



KPMG LLP
Two Financial Center
60 South Street
Boston, MA 02111

Report of Independent Registered Public Accounting Firm

The Board of Directors of Massachusetts Mutual Life Insurance Company and Contract Owners of Massachusetts Mutual Variable Annuity Separate Account 3:

Opinion on the Financial Statements and Financial Highlights

We have audited the accompanying statements of assets and liabilities of Massachusetts Mutual Variable Annuity Separate Account 3 (comprised of the divisions listed in Appendix A to the opinion) (collectively, “the Separate Account”) as of December 31, 2019, the related statements of operations and changes in net assets for each of the years (as described in Appendix A) in the two-year period then ended, and the related notes (collectively, the “financial statements”) and the financial highlights for each of the years in the five-year period then ended. In our opinion, the financial statements and financial highlights present fairly, in all material respects, the financial position of the Separate Account as of December 31, 2019, the results of its operations and changes in its net assets for each of the years in the two-year period then ended, and the financial highlights for each of the years in the five-year period then ended, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements and financial highlights are the responsibility of the Separate Account’s management. Our responsibility is to express an opinion on these financial statements and financial highlights based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Separate Account in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements and financial highlights are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements and financial highlights, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements and financial highlights. Such procedures also included confirmation of securities owned as of December 31, 2019, by correspondence with the underlying mutual funds or their transfer agent. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements and financial highlights. We believe that our audits provide a reasonable basis for our opinion.

KPMG LLP

We have served as the Separate Account’s auditor since 2004.

Boston, Massachusetts
April 3, 2020

Appendix A

Massachusetts Mutual Variable Annuity Separate Account 3 is comprised of the following divisions and the activities of each division have been included within the accompanying statements of assets and liabilities as of December 31, 2019 and the related statements of operations and changes in net assets for each of the years in the two-year period then ended.

Divisions

Invesco Oppenheimer V.I. Capital Appreciation Division *
Invesco Oppenheimer V.I. Conservative Balanced Division *
Invesco Oppenheimer V.I. Discovery Mid Cap Growth Division *
Invesco Oppenheimer V.I. Global Division *
Invesco Oppenheimer V.I. Global Strategic Income Division *
Invesco Oppenheimer V.I. Government Money Division *
Invesco Oppenheimer V.I. Main Street Division *
Invesco Oppenheimer V.I. Main Street Small Cap Division *
Invesco Oppenheimer V.I. Total Return Bond Division *
MML Blend Division
MML Equity Division
MML Managed Bond Division
MML U.S. Government Money Market Division

* See Note 2 to the financial statements for information regarding the merger of this division.

Massachusetts Mutual Variable Annuity Separate Account 3

STATEMENTS OF ASSETS AND LIABILITIES

December 31, 2019

	Invesco Oppenheimer V.I. Capital Appreciation Division	Invesco Oppenheimer V.I. Conservative Balanced Division	Invesco Oppenheimer V.I. Discovery Mid Cap Growth Division	Invesco Oppenheimer V.I. Global Division	Invesco Oppenheimer V.I. Global Strategic Income Division	Invesco Oppenheimer V.I. Government Money Division	Invesco Oppenheimer V.I. Main Street Division
ASSETS							
Investments							
Number of shares	171,352	88,240	84,605	232,258	736,115	217,929	384,582
Identified cost	\$ 8,489,620	\$ 1,077,881	\$ 5,350,086	\$ 7,476,764	\$ 3,854,300	\$ 217,929	\$ 9,840,035
Value	\$ 10,241,722	\$ 1,439,202	\$ 7,091,563	\$ 9,882,569	\$ 3,658,491	\$ 217,929	\$ 11,322,100
Dividends receivable	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company	415	-	572	707	455	-	377
Total assets	10,242,137	1,439,202	7,092,135	9,883,276	3,658,946	217,929	11,322,477
LIABILITIES							
Annuitant mortality fluctuation reserve	4,317	1,068	3,038	5,059	2,188	221	5,820
Payable to Massachusetts Mutual Life Insurance Company	-	35	-	-	-	11	-
Total liabilities	4,317	1,103	3,038	5,059	2,188	232	5,820
NET ASSETS	\$ 10,237,820	\$ 1,438,099	\$ 7,089,097	\$ 9,878,217	\$ 3,656,758	\$ 217,697	\$ 11,316,657
Net Assets:							
Accumulation units - value	\$ 10,093,931	\$ 1,402,510	\$ 6,987,838	\$ 9,709,596	\$ 3,583,828	\$ 210,339	\$ 11,122,647
Contracts in payout (annuitization) period	143,889	35,589	101,259	168,621	72,931	7,359	194,010
Net assets	\$ 10,237,820	\$ 1,438,099	\$ 7,089,097	\$ 9,878,217	\$ 3,656,758	\$ 217,697	\$ 11,316,657
Outstanding units							
Contract owners	1,396,258	472,291	1,251,738	1,393,518	1,223,560	172,871	1,886,433
UNIT VALUE							
LifeTrust	\$ 7.33	\$ 3.04	\$ 5.66	\$ 7.09	\$ 2.99	\$ 1.26	\$ 6.00

