



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 4:

Opinion on the Financial Statements

We have audited the accompanying statements of assets and liabilities of the sub-accounts listed in Appendix A that comprise Massachusetts Mutual Variable Annuity Separate Account 4 (Separate Account), as of December 31, 2023, the related statements of operations and changes in net assets for each of the years in the two-year period then ended (or for the periods indicated in Appendix A), and the related notes, including the financial highlights in Note 8, for each of the years or periods in the five-year period then ended (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of each sub-account as of December 31, 2023, and the results of their operations and the changes in their net assets for each of the years in the two-year period then ended (or for the periods indicated in Appendix A), and the financial highlights for each of the years or periods in the five-year period then ended, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Separate Account's management. Our responsibility is to express an opinion on these financial statements 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 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, 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. Such procedures also included confirmation of securities owned as of December 31, 2023, 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. 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
March 7, 2024

Appendix A

Massachusetts Mutual Variable Annuity Separate Account 4 was comprised of the following sub-accounts. Statements of assets and liabilities as of December 31, 2023, and statements of operations and changes in net assets for each of the years in the two-year period ended December 31, 2023 unless otherwise noted..

Sub-Accounts

BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)
Cboe Vest U.S. Large Cap 10% Buffer Strategies V.I. Sub-Account *
Delaware Ivy VIP Asset Strategy Sub-Account (Class II)
Fidelity® VIP Contrafund® Sub-Account (Initial Class)
Fidelity® VIP Contrafund® Sub-Account (Service Class 2)
Fidelity® VIP Health Care Sub-Account**
Fidelity® VIP Overseas Sub-Account (Service Class 2) *
Fidelity® VIP Real Estate Sub-Account**
Fidelity® VIP Strategic Income Sub-Account**
Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)
Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)
Invesco V.I. Capital Appreciation Sub-Account (Series I)
Invesco V.I. Capital Appreciation Sub-Account (Series II)
Invesco V.I. Conservative Balanced Sub-Account (Series I)
Invesco V.I. Conservative Balanced Sub-Account (Series II)
Invesco V.I. Core Plus Bond Sub-Account
Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)
Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)
Invesco V.I. Diversified Dividend Sub-Account (Series I)
Invesco V.I. Diversified Dividend Sub-Account (Series II)
Invesco V.I. Global Sub-Account (Series I)
Invesco V.I. Global Sub-Account (Series II)
Invesco V.I. Global Strategic Income Sub-Account (Series I)
Invesco V.I. Global Strategic Income Sub-Account (Series II)
Invesco V.I. Health Care Sub-Account (Series I)
Invesco V.I. Health Care Sub-Account (Series II)
Invesco V.I. Main Street Sub-Account (Series I)
Invesco V.I. Main Street Sub-Account (Series II)
Invesco V.I. Technology Sub-Account (Series I)
Invesco V.I. Technology Sub-Account (Series II)
Invesco V.I. U.S. Government Money Sub-Account
Janus Henderson Global Technology and Innovation Sub-Account**
MML Aggressive Allocation Sub-Account (Initial Class)
MML Aggressive Allocation Sub-Account (Service Class)
MML American Funds Core Allocation Sub-Account
MML American Funds Growth Sub-Account
MML Balanced Allocation Sub-Account (Initial Class)
MML Balanced Allocation Sub-Account (Service Class)
MML Blend Sub-Account (Initial Class)
MML Blend Sub-Account (Service Class)
MML Blue Chip Growth Sub-Account (Initial Class)
MML Blue Chip Growth Sub-Account (Service Class)
MML Conservative Allocation Sub-Account (Initial Class)
MML Conservative Allocation Sub-Account (Service Class)
MML Dynamic Bond Sub-Account (Service Class I)
MML Equity Sub-Account (Initial Class)
MML Equity Sub-Account (Service Class)
MML Equity Income Sub-Account (Initial Class)
MML Equity Income Sub-Account (Service Class)
MML Equity Index Sub-Account (Class I)
MML Equity Index Sub-Account (Service Class I)
MML Equity Rotation Sub-Account (Service Class I)
MML Focused Equity Sub-Account
MML Foreign Sub-Account (Initial Class)
MML Foreign Sub-Account (Service Class)
MML Fundamental Equity Sub-Account
MML Fundamental Value Sub-Account
MML Global Sub-Account (Class I)
MML Global Sub-Account (Class II)
MML Global Sub-Account (Service Class I)
MML Growth Allocation Sub-Account (Initial Class)
MML Growth Allocation Sub-Account (Service Class)
MML High Yield Sub-Account
MML Income & Growth Sub-Account (Initial Class)
MML Income & Growth Sub-Account (Service Class)
MML Inflation-Protected and Income Sub-Account (Initial Class)
MML Inflation-Protected and Income Sub-Account (Service Class)
MML International Equity Sub-Account
MML iShares® 60/40 Allocation Sub-Account**
MML iShares® 80/20 Allocation Sub-Account**
MML Large Cap Growth Sub-Account (Initial Class)
MML Large Cap Growth Sub-Account (Service Class)

