MassMutual Global Funding II

USD 21,000,000,000
GLOBAL DEBT ISSUANCE PROGRAM

This Offering Memorandum supplement dated November 18, 2019 (this "**Supplement**") is in addition to and must be read in conjunction with the Offering Memorandum dated June 11, 2019, as supplemented by the Offering Memorandum supplement dated August 15, 2019 (collectively, the "**Offering Memorandum**") prepared by MassMutual Global Funding II (the "**Issuer**") under the Issuer's Global Debt Issuance Program (the "**Program**"). Capitalized terms used herein and not otherwise defined shall have the meanings of such terms set forth in the Offering Memorandum.

This Supplement constitutes a base listing particulars supplement for the purposes of listing on Euronext Dublin's Official List and trading on the Global Exchange Market and has been approved by Euronext Dublin. References herein to this document are to this Supplement, incorporating Annex 1 hereto.

On November 12, 2019, Massachusetts Mutual Life Insurance Company ("**MassMutual**") published its unconsolidated quarterly unaudited condensed statutory statements (including any notes thereto, the "**Third Quarter 2019 Condensed Statutory Financial Statements**"), which are attached hereto as Annex 1.

Except as disclosed in this Supplement, there has been no other significant new factor, material mistake or inaccuracy relating to the information included in the Offering Memorandum since the publication of the Offering Memorandum.

Where there is any inconsistency between this Supplement and the Offering Memorandum, the language used in this Supplement shall prevail.

The Issuer accepts responsibility for the information contained in this Supplement. To the best of the knowledge and belief of the Issuer (which has taken all reasonable care to ensure that such is the case), the information contained in this Supplement is in accordance with the facts and does not omit anything likely to affect the import of such information.

Supplement dated November 18, 2019

FOR EUROPEAN ECONOMIC AREA RESIDENTS ONLY

Neither this Offering Memorandum nor any related Pricing Supplement is a prospectus for the purposes of Regulation (EU) 2017/1129, as amended (the "**Prospectus Regulation**").

Prohibition of sales to EEA retail investors – If the Pricing Supplement in respect of any Series of Notes states "Applicable" under "Prohibition of Sales to EEA Retail Investors" then the Notes are not intended to be offered, sold or otherwise made available to and should not be offered, sold or otherwise made available to any retail investor in the European Economic Area ("**EEA**"). For these purposes, a retail investor means a person who is one (or more) of: (i) a retail client as defined in point (11) of Article 4(1) of MiFID II; or (ii) a customer within the meaning of Directive (EU) 2016/97, as amended (the "**Insurance Distribution Directive**"), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II. Consequently no key information document required by Regulation (EU) No 1286/2014 (as amended, the "**PRIIPs Regulation**") for offering or selling the Notes or otherwise making them available to retail investors in the EEA will be prepared and therefore offering or selling the Notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

MIFID II product governance / target market – The Pricing Supplement in respect of any Notes may include a legend entitled "MiFID II Product Governance/Professional investors and ECPs only target market" which will outline the target market assessment in respect of the Notes and which channels for distribution of the Notes are appropriate. Any person subsequently offering, selling or recommending the Notes (a "**Distributor**") should take into consideration the target market assessment; however, a Distributor subject to MiFID II is responsible for undertaking its own target market assessment in respect of the Notes (by either adopting or refining the target market assessment) and determining appropriate distribution channels. A determination will be made in relation to each issue about whether, for the purpose of the MiFID product governance rules under EU Delegated Directive (EU) 2017/593 (as amended, the "**MiFID Product Governance Rules**"), any Purchasing Agent subscribing for any Notes is a "manufacturer" in respect of such Notes, but otherwise neither the Arranger nor the Purchasing Agent(s) nor any of their respective affiliates will be a manufacturer for the purpose of the MiFID Product Governance Rules.

Benchmarks Regulation – Interest and/or other amounts payable under the Notes may be calculated by reference to certain reference rates. Any such reference rate may constitute a benchmark for the purposes of Regulation (EU) 2016/1011 (as amended, the "**Benchmarks Regulation**"). If any such reference rate does constitute such a benchmark, the applicable Pricing Supplement will indicate whether or not the benchmark is provided by an administrator included in the register of administrators and benchmarks established and maintained by the ESMA pursuant to Article 36 (Register of administrators and benchmarks) of the Benchmarks Regulation. Transitional provisions in the Benchmarks Regulation may have the result that the administrator of a particular benchmark is not required to appear in the register of administrators and benchmarks at the date of the applicable Pricing Supplement. The registration status of any administrator under the Benchmarks Regulation is a matter of public record and, save where required by applicable law, the Issuer does not intend to update the applicable Pricing Supplement to reflect any change in the registration status of the administrator.

Recent Developments

The following language replaces the fourth paragraph of the section on page 157 of the Offering Memorandum titled "TAXATION" under the heading "United States Federal Income Taxation":

An accrual method taxpayer that reports revenues on an applicable financial statement generally must recognize income for U.S. federal income tax purposes no later than the taxable year in which such income is taken into account as revenue in an applicable financial statement of the taxpayer. To the extent this rule is inconsistent with the rules described below, this rule supersedes such rules. Thus, this rule could potentially require such a taxpayer to recognize income for U.S. federal income tax purposes with respect to the Notes prior to the time such income would be recognized pursuant to the rules described below. However, recently proposed Treasury Regulations generally exclude OID, as well as income under the variable rate debt instrument and contingent payment debt instrument rules, from this rule. The proposed Treasury Regulations state that taxpayers may rely on them until final Treasury Regulations are issued, but such Treasury Regulations are subject to change. Potential investors in the Notes should consult their tax advisors regarding the potential applicability of these rules to their investment in the Notes.

Surplus Notes Exchange Offers

On October 11, 2019, MassMutual issued approximately $838 million aggregate principal amount of surplus notes (the "**New Surplus Notes**") in exchange for portions of its outstanding surplus notes maturing in 2033, 2039, 2041 and 2065. The New Surplus Notes were priced at a fixed 3.729% coupon and will mature on October 15, 2070. MassMutual's capitalization (including its debt profile) did not materially change as a result of this transaction.

Interim Update for the Nine Months Ended September 30, 2019

The unaudited statements of operations and statements of financial position data of MassMutual for the nine months ended September 30, 2019 and September 30, 2018, and as of September 30, 2019, respectively, presented below should be read in conjunction with, and is qualified in its entirety by reference to, the Statutory Financial Statements, Notes to Statutory Financial Statements, "Management's Discussion and Analysis of Financial Condition and Results of Operations - Analysis of Results of Operations – For the Years Ended December 31, 2018, 2017 and 2016" and "Management's Discussion and Analysis of Financial Condition and Results of Operations - Statement of Financial Position at December 31, 2018 compared to December 31, 2017," in each case, included in the Offering Memorandum and the Third Quarter 2019 Condensed Statutory Financial Statements of MassMutual as of and for the nine months ended September 30, 2019 which are attached hereto as Annex 1.

Analysis of Results of Operations – For the Nine Months Ended September 30, 2019 Compared to the Nine Months Ended September 30, 2018

The following table sets forth the components of MassMutual's statement of operations for the periods presented:

	Nine Months Ended September 30,		
	2019	**2018**	**% Change**
	(unaudited)	**(unaudited)**	
	($ In Millions)		
Revenue:			
Premium income	$ 16,472	$ 16,730	(2)%
Net investment income	5,369	5,304	1
Fees and other income	993	739	34
Total revenue	22,834	22,773	-
Benefits and expenses:			
Policyholders' benefits	18,708	15,874	18
Change in policyholders' reserves	1,380	4,040	(66)
Change in group annuity reserves assumed	(1,004)	(1,007)	-
General insurance expenses	1,702	1,754	(3)
Commissions	771	775	(1)
State taxes, licenses and fees	204	186	10
Total benefits and expenses	21,761	21,622	1
Net gain from operations before dividends and federal income taxes	1,073	1,151	(7)
Dividends to policyholders	1,237	1,145	8
Net (loss) gain from operations before federal income taxes	(164)	6	NM
Federal income tax (benefit) expense	(76)	21	(462)
Net loss from operations	(88)	(15)	(487)
Net realized capital gains (losses)	132	(1,284)	110
Net income (loss)	**$ 44**	**$ (1,299)**	103 **%**

The $1.3 billion increase in net income from a loss of $1.3 billion to $44 million of net income for the nine months ended September 30, 2019 is due to a decrease in net realized capital losses of $1.4 billion, partially offset by an increase in net loss from operations of $73 million. The major components of the increase in net loss from operations includes an increase in policyholders' benefits of $2.8 billion, partially offset by a decrease in the change in policyholders' reserves of $2.7 billion.

Selected premium income information is presented below:

	Nine Months Ended September 30,		
	2019	2018	% Change
	(unaudited)	(unaudited)	
	($ In Millions)		
Premium income:			
Group annuity	$ 9,003	$ 9,551	(6)%
Whole life	4,386	4,214	4
Individual annuity and supplemental contracts	1,279	1,542	(17)
Universal, variable, group and other life	1,304	832	57
Disability income	387	380	2
Other	113	211	(46)
Total	**$ 16,472**	**$ 16,730**	**(2)%**

The decrease in group annuities was primarily due to lower sales of investment only, defined benefit and pension buyout products, partially offset by an increase in defined contribution products. The decrease in annuities and supplemental contracts was primarily due to lower income annuity and variable annuity sales, partially offset by increased fixed annuity sales. The increase in universal, variable and group life is primarily due to an increase in bank-owned life insurance sales. The increase in whole life was primarily due to higher renewal premium.