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 3

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2019

	Invesco Oppenheimer V.I. Main Street Small Cap Division	Invesco Oppenheimer V.I. Total Return Bond Division	MML Blend Division	MML Equity Division	MML Managed Bond Division	MML U.S. Government Money Market Division
ASSETS						
Investments						
Number of shares	56,720	64,109	53,676	64,837	63,394	¹ 160,694
Identified cost	\$ 1,355,499	\$ 495,900	\$ 1,117,492	\$ 1,511,911	\$ 807,522	\$ 160,694
Value	\$ 1,322,720	\$ 508,387	\$ 1,230,800	\$ 1,821,664	\$ 800,762	\$ 160,694
Dividends receivable	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company	625	-	-	197	-	¹ 156
Total assets	1,323,345	508,387	1,230,800	1,821,861	800,762	1 160,850
LIABILITIES						
Annuitant mortality fluctuation reserve	667	598	452	771	-	¹ 162
Payable to Massachusetts Mutual Life Insurance Company	-	13	71	-	-	-
Total liabilities	667	611	523	771	-	1 162
NET ASSETS	\$ 1,322,678	\$ 507,776	\$ 1,230,277	\$ 1,821,090	\$ 800,762	\$ 160,688
Net Assets:						
Accumulation units - value	\$ 1,300,449	\$ 487,843	\$ 1,215,205	\$ 1,795,398	\$ 800,762	\$ 147,675
Contracts in payout (annuitization) period	22,229	19,933	15,072	25,692	-	¹ 13,013
Net assets	\$ 1,322,678	\$ 507,776	\$ 1,230,277	\$ 1,821,090	\$ 800,762	\$ 160,688
Outstanding units						
Contract owners	312,904	288,607	283,811	417,062	286,139	1 131,348
UNIT VALUE						
LifeTrust	\$ 4.23	\$ 1.76	\$ 4.33	\$ 4.37	\$ 2.80	\$ 1.22

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 3

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS

For The Year Ended December 31, 2019

	Invesco Oppenheimer V.I. Capital Appreciation Division	Invesco Oppenheimer V.I. Conservative Balanced Division	Invesco Oppenheimer V.I. Discovery Mid Cap Growth Division	Invesco Oppenheimer V.I. Global Global Division	Invesco Oppenheimer V.I. Global Strategic Income Division	Invesco Oppenheimer V.I. Government Money Division	Invesco Oppenheimer V.I. Main Street Division
Investment Income							
Dividends	\$ 5,930	\$ 34,303	\$ -	\$ 83,400	\$ 139,064	\$ 3,561	\$ 118,898
Expenses							
Mortality and expense risk fees and administrative expense charges	137,031	20,906	93,414	129,854	51,471	2,986	154,529
Net investment income (loss)	(131,101)	13,397	(93,414)	(46,454)	87,593	575	(35,631)
Net realized and unrealized gain (loss) on investments							
Realized gain (loss) on sale of fund shares	478,425	25,640	333,112	255,236	(36,392)	-	422,474
Realized gain distribution	933,746	24,297	848,631	1,317,359	-	-	1,789,869
Realized gain (loss)	1,412,171	49,937	1,181,743	1,572,595	(36,392)	-	2,212,343
Change in net unrealized appreciation/ depreciation of investments	1,559,612	156,582	945,893	861,639	272,445	-	681,692
Net gain (loss) on investments	2,971,783	206,519	2,127,636	2,434,234	236,053	-	2,894,035
Net increase (decrease) in net assets resulting from operations	2,840,682	219,916	2,034,222	2,387,780	323,646	575	2,858,404
Capital transactions:							
Transfer of net premiums	18,015	-	720	1,800	540	-	44,963
Transfers due to death benefits	(227,596)	(145,926)	(203,012)	(153,208)	(31,809)	-	(477,775)
Transfers due to annuity benefit payments	(15,319)	(7,143)	(10,856)	(16,828)	(11,740)	(718)	(25,250)
Transfers due to withdrawal of funds	(1,024,269)	(46,447)	(266,243)	(464,235)	(207,724)	(45,779)	(844,548)
Transfers due to administrative charges	(3,776)	(580)	(2,365)	(3,012)	(1,146)	(400)	(3,502)
Transfers due to net charge (credit) to annuitant mortality fluctuation	(5,673)	(2,036)	(4,795)	(8,108)	934	45	(7,221)
Transfers between divisions and to/from the Fixed Account	2,725	(8,114)	(24,555)	16,930	41,385	55,811	7,191
Net increase (decrease) in net assets resulting from capital transactions	(1,255,893)	(210,246)	(511,106)	(626,661)	(209,560)	8,959	(1,306,142)
Total increase (decrease)	1,584,789	9,670	1,523,116	1,761,119	114,086	9,534	1,552,262
NET ASSETS, at beginning of the year	8,653,031	1,428,429	5,565,981	8,117,098	3,542,672	208,163	9,764,395
NET ASSETS, at end of the year	\$ 10,237,820	\$ 1,438,099	\$ 7,089,097	\$ 9,878,217	\$ 3,656,758	\$ 217,697	\$ 11,316,657

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 3

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued)