MML Managed Bond Sub-Account (Initial Class)	(Service Class)
MML Managed Bond Sub-Account (Service Class)	MML Small Company Value Sub-Account
MML Managed Volatility Sub-Account (Initial Class)	MML Small/Mid Cap Value Sub-Account (Initial Class)
MML Managed Volatility Sub-Account (Service Class)	MML Small/Mid Cap Value Sub-Account (Service Class)
MML Mid Cap Growth Sub-Account (Initial Class)	MML Strategic Emerging Markets Sub-Account (Service Class I)
MML Mid Cap Growth Sub-Account (Service Class)	MML Sustainable Equity Sub-Account (Initial Class)
MML Mid Cap Value Sub-Account (Initial Class)	MML Sustainable Equity Sub-Account (Service Class)
MML Mid Cap Value Sub-Account (Service Class)	MML Total Return Bond Sub-Account
MML Moderate Allocation Sub-Account (Initial Class)	MML U.S. Government Money Market Sub-Account
MML Moderate Allocation Sub-Account (Service Class)	PIMCO CommodityRealReturn® Strategy Sub-Account
MML Short-Duration Bond Sub-Account	PIMCO Income Sub-Account**
MML Small Cap Equity Sub-Account (Initial Class)	VY® CBRE Global Real Estate Sub-Account
MML Small Cap Equity Sub-Account (Service Class)	
MML Small Cap Growth Equity Sub-Account (Initial Class)	
MML Small Cap Growth Equity Sub-Account	

* Statements of operations and changes in net assets for the period from May 1, 2023 to December 31, 2023.

** Statements of operations and changes in net assets for the year ended December 31, 2023 and the period from February 28, 2022 to December 31, 2022.

Other periods presented:

MML Equity Momentum Sub-Account (Service Class I) and MML Special Situations Sub-Account: Financial highlights for each of the years in the three-year period ended December 31, 2021.

Oppenheimer Global Multi-Alternatives Sub-Account: Financial highlights for the year ended December 31, 2019.

MML American Funds International Sub-Account: Statements of operations and changes in net assets for the period from January 1, 2022 to November 22, 2022 (the date of liquidation) and the financial highlights for the period from January 1, 2022 to November 22, 2022 and each of the years in the three-year period ended December 31, 2021