Net investment income increased $65 million to $5.4 billion for the nine months ended September 30, 2019. The change was primarily due to increases in income of $287 million for bonds, $54 million for policy loans, $53 million for mortgage loans and $38 million for common stocks, partially offset by a decrease in income of $348 million for partnerships and LLCs. MassMutual's overall net annualized portfolio yield was 4.47% for the nine months ended September 30, 2019 and 4.66% for the nine months ended September 30, 2018.

Fees and other income increased $254 million for the nine months ended September 30, 2019 primarily due to a recapture of a modified coinsurance agreement for $102 million in 2018 that did not recur in 2019, an increase in investment return on MassMutual's corporate owned life insurance asset of $93 million and reinsurance commission and expense allowances of $68 million.

Policyholders' benefits, which include payments for supplementary contracts involving life contingencies, matured endowments, death, annuity, disability and surrender benefits and interest, increased $2.8 billion for the nine months ended September 30, 2019. The increase was primarily due to increases in group annuity surrenders of $2.6 billion, whole life death benefits of $200 million and whole life surrenders of $199 million.

Change in policyholders' reserves, including transfers to and from separate accounts, decreased $2.7 billion for the nine months ended September 30, 2019. The decrease was primarily due to higher withdrawals of group annuity products.

Federal income tax benefit increased $97 million for the nine months ended September 30, 2019, driven largely by greater deferrals of investment income, most notably partnerships, relative to the prior year.

Net realized capital gains (losses), which include other-than-temporary impairments ("**OTTI**"), comprised the following:

	Nine Months Ended September 30, 2019 (unaudited)	Nine Months Ended September 30, 2018 (unaudited)
	(In Millions)	
Net realized capital gains (losses):		
Bonds	$ 11	$ (106)
Common stocks - subsidiaries and affiliates	1	(1,259)
Common stocks - unaffiliated	24	72
Mortgage loans	1	(2)
Real estate	33	168
Partnerships and LLCs	(41)	(41)
Derivatives	1,115	(293)
Other	(14)	(26)
Net realized capital gains (losses) before federal and state taxes and deferral to the IMR	1,130	(1,487)
Net federal and state tax (expense) benefit	(109)	7
Net realized capital gains (losses) before deferral to the IMR	1,021	(1,480)
Net after tax (gains) losses deferred to the IMR	(889)	196
Net realized capital gains (losses)	**$ 132**	**$ (1,284)**

OTTI decreased $1.2 billion to $140 million for the nine months ended September 30, 2019. OTTI decreased $1.2 billion for common stocks affiliated primarily due to the impairment of MassMutual International LLC in 2018 and $4 million for common stocks unaffiliated, partially offset by $17 million for bonds, $2 million for partnerships and LLCs. The book values of investments are written down when a decline in value is considered to be other than temporary. OTTI is determined in a disciplined manner using available evidence in both quantitative and qualitative processes.

Residential mortgage-backed exposure

During the nine months ended September 30, 2019, there were no significant credit downgrades for the securities held by MassMutual that were backed by residential mortgage pools.

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

As of September 30, 2019, RMBS had a total carrying value of $1.1 billion and a fair value of $1.2 billion, of which approximately 24%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of $458 million and a fair value of $516 million. As of December 31, 2018, RMBS had a total carrying value of $1.3 billion and a fair value of $1.4 billion, of which approximately 20%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of $472 million and a fair value of $553 million.

Derivative financial instruments

MassMutual 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. MassMutual also uses a combination of derivatives and fixed income investments to create synthetic investments. These synthetic investments are created when they are economically more attractive than the actual instrument or when similar instruments are unavailable. Synthetic investments are created either to hedge and reduce MassMutual's credit and foreign currency exposure or to create an investment in a particular asset. MassMutual held synthetic investments with a notional amount of $18.0 billion as of September 30, 2019 and $15.5 billion as of December 31, 2018. These notional amounts included replicated asset transaction values of $16.0 billion as of September 30, 2019 and $13.6 billion as of December 31, 2018, as defined under statutory accounting practices as the result of pairing of a long derivative contract with cash instruments.

MassMutual'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. MassMutual is exposed to credit-related losses in the event of nonperformance by counterparties to derivative financial instruments. MassMutual 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.

MassMutual 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, MassMutual 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 MassMutual 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 MassMutual, to be offset by contracts in a negative position. This right of offset, combined with collateral obtained from counterparties, reduces MassMutual's credit exposure.

Net collateral pledged by the counterparties was $4.3 billion as of September 30, 2019 and $2.5 billion as of December 31, 2018. In the event of default, the full market value exposure at risk in a net gain position, net of offsets and collateral, was $115 million as of September 30, 2019 and $146 million as of December 31, 2018. The statutory net amount at risk, defined as net collateral pledged and statement values excluding accrued interest, was $741 million as of September 30, 2019 and $695 million as of December 31, 2018.

MassMutual had the right to rehypothecate or repledge securities totaling $2.1 billion of the $4.3 billion as of September 30, 2019 and $709 million of the $2.5 billion as of December 31, 2018 of net collateral pledged by counterparties. There were no securities rehypothecated to other counterparties as of September 30, 2019 or December 31, 2018.

Analysis of Financial Condition – at September 30, 2019 Compared to at December 31, 2018

The following table sets forth MassMutual's significant assets, liabilities and surplus for the dates presented:

	September 30, 2019 (unaudited)	December 31, 2018	% Change
	($ In Millions)		
Assets:			
Bonds	$ 100,312	$ 97,079	3 %
Preferred stocks	742	744	-
Common stocks – subsidiaries and affiliates	16,931	12,327	37
Common stocks – unaffiliated	1,182	500	136
Mortgage loans	25,918	23,624	10
Policy loans	14,557	13,873	5
Real estate	338	488	(31)
Partnerships and LLCs	9,046	8,599	5
Derivatives	16,679	8,741	91
Cash, cash equivalents and short-term investments	5,114	4,318	18
Other invested assets	1,293	943	37
Total invested assets	192,112	171,236	12
Investment income due and accrued	2,574	3,018	(15)
Federal income taxes	264	612	(57)
Deferred income taxes	871	983	(11)
Other than invested assets	3,412	3,320	3
Total assets excluding separate accounts	199,233	179,169	11
Separate account assets	69,211	64,478	7
Total assets	**$ 268,444**	**$ 243,647**	**10 %**
Liabilities and Surplus:			
Policyholders' reserves	$ 127,105	$ 121,978	4 %
Liabilities for deposit-type contracts	15,289	14,370	6
Contract claims and other benefits	534	479	11
Policyholders' dividends	1,767	1,713	3
General expenses due or accrued	1,007	1,096	(8)
Asset valuation reserve	5,067	3,307	53
Repurchase agreements	3,912	4,768	(18)
Commercial paper and other borrowed money	250	250	-
Collateral	3,676	2,946	25
Derivatives	12,209	4,912	149
Funds held under coinsurance	4,203	4,099	3
Other liabilities	4,977	3,641	37
Total liabilities excluding separate accounts	179,996	163,559	10
Separate account liabilities	69,211	64,478	7
Total liabilities	**249,207**	**228,037**	**9**
Surplus	19,237	15,610	23
Total liabilities and surplus	**$ 268,444**	**$ 243,647**	**10 %**

Assets

Total assets increased $24.8 billion as of September 30, 2019, primarily due to an increase in derivatives of $7.9 billion, common stocks of $5.3 billion, separate account assets of $4.7 billion, bonds of $3.2 billion, mortgage loans of $2.3 billion, cash equivalents and short-term investments of $796 million and policy loans of $684 million.

Bonds increased $3.2 billion to $100.3 billion as of September 30, 2019, primarily due to $3.7 billion of net acquisitions, partially offset by $484 million of unrealized foreign currency losses.

Common stocks – subsidiaries and affiliates increased $4.6 billion to $16.9 billion as of September 30, 2019, primarily due to an increased valuation of MassMutual Holding LLC.

Common stocks – unaffiliated increased $682 million to $1.2 billion as of September 30, 2019, primarily due to net acquisitions of mutual funds.

Mortgage loans increased $2.3 billion to $25.9 billion as of September 30, 2019, primarily due to $2.4 billion of net acquisitions, partially offset by $95 million of transfers to partnerships and LLCs and $11 million of net unrealized foreign currency revaluation loss primarily related to the strengthening of the British Pound against the U.S. Dollar. Residential mortgage loans are primarily seasoned pools of homogeneous residential mortgage loans that are predominantly Federal Housing Administration insured or Veterans Administration guaranteed, though the pools may contain mortgages of subprime credit quality. MassMutual had residential mortgage loan pools with a carrying value of $2.4 billion as of September 30, 2019 and $1.3 billion as of December 31, 2018.

Policy loans increased $684 million to $14.6 billion as of September 30, 2019 primarily due to new loans and interest capitalization of $1.5 billion, partially offset by loan repayments and surrenders of $849 million.