For The Year Ended December 31, 2019

	Invesco Oppenheimer V.I. Main Street Small Cap Division	Invesco Oppenheimer V.I. Total Return Bond Division	MML Blend Division	MML Equity Division	MML Managed Bond Division	MML U.S. Government Money Market Division
Investment Income						
Dividends	\$ 2,557	\$ 17,169	\$ 28,697	\$ 35,307	\$ 29,125	\$ 3,378
Expenses						
Mortality and expense risk fees and administrative expense charges	17,912	7,302	16,483	24,127	10,994	2,728
Net investment income (loss)	(15,355)	9,867	12,214	11,180	18,131	650
Net realized and unrealized gain (loss) on investments						
Realized gain (loss) on sale of fund shares	19,255	8,397	29,200	19,436	(1,116)	(2)
Realized gain distribution	118,108	-	57,112	91,461	-	-
Realized gain (loss)	137,363	8,397	86,312	110,897	(1,116)	(2)
Change in net unrealized appreciation/ depreciation of investments	155,941	22,141	111,545	247,517	44,771	2
Net gain (loss) on investments	293,304	30,538	197,857	358,414	43,655	-
Net increase (decrease) in net assets resulting from operations	277,949	40,405	210,071	369,594	61,786	650
Capital transactions:						
Transfer of net premiums	-	-	-	-	1,800	113,882
Transfers due to death benefits	(48,131)	(7,557)	(434)	(20,209)	(3)	-
Transfers due to annuity benefit payments	(448)	(2,737)	(1,896)	(2,040)	-	(104)
Transfers due to withdrawal of funds	(49,226)	(53,713)	(89,792)	(90,608)	(41,120)	(88,556)
Transfers due to administrative charges	(378)	(265)	(408)	(787)	(240)	(242)
Transfers due to net charge (credit) to annuitant mortality fluctuation	76	353	(1,207)	(1,114)	-	-
Transfers between divisions and to/from the Fixed Account	(7,226)	-	7,959	406	20,502	(113,015)
Net increase (decrease) in net assets resulting from capital transactions	(105,333)	(63,919)	(85,778)	(114,352)	(19,061)	(88,035)
Total increase (decrease)	172,616	(23,514)	124,293	255,242	42,725	(87,385)
NET ASSETS, at beginning of the year	1,150,062	531,290	1,105,984	1,565,848	758,037	248,073
NET ASSETS, at end of the year	\$ 1,322,678	\$ 507,776	\$ 1,230,277	\$ 1,821,090	\$ 800,762	\$ 160,688

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 3

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS

For The Year Ended December 31, 2018

	MML Blend Division	MML Equity Division	MML Managed Bond Division	MML U.S. Government Money Market Division	Oppenheimer Capital Appreciation Division	Oppenheimer Conservative Balanced Division	Oppenheimer Discovery Mid Cap Growth Division	Oppenheimer Global Division
Investment Income								
Dividends	\$ 26,689	\$ 32,553	\$ 32,847	\$ 3,257	\$ 32,854	\$ 31,349	\$ -	\$ 99,109
Expenses								
Mortality and expense risk fees and administrative expense charges	17,792	25,644	13,737	3,540	145,443	22,319	94,824	140,220
Net investment income (loss).....	8,897	6,909	19,110	(283)	(112,589)	9,030	(94,824)	(41,111)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	50,550	35,917	(24,074)	(1)	530,830	17,738	613,003	479,545
Realized gain distribution	85,343	257,084	-	-	772,673	37,070	922,069	700,694
Realized gain (loss).....	135,893	293,001	(24,074)	(1)	1,303,503	54,808	1,535,072	1,180,239
Change in net unrealized appreciation/ depreciation of investments	(211,917)	(496,313)	(17,394)	1	(1,815,116)	(169,543)	(1,837,539)	(2,498,637)
Net gain (loss) on investments	(76,024)	(203,312)	(41,468)	-	(511,613)	(114,735)	(302,467)	(1,318,398)
Net increase (decrease) in net assets resulting from operations	(67,127)	(196,403)	(22,358)	(283)	(624,202)	(105,705)	(397,291)	(1,359,509)
Capital transactions:								
Transfer of net premiums	391	927	2,544	-	16,338	-	1,673	2,541
Transfers due to death benefits	(24,136)	(31,947)	-	(15,292)	(98,170)	(44,278)	(4,583)	(40,872)
Transfers due to annuity benefit payments	(1,706)	(1,844)	-	-	(12,233)	(5,719)	(7,849)	(13,633)
Transfers due to withdrawal of funds	(95,788)	(131,946)	(89,979)	(26,148)	(1,104,249)	(97,011)	(963,273)	(881,505)
Transfers due to administrative charges	(467)	(883)	(284)	(235)	(4,038)	(638)	(2,472)	(3,328)
Transfers due to net charge (credit) to annuitant mortality fluctuation	411	564	-	-	1,709	(2,399)	(2,539)	2,875
Transfers between divisions and to/from the Fixed Account	-	4,968	(196,982)	(19,497)	(7,614)	-	118,092	(218,992)
Net increase (decrease) in net assets resulting from capital transactions	(121,295)	(160,161)	(284,701)	(61,172)	(1,208,257)	(150,045)	(860,951)	(1,152,914)
Total increase (decrease).....	(188,422)	(356,564)	(307,059)	(61,455)	(1,832,459)	(255,750)	(1,258,242)	(2,512,423)
NET ASSETS, at beginning of the year	1,294,406	1,922,412	1,065,096	309,528	10,485,490	1,684,179	6,824,223	10,629,521
NET ASSETS, at end of the year	\$ 1,105,984	\$ 1,565,848	\$ 758,037	\$ 248,073	\$ 8,653,031	\$ 1,428,429	\$ 5,565,981	\$ 8,117,098