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES

December 31, 2023

	BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	Choe Vest U.S. Large Cap 10% Buffer Strategies V.I. Sub-Account	Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Health Care Sub-Account	Fidelity® VIP Overseas Sub-Account (Service Class 2)	Fidelity® VIP Real Estate Sub-Account
ASSETS								
Investments								
Number of shares.....	1,431,444	21,377	1,265,876	3,854,056	4,940,992	31,496	6,037	31,479
Identified cost	\$ 18,851,291	\$ 458,493	\$ 11,551,681	\$ 150,285,419	\$ 193,878,448	\$ 1,027,547	\$ 144,645	\$ 524,978
Value	\$ 18,823,486	\$ 488,039	\$ 11,089,071	\$ 187,422,752	\$ 231,386,669	\$ 1,069,597	\$ 154,002	\$ 531,372
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company.....	-	-	-	159	-	-	-	-
Total assets	\$ 18,823,486	\$ 488,039	\$ 11,089,071	\$ 187,422,911	\$ 231,386,669	\$ 1,069,597	\$ 154,002	\$ 531,372
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	-	-	-	11,241	-	-	-	-
Payable to Massachusetts Mutual Life Insurance Company	-	-	21	-	5	-	6	-
Total liabilities	-	-	\$ 21	\$ 11,241	\$ 5	-	\$ 6	-
NET ASSETS	\$ 18,823,486	\$ 488,039	\$ 11,089,050	\$ 187,411,670	\$ 231,386,664	\$ 1,069,597	\$ 153,996	\$ 531,372
Net Assets:								
Accumulation units - value.....	\$ 18,823,486	\$ 488,039	\$ 11,089,050	\$ 180,526,304	\$ 231,382,547	\$ 1,069,597	\$ 153,996	\$ 531,372
Contracts in payout (annuitization) period	-	-	-	6,885,366	4,117	-	-	-
Net assets	\$ 18,823,486	\$ 488,039	\$ 11,089,050	\$ 187,411,670	\$ 231,386,664	\$ 1,069,597	\$ 153,996	\$ 531,372
Outstanding units								
Contract owners	1,201,079	44,048	760,284	3,269,827	8,181,542	101,885	14,620	58,941
UNIT VALUE								
Panorama Premier.....	\$ -	\$ -	\$ -	\$ 76.31	\$ -	\$ -	\$ -	\$ -
Panorama Passage®								
Tier 1	-	-	-	56.93	-	-	-	-
Tier 2	-	-	-	55.08	-	-	-	-
Tier 3	-	-	-	60.49	-	-	-	-
Tier 4	-	-	-	57.32	-	-	-	-
MassMutual Artistry.....	-	-	-	52.15	-	-	-	-
MassMutual Transitions®								
Custom Plan	-	-	-	66.62	-	-	-	-
Package Plan I	-	-	-	66.62	-	-	-	-
Package Plan II	-	-	-	61.77	-	-	-	-
Package Plan III	-	-	-	58.52	-	-	-	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	Choe Vest U.S. Large Cap 10% Buffer Strategies V.I. Sub-Account	Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Health Care Sub-Account	Fidelity® VIP Overseas Sub-Account (Service Class 2)	Fidelity® VIP Real Estate Sub-Account
UNIT VALUE (continued)								
MassMutual Evolution SM								
Tier 1	-	-	15.57	50.84	-	-	-	-
Tier 2	-	-	14.89	46.97	-	-	-	-
Tier 3	-	-	14.48	44.69	-	-	-	-
Tier 4	-	-	14.89	46.89	-	-	-	-
Tier 5	-	-	14.24	43.32	-	-	-	-
Tier 6	-	-	13.84	41.22	-	-	-	-
Tier 7	-	-	14.72	46.16	-	-	-	-
Tier 8	-	-	14.08	42.57	-	-	-	-
Tier 9	-	-	14.40	-	43.09	-	-	-
Tier 10	-	-	15.22	-	47.46	-	-	-
Tier 11	-	-	13.77	-	39.74	-	-	-
Tier 12	-	-	14.56	-	44.64	-	-	-
Tier 13	-	-	13.09	-	37.37	-	-	-
Tier 14	-	-	13.69	-	40.52	-	-	-
MassMutual RetireEase Select SM								
Tier 1	-	-	-	33.31	-	-	-	-
Tier 2	-	-	-	36.19	-	-	-	-
MassMutual Transitions Select SM								
Tier 1	-	-	16.28	58.67	-	-	-	-
Tier 2	-	-	16.28	-	56.46	-	-	-
MassMutual Equity Edge SM								
Tier 1	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II								
Tier 1	-	-	14.06	-	23.35	-	-	-
Tier 2	-	-	13.66	-	22.69	-	-	-
Tier 3	-	-	14.06	-	23.35	-	-	-
MassMutual Capital Vantage SM								
Tier 1	15.25	-	14.00	-	23.25	-	-	-
Tier 2	15.69	-	14.41	-	23.92	-	-	-
Tier 3	14.69	-	13.50	-	22.41	-	-	-
Tier 4	15.25	-	14.00	-	23.25	-	-	-
Tier 5	15.12	-	13.89	-	23.06	-	-	-
Tier 6	15.69	-	14.41	-	23.92	-	-	-
MassMutual Envision VA	-	11.08	10.07	-	11.13	10.50	10.53	9.02