Derivative assets increased $7.9 billion to $16.7 billion as of September 30, 2019, primarily due to an increase in interest related hedge values resulting from the decrease in the swap curve rates, increased equity related hedge values resulting from the strengthening of equity markets, increased foreign currency hedge values resulting from the weakening of the British Pound and Euro relative to the U.S. Dollar, net of a decrease in futures resulting from the rolling of positions followed by the decrease in treasury rates, as well as changes in notional related to the repositioning of the portfolio as part of ongoing asset-liability management activity.

Cash, cash equivalents and short-term investments increased $796 million to $5.1 billion as of September 30, 2019. The increase was primarily due to net cash provided from operations of $5.7 billion and net cash used in financing and other sources of $1.4 billion, partially offset by net cash applied to investing activities of $6.3 billion.

Separate account assets increased $4.7 billion to $69.2 billion as of September 30, 2019, primarily due to net market appreciation of $8.1 billion, partially offset by net customer cash outflows of $3.0 billion, fees of $298 million and pending security settlements of $87 million.

Liabilities

Total liabilities increased $21.2 billion to $249.2 billion as of September 30, 2019, primarily due to increases in derivatives of $7.3 billion, policyholders' reserves of $5.1 billion, separate account liabilities of $4.7 billion, asset valuation reserve of $1.8 billion, other liabilities of $1.3 billion, liabilities for deposit-type contracts of $919 million and collateral of $730 million, partially offset by a decrease in repurchase agreements of $856 million.

Policyholders' reserves increased $5.1 billion to $127.1 billion as of September 30, 2019. Whole life products increased $2.5 billion, group life products increased $1.3 billion, individual annuity products increased $524 million, universal, variable, and other life products increased $300 million and group annuity products increased $454 million primarily due to premiums and interest on reserves outpacing surrenders and payments.

Liabilities for deposit-type contracts increased $919 million to $15.3 billion as of September 30, 2019, primarily due to medium term note ("**MTN**") deposits of $1.5 billion partially offset by MTN withdrawals of $709 million.

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

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

Liability as of January 1, 2018	$ 512
Incurred guarantee benefits	250
Paid guarantee benefits	(6)
Liability as of December 31, 2018	756
Incurred guarantee benefits	131
Paid guarantee benefits	(4)
Liability as of September 30, 2019	$ 883

MassMutual held reserves for variable annuity guarantees in accordance with the stochastic scenarios as of September 30, 2019 and December 31, 2018. As of September 30, 2019 and December 31, 2018, MassMutual held additional reserves above those indicated based on the stochastic scenarios in order to maintain a prudent level of reserve adequacy.

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

	September 30, 2019			**December 31, 2018**		
	Account Value	**Net Amount at Risk**	**Weighted Average Attained Age**	**Account Value**	**Net Amount at Risk**	**Weighted Average Attained Age**
			($ In Millions)			
GMDB..........	$ 18,007	$ 45	65	$ 17,392	$ 132	64
GMIB Basic .	707	47	69	700	97	69
GMIB Plus ...	2,831	595	68	2,687	813	67
GMAB..........	2,530	4	60	2,573	74	60
GMWB.........	154	14	71	160	23	70

As of September 30, 2019, the GMDB account value above consists of $3.8 billion within the general account and $14.2 billion within the separate account that includes $4.3 billion of modified coinsurance assumed. As of December 31, 2018, the GMDB account value above consists of $3.9 billion within the general account and $13.5 billion within the separate account that includes $3.8 billion of modified coinsurance.

AVR increased $1.8 billion to $5.1 billion as of September 30, 2019. The increase was primarily due to net unrealized capital gains of $3.8 billion primarily due to the change in value of MassMutual Holding LLC and an increase of $107 million in net realized capital gains, partially offset by a decrease of $2.0 billion to adjust the reserve down to the maximum and a decrease in reserve contributions of $119 million. AVR is a formula driven reserve, the purpose of which is to reduce the surplus volatility of after-tax credit-related realized and unrealized gains and losses. It is calculated based on statement values by asset type, credit quality and reserve factors. AVR can range from zero to a maximum allowable reserve. Any amounts calculated in excess of the maximum allowable reserve will not be included in the calculation of AVR. Any losses that exceed their related component of the AVR will not be absorbed. Changes in statement values, credit quality and capital gains or losses will affect the reserve balance.

Repurchase agreements decreased $856 million to $3.9 billion as of September 30, 2019. Proceeds from repurchase agreements are used in overall portfolio management to help ensure MassMutual has the assets needed to provide yield, spread and duration to support liabilities and other corporate needs. MassMutual increases and decreases repurchase agreements in response to changing market conditions and changing liability needs.

Collateral increased $730 million to $3.7 billion as of September 30, 2019. This increase in collateral liability was consistent with the change in net derivative asset values. In addition, securities that were held as collateral by a trustee off the balance sheet increased by $1.6 billion to $2.1 billion as of September 30, 2019 from 475 million as of December 31, 2018. The derivative collateral liability is a function of contractual requirements. When certain threshold exposure levels and transfer amount levels are reached, MassMutual requires additional collateral or returns excess collateral held.

Derivative liabilities increased $7.3 billion to $12.2 billion as of September 30, 2019, primarily due to an increase in interest related hedge values resulting from the decrease in the swap curve rates and increase in foreign currency hedge values resulting from the weakening of the British Pound and Euro relative to the U.S. Dollar, as well as changes in notional related to the repositioning of the portfolio as part of ongoing asset-liability management activity.

Other liabilities increased $1.3 billion to $5.0 billion as of September 30, 2019, primarily due to increases in pending settlements of $414 million, IMR of $306 million, derivative interest expense of $269 million and pending security settlements of $121 million.

Separate account liabilities increased $4.7 billion to $69.2 billion as of September 30, 2019. See analysis related to separate account assets.

Surplus

Surplus increased $3.6 billion to $19.2 billion as of September 30, 2019. The following table shows the change in surplus:

	September 30, 2019
	(In Millions)
Beginning surplus	$ 15,610
Net income	44
Change in net unrealized capital gains (losses), net of tax	5,174
Change in net unrealized foreign exchange capital gains (losses), net of tax	(468)
Change in other net deferred income taxes	(47)
Change in nonadmitted assets	751
Change in AVR	(1,760)
Prior period adjustments	(57)
Other	(10)
Net increase	3,627
Ending surplus	**$ 19,237**

MassMutual's total adjusted capital, as defined by the NAIC, increased to $25.3 billion as of September 30, 2019 compared to $19.9 billion as of December 31, 2018.

The following table sets forth the calculation of total adjusted capital:

	September 30, 2019	**December 31, 2018**
	(In Millions)	
Surplus[1]	$ 19,237	$ 15,610
AVR[2]	5,190	3,414
One-half of the apportioned dividend liability[2]	880	852
Total adjusted capital [3]	**$ 25,307**	**$ 19,876**

[1] Surplus as of September 30, 2019 includes surplus notes with a carrying value of $2,268 million, comprised of the following surplus notes at face value issued and outstanding: $250 million of surplus notes maturing in 2023, $100 million of surplus notes maturing in 2024, $250 million of surplus notes maturing in 2033, $310 million of surplus notes maturing in 2039, $400 million of surplus notes maturing in 2041, $500 million of surplus notes maturing in 2065 and $475 million of surplus notes maturing in 2077. See "Recent Developments—Surplus Notes Exchange Offers."

[2] Consolidated for MassMutual, C.M. Life Insurance Company and MML Bay State Life Insurance Company.

[3] Defined by the NAIC as surplus plus consolidated AVR and one-half of the consolidated apportioned dividend liability and a deduction for applicable foreign insurance subsidiaries.

Annex 1

MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY

CONDENSED STATUTORY FINANCIAL STATEMENTS

As of September 30, 2019 and December 31, 2018 and for the nine months ended
September 30, 2019 and 2018

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

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

	September 30, 2019	December 31, 2018
	($ In Millions)	
Assets:		
Bonds	$ 100,312	$ 97,079
Preferred stocks	742	744
Common stocks – subsidiaries and affiliates	16,931	12,327
Common stocks – unaffiliated	1,182	500
Mortgage loans	25,918	23,624
Policy loans	14,557	13,873
Real estate	338	488
Partnerships and limited liability companies	9,046	8,599
Derivatives	16,679	8,741
Cash, cash equivalents and short-term investments	5,114	4,318
Other invested assets	1,293	943
Total invested assets	192,112	171,236
Investment income due and accrued	2,574	3,018
Federal income taxes	264	612
Deferred income taxes	871	983
Other than invested assets	3,412	3,320
Total assets excluding separate accounts	199,233	179,169
Separate account assets	69,211	64,478
Total assets	$ 268,444	$ 243,647
Liabilities and Surplus:		
Policyholders' reserves	$ 127,105	$ 121,978
Liabilities for deposit-type contracts	15,289	14,370
Contract claims and other benefits	534	479
Policyholders' dividends	1,767	1,713
General expenses due or accrued	1,007	1,096
Asset valuation reserve	5,067	3,307
Repurchase agreements	3,912	4,768
Commercial paper	250	250
Collateral	3,676	2,946
Derivatives	12,209	4,912
Funds held under coinsurance	4,203	4,099
Other liabilities	4,977	3,641
Total liabilities excluding separate accounts	179,996	163,559
Separate account liabilities	69,211	64,478
Total liabilities	249,207	228,037
Surplus	19,237	15,610
Total liabilities and surplus	$ 268,444	$ 243,647