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 3

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2018

	Oppenheimer Global Strategic Income Division	Oppenheimer Government Money Division	Oppenheimer Main Street Main Street Division	Oppenheimer Main Street Small Cap Division	Oppenheimer Total Return Bond Division
Investment Income					
Dividends	\$ 209,557	\$ 2,850	\$ 128,887	\$ 4,601	\$ 23,909
Expenses					
Mortality and expense risk fees and administrative expense charges	58,967	2,995	157,911	21,656	9,897
Net investment income (loss)	150,590	(145)	(29,024)	(17,055)	14,012
Net realized and unrealized gain (loss) on investments					
Realized gain (loss) on sale of fund shares	(54,659)	-	382,922	224,859	17,666
Realized gain distribution	-	-	969,440	189,497	-
Realized gain (loss)	(54,659)	-	1,352,362	414,356	17,666
Change in net unrealized appreciation/ depreciation of investments	(341,619)	-	(2,318,111)	(562,373)	(50,258)
Net gain (loss) on investments	(396,278)	-	(965,749)	(148,017)	(32,592)
Net increase (decrease) in net assets resulting from operations	(245,688)	(145)	(994,773)	(165,072)	(18,580)
Capital transactions:					
Transfer of net premiums	1,135	-	6,177	204	-
Transfers due to death benefits	(41,516)	-	(84,039)	-	(16,034)
Transfers due to annuity benefit payments	(11,203)	(587)	(24,843)	(333)	(3,627)
Transfers due to withdrawal of funds	(742,062)	(11,071)	(1,193,645)	(535,160)	(179,909)
Transfers due to administrative charges	(1,239)	(401)	(3,813)	(467)	(334)
Transfers due to net charge (credit) to annuitant mortality fluctuation	(1,662)	(631)	(887)	80	802
Transfers between divisions and to/from the Fixed Account	(33,672)	-	228,913	104,785	-
Net increase (decrease) in net assets resulting from capital transactions	(830,219)	(12,690)	(1,072,137)	(430,891)	(199,102)
Total increase (decrease)	(1,075,907)	(12,835)	(2,066,910)	(595,963)	(217,682)
NET ASSETS, at beginning of the year	4,618,579	220,998	11,831,305	1,746,025	748,972
NET ASSETS, at end of the year	\$ 3,542,672	\$ 208,163	\$ 9,764,395	\$ 1,150,062	\$ 531,290

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 3

Notes To Financial Statements

1. ORGANIZATION

Massachusetts Mutual Variable Annuity Separate Account 3 (“the Separate Account”) is a separate investment account of Massachusetts Mutual Life Insurance Company (“MassMutual”) established on January 12, 1994. The Separate Account is registered as a unit investment trust under the Investment Company Act of 1940 (“the 1940 Act”).

The assets and liabilities of the Separate Account are clearly identified and distinguished from MassMutual’s other assets and liabilities. The Separate Account’s assets are not chargeable with liabilities arising from any other MassMutual business.

Notes To Financial Statements (Continued)

2. INVESTMENT OF THE SEPARATE ACCOUNT'S ASSETS

As of December 31, 2019, the Separate Account consists of thirteen divisions which invest in the following mutual funds:

Divisions	The division listed in the first column invests in the fund in this column
Invesco Oppenheimer V.I. Capital Appreciation Division	Invesco Oppenheimer V.I. Capital Appreciation Fund ^{1,2}
Invesco Oppenheimer V.I. Conservative Balanced Division	Invesco Oppenheimer V.I. Conservative Balanced Fund ^{1,2}
Invesco Oppenheimer V.I. Discovery Mid Cap Growth Division	Invesco Oppenheimer V.I. Discovery Mid Cap Growth Fund ^{1,2}
Invesco Oppenheimer V.I. Global Division	Invesco Oppenheimer V.I. Global Fund ^{1,2}
Invesco Oppenheimer V.I. Global Strategic Income Division	Invesco Oppenheimer V.I. Global Strategic Income Fund ^{1,2}
Invesco Oppenheimer V.I. Government Money Division	Invesco Oppenheimer V.I. Government Money Fund ^{1,2}
Invesco Oppenheimer V.I. Main Street Division	Invesco Oppenheimer V.I. Main Street Fund ^{®1,2}
Invesco Oppenheimer V.I. Main Street Small Cap Division	Invesco Oppenheimer V.I. Main Street Small Cap Fund ^{®1,2}
Invesco Oppenheimer V.I. Total Return Bond Division	Invesco Oppenheimer V.I. Total Return Bond Fund ^{1,2}
MML Blend Division	MML Blend Fund ³
MML Equity Division	MML Equity Fund ³
MML Managed Bond Division	MML Managed Bond Fund ³
MML U.S. Government Money Market Division	MML U.S. Government Money Market Fund ³

In addition to the thirteen divisions, some contract owners may also allocate funds to the Fixed Interest Account ("FIA"), which is part of MassMutual's general investment account ("General Account"). Because of exemptive and exclusionary provisions in the securities law, interests in the FIA are not registered under the Securities Act of 1933, and the General Account and the FIA are not registered as an investment company under the 1940 Act.