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	Fidelity® VIP Strategic Income Sub-Account	Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)	Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)	Invesco V.I. Capital Appreciation Sub-Account (Series I)	Invesco V.I. Capital Appreciation Sub-Account (Series II)	Invesco V.I. Conservative Balanced Sub-Account (Series I)	Invesco V.I. Conservative Balanced Sub-Account (Series II)	Invesco V.I. Core Plus Bond Sub-Account
ASSETS								
Investments								
Number of shares.....	67,512	10,502,224	9,501,658	2,472,361	194,919	350,507	897	234,227
Identified cost	\$ 692,860	\$ 22,689,349	\$ 21,213,206	\$ 117,831,831	\$ 8,977,819	\$ 4,965,880	\$ 13,788	\$ 1,547,668
Value	\$ 698,753	\$ 21,214,493	\$ 20,333,547	\$ 116,374,018	\$ 8,701,167	\$ 5,383,783	\$ 13,538	\$ 1,344,464
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company	-	-	-	-	-	-	-	-
Total assets	698,753	21,214,493	20,333,547	116,374,018	8,701,167	5,383,783	13,538	1,344,464
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	-	301	-	6,220	-	1,105	-	10
Payable to Massachusetts Mutual Life Insurance Company	-	156	21	511	14	100	6	-
Total liabilities	-	457	21	6,731	14	1,205	6	10
NET ASSETS	\$ 698,753	\$ 21,214,036	\$ 20,333,526	\$ 116,367,287	\$ 8,701,153	\$ 5,382,578	\$ 13,532	\$ 1,344,454
Net Assets:								
Accumulation units - value.....	\$ 698,753	\$ 20,402,825	\$ 20,333,526	\$ 112,912,950	\$ 8,701,153	\$ 5,345,751	\$ 13,532	\$ 1,344,121
Contracts in payout (annuitization) period	-	811,211	-	3,454,337	-	36,827	-	333
Net assets	\$ 698,753	\$ 21,214,036	\$ 20,333,526	\$ 116,367,287	\$ 8,701,153	\$ 5,382,578	\$ 13,532	\$ 1,344,454
Outstanding units								
Contract owners	71,420	740,991	1,072,463	2,847,791	223,386	287,172	797	94,073
UNIT VALUE								
Panorama Premier.....	\$ -	\$ 40.98	\$ -	\$ 39.30	\$ -	\$ 18.02	\$ -	\$ 14.29
Panorama Passage®								
Tier 1.....	-	26.26	-	39.15	-	17.64	-	-
Tier 2.....	-	25.41	-	37.88	-	17.07	-	-
Tier 3.....	-	27.91	-	41.59	-	18.72	-	-
Tier 4.....	-	26.45	-	39.42	-	17.74	-	-
MassMutual Artistry.....	-	19.80	-	29.14	-	18.39	-	-
MassMutual Transitions®								
Custom Plan	-	32.39	-	44.88	-	20.28	-	-
Package Plan I	-	32.39	-	44.88	-	20.28	-	-
Package Plan II	-	30.03	-	41.61	-	18.80	-	-
Package Plan III	-	28.46	-	39.43	-	17.81	-	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued) December 31, 2023

