487
June 30, 2024	\$ 3,741	\$ 14	\$ 3,431	\$ -
September 30, 2024	\$ 5,658	\$ 13	\$ 3,622	\$ -
March 31, 2023	\$ 130	\$ 3,066	\$ 19	\$ 3,022
June 30, 2023	\$ 89	\$ 3,031	\$ 4	\$ 2,918
September 30, 2023	\$ 110	\$ 3,247	\$ 110	\$ 2,717

The company did not have any reverse repurchase transactions accounted for as secured borrowings as of September 30, 2024 and December 31, 2023.

The Company did not have any repurchase agreements transactions accounted for as a sale as of September 30, 2024 and December 31, 2023.

The Company did not have any reverse repurchase agreements transactions accounted for as a sale as of September 30, 2024 and December 31, 2023.

**j. Net investment income**

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

	Nine Months Ended	
	September 30, 2024	2023
	(In Millions)	
Bonds	\$ 6,244	\$ 5,444
Preferred stocks	18	23
Common stocks - subsidiaries and affiliates	160	283
Common stocks - unaffiliated	93	86
Mortgage loans	893	840
Policy loans	784	821
Real estate	59	51
Partnerships and limited liability companies	623	706
Derivatives	(406)	(30)
Cash, cash equivalents and short-term investments	290	253
Other	212	192
Subtotal investment income	8,970	8,669
Amortization of the IMR	(90)	(36)
Net gains from separate accounts	2	-
Investment expenses	(777)	(761)
Net investment income	\$ 8,105	\$ 7,872

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

**k. Net realized capital losses**

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

	Nine Months Ended	
	September 30,	
	2024	2023
	<u>(In Millions)</u>	
Bonds	\$ (376)	\$ (625)
Preferred stocks	(8)	-
Common stocks - subsidiaries and affiliates	21	-
Common stocks - unaffiliated	11	13
Mortgage loans	(265)	(41)
Real estate	-	3
Partnerships and limited liability companies	(114)	(164)
Derivatives	(272)	(383)
Other	27	16
Net realized capital losses before federal and state taxes and deferral to the IMR	<u>(976)</u>	<u>(1,181)</u>
Net federal and state tax benefit	148	295
Net realized capital losses before deferral to the IMR	<u>(828)</u>	<u>(886)</u>
Net after tax capital losses deferred to the IMR	189	491
Net realized capital losses	<u>\$ (639)</u>	<u>\$ (395)</u>

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

	Nine Months Ended	
	September 30,	
	2024	2023
	<u>(In Millions)</u>	
Bonds	\$ (176)	\$ (163)
Common stocks - unaffiliated	(11)	(1)
Mortgage loans	(220)	(14)
Partnerships and limited liability companies	<u>(109)</u>	<u>(174)</u>
Total OTTI	<u>\$ (516)</u>	<u>\$ (352)</u>

The Company recognized OTTI of \$10 million for the nine months ended September 30, 2024 and \$14 million for the nine months ended September 30, 2023 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**

As of September 30, 2024, the Company had \$1,371 million of disallowed IMR in aggregate and in the general account.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

As of September 30, 2024, the Company had \$1,371 million of disallowed IMR admitted in the general account.

As of September 30, 2024, the calculated adjusted general capital and surplus was \$24,595 million.

As of September 30, 2024, the percentage of adjusted general capital and surplus for which the admitted disallowed IMR represents was 5%.

The following represents allocated gains (losses) to IMR from derivatives:

	September 30, 2024
	(In Millions)
Unamortized fair value derivative gain	\$ 3,243
Unamortized fair value derivative losses	(4,356)
Total allocated net losses to IMR from derivatives	\$ (1,113)

When the Company sells bonds and recognizes losses due to interest-rate related factors, and the realized losses are transferred to the IMR, the sales proceeds are generally used for reinvestment as governed by prudent asset liability management (ALM) policies and procedures. Such sales of bonds are intermittently used to meet liquidity needs and managed within the ALM framework.