¹Effective after the close of the New York Stock Exchange on May 24, 2019, Invesco Ltd. completed its acquisition of OppenheimerFunds, Inc. The Acquiring Funds/Divisions assume the accounting and performance history of the corresponding Merging Funds/Divisions. In connection with that transaction the following Funds/Divisions merged:

MERGING FUND/DIVISION	ACQUIRING FUND/DIVISION
Fund: Oppenheimer Capital Appreciation Fund/VA Division: Oppenheimer Capital Appreciation Division	Fund: Invesco Oppenheimer V.I. Capital Appreciation Fund Division: Invesco Oppenheimer V.I. Capital Appreciation Division
Fund: Oppenheimer Conservative Balanced Fund/VA Division: Oppenheimer Conservative Balanced Division	Fund: Invesco Oppenheimer V.I. Conservative Balanced Fund Division: Invesco Oppenheimer V.I. Conservative Balanced Division
Fund: Oppenheimer Discovery Mid Cap Growth Fund/VA Division: Oppenheimer Discovery Mid Cap Growth Division	Fund: Invesco Oppenheimer V.I. Discovery Mid Cap Growth Fund Division: Invesco Oppenheimer V.I. Discovery Mid Cap Growth
Fund: Oppenheimer Global Fund/VA Division: Oppenheimer Global Division	Fund: Invesco Oppenheimer V.I. Global Fund Division: Invesco Oppenheimer V.I. Global Division
Fund: Oppenheimer Global Strategic Income Fund/VA Division: Oppenheimer Global Strategic Income Division	Fund: Invesco Oppenheimer V.I. Global Strategic Income Fund Division: Invesco Oppenheimer V.I. Global Strategic Income Division
Fund: Oppenheimer Government Money Fund/VA Division: Oppenheimer Government Money Division	Fund: Invesco Oppenheimer V.I. Government Money Fund Division: Invesco Oppenheimer V.I. Government Money Division
Fund: Oppenheimer Main Street Fund [®] /VA Division: Oppenheimer Main Street Division	Fund: Invesco Oppenheimer V.I. Main Street Fund [®] Division: Invesco Oppenheimer V.I. Main Street Division
Fund: Oppenheimer Main Street Small Cap Fund/VA Division: Oppenheimer Main Street Small Cap Division	Fund: Invesco Oppenheimer V.I. Main Street Small Cap Fund [®] Division: Invesco Oppenheimer V.I. Main Street Small Cap Division
Fund: Oppenheimer Total Return Bond Fund/VA Division: Oppenheimer Total Return Bond Division	Fund: Invesco Oppenheimer V.I. Total Return Bond Fund Division: Invesco Oppenheimer V.I. Total Return Bond Division

²Invesco Advisers, Inc. is the investment adviser to this Fund.

³MML Investment Advisers, LLC is the investment adviser to this Fund.

Notes To Financial Statements (Continued)

3. SIGNIFICANT ACCOUNTING POLICIES

The following is a summary of significant accounting policies followed by the Separate Account in preparation of the financial statements in conformity with generally accepted accounting principles. Separate Account Massachusetts Mutual Variable Annuity Separate Account 3 follows the accounting and reporting guidance in FASB Accounting Standards Codification 946.

A. Investment Valuation

Investments in the investment divisions are valued at the closing net asset value of each of the respective underlying funds, which value their investment securities at fair value.

B. Accounting for Investments

Investment transactions are accounted for on a trade-date basis and identified cost is the basis followed in determining the cost of investments sold for financial statement purposes. Dividend income and gains from realized gain distributions are recorded on the ex-distribution date, and they are generally reinvested in the underlying investment divisions.

C. Federal Income Taxes

MassMutual is taxed under federal law as a life insurance company under the provisions of the 1986 Internal Revenue Code, as amended. Under existing federal law, no taxes are payable on net investment income and net realized capital gains attributable to contracts which depend on the Separate Account's investment performance. Accordingly, no provision for federal income tax has been made. MassMutual may, however, make such a charge in the future if an unanticipated change of current law results in a company tax liability attributable to the Separate Account.

D. Contract Charges

See Note 8B for charges associated with the contracts

E. Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

F. Annuitant Mortality Fluctuation

The Separate Account maintains a reserve as required by regulatory authorities to provide for mortality losses incurred. The reserve is adjusted quarterly for mortality losses and gains and its proportionate share of changes in value. Transfers to or from MassMutual are then made quarterly to adjust the Separate Account. Net transfers from the Separate Account to MassMutual totaled \$28,746 for the year ended December 31, 2019. Net transfers from MassMutual to the Separate Account totaled \$1,678 for the year ended December 31, 2018. The reserve is subject to a maximum of 3% of the Separate Account's annuity reserves. Any mortality losses in excess of this reserve will be borne by MassMutual. The reserve is not available to owners of the contracts except to the extent necessary to cover mortality losses under the contracts.

G. Annuity Reserves

Annuity reserves are developed by using accepted actuarial methods and are computed using the 1994 MGDB table.

Notes To Financial Statements (Continued)

4. FAIR VALUE OF FINANCIAL INSTRUMENTS

The Separate Account defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. In determining fair value, the Separate Account generally uses the market approach as the valuation technique due to the nature of the mutual fund investments offered in the Separate Account. This technique maximizes the use of observable inputs and minimizes the use of unobservable inputs. Investments in mutual funds are valued at the mutual fund's closing net asset value per share on the day of valuation.