	Fidelity® VIP Strategic Income Sub-Account	Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)		Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)		Invesco V.I. Capital Appreciation Sub-Account (Series I)		Invesco V.I. Capital Appreciation Sub-Account (Series II)		Invesco V.I. Conservative Balanced Sub-Account (Series I)		Invesco V.I. Conservative Balanced Sub-Account (Series II)		Invesco V.I. Core Plus Bond Sub-Account	
UNIT VALUE (continued)															
MassMutual Evolution SM															
Tier 1	-	26.21	-	-	-	37.03	-	-	-	15.49	-	-	-	-	-
Tier 2	-	24.21	-	-	-	34.21	-	-	-	14.31	-	-	-	-	-
Tier 3	-	23.04	-	-	-	32.56	-	-	-	13.61	-	-	-	-	-
Tier 4	-	24.17	-	-	-	34.16	-	-	-	14.28	-	-	-	-	-
Tier 5	-	22.33	-	-	-	31.55	-	-	-	13.19	-	-	-	-	-
Tier 6	-	21.25	-	-	-	30.03	-	-	-	12.56	-	-	-	-	-
Tier 7	-	23.79	-	-	-	33.62	-	-	-	14.06	-	-	-	-	-
Tier 8	-	21.94	-	-	-	31.01	-	-	-	12.97	-	-	-	-	-
Tier 9	-	-	-	22.22	-	-	-	31.38	-	13.12	-	-	-	-	-
Tier 10	-	-	-	24.47	-	-	-	34.56	-	14.45	-	-	-	-	-
Tier 11	-	-	-	20.49	-	-	-	28.94	-	12.10	-	-	-	-	-
Tier 12	-	-	-	23.02	-	-	-	32.51	-	13.60	-	-	-	-	-
Tier 13	-	-	-	19.27	-	-	-	27.21	-	-	-	-	-	-	-
Tier 14	-	-	-	20.89	-	-	-	29.51	-	-	-	-	-	-	-
MassMutual RetireEase Select SM															
Tier 1	-	14.29	-	-	-	29.71	-	-	-	12.10	-	-	-	-	-
Tier 2	-	15.52	-	-	-	32.28	-	-	-	13.15	-	-	-	-	-
MassMutual Transitions Select SM															
Tier 1	-	31.58	-	-	-	43.50	-	-	-	17.65	-	-	-	-	-
Tier 2	-	-	-	30.41	-	-	-	41.86	-	-	-	-	-	-	-
MassMutual Equity Edge SM															
Tier 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II															
Tier 1	-	-	-	13.11	-	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	12.74	-	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	13.11	-	-	-	-	-	-	-	-	-	-	-
MassMutual Capital Vantage SM															
Tier 1	-	-	-	13.05	-	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	13.43	-	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	12.58	-	-	-	-	-	-	-	-	-	-	-
Tier 4	-	-	-	13.05	-	-	-	-	-	-	-	-	-	-	-
Tier 5	-	-	-	12.95	-	-	-	-	-	-	-	-	-	-	-
Tier 6	-	-	-	13.43	-	-	-	-	-	-	-	-	-	-	-
MassMutual Envision VA	9.78	-	-	10.17	-	-	-	-	-	-	-	-	-	-	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)	Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Diversified Dividend Sub-Account (Series II)	Invesco V.I. Global Sub-Account (Series I)	Invesco V.I. Global Sub-Account (Series II)	Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Strategic Income Sub-Account (Series II)
ASSETS								
Investments								
Number of shares.....	1,154,235	456,124	182,544	356,296	3,476,834	1,636,495	23,072,563	9,453,530
Identified cost	\$ 85,002,683	\$ 31,665,194	\$ 4,619,375	\$ 8,944,648	\$ 130,572,378	\$ 60,960,613	\$ 108,650,908	\$ 45,965,937
Value	\$ 72,497,476	\$ 24,635,268	\$ 4,424,876	\$ 8,547,529	\$ 127,113,050	\$ 58,095,558	\$ 98,981,294	\$ 41,784,604
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company	-	-	-	-	-	-	-	-
Total assets	\$ 72,497,476	\$ 24,635,268	\$ 4,424,876	\$ 8,547,529	\$ 127,113,050	\$ 58,095,558	\$ 98,981,294	\$ 41,784,604
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	4,714	-	-	-	6,435	-	7,569	-
Payable to Massachusetts Mutual Life Insurance Company	273	9	78	11	295	21	284	15
Total liabilities	4,987	9	78	11	6,730	21	7,853	15
NET ASSETS	\$ 72,492,489	\$ 24,635,259	\$ 4,424,798	\$ 8,547,518	\$ 127,106,320	\$ 58,095,537	\$ 98,973,441	\$ 41,784,589
Net Assets:								
Accumulation units - value.....	\$ 69,849,845	\$ 24,633,617	\$ 4,299,143	\$ 8,547,518	\$ 123,387,861	\$ 58,091,380	\$ 95,961,186	\$ 41,784,589