IMR losses for fixed income related derivatives were in accordance with documented risk management procedures, as well as the Company's derivative use plans, and reflect the same historical treatment of derivative gains reversed to IMR and amortized rather than immediately recognized as realized gain upon termination.

As of the period ended September 30, 2024, the IMR asset admitted under the currently adopted statutory accounting interpretation includes approximately \$134 million, net of tax, related to various Funds Withheld (FWH) reinsurance treaties. Included in the FWH assets are reimbursements of capital losses on the invested assets to back the ceded reinsurance liabilities and are recorded as an adjustment to the income statement. Both the IMR and FWH assets are admitted under statutory accounting guidance.

## **8. Policyholders' liabilities**

### **a. Liabilities for deposit-type contracts**

On January 17, 2024, MassMutual issued a \$650 million funding agreement with a 4.85% fixed rate and a 5-year maturity.

On January 29, 2024, MassMutual issued a \$300 million funding agreement with a floating rate based on the Secured Overnight Financing Rate (SOFR) and a 3-year maturity.

On April 9, 2024, MassMutual issued a \$1.2 billion funding agreement of which \$850 million has a 5.10% fixed rate and a 3-year maturity and \$350 million has a floating rate based on the SOFR plus the spread and a 3-year maturity.

On May 30, 2024, MassMutual issued a \$500 million funding agreement with a 5.15% fixed rate and a 5-year maturity.

On September 5, 2024, MassMutual issued a £400 million funding agreement with a 4.625% fixed rate and a 5-year maturity.

On September 17, 2024, MassMutual issued a \$500 million funding agreement with a 4.35% fixed rate and a 7-year maturity.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

**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, 2023	\$	56
Incurred guarantee benefits		27
Paid guarantee benefits		(9)
Liability as of December 31, 2023		74
Incurred guarantee benefits		(35)
Paid guarantee benefits		(6)
Liability as of September 30, 2024	\$	33

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.

	September 30, 2024			December 31, 2023		
	Account Value	Net Amount at Risk	Weighted Average Attained Age	Account Value	Net Amount at Risk	Weighted Average Attained Age
	(\$ In Millions)					
GMDB	\$ 9,893	\$ 85	66	\$ 9,935	\$ 45	66
GMIB Basic	434	3	73	449	7	73
GMIB Plus	1,271	367	69	1,240	448	69
GMAB	1,218	1	64	1,400	20	63
GLWB	87	11	75	94	15	75

As of September 30, 2024, the GMDB account value above consists of \$1,333 million within the general account and \$8,560 million within separate accounts that includes \$3,892 million of modified coinsurance (Modco) assumed. As of December 31, 2023, the GMDB account value above consists of \$1,405 million within the general account and \$8,530 million within separate accounts that includes \$3,712 million of Modco assumed.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

**9. Reinsurance**

No significant changes.

**10. Withdrawal characteristics**

No significant changes.

**11. Debt**

MassMutual issues commercial paper in the form of Notes in minimum denominations of \$250 thousand up to a total aggregation of \$1,000 million with maturity dates up to a maximum of 270 days from the date of issuance. Noninterest bearing Notes are sold at par less a discount representing an interest factor. Interest bearing Notes are sold at par. The Notes are not redeemable or subject to voluntary prepayments by MassMutual. The Notes have a carrying value and face amount of \$499 million as of September 30, 2024 and \$50 million as of December 31, 2023. Notes issued in 2024 had interest rates ranging from 4.85% to 5.41% with maturity dates ranging from 1 to 62 days. Interest expense for commercial paper was \$14 million for the nine months ended September 30, 2024 and \$6 million for the nine months ended September 30, 2023.

**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.

**a. Pension plans**

The Company sponsors funded and unfunded noncontributory defined benefit pension plans for its eligible employees, agents and retirees.

The funded qualified defined benefit plan generally provides benefits under a cash balance formula based on age, service and salary during the participants' careers. Certain eligible participants may be entitled to benefits under a legacy defined benefit formula. The Company's policy is to fund the qualified pension plan in accordance with the Employee Retirement Income Security Act of 1974. There were no contributions in 2024 and 2023.