Valuation Inputs: Various inputs are used to determine the value of the Separate Account's investments. These inputs are summarized in the three broad levels listed below:

- **Level 1** – quoted prices in active markets for identical securities
- **Level 2** – observable inputs other than Level 1 quoted prices (including, but not limited to, quoted prices for similar securities, interest rates, prepayment speeds and credit risk)
- **Level 3** – unobservable inputs

The net assets of the Separate Account are measured at fair value. All the net assets are categorized as Level 1 as of December 31, 2019. There have been no transfers between levels for the year ended December 31, 2019.

5. RELATED PARTY TRANSACTIONS

A. Sales Agreements

Pursuant to separate underwriting agreements with MassMutual, on its own behalf and on behalf of the Separate Account, MML Investors Services, LLC (“MMLIS”) serves as principal underwriter of the contracts sold by its registered representatives, and MML Strategic Distributors, LLC (“MSD”) serves as principal underwriter of the contracts sold by registered representatives of other broker-dealers who have entered into distribution agreements with MSD.

Both MMLIS and MSD are registered with the Securities and Exchange Commission (the “SEC”) as broker-dealers under the Securities Exchange Act of 1934 and are members of the Financial Industry Regulatory Authority (“FINRA”). Commissions for sales of contracts by MMLIS registered representatives are paid on behalf of MMLIS to its registered representatives. Commissions for sales of contracts by registered representatives of other broker-dealers are paid on behalf of MSD to those broker-dealers. MMLIS and MSD also receive compensation for their actions as principal underwriters of the contracts.

The contracts are no longer offered for sale to the public. Contract owners may continue, however, to make purchase payments under existing contracts.

B. Receivable from/Payable to MassMutual

Certain fees such as cost of insurance fees and mortality and expense risk fees are charges paid between the General Account and the Separate Account.

Notes To Financial Statements (Continued)

6. PURCHASES AND SALES OF INVESTMENTS

The cost of purchases and proceeds from sales of investments for the year ended December 31, 2019 were as follows:

	Invesco Oppenheimer V.I. Capital Appreciation Division	Invesco Oppenheimer V.I. Conservative Balanced Division	Invesco Oppenheimer V.I. Discovery Mid Cap Growth Division	Invesco Oppenheimer V.I. Global Division	Invesco Oppenheimer V.I. Global Strategic Income Division
Cost of purchases	\$ 1,025,180	\$ 73,153	\$ 892,087	\$ 1,531,887	\$ 197,076
Proceeds from sales	(1,476,735)	(245,417)	(647,085)	(885,560)	(319,211)

	Invesco Oppenheimer V.I. Government Money Division	Invesco Oppenheimer V.I. Main Street Division	Invesco Oppenheimer V.I. Main Street Small Cap Division	Invesco Oppenheimer V.I. Total Return Bond Division	MML Blend Division
Cost of purchases	\$ 59,708	\$ 1,969,958	\$ 140,694	\$ 22,185	\$ 101,834
Proceeds from sales	(50,021)	(1,521,335)	(143,272)	(76,413)	(118,014)

	MML Equity Division	MML Managed Bond Division	MML U.S. Government Money Market Division
Cost of purchases	\$ 144,087	\$ 49,788	\$ 130,662
Proceeds from sales	(155,514)	(50,719)	(218,039)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS

The changes in outstanding units for the two years ended December 31, 2019 were as follows:

	Invesco Oppenheimer V.I. Capital Appreciation Division	Invesco Oppenheimer V.I. Conservative Balanced Division	Invesco Oppenheimer V.I. Discovery Mid Cap Growth Division	Invesco Oppenheimer V.I. Global Division	Invesco Oppenheimer V.I. Global Strategic Income Division
2019					
Units purchased	12,276	5,161	9,264	14,332	6,585
Units withdrawn	(201,463)	(73,690)	(103,520)	(111,811)	(92,659)
Units transferred between divisions and to/from the Fixed Account	513	(2,796)	(4,625)	2,906	14,442
Net increase (decrease)	<u>(188,674)</u>	<u>(71,325)</u>	<u>(98,881)</u>	<u>(94,573)</u>	<u>(71,632)</u>

	Invesco Oppenheimer V.I. Government Money Division	Invesco Oppenheimer V.I. Main Street Division	Invesco Oppenheimer V.I. Main Street Small Cap Division	Invesco Oppenheimer V.I. Total Return Bond Division	MML Blend Division
2019 (continued)					
Units purchased	36	13,537	4,997	2,177	1,986
Units withdrawn	(37,256)	(248,554)	(29,446)	(39,712)	(25,555)
Units transferred between divisions and to/from the Fixed Account	44,307	1,482	(1,951)	-	1,994
Net increase (decrease)	<u>7,087</u>	<u>(233,536)</u>	<u>(26,400)</u>	<u>(37,535)</u>	<u>(21,575)</u>

Notes To Financial Statements (Continued)

	MML Equity Division	MML Managed Bond Division	MML U.S. Government Money Market Division
2019 (continued)			
Units purchased	3,973	661	103,929
Units withdrawn	(32,321)	(15,356)	(83,493)
Units transferred between divisions and to/from the Fixed Account	113	7,523	(92,461)
Net increase (decrease)	<u>(28,235)</u>	<u>(7,172)</u>	<u>(72,025)</u>