Contracts in payout (annuitization) period	2,642,644	1,642	125,655	-	3,718,459	4,157	3,012,255	-
Net assets	\$ 72,492,489	\$ 24,635,259	\$ 4,424,798	\$ 8,547,518	\$ 127,106,320	\$ 58,095,537	\$ 98,973,441	\$ 41,784,589
Outstanding units								
Contract owners	2,017,336	1,137,821	282,594	610,808	2,990,290	2,263,619	6,098,483	3,221,166
UNIT VALUE								
Panorama Premier.....	\$ 29.56	\$ -	\$ 17.31	\$ -	\$ 52.68	\$ -	\$ 20.53	\$ -
Panorama Passage®								
Tier 1.....	29.03	-	16.95	-	51.73	-	19.99	-
Tier 2.....	28.08	-	16.40	-	50.05	-	19.34	-
Tier 3.....	30.84	-	17.98	-	54.96	-	21.24	-
Tier 4.....	29.23	-	17.04	-	52.09	-	20.13	-
MassMutual Artistry.....	16.53	-	15.86	-	36.84	-	20.62	-
MassMutual Transitions®								
Custom Plan	42.42	-	17.09	-	48.24	-	20.49	-
Package Plan I	42.42	-	17.09	-	48.24	-	20.49	-
Package Plan II	39.33	-	15.85	-	44.73	-	19.00	-
Package Plan III	37.26	-	15.01	-	42.38	-	18.00	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)		Invesco V.I. Diversified Dividend Sub-Account (Series I)		Invesco V.I. Global Sub-Account (Series I)		Invesco V.I. Global Strategic Income Sub-Account (Series I)		Invesco V.I. Global Strategic Income Sub-Account (Series II)	
	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)	Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Global Sub-Account (Series I)	Invesco V.I. Global Sub-Account (Series I)	Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Sub-Account (Series II)	Invesco V.I. Global Strategic Income Sub-Account (Series II)	Invesco V.I. Global Strategic Income Sub-Account (Series II)
UNIT VALUE (continued)										
MassMutual Evolution SM										
Tier 1	35.81	13.15	-	36.50	-	14.86	-	-	-	-
Tier 2	33.08	12.15	-	33.72	-	13.73	-	-	-	-
Tier 3	31.48	11.56	-	32.09	-	13.07	-	-	-	-
Tier 4	33.03	12.13	-	33.66	-	13.71	-	-	-	-
Tier 5	30.51	11.21	-	31.10	-	12.66	-	-	-	-
Tier 6	29.03	10.66	-	29.59	-	12.05	-	-	-	-
Tier 7	32.51	11.94	-	33.14	-	13.49	-	-	-	-
Tier 8	29.98	11.01	-	30.56	-	12.45	-	-	-	-
Tier 9	-	-	30.32	-	11.17	-	30.94	-	12.58	-
Tier 10	-	-	33.40	-	12.30	-	34.08	-	13.86	-
Tier 11	-	-	27.96	-	10.30	-	28.53	-	11.60	-
Tier 12	-	-	31.41	-	11.57	-	32.05	-	13.04	-
Tier 13	-	-	26.30	-	9.69	-	26.83	-	10.91	-
Tier 14	-	-	28.51	-	10.50	-	29.09	-	11.83	-
MassMutual RetireEase Select SM										
Tier 1	25.98	10.28	-	22.68	-	12.18	-	-	-	-
Tier 2	28.23	11.17	-	24.64	-	13.24	-	-	-	-
MassMutual Transitions Select SM										
Tier 1	41.67	15.57	-	43.90	-	16.02	-	42.26	15.41	-
Tier 2	-	-	40.07	-	15.02	-	-	-	-	-
MassMutual Equity Edge SM										
Tier 1	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II										
Tier 1	-	-	19.91	-	-	-	18.22	-	9.93	-
Tier 2	-	-	19.35	-	-	-	17.70	-	9.65	-
Tier 3	-	-	19.91	-	-	-	18.22	-	9.93	-
MassMutual Capital Vantage SM										
Tier 1	-	-	19.83	-	-	-	18.14	-	9.89	-
Tier 2	-	-	20.40	-	-	-	18.67	-	10.18	-
Tier 3	-	-	19.11	-	-	-	17.49	-	9.53	-
Tier 4	-	-	19.83	-	-	-	18.14	-	9.89	-
Tier 5	-	-	19.67	-	-	-	18.00	-	9.81	-
Tier 6	-	-	20.40	-	-	-	18.67	-	10.18	-
MassMutual Envision VA	-	-	-	-	9.38	-	10.76	-	9.63	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	Invesco V.I. Health Care Sub-Account (Series I)	Invesco V.I. Health Care Sub-Account (Series II)	Invesco V.I. Main Street Sub-Account (Series I)	Invesco V.I. Main Street Sub-Account (Series II)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. U.S. Government Money Sub-Account	Janus Henderson Global Technology and Innovation Sub-Account
ASSETS								
Investments								