See notes to condensed statutory financial statements

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

	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
	($ In Millions)	
Revenue:		
Premium income	$ 16,472	$ 16,730
Net investment income	5,369	5,304
Fees and other income	993	739
Total revenue	22,834	22,773
Benefits and expenses:		
Policyholders' benefits	18,708	15,874
Change in policyholders' reserves	1,380	4,040
Change in group annuity reserves assumed	(1,004)	(1,007)
General insurance expenses	1,702	1,754
Commissions	771	775
State taxes, licenses and fees	204	186
Total benefits and expenses	21,761	21,622
Net gain from operations before dividends and federal income taxes	1,073	1,151
Dividends to policyholders	1,237	1,145
Net (loss) gain from operations before federal income taxes	(164)	6
Federal income tax expense (benefit)	(76)	21
Net loss from operations	(88)	(15)
Net realized capital (losses) gains	132	(1,284)
Net income (loss)	$ 44	$ (1,299)

See notes to condensed statutory financial statements

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

	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
	($ In Millions)	
Surplus, beginning of year	$ 15,610	$ 15,705
Decrease due to:		
Net income (loss)	44	(1,299)
Change in net unrealized capital gains (losses), net of tax	5,174	343
Change in net unrealized foreign exchange capital (losses) gains, net of tax	(468)	(384)
Change in other net deferred income taxes	(47)	301
Change in nonadmitted assets	751	(376)
Change in asset valuation reserve	(1,760)	491
Prior period adjustments	(57)	(49)
Other	(10)	(10)
Net increase (decrease)	3,627	(983)
Surplus, end of period	$ 19,237	$ 14,722

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

	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
	($ In Millions)	
Cash from operations:		
Premium and other income collected	$ 16,825	$ 17,779
Net investment income	6,391	4,940
Benefit payments	(18,609)	(16,025)
Net transfers from separate accounts	3,692	1,125
Net receipts from group annuity reserves assumed	1,004	1,007
Commissions and other expenses	(2,743)	(2,857)
Dividends paid to policyholders	(1,183)	(1,112)
Federal and foreign income taxes recovered	328	230
Net cash from operations	5,705	5,087
Cash from investments:		
Proceeds from investments sold, matured or repaid:		
Bonds	16,608	13,181
Preferred and common stocks – unaffiliated	757	489
Common stocks – affiliated	5	915
Mortgage loans	1,774	2,113
Real estate	191	276
Partnerships and limited liability companies	667	1,643
Derivatives	1,181	287
Other	(301)	(569)
Total investment proceeds	20,882	18,335
Cost of investments acquired:		
Bonds	(19,637)	(19,639)
Preferred and common stocks – unaffiliated	(1,427)	(270)
Common stocks – affiliated	(148)	(541)
Mortgage loans	(4,213)	(2,993)
Real estate	(78)	(20)
Partnerships and limited liability companies	(902)	(1,384)
Derivatives	(259)	(615)
Other	121	403
Total investments acquired	(26,543)	(25,059)
Net increase in policy loans	(683)	(728)
Net cash from investing activities	(6,344)	(7,452)
Cash from financing and miscellaneous sources:		
Net withdrawals on deposit-type contracts	(358)	(254)
Change in repurchase agreements	(856)	628
Change in collateral	931	(657)
Other cash provided	1,718	758
Net cash from financing and miscellaneous sources	1,435	475
Net change in cash, cash equivalents and short-term investments	796	(1,890)
Cash, cash equivalents and short-term investments:		
Beginning of year	4,318	3,580
End of period	$ 5,114	$ 1,690

See notes to condensed statutory financial statements

1. Nature of operations

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

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

2. Summary of significant accounting policies

a. Basis of presentation

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

The condensed statutory financial statements and notes as of September 30, 2019 and December 31, 2018, and for the nine months ended September 30, 2019 and 2018, are unaudited. These condensed statutory financial statements, in the opinion of management, reflect the fair presentation of the financial position, results of operations, changes in surplus and cash flows for the interim periods. These condensed statutory financial statements and notes should be read in conjunction with the statutory financial statements and notes thereto included in the Company's 2018 audited yearend financial statements as these condensed statutory financial statements disclose only significant changes from yearend 2018. The results of operations for the interim periods should not be considered indicative of results to be expected for the full year. The Condensed Statutory Statements of Financial Position as of December 31, 2018 have been derived from the audited financial statements at that date, but do not include all of the information and footnotes required by statutory accounting practices for complete financial statements.

For the full description of accounting policies, see *Note 2. "Summary of significant accounting policies"* of Notes to Statutory Financial Statements included in the Company's 2018 audited yearend financial statements.

b. Common stocks – subsidiaries and affiliates

Common stocks of unconsolidated subsidiaries, primarily C.M. Life Insurance Company (C.M. Life), MML Bay State Life Insurance Company (MML Bay State), and MassMutual Holding LLC (MMHLLC), are accounted for using the statutory equity method. The Company accounts for the value of MMHLLC at its underlying U.S. generally accepted accounting principles (U.S GAAP) equity value, adjusted by a portion of its noncontrolling interests (NCI) after consideration of MMHLLC's fair value and the Company's capital levels. The Division has affirmed the statutory recognition of the Company's application of the NCI guidelines in MMHLLC's statutory carrying value. However, the Company has limited this recognition to $3,724 million as of September 30, 2019 and $2,749 million as of December 31, 2018. Operating results, less dividends declared, for MMHLLC are reflected as net unrealized capital gains (losses) in the Statutory Statements of Changes in Surplus. Dividends declared from MMHLLC are recorded in net investment income when declared and are limited to MMHLLC's U.S. GAAP retained earnings. The cost basis of common stocks – subsidiaries and affiliates is adjusted for impairments deemed to be other than temporary.

MassMutual International LLC (MMI) was classified as common stocks – subsidiaries and affiliates as of December 31, 2017 and as partnerships and LLCs as of December 31, 2018. MMI was accounted for using the statutory equity method in both years. Prior to December 31, 2018, the Company accounted for the value of MMI at its underlying U.S. GAAP equity value adjusted to remove certain nonadmitted and intangible assets. Beginning on December 31, 2018, the value of MMI is recorded at its underlying U.S. GAAP equity value. The change in the value of MMI is reflected as net unrealized capital gains (losses) in the Statutory Statements of Changes in Surplus.

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

3. New accounting standards

Adoption of new accounting standards

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

In October 2018, the NAIC issued modifications to SSAP No. 86, *Derivatives,* effective January 1, 2019. This guidance permits the use of the Overnight Index Swap (OIS) rate based on Secured Overnight Financing Rate as a U.S. benchmark interest rate for hedge accounting purposes under ASC Topic 815 in addition to the U.S. Treasury rate, the LIBOR swap rate, the OIS rate based on the Fed Funds Effective Rate, and the SIFMA Municipal Swap Rate. The Company has not elected to apply hedge accounting, therefore adoption of this guidance did not have an impact on the Company's financial statements.

In November 2018, the NAIC issued SSAP No. 30R, *Unaffiliated Common Stock*, effective January 1, 2019. These clarifications applies to unaffiliated common stock including Securities Exchange Commission registered investment companies, such as closed-end mutual funds and unit investments trusts. The modification also includes public stock warrants, while nonpublic stock warrants would be classified as derivative instruments. The modifications did not have a material effect on the Company's financial statements.

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

Future adoption of new accounting standards

In November 2018, the NAIC adopted modifications to the liquidity risk disclosure requirements of SSAP No. 51R, *Life Contracts*, No. 52, *Deposit-Type Contracts*, and No. 61R, *Life, Deposit-Type and Accident and Health Reinsurance*, effective December 31, 2019. The modifications will require the Company to provide additional liquidity risk information such as current surrender charges, amount of account value, cash value and reserves breakouts by withdrawal characteristics for certain general and separate account products and groups of products. Additionally, a reconciliation of amounts of total reserves disclosed to the applicable annual statement exhibits, and the corresponding financial statement line items will be required. The Company is currently evaluating the impact of the modifications to the liquidity risk disclosures in its financial statements.

In November 2018, the NAIC issued SSAP No. 108, *Derivatives Hedging Variable Annuity Guarantees*, to provide special accounting guidance for limited derivatives hedging variable annuity guarantee benefits that are subject to fluctuations from interest rates, effective January 1, 2020 with early adoption permitted as of January 1, 2019. This modification applies to variable annuity contracts and other contracts involving certain guaranteed benefits that are valued under principles-based reserving. This modification permits an insurer to use macro-hedging by designating as the host contract, an entire book of business or subsection consisting of interest sensitive variable annuity guarantee benefits, in a fair value hedge. The Company is required to record at fair value the interest rate sensitive variable annuity guarantee (that is, the hedged item) and the related derivative hedging instrument. Changes in the fair value of the derivatives attributable to the hedged item are recorded in realized gains and losses to offset the changes in the fair value of the hedged item. The excess or deficiency of the change in fair value of the derivative compared to the change in the fair value of the hedged item should be recorded as an admitted deferred asset or deferred liability, and amortized through realized capital gains and losses over the remaining term of the interest rate sensitive variable annuity, not to exceed 10 years. The Company is also required to record a special surplus allocation of an amount equal to the deferred asset and deferred liability from unassigned surplus. Changes in the fair value of the derivative that is not attributable to the hedge risk should be recorded in unrealized gains and losses. The Company will be required to disclose information about the derivative and related hedged items. The Company is currently evaluating this guidance to determine the potential impact on its financial statements.