The Company has announced there will be no new benefit accruals under the plan after December 31, 2024.

**b-f.** No significant changes.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

**g. 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 Statutory Statements of Operations. The net periodic cost recognized is as follows:

	Nine Months Ended September 30,			
	2024	2023	2024	2023
	Pension Benefits		Other Postretirement Benefits	
	(In Millions)			
Service cost	\$ 74	\$ 64	\$ 6	\$ 6
Interest cost	92	94	11	12
Expected return on plan assets	(128)	(126)	-	-
Amortization of unrecognized losses and (gains)	14	20	(6)	(7)
Amortization of unrecognized prior service benefit	-	-	(4)	(4)
Total net periodic expense	<u>\$ 52</u>	<u>\$ 52</u>	<u>\$ 7</u>	<u>\$ 7</u>

**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 nine months ended September 30, 2024 and 2023. Accordingly, the Company has excluded these non-cash activities from the Statutory Statements of Cash Flows for the nine months ended September 30, 2024 and 2023.

	Nine Months Ended September 30,	
	2024	2023
	(In Millions)	
Stock conversions	\$ 4,083	\$ 187
Bond conversions and refinancing	1,368	481
Change in market value of corporate owned life insurance asset	180	124
Transfer of mortgage loans to partnerships and limited liability companies	140	-
Transfer of affiliated common stocks to partnerships and limited liability companies	77	-
Transfer of mortgage loans to bonds	63	3
Net investment income payment-in-kind bonds	28	12
Transfer of mortgage loans to mortgage loans	17	-
Transfer of bonds to partnerships and limited liability companies	-	122
Transfer of partnerships and limited liability companies to partnerships and limited liability companies	-	81

**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 statutory disclosure in the Company's 2023 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.



MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

***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.

***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 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.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
(UNAUDITED)

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 September 2024, MassMutual made capital contributions of \$10 million to ITPS Holdings LLC and \$55 million to DPI Acres Capital LLC. MMIH paid MassMutual \$50 million return of capital and MMLIA paid MassMutual \$12 million in dividends.

In August 2024, MassMutual made capital contributions of \$31 million to DPI Acres Capital LLC.

In June 2024, MM/Barings Multifamily paid MassMutual \$22 million in dividends and \$10 million return of capital, Insurance Road LLC paid MassMutual \$99 million in dividends, and MMIA paid MassMutual \$11 million in dividends.

In May 2024, MassMutual made capital contributions of \$20 million to ITPS Holdings LLC.

In April 2024, MassMutual made capital contributions of \$300 million to DPI Ares Mortgage Lending LLC.

In February 2024, MassMutual made capital contributions of \$30 million to ITPS Holdings LLC.

**18. Subsequent events**

Management of the Company has evaluated subsequent events through November 13, 2024, 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 24, 2024, MassMutual issued a \$500 million funding agreement with a 4.3% fixed rate and a 3-year maturity.

On October 25, 2024, the Company executed a certain coinsurance treaty amendment to increase quota share reinsurance of certain long-term care business from 50% to 75%. The Company transferred approximately \$357 million of premium to the reinsurer in exchange for ceding \$337 million in statutory reserves.

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY AND SUBSIDIARIES  
 NOTES TO INTERIM CONSOLIDATED STATUTORY FINANCIAL STATEMENTS, continued  
 (UNAUDITED)

Glossary of Terms

<u>Term</u>	<u>Description</u>
ALM	Asset liability management
ATLAS	ATLAS SP Partners
CMBS	Commercial mortgage-backed securities
C.M. Life	C.M. Life Insurance Company
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
IS	Institutional Solutions
LLC	Limited liability companies
LTC	Long-term care
MassMutual	Massachusetts Mutual Life Insurance Company
MMHLLC	MassMutual Holding LLC
MMIH	MM Investment Holding
MMSD	MassMutual Strategic Distributors
Modco	Modified coinsurance
NAIC	National Association of Insurance Commissioners
OTTI	Other-than-temporary impairment(s)
RMBS	Residential mortgage-backed securities
SOFR	Secured Overnight Financing Rate
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