Number of shares.....	319,569	313,086	1,618,608	1,141,907	422,339	524,777	5,993,170	43,826
Identified cost.....	\$ 8,846,835	\$ 8,142,205	\$ 34,954,054	\$ 24,000,714	\$ 8,689,163	\$ 9,692,760	\$ 5,993,170	\$ 574,601
Value	\$ 8,280,032	\$ 7,445,183	\$ 29,491,035	\$ 20,291,691	\$ 7,813,274	\$ 8,322,967	\$ 5,993,169	\$ 703,850
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company.....	-	1	-	-	-	-	-	-
Total assets	\$ 8,280,032	\$ 7,445,184	\$ 29,491,035	\$ 20,291,691	\$ 7,813,274	\$ 8,322,967	\$ 5,993,169	\$ 703,850
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	703	-	1,911	-	1,293	-	2,592	-
Payable to Massachusetts Mutual Life Insurance Company	112	-	147	18	107	-	76	-
Total liabilities	\$ 815	\$ -	\$ 2,058	\$ 18	\$ 1,400	\$ -	\$ 2,668	\$ -
NET ASSETS	\$ 8,279,217	\$ 7,445,184	\$ 29,488,977	\$ 20,291,673	\$ 7,811,874	\$ 8,322,967	\$ 5,990,501	\$ 703,850
Net Assets:								
Accumulation units - value.....	\$ 7,922,242	\$ 7,445,184	\$ 29,202,505	\$ 20,291,673	\$ 7,590,234	\$ 8,321,135	\$ 5,896,929	\$ 703,850
Contracts in payout (annuitization) period	356,975	-	286,472	-	221,640	1,832	93,572	-
Net assets	\$ 8,279,217	\$ 7,445,184	\$ 29,488,977	\$ 20,291,673	\$ 7,811,874	\$ 8,322,967	\$ 5,990,501	\$ 703,850
Outstanding units								
Contract owners	237,830	221,061	778,371	881,293	341,037	181,352	559,667	61,103
UNIT VALUE								
Panorama Premier.....	\$ 34.80	\$ -	\$ 33.10	\$ -	\$ 11.50	\$ -	\$ 12.04	\$ -
Panorama Passage®								
Tier 1	34.07	-	33.53	-	11.25	-	10.30	-
Tier 2	32.96	-	32.44	-	10.89	-	9.97	-
Tier 3	36.14	-	35.62	-	11.94	-	10.94	-
Tier 4	34.25	-	33.76	-	11.32	-	10.37	-
MassMutual Artistry.....	31.61	-	31.11	-	11.40	-	10.67	-
MassMutual Transitions®								
Custom Plan	39.40	-	43.45	-	45.06	-	10.71	-
Package Plan I	39.40	-	43.45	-	45.06	-	10.71	-
Package Plan II	36.53	-	40.29	-	41.78	-	9.93	-
Package Plan III	34.61	-	38.17	-	39.58	-	9.41	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	Invesco V.I. Health Care Sub-Account (Series I)	Invesco V.I. Health Care Sub-Account (Series II)	Invesco V.I. Main Street Sub-Account (Series I)	Invesco V.I. Main Street Sub-Account (Series II)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. U.S. Government Money Sub-Account	Janus Henderson Global Technology and Innovation Sub-Account
UNIT VALUE (continued)								
MassMutual Evolution SM								
Tier 1	31.20	-	35.85	-	39.95	-	9.48	-
Tier 2	28.82	-	33.11	-	36.90	-	8.76	-
Tier 3	27.42	-	31.51	-	35.12	-	8.34	-
Tier 4	28.77	-	33.06	-	36.84	-	8.74	-
Tier 5	26.58	-	30.54	-	34.03	-	8.08	-
Tier 6	25.29	-	29.06	-	32.39	-	7.69	-
Tier 7	28.32	-	32.54	-	36.27	-	8.61	-
Tier 8	26.12	-	30.01	-	33.45	-	7.94	-
Tier 9	-	26.45	-	30.37	-	33.86	-	-
Tier 10	-	29.13	-	33.45	-	37.29	-	-
Tier 11	-	24.39	-	28.01	-	31.22	-	-
Tier 12	-	27.40	-	31.47	-	35.08	-	-
Tier 13	-	22.94	-	26.34	-	29.36	-	-
Tier 14	-	24.87	-	28.56	-	31.84	-	-
MassMutual RetireEase Select SM								
Tier 1	25.41	-	26.49	-	34.43	-	-	-
Tier 2	27.60	-	28.78	-	37.41	-	-	-
MassMutual Transitions Select SM								
Tier 1	37.22	-	41.76	-	54.01	-	10.29	-
Tier 2	-	35.84	-	40.18	-	51.98	-	-
MassMutual Equity Edge SM								
Tier 1	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II								
Tier 1	-	-	-	19.89	-	-	-	-
Tier 2	-	-	-	19.33	-	-	-	-
Tier 3	-	-	-	19.89	-	-	-	-
MassMutual Capital Vantage SM								
Tier 1	-	-	-	19.80	-	-	-	-
Tier 2	-	-	-	20.38	-	-	-	-
Tier 3	-	-	-	19.09	-	-	-	-
Tier 4	-	-	-	19.80	-	-	-	-
Tier 5	-	-	-	19.64	-	-	-	-
Tier 6	-	-	-	20.38	-	-	-	-
MassMutual Envision VA	-	-	-	-	-	-	-	11.52