In April 2019, the NAIC adopted modifications to SSAP Nos. 26R, *Bonds*, 43R, *Loan-Backed and Structured Securities*, and 86, *Derivatives*, reclassifying structured notes as specifically defined that expose the investor to the risk of principal loss as derivative instruments, effective December 31, 2019. These types of structured notes where there is an embedded derivative wrapped by a bond include underlying risks that are not linked to the issuer’s credit. Structured notes are currently reported as long-term bonds valued at amortized cost; while as derivative instruments, structured notes would be carried at fair value. The Company is currently evaluating this guidance to determine potential impact on its financial statements, but anticipates minimal impact.

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, 2019				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	$ 4,353	$ 5,059	$ -	$ 5,059	$ -
All other governments	1,579	1,755	-	1,686	69
States, territories and possessions	551	615	-	615	-
Political subdivisions	537	600	-	600	-
Special revenue	5,802	6,702	-	6,692	10
Industrial and miscellaneous	81,342	87,384	10	49,709	37,665
Parent, subsidiaries and affiliates	6,148	6,322	-	439	5,883
Preferred stocks	742	768	11	-	757
Common stocks - subsidiaries and affiliates	272	272	157	-	115
Common stocks - unaffiliated	1,182	1,182	934	-	248
Mortgage loans - commercial	23,513	24,755	-	-	24,755
Mortgage loans - residential	2,405	2,405	-	-	2,405
Derivatives:					
Interest rate swaps	14,306	16,617	-	16,617	-
Options	742	742	59	683	-
Currency swaps	1,499	1,499	-	1,499	-
Forward contracts	95	95	-	95	-
Credit default swaps	22	22	-	22	-
Financial futures	15	15	15	-	-
Cash, cash equivalents and short-term investments	5,114	5,114	-	5,114	-
Separate account assets	69,211	69,211	46,100	22,120	991
Financial liabilities:					
Guaranteed interest contracts	9,769	9,912	-	-	9,912
Group annuity contracts and other deposits	17,511	18,121	-	-	18,121
Individual annuity contracts	8,463	10,123	-	-	10,123
Supplementary contracts	1,179	1,180	-	-	1,180
Repurchase agreements	3,912	3,912	-	3,912	-
Commercial paper	250	250	-	250	-
Derivatives:					
Interest rate swaps	12,008	13,071	-	13,070	-
Options	2	2	2	-	-
Currency swaps	100	100	-	100	-
Forward contracts	21	21	-	21	-
Financial futures	79	79	79	-	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of $16,658 million.

	December 31, 2018				
	Carrying Value	Fair Value	Level 1	Level 2	Level 3
	(In Millions)				
Financial assets:					
Bonds:					
U. S. government and agencies	$ 5,854	$ 6,193	$ -	$ 6,193	$ -
All other governments	1,487	1,481	-	1,415	66
States, territories and possessions	614	647	-	647	-
Political subdivisions	547	571	-	571	-
Special revenue	5,927	6,421	-	6,412	9
Industrial and miscellaneous	75,124	74,538	10	42,695	31,833
	7,526	7,570	-	1,172	6,398
Preferred stocks	744	734	12	-	722
Common stocks - subsidiaries and affiliates	398	398	233	-	165
Common stocks - unaffiliated	500	500	194	-	306
Mortgage loans - commercial	22,357	22,794	-	-	22,794
Mortgage loans - residential	1,267	1,211	-	-	1,211
Derivatives:					
Interest rate swaps	6,629	6,858	-	6,858	-
Options	911	911	-	911	-
Currency swaps	843	843	-	843	-
Forward contracts	106	113	-	113	-
Credit default swaps	18	6	-	6	-
Interest rate caps and floors	18	18	-	18	-
Financial futures	216	216	-	216	-
Cash, cash equivalents and short-term investments	4,318	4,318	175	4,143	-
Separate account assets	64,478	64,478	41,358	22,568	551
Financial liabilities:					
Guaranteed interest contracts	8,825	8,729	-	-	8,729
Group annuity contracts and other deposits	17,863	17,951	-	-	17,951
Individual annuity contracts	8,131	8,925	-	-	8,925
Supplementary contracts	1,178	1,179	-	-	1,179
Repurchase agreements	4,768	4,768	-	4,768	-
Commercial paper	250	250	-	250	-
Derivatives:					
Interest rate swaps	4,647	5,111	-	5,111	-
Options	5	5	-	5	-
Currency swaps	232	232	-	232	-
Forward contracts	12	28	-	28	-
Credit default swaps	2	3	-	3	-
Financial futures	13	14	-	14	-

Common stocks - subsidiaries and affiliates do not include unconsolidated subsidiaries, which had statutory carrying values of $11,929 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:

	September 30, 2019			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
Industrial and miscellaneous	$ 10	$ 200	$ 64	$ 274
Preferred stocks	-	-	12	12
Common stocks - subsidiaries and affiliates	157	-	115	272
Common stocks - unaffiliated	934	-	248	1,182
Derivatives:				
Interest rate swaps	-	14,307	-	14,307
Options	59	683	-	742
Currency swaps	-	1,499	-	1,499
Forward contracts	-	95	-	95
Financial futures	15	-	-	15
Separate account assets	46,100	22,120	991	69,211
Total financial assets carried at fair value	$ 47,275	$ 38,904	$ 1,430	$ 87,609
Financial liabilities:				
Derivatives:				
Interest rate swaps	$ -	$ 12,007	$ -	$ 12,007
Options	2	(1)	-	1
Currency swaps	-	100	-	100
Forward contracts	-	21	-	21
Financial futures	79	-	-	79
Total financial liabilities carried at fair value	$ 81	$ 12,127	$ -	$ 12,208

For the nine months ended September 30, 2019, the Company does not have any financial instruments that were carried at NAV 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, 2018			
	Level 1	Level 2	Level 3	Total
	(In Millions)			
Financial assets:				
Bonds:				
Industrial and miscellaneous	10	30	64	104
Parent, subsidiaries and affiliates	-	82	66	148
Common stocks - subsidiaries and affiliates	233	-	165	398
Common stocks - unaffiliated	194	-	306	500
Derivatives:				
Interest rate swaps	-	6,629	-	6,629
Options	-	911	-	911
Currency swaps	-	843	-	843
Interest rate caps and floors	-	18	-	18
Forward contracts	-	106	-	106
Financial futures	-	216	-	216
Separate account assets	41,358	22,569	551	64,478
Total financial assets carried at fair value	$ 41,795	$ 31,404	$ 1,152	$ 74,351
Financial liabilities:				
Derivatives:				
Interest rate swaps	$ -	$ 4,647	$ -	$ 4,647
Options	-	5	-	5
Currency swaps	-	232	-	232
Forward contracts	-	12	-	12
Financial futures	-	15	-	15
Total financial liabilities carried at fair value	$ -	$ 4,911	$ -	$ 4,911

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

	Balance as of 1/1/19	Gains (Losses) in Net Income	Losses (Gains) in Surplus	Purchases	Issuances	Sales	Settlements	Transfers In	Transfers Out	Other	Balance as of 09/30/19
	(In Millions)										
Financial assets:											
Bonds:											
Industrial and miscellaneous	$ 64	$ (2)	$ (1)	$ -	$ 1	$ -	$ (5)	$ 2	$ -	$ 5	$ 64
Parent, subsidiaries, and affiliates	66	-	-	-	-	-	-	-	(8)	(58)	-
Preferred stocks	-	-	-	1	-	-	-	-	-	11	12
Common stocks - subsidiaries and affiliates	165	1	(47)	1	-	-	(5)	-	-	-	115
Common stocks - unaffiliated	306	11	(12)	4	-	(60)	(1)	-	-	-	248
Separate account assets	551	29	-	806	-	(394)	-	-	-	-	992
Total financial assets	$ 1,152	$ 39	$ (60)	$ 813	$ 1	$ (454)	$ (11)	$ 2	$ (8)	$ (42)	$ 1,431

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.

	Balance as of 1/1/18	Gains (Losses) in Net Income	Losses (Gains) in Surplus	Purchases	Issuances	Sales	Settlements	Transfers In	Transfers Out	Other	Balance as of 12/31/18
	(In Millions)										
Financial assets:											
Bonds:											
Industrial and miscellaneous	$ 55	$ (3)	$ (5)	$ -	$ 1	$ -	$ (9)	$ -	$ -	$ 26	$ 65
Parent, subsidiaries, and affiliates	61	4	(8)	9	-	-	(6)	5	-	-	65
Preferred stocks	2	-	-	-	1	-	-	-	-	(2)	1
Common stocks - subsidiaries and affiliates	109	-	40	5	6	-	(10)	9	-	4	164
Common stocks - unaffiliated	311	6	14	16	3	-	(44)	-	-	-	306
Derivatives:											
Currency swaps	1	-	-	-	-	-	-	(1)	-	-	-
Separate account assets	710	7	-	112	-	(278)	-	-	-	-	551
Total financial assets	$ 1,249	$ 14	$ 41	$ 142	$ 11	$ (278)	$ (69)	$ 13	$ -	$ 28	$ 1,152
Financial liabilities											
Derivatives:											
Currency swaps	$ 8	-	-	-	-	-	-	-	(8)	-	$ -

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

As of September 30, 2019, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of $7,186 million. Securities in an unrealized loss position for less than 12 months had a fair value of $3,357 million and unrealized losses of $37 million. Securities in an unrealized loss position for greater than 12 months had a fair value of $3,830 million and unrealized losses of $84 million. These securities were primarily categorized as industrial and miscellaneous or parent, subsidiaries and affiliates.