	MML Blend Division	MML Equity Division	MML Managed Bond Division	MML U.S. Government Money Market Division	Oppenheimer Capital Appreciation Division
2018					
Units purchased	203	363	989	-	3,614
Units withdrawn	(31,942)	(41,579)	(34,995)	(34,174)	(202,533)
Units transferred between divisions and to/from the Fixed Account	-	1,325	(77,269)	(16,002)	(1,376)
Net increase (decrease)	<u>(31,739)</u>	<u>(39,891)</u>	<u>(111,275)</u>	<u>(50,176)</u>	<u>(200,295)</u>

	Oppenheimer Conservative Balanced Division	Oppenheimer Global Bond Division	Oppenheimer Global Strategic Income Division	Oppenheimer Government Money Market Division	Oppenheimer Main Street Division
2018 (continued)					
Units purchased	4,710	792	5,485	2,606	6,281
Units withdrawn	(59,447)	(144,179)	(289,775)	(12,720)	(264,564)
Units transferred between divisions and to/from the Fixed Account	-	(36,710)	(12,241)	-	45,188
Net increase (decrease)	<u>(54,736)</u>	<u>(180,097)</u>	<u>(296,532)</u>	<u>(10,114)</u>	<u>(213,095)</u>

	Oppenheimer Main Street Small Cap Division	Oppenheimer Total Return Bond Division	Oppenheimer Discovery Mid Cap Growth Division
2018 (continued)			
Units purchased	73	480	4,573
Units withdrawn	(142,157)	(123,045)	(213,412)
Units transferred between divisions and to/from the Fixed Account	25,898	-	25,991
Net increase (decrease)	<u>(116,187)</u>	<u>(122,565)</u>	<u>(182,849)</u>

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS

A. A summary of units outstanding, unit values, net assets, investment income ratios, expense ratios (excluding expenses of the underlying funds) and total return ratios for each of the five years in the period ended December 31, 2019 follows:

	At December 31,			For the Years Ended December 31,		
	Units	Net Assets		Investment Income Ratio ¹	Expense Ratio ²	Total Return ³
		Unit Value ³	Amount			
Invesco Oppenheimer V.I. Capital Appreciation Division⁴						
2019	1,396,258	\$ 7.33	\$ 10,237,820	0.06 %	1.40 %	34.30 %
2018	1,584,932	5.46	8,653,031	0.32	1.40	(7.05)
2017	1,785,227	5.87	10,485,490	0.23	1.40	25.08
2016	2,069,494	4.70	9,718,246	0.41	1.40	(3.56)
2015	2,246,441	4.87	10,938,408	0.09	1.40	2.10
Invesco Oppenheimer V.I. Conservative Balanced Division⁴						
2019	472,291	3.04	1,438,099	2.30	1.40	15.88
2018	543,617	2.63	1,428,429	1.98	1.40	(6.65)
2017	598,353	2.81	1,684,179	1.95	1.40	7.74
2016	668,643	2.61	1,746,866	2.41	1.40	3.80
2015	891,991	2.52	2,245,066	2.26	1.40	(0.57)
Invesco Oppenheimer V.I. Discovery Mid Cap Growth Division⁴						
2019	1,251,738	5.66	7,089,097	-	1.40	37.43
2018	1,350,618	4.12	5,565,981	-	1.40	(7.40)
2017	1,533,467	4.45	6,824,223	0.03	1.40	27.01
2016	1,701,476	3.50	5,961,809	-	1.40	0.92
2015	1,889,493	3.47	6,560,530	-	1.40	5.12
Invesco Oppenheimer V.I. Global Division⁴						
2019	1,393,518	7.09	9,878,217	0.90	1.40	29.96
2018	1,488,091	5.45	8,117,098	0.99	1.40	(14.39)
2017	1,668,188	6.37	10,629,521	0.92	1.40	34.77
2016	1,942,248	4.73	9,182,824	1.06	1.40	(1.31)
2015	2,062,174	4.79	9,878,839	1.29	1.40	2.50
Invesco Oppenheimer V.I. Global Strategic Income Division⁴						
2019	1,223,560	2.99	3,656,758	3.78	1.40	9.26
2018	1,295,192	2.74	3,542,672	5.01	1.40	(5.73)
2017	1,591,724	2.90	4,618,579	2.28	1.40	4.80
2016	1,798,333	2.77	4,979,149	4.99	1.40	5.06
2015	1,964,482	2.64	5,177,424	5.87	1.40	(3.62)
Invesco Oppenheimer V.I. Government Money Division⁴						
2019	172,871	1.26	217,697	1.67	1.40	0.29
2018	165,784	1.26	208,163	1.34	1.40	(0.06)
2017	175,898	1.26	220,998	0.37	1.40	(1.00)
2016	180,901	1.27	229,585	0.01	1.40	(1.38)
2015	787,169	1.29	1,012,958	0.01	1.40	(1.38)
Invesco Oppenheimer V.I. Main Street Division⁴						
2019	1,886,433	6.00	11,316,657	1.08	1.40	30.24
2018	2,119,968	4.61	9,764,395	1.15	1.40	(9.17)
2017	2,333,063	5.07	11,831,305	1.24	1.40	15.29
2016	2,582,713	4.40	11,360,410	1.11	1.40	10.07
2015	2,841,199	4.00	11,354,089	0.93	1.40	1.89