As of December 31, 2018, investments in structured and loan-backed securities that had unrealized losses, which were not recognized in earnings, had a fair value of $9,992 million. Securities in an unrealized loss position for less than 12 months had a fair value of $7,859 million and unrealized losses of $141 million. Securities in an unrealized loss position for greater than 12 months had a fair value of $2,133 million and unrealized losses of $78 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, 2019 or 2018, that were reacquired within 30 days of the sale date.

Residential mortgage-backed exposure

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

As of September 30, 2019, RMBS had a total carrying value of $1,143 million and a fair value of $1,249 million, of which approximately 24%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of $458 million and a fair value of $516 million. As of December 31, 2018, RMBS had a total carrying value of $1,287 million and a fair value of $1,395 million, of which approximately 20%, based on carrying value, was classified as Alt-A. Alt-A and subprime RMBS had a total carrying value of $472 million and a fair value of $553 million.

b. Common stocks – subsidiaries and affiliates

MMHLLC paid $300 million in dividends to MassMutual for the period ended September 30, 2019 and paid $250 million in dividends for the period ended September 30, 2018.

MassMutual contributed capital of $282 million to MMHLLC for the period ended September 30, 2019 and $371 million for the period ended September 30, 2018.

On May 24, 2019, an indirectly wholly owned subsidiary of MassMutual, MM Asset Management Holding LLC (MMAMH) executed the sale of its retail asset management affiliate, OppenheimerFunds, Inc. (OFI), to Invesco Ltd (Invesco), a global asset manager. Under the terms of the sale, MMAMH and OFI employee shareholders received 81.8 million of Invesco common shares and $4.0 billion in perpetual, non-cumulative preference shares with a fixed cash dividend rate of 5.9%. MMAMH is a directly wholly owned subsidiary of MMHLLC. In turn, MMAMH received a 15.7% common equity interest in post transaction Invesco and MMAMH entered into a shareholder agreement pursuant to which MMAMH has customary minority shareholder rights, including the appointment of a director to Invesco's board of directors. MassMutual's investment in MMHLLC was increased from the impact of this sale through change in unrealized capital gains of $3,344 million, with an approximate net increase to surplus of $2,500 million.

c. *Mortgage loans*

Mortgage loans comprised commercial mortgage loans and residential mortgage loans. The Company's commercial mortgage loans primarily finance various types of real estate properties throughout the U.S., the United Kingdom and Canada. The Company holds commercial mortgage loans for which it is the primary lender or a participant or co-lender in a mortgage loan agreement and mezzanine loans that are subordinate to senior secured first liens. Residential mortgage loans 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, 2019		December 31, 2018	
	Carrying Value	Fair Value	Carrying Value	Fair Value
	(In Millions)			
Commercial mortgage loans:				
Primary lender	$ 23,513	$ 24,755	$ 22,287	$ 22,723
Mezzanine loans	-	-	70	71
Total commercial mortgage loans	23,513	24,755	22,357	22,794
Residential mortgage loans:				
FHA insured and VA guaranteed	1,881	1,877	1,263	1,207
Other residential loans	524	528	4	4
Total residential mortgage loans	2,405	2,405	1,267	1,211
Total mortgage loans	$ 25,918	$ 27,160	$ 23,624	$ 24,005

As of September 30, 2019 and December 31, 2018, the loan-to-value ratios of 99% of the Company's commercial mortgage loans were less than 81%.

As of September 30, 2019 and December 31, 2018, the Company had no impaired mortgage loans with or without a valuation allowance or mortgage loans derecognized as a result of foreclosure, including mortgage loans subject to a participant or co-lender mortgage loan agreement with a unilateral mortgage loan foreclosure restriction or mortgage loan derecognized as a result of a foreclosure.

As of and for the nine months ended September 30, 2019 and 2018, the Company had no valuation allowance recorded for commercial mortgage loans.

d. Derivatives

The Company uses derivative financial instruments in the normal course of business to manage risks, primarily to reduce currency, interest rate and duration imbalances determined in asset/liability analyses. The Company also uses a combination of derivatives and fixed income investments to create synthetic investments. These synthetic investments are created when they are economically more attractive than the actual instrument or when similar instruments are unavailable. Synthetic investments are created either to hedge and reduce the Company's credit and foreign currency exposure or to create an investment in a particular asset. The Company held synthetic investments with a notional amount of $17,979 million as of September 30, 2019 and $15,522 million as of December 31, 2018. These notional amounts included replicated asset transaction values of $16,039 million as of September 30, 2019 and $13,582 million as of December 31, 2018, 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 $4,263 million as of September 30, 2019 and $2,491 million as of December 31, 2018. In the event of default, the full market value exposure at risk in a net gain position, net of offsets and collateral, was $115 million as of September 30, 2019 and $146 million as of December 31, 2018. The statutory net amount at risk, defined as net collateral pledged and statement values excluding accrued interest, was $741 million as of September 30, 2019 and $695 million as of December 31, 2018.

The Company had the right to rehypothecate or repledge securities totaling $2,120 million of the $4,263 million as of September 30, 2019 and $709 million of the $2,491 million as of December 31, 2018 of net collateral pledged by counterparties. There were no securities rehypothecated to other counterparties as of September 30, 2019 or December 31, 2018.

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

	September 30, 2019			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	$ 14,306	$ 90,240	$ 12,007	$ 106,517
Options	742	19,355	2	3
Currency swaps	1,499	12,523	100	2,388
Forward contracts	95	7,027	21	3,025
Credit default swaps	22	1,185	-	34
Financial futures	15	291	79	3,034
Total	$ 16,679	$ 130,621	$ 12,209	$ 115,001

	December 31, 2018			
	Assets		Liabilities	
	Carrying Value	Notional Amount	Carrying Value	Notional Amount
	(In Millions)			
Interest rate swaps	$ 6,629	$ 88,214	$ 4,647	$ 86,096
Options	911	19,657	5	3
Currency swaps	843	8,976	232	4,022
Interest rate caps and floors	18	8,465	-	-
Forward contracts	106	6,642	12	3,633
Credit default swaps	18	1,135	2	104
Financial futures	216	3,036	14	291
Total	$ 8,741	$ 136,125	$ 4,912	$ 94,149

The average fair value of outstanding derivative assets was $11,765 million for the nine months ended September 30, 2019 and $8,514 million for the nine months ended September 30, 2018. The average fair value of outstanding derivative liabilities was $7,976 million for the nine months ended September 30, 2019 and $5,503 million for the nine months ended September 30, 2018.

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

	September 30, 2019	December 31, 2018
	(In Millions)	
Due in one year or less	$ 9	$ 20
Due after one year through five years	-	1,219
Due after five years through ten years	1,210	-
Total	$ 1,219	$ 1,239

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

	Nine Months Ended September 30,			
	2019		2018	
	Net Realized Gains (Losses) on Closed Contracts	Change In Net Unrealized Gains (Losses) on Open Contracts	Net Realized Gains (Losses) on Closed Contracts	Change In Net Unrealized Gains (Losses) on Open Contracts
	(In Millions)			
Interest rate swaps	$ 17	$ 318	$ (90)	$ 15
Currency swaps	23	788	20	218
Options	(13)	(104)	(118)	18
Credit default swaps	13	-	12	2
Interest rate caps and floors	-	(6)	(3)	(2)
Forward contracts	340	(20)	86	107
Financial futures	735	(264)	(200)	(127)
Total	$ 1,115	$ 712	$ (293)	$ 231

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

	September 30, 2019			December 31, 2018		
	Derivative Assets	Derivative Liabilities	Net	Derivative Assets	Derivative Liabilities	Net
	(In Millions)					
Gross	$ 16,679	$ 12,209	$ 4,470	$ 8,741	$ 4,912	$ 3,829
Due and accrued	679	2,167	(1,488)	839	1,899	(1,060)
Gross amounts offset	(12,116)	(12,116)	-	(6,034)	(6,034)	-
Net asset	5,242	2,260	2,982	3,546	777	2,769
Collateral posted	(5,791)	(1,528)	(4,263)	(3,657)	(1,166)	(2,491)
Net	$ (549)	$ 732	$ (1,281)	$ (111)	$ (389)	$ 278

e. Net investment income

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

	Nine Months Ended September 30,	
	2019	2018
	(In Millions)	
Bonds	$ 3,304	$ 3,017
Preferred stocks	18	27
Common stocks - subsidiaries and affiliates	300	258
Common stocks - unaffiliated	29	33
Mortgage loans	796	743
Policy loans	687	633
Real estate	96	81
Partnerships and LLCs	338	686
Derivatives	260	237
Cash, cash equivalents and short-term investments	59	54
Other	40	6
Subtotal investment income	5,927	5,775
Amortization of the IMR	16	59
Investment expenses	(574)	(530)
Net investment income	$ 5,369	$ 5,304

f. Net realized capital (losses) gains

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

	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
	(In Millions)	
Bonds	$ 11	$ (106)
Common stocks - subsidiaries and affiliates	1	(1,259)
Common stocks - unaffiliated	24	72
Mortgage loans	1	(2)
Real estate	33	168
Partnerships and LLCs	(41)	(41)
Derivatives	1,115	(293)
Other	(14)	(26)
Net realized capital gains (losses) before federal and state taxes and deferral to the IMR	1,130	(1,487)
Net federal and state tax benefit	(109)	7
Net realized capital gains (losses) before deferral to the IMR	1,021	(1,480)
Net after tax (gains) losses deferred to the IMR	(889)	196
Net realized capital gains (losses)	$ 132	$ (1,284)

IMR had a liability balance of $306 million as of September 30, 2019. IMR had an asset balance of $563 million as of December 31, 2018, which was nonadmitted.

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

	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
	(In Millions)	
Bonds	$ (85)	$ (68)
Common stocks- subsidiaries and affiliates	-	(1,258)
Common stocks - unaffiliated	(8)	(12)
Partnerships and LLCs	(47)	(45)
Total OTTI	$ (140)	$ (1,383)

The Company recognized OTTI of less than $1 million for the nine months ended September 30, 2019 and $1 million for the nine months ended September 30, 2018 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 March 8, 2019, MassMutual issued a $650 million funding agreement, which supports a series of medium-term notes with 3.4% fixed rate coupons and 7-year maturities.

On March 13, 2019, MassMutual issued a $200 million funding agreement, which supports a series of medium-term notes with 2.7% fixed rate coupons and 2-year maturities.

On June 26, 2019, MassMutual issued a $500 million funding agreement, which supports a series of medium-term notes with 2.25% fixed rate coupons and 3-year maturities.

On July 1, 2019, MassMutual issued a $150 million funding agreement, which supports a series of medium-term notes with 2.87% fixed rate coupons and 10-year maturities.

b. Additional liability for annuity contracts

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

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

Liability as of January 1, 2018	$ 512
Incurred guarantee benefits	250
Paid guarantee benefits	(6)
Liability as of December 31, 2018	756
Incurred guarantee benefits	131
Paid guarantee benefits	(4)
Liability as of September 30, 2019	$ 883

The Company held reserves in accordance with the stochastic scenarios as of September 30, 2019 and December 31, 2018. As of September 30, 2019 and December 31, 2018, the Company held additional reserves above those indicated based on the stochastic scenarios in order to maintain a prudent level of reserve adequacy.

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

	September 30, 2019			December 31, 2018		
	Account Value	Net Amount at Risk	Weighted Average Attained Age	Account Value	Net Amount at Risk	Weighted Average Attained Age
	($ In Millions)					
GMDB	$ 18,007	$ 45	65	$ 17,392	$ 132	64
GMIB Basic	707	47	69	700	97	69
GMIB Plus	2,831	595	68	2,687	813	67
GMAB	2,530	4	60	2,573	74	60
GMWB	154	14	71	160	23	70

As of September 30, 2019, the GMDB account value above consists of $3,769 million within the general account and $14,238 million within separate accounts that includes $4,088 million of modified coinsurance assumed. As of December 31, 2018, the GMDB account value above consists of $3,905 million within the general account and $13,487 million within separate accounts that includes $3,838 million of modified coinsurance assumed.

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.

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

	Nine Months Ended September 30,			
	2019	2018	2019	2018
	Pension Benefits		Other Postretirement Benefits	
	(In Millions)			
Service cost	$ 83	$ 85	$ 10	$ 10
Interest cost	88	81	10	9
Expected return on plan assets	(120)	(129)	-	-
Amortization of unrecognized net actuarial and other losses	42	41	(1)	2
Amortization of unrecognized prior service cost	-	2	(4)	(4)
Total net periodic cost	$ 93	$ 80	$ 15	$ 17

13. Employee compensation plans

No significant changes.

14. Surplus notes

No significant changes.

15. Presentation of the Condensed Statutory Statements of Cash Flows

The following table presents those transactions that have affected the Company's recognized assets or liabilities but have not resulted in cash receipts or payments during the nine months ended September 30, 2019 and 2018. Accordingly, the Company has excluded these non-cash activities from the Condensed Statutory Statements of Cash Flows for the nine months ended September 30, 2019 and 2018.

	Nine Months Ended September 30,	
	2019	2018
	(In Millions)	
Bonds received as consideration for group annuity contract	$ 642	$ -
Premium income recognized for group annuity contracts	599	-
Bond conversions and refinancing	546	414
Change in market value of COLI	128	36
Bank loan rollovers	127	49
Transfer of mortgage loans to partnerships and LLCs	95	81
Stock conversion	64	62
Net investment income payment in-kind bonds	5	8
Dividend reinvestment	3	11
Transfer of bonds to other invested assets	-	200
Partnerships and LLCs contributed to Insurance Road LLC	-	188
Premium liabilities to bonds	-	117
Bonds and common stock contributed to EM Opportunities LLC	-	74
Transfer of partnerships and LLCs to real estate	-	57
Dividend declared from Insurance Road LLC	-	40

16. Business risks, commitments and contingencies

a. Risks and uncertainties

The Company operates in a business environment subject to various risks and uncertainties. The principal risks include insurance and underwriting risks, investment and interest rate risks, currency exchange risk and credit risk. The combined impact of these risks could have a material, adverse effect on the Company’s financial statements or result in operating losses in future periods. The Company employs the use of reinsurance, portfolio diversification, asset/liability management processes and other risk management techniques to mitigate the impact of these risks. This condensed risks and uncertainties disclosure should be read in conjunction with the statutory disclosure in the Company’s 2018 audited yearend financial statements.

Insurance and underwriting risks

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

Investment and interest rate risks

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

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

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

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

Currency exchange risk

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

Credit and other market risks

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

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

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

Political Uncertainties

Political events, domestically or internationally, may directly or indirectly trigger or exacerbate the risk factors described above. Whether those underlying risk factors are driven by politics or not, the Company's dynamic approach to managing risks enables management to utilize the mitigating actions described above to attempt to reduce the potential impact of each underlying risk factor on the Company.

b. Litigation and regulatory matters

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

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

c. Commitments

In March 2019, MassMutual entered into a Contingent Capital Facility Agreement (the Facility) with an unaffiliated entity (the Trust). Under the Facility, subject to regulatory approval in certain circumstances, MassMutual has the right, and upon the occurrence of certain events has an obligation, to issue up to $800 million of surplus notes to the Trust in exchange for all or a pro rata portion of certain principal and interest strips of U.S. Treasury Securities held by the Trust. MassMutual is required to pay a facility fee of approximately 2.00% per year to the Trust on the undrawn portion of the Facility, totaling approximately $16 million per year if the Facility remains undrawn, and certain additional administrative fees and expenses.

17. Related party transactions

No significant changes.

18. Subsequent events

Management of the Company has evaluated subsequent events through November 12, 2019, the date the financial statements were available to be issued to state regulators and subsequently on the Company's website.

On October 11, 2019 MassMutual exchanged $57 million of its 5.625% surplus notes due 2033, $180 million of its 8.875% surplus notes due 2039, $137 million of its 5.375% surplus notes due 2041 and $242 million of its 4.5% surplus notes due 2065 for $838 million of surplus notes due 2070 and $39 million cash. Interest on the 2070 surplus notes is payable semi-annually at a fixed rate of 3.729%.

On October 17, 2019, MassMutual issued a £350 million funding agreement with a 1.375% fixed rate and a 7-year maturity.

On October 25, 2019, MassMutual issued a $178 million funding agreement with a 2.479% fixed rate and a 10-year maturity.

No other events have occurred subsequent to the date of the Statements of Financial Position and before the date of evaluation that would require disclosure.