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,			For the Years Ended December 31,		
	Units	Net Assets		Investment Income Ratio ¹	Expense Ratio ²	Total Return ³
		Unit Value ³	Amount			
Invesco Oppenheimer V.I. Main Street Small Cap Division⁴						
2019	312,904	4.23	1,322,678	0.20	1.40	24.71
2018	339,303	3.39	1,150,062	0.30	1.40	(11.58)
2017	455,490	3.83	1,746,025	0.87	1.40	12.57
2016	473,438	3.41	1,612,122	0.51	1.40	16.42
2015	486,618	2.92	1,423,344	0.89	1.40	(7.21)
Invesco Oppenheimer V.I. Total Return Bond Division⁴						
2019	288,607	1.76	507,776	3.29	1.40	8.00
2018	326,142	1.63	531,290	3.40	1.40	(2.41)
2017	448,707	1.67	748,972	2.34	1.40	3.14
2016	520,325	1.62	842,107	3.69	1.40	1.84
2015	577,863	1.59	918,351	4.06	1.40	(0.44)
MML Blend Division						
2019	283,811	4.33	1,230,277	2.44	1.40	19.69
2018	305,386	3.62	1,105,984	2.11	1.40	(5.68)
2017	337,125	3.84	1,294,406	2.10	1.40	13.66
2016	384,590	3.38	1,299,222	2.14	1.40	7.90
2015	422,659	3.13	1,323,271	2.13	1.40	(1.31)
MML Equity Division						
2019	417,062	4.37	1,821,090	2.05	1.40	24.17
2018	445,296	3.52	1,565,848	1.79	1.40	(11.25)
2017	485,187	3.96	1,922,412	1.81	1.40	14.19
2016	570,682	3.47	1,980,211	1.74	1.40	11.03
2015	637,696	3.13	1,992,891	2.06	1.40	(4.77)
MML Managed Bond Division						
2019	286,139	2.80	800,762	3.71	1.40	8.28
2018	293,311	2.58	758,037	3.37	1.40	(1.83)
2017	404,587	2.63	1,065,096	3.11	1.40	3.24
2016	511,730	2.55	1,304,833	2.82	1.40	1.32
2015	574,521	2.52	1,445,785	2.85	1.40	(2.13)
MML U.S. Government Money Market Division						
2019	131,348	\$ 1.22	\$ 160,688	1.74 %	1.40	0.29 %
2018	203,373	1.22	248,073	1.30	1.40	(0.08)
2017	253,549	1.22	309,528	0.35	1.40	(1.03)
2016	355,192	1.23	438,138	-	1.40	(1.28)
2015	635,868	1.25	794,529	-	1.40	(1.39)

¹ The investment income ratios represent the dividends, excluding distributions of capital gains, received by the division from the underlying mutual fund, net of management fees assessed by the fund manager, divided by the average net assets. These ratios exclude those expenses, such as mortality and expense charges, that are assessed against contract owner accounts either through reductions in the unit values or the redemption of units. The recognition of investment income by the division is affected by the timing of the declaration of dividends by the underlying fund in which the division invests.

² The expense ratios represent the annualized contract expenses of the Separate Account, consisting primarily of mortality and expense charges, for each period indicated. The ratios include only those expenses that result in a direct reduction of unit values. Charges made directly to contract owner accounts through the redemption of units and expenses of the underlying fund have been excluded.

³ The total returns are for the periods indicated, including changes in the value of the underlying fund, and the expenses assessed through the reduction of unit values. These ratios do not include any expenses assessed through the redemption of units. Investment options with a date notation indicate the effective date of that investment option in the variable account. The total return is calculated for each period indicated or from the effective date through the end of the reporting period.

⁴ Effective after the close of the New York Stock Exchange on May 24, 2019, Invesco Ltd. completed its acquisition of OppenheimerFunds, Inc. See Note 2 to the financial statements for information regarding the merger of this division.

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

- B.** The Separate Account assesses charges associated with the contract. These charges are either assessed as a direct reduction in unit values or through a redemption of units for all contracts contained within the Separate Account.

<p>Mortality and Expense Risk Charge</p> <p>This charge is assessed through reduction of unit values.</p>	<p>This charge is equal, on an annual basis, to 1.15% of the daily value of the assets invested in each fund.</p>
<p>Administrative Expense Charge</p> <p>This charge is assessed through reduction of unit values.</p>	<p>This charge is equal, on an annual basis, to 0.15% of the daily value of the assets invested in each fund.</p>
<p>Death Benefit Charge</p> <p>This charge is assessed through reduction of unit values.</p>	<p>This charge is equal, on an annual basis, to 0.10% of the daily value of the assets invested in each fund.</p>
<p>Administrative Charge</p> <p>This charge is assessed through the redemption of units.</p>	<p>\$30 per contract, annually. These charges are not applicable to contracts with values of \$50,000 or more.</p>
<p>Contingent Deferred Sales Charge</p> <p>This charge is assessed through the redemption of units.</p>	<p>0% - 7%</p>

9. SUBSEQUENT EVENTS

The spread of the coronavirus, causing increased cases of COVID-19, around the world in the first quarter of 2020 has caused significant volatility in U.S. and international markets. There is significant uncertainty around the breadth and duration of business disruptions related to COVID-19, as well as its impact on the U.S. and international economies and, as such, MassMutual is actively monitoring the extent of the impact to its operations.

The Separate Account's management has reviewed events occurring through April 3, 2020, the date the financial statements were issued, and no subsequent events occurred requiring accrual or disclosure.