19. Impairment listing for loan-backed and structured securities

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

Period Ended	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
September 30, 2019	$ 25,757,347	$ -	$ 25,757,347	$ 21,725,681	$ (4,035,763)	$ 21,725,681	$ 22,996,996
June 30, 2019	8,254,883	-	8,254,883	7,327,949	(934,276)	7,327,949	8,109,650
March 31, 2019	7,728,041	-	7,728,041	7,592,730	(135,311)	7,592,730	7,624,610
December 31, 2018	4,550,173	-	4,550,173	3,815,559	(734,614)	3,815,559	4,014,514
September 30, 2018	4,320,826	-	4,320,826	3,663,181	(657,645)	3,663,181	3,687,297
June 30, 2018	634,235	-	634,235	279,221	(355,014)	279,221	386,752
March 31, 2018	645,690	-	645,690	488,181	(157,509)	488,181	448,494
December 31, 2017	3,949,513	-	3,949,513	1,958,759	(1,990,754)	1,958,759	2,023,952
September 30, 2017	4,436,542	-	4,436,542	876,942	(3,559,600)	876,942	4,647,683
June 30, 2017	40,538,551	-	40,538,551	39,808,956	(729,595)	39,808,956	60,990,732
March 31, 2017	41,788,380	-	41,788,380	41,391,889	(396,491)	41,391,889	56,156,936
December 31, 2016	42,175,938	-	42,175,938	42,045,721	(130,217)	42,045,721	54,619,477
September 30, 2016	44,266,478	-	44,266,478	41,890,535	(2,375,942)	41,890,535	61,300,066
June 30, 2016	49,097,217	-	49,097,217	48,202,703	(894,514)	48,202,703	63,207,410
March 31, 2016	57,985,071	-	57,985,071	55,783,979	(2,201,092)	55,783,979	70,578,397
December 31, 2015	4,881,394	-	4,881,394	4,783,194	(98,200)	4,783,194	4,728,736
September 30, 2015	50,531,382	-	50,531,382	45,665,859	(4,865,524)	45,665,859	58,523,652
June 30, 2015	66,924,927	-	66,924,927	65,240,585	(1,684,341)	65,240,585	72,953,475
March 31, 2015	17,856,447	-	17,856,447	17,681,510	(174,937)	17,681,510	17,553,999
December 31, 2014	69,225,743	-	69,225,743	68,301,291	(924,452)	68,301,291	79,410,553
September 30, 2014	645,721	-	645,721	604,437	(41,284)	604,437	627,381
June 30, 2014	57,012,606	-	57,012,606	55,422,168	(1,590,438)	55,422,168	75,253,388
March 31, 2014	91,702,041	-	91,702,041	80,744,074	(10,957,967)	80,744,074	97,672,071
December 31, 2013	113,707,951	-	113,707,951	108,815,640	(4,892,311)	108,815,640	111,783,052
September 30, 2013	81,945,730	-	81,945,730	80,589,482	(1,356,248)	80,589,482	77,049,314
June 30, 2013	147,215,936	-	147,215,936	142,140,572	(5,075,365)	142,140,572	130,973,023
March 31, 2013	194,772,025	-	194,772,025	188,372,089	(6,399,936)	188,372,089	176,678,910
December 31, 2012	378,096,660	-	378,096,660	366,323,110	(11,773,550)	366,323,110	333,086,073
September 30, 2012	816,573,456	-	816,573,456	788,350,823	(28,222,633)	788,350,823	697,683,289
June 30, 2012	912,025,937	-	912,025,937	890,494,221	(21,531,716)	890,494,221	708,872,106
March 31, 2012	1,095,018,529	-	1,095,018,529	1,058,132,041	(36,886,488)	1,058,132,041	841,095,013
December 31, 2011	1,090,904,993	-	1,090,904,993	1,056,761,288	(34,143,705)	1,056,761,288	754,310,838
September 30, 2011	762,320,632	-	762,320,632	738,510,048	(23,810,584)	738,510,048	546,494,232
June 30, 2011	1,130,732,656	-	1,130,732,656	1,078,535,670	(52,196,986)	1,078,535,670	839,143,290
March 31, 2011	1,097,705,351	-	1,097,705,351	1,068,852,204	(28,853,147)	1,068,852,204	816,688,348
December 31, 2010	968,742,508	-	968,742,508	950,111,417	(18,631,091)	950,111,417	708,895,637
September 30, 2010	915,728,030	-	915,728,030	889,896,058	(25,831,972)	889,896,058	673,462,493
June 30, 2010	1,362,887,892	-	1,362,887,892	1,335,628,212	(27,259,681)	1,335,628,212	975,241,506
March 31, 2010	1,471,905,696	-	1,471,905,696	1,391,337,543	(80,568,153)	1,391,337,543	1,015,645,802
December 31, 2009	1,349,124,214	-	1,349,124,214	1,290,817,168	(58,307,047)	1,290,817,168	852,088,739
September 30, 2009	2,953,442,689	(106,853,708)	2,846,588,981	2,700,948,264	(145,640,717)	2,700,948,264	1,692,409,640
Totals		$ (106,853,708)			$ (651,006,807)		

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

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
05535DCF9	$ 3,311,270	$ -	$ 3,311,270	$ 2,997,893	$ (313,377)	$ 2,997,893	$ 4,275,367
61750MAB1	5,274	-	5,274	4,891	(383)	4,891	4,194
65106FAG7	412,640	-	412,640	207,305	(205,335)	207,305	6,384

07384YPP5	370,776	-	370,776	197,832	(172,945)	197,832	111,784
07386HCP4	(6,569)	-	(6,569)	(14,987)	(8,418)	(14,987)	-
12667F2A2	642,800	-	642,800	484,346	(158,455)	484,346	68,241
18974BAA7	274,461	-	274,461	270,666	(3,795)	270,666	244,479
18974BAN9	152,278	-	152,278	141,835	(10,443)	141,835	135,566
22541QQR6	24,705	-	24,705	(15,310)	(40,015)	(15,310)	-
32051GCF0	31,560	-	31,560	(9,959)	(41,519)	(9,959)	4,356
32053LAA0	47,447	-	47,447	40,280	(7,167)	40,280	47,846
76110H4M8	4,906	-	4,906	-	(4,906)	-	-
761118FM5	2,946,839	-	2,946,839	2,789,133	(157,706)	2,789,133	2,918,992
79548KXQ6	350,688	-	350,688	277,239	(73,450)	277,239	60,979
23332UBW3	78,084	-	78,084	76,934	(1,151)	76,934	43,636
576433H33	1,579,401	-	1,579,401	1,448,247	(131,155)	1,448,247	1,448,863
12669GWN7	1,037,688	-	1,037,688	957,205	(80,484)	957,205	936,853
17309FAE8	162,671	-	162,671	129,536	(33,135)	129,536	159,357
36298XAA0	10,097,887	-	10,097,887	8,887,246	(1,210,641)	8,887,246	8,841,272
466247UG6	399,796	-	399,796	384,442	(15,354)	384,442	391,621
55274SAM3	110,359	-	110,359	75,794	(34,565)	75,794	103,204
57643QAE5	3,472,756	-	3,472,756	2,305,288	(1,167,469)	2,305,288	2,986,979
86359ACG6	(15,250)	-	(15,250)	(11,154)		(11,154)	-
92990GAE3	89,614	-	89,614	85,680	(3,934)	85,680	87,117
939336Z48	116,820	-	116,820	(787)	(117,607)	(787)	93,306
US74951PBV94	58,443	-	58,443	16,087	(42,357)	16,087	26,602
Totals	$ 25,757,347	$ -	$ 25,757,347	$ 21,725,681	$ (4,035,763)	$ 21,725,681	$ 22,996,996

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

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
61750MAB1	$ 5,283	$ -	$ 5,283	$ 4,899	$ (383)	$ 4,899	$ 4,344
65106FAG7	229,769	-	229,769	212,651	(17,118)	212,651	1,111
18974BAA7	267,105	-	267,105	274,447		274,447	256,288
18974BAN9	154,354	-	154,354	143,911	(10,443)	143,911	141,999
22541QQR6	(12,108)	-	(12,108)	(13,677)	(1,569)	(13,677)	10,201
32051GCF0	21,220	-	21,220	(8,287)	(29,507)	(8,287)	4,335
761118FM5	3,379,906	-	3,379,906	3,276,460	(103,447)	3,276,460	3,468,889
79548KXQ6	335,309	-	335,309	321,864	(13,445)	321,864	218,663
17309FAE8	201,350	-	201,350	201,339	(11)	201,339	203,249
466247UG6	455,076	-	455,076	439,722	(15,354)	439,722	450,923
55274SAM3	114,173	-	114,173	79,608	(34,565)	79,608	119,029
57643QAE5	3,047,671	-	3,047,671	2,360,287	(687,385)	2,360,287	3,180,695
US74951PBV94	55,776	-	55,776	34,724	(21,051)	34,724	49,924
Totals	$ 8,254,883	$ -	$ 8,254,883	$ 7,327,949	$ (934,276)	$ 7,327,949	$ 8,109,650

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

CUSIP	Amortized Cost before Cumulative Adjustment	Cumulative Adjustment	Amortized Cost before OTTI	Projected Cash Flow	Recognized OTTI	Amortized Cost after OTTI	Fair Value
61750MAB1	$ 5,275	$ -	$ 5,275	$ 4,933	$ (341)	$ 4,933	$ 4,989
65106FAG7	232,843	-	232,843	215,726	(17,118)	215,726	6,316
18974BAA7	285,889	-	285,889	270,801	(15,088)	270,801	278,616
18974BAN9	149,774	-	149,774	139,333	(10,441)	139,333	148,234
22541QQR6	(10,378)	-	(10,378)	(11,947)	(1,569)	(11,947)	1

32051GCF0	22,786	-	22,786	(6,720)	(29,507)	(6,720)	17,553
761118FM5	3,259,303	-	3,259,303	3,218,368	(40,935)	3,218,368	3,244,154
17309FAE8	200,512	-	200,512	200,501	(11)	200,501	208,828
466247UG6	467,713	-	467,713	452,359	(15,354)	452,359	459,812
57643QAE5	3,114,325	-	3,114,325	3,109,376	(4,949)	3,109,376	3,256,107
Totals	$ 7,728,041	$ -	$ 7,728,041	$ 7,592,730	$ (135,311)	$ 7,592,730	$ 7,624,610

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

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

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

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

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

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

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

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