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Aggressive Allocation Sub-Account (Initial Class)	MML Aggressive Allocation Sub-Account (Service Class)	MML American Funds Core Allocation Sub-Account	MML American Funds Growth Sub-Account	MML Balanced Allocation Sub-Account (Initial Class)	MML Balanced Allocation Sub-Account (Service Class)	MML Blend Sub-Account (Initial Class)	MML Blend Sub-Account (Service Class)
ASSETS								
Investments								
Number of shares.....	3,196,294	8,681,774	65,448,686	16,828,953	6,623,132	31,055,790	2,611,987	9,721,555
Identified cost.....	\$ 30,206,672	\$ 79,469,075	\$ 733,431,836	\$ 248,649,660	\$ 62,572,725	\$ 287,995,897	\$ 55,292,947	\$ 203,672,001
Value.....	\$ 26,625,130	\$ 70,496,002	\$ 658,413,776	\$ 234,932,185	\$ 54,442,143	\$ 252,483,577	\$ 50,812,847	\$ 187,651,148
Dividends receivable.....	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company.....	-	-	-	-	-	-	-	-
Total assets.....	\$ 26,625,130	\$ 70,496,002	\$ 658,413,776	\$ 234,932,185	\$ 54,442,143	\$ 252,483,577	\$ 50,812,847	\$ 187,651,148
LIABILITIES								
Payable to Annuity mortality fluctuation fund reserve.....	-	-	-	-	-	-	314	-
Payable to Massachusetts Mutual Life Insurance Company.....	40	22	82	39	64	11	56	13
Total liabilities.....	40	22	82	39	64	11	370	13
NET ASSETS.....	\$ 26,625,090	\$ 70,495,980	\$ 658,413,694	\$ 234,932,146	\$ 54,442,079	\$ 252,483,566	\$ 50,812,477	\$ 187,651,135
Net Assets:								
Accumulation units - value.....	\$ 26,625,090	\$ 70,495,980	\$ 658,069,402	\$ 234,734,056	\$ 54,442,079	\$ 252,372,531	\$ 49,570,542	\$ 187,651,135
Contracts in payout (annuitization) period.....	-	-	344,292	198,090	-	111,035	1,241,935	-
Net assets.....	\$ 26,625,090	\$ 70,495,980	\$ 658,413,694	\$ 234,932,146	\$ 54,442,079	\$ 252,483,566	\$ 50,812,477	\$ 187,651,135
Outstanding units								
Contract owners.....	1,027,797	3,406,635	33,354,597	7,531,821	2,873,841	15,847,072	1,626,991	10,381,369
UNIT VALUE								
Panorama Premier.....	\$ 25.11	\$ -	\$ -	\$ -	\$ 18.67	\$ -	\$ 27.35	\$ -
Panorama Passage®								
Tier 1.....	24.76	-	-	-	18.40	-	28.82	-
Tier 2.....	24.13	-	-	-	17.94	-	27.89	-
Tier 3.....	25.76	-	-	-	19.15	-	30.62	-
Tier 4.....	24.72	-	-	-	18.37	-	29.02	-
MassMutual Artistry.....	26.01	-	27.72	68.55	19.33	-	30.41	-
MassMutual Transitions®								
Custom Plan.....	26.98	-	-	-	20.06	-	36.34	-
Package Plan I.....	26.98	-	-	-	20.06	-	36.34	-
Package Plan II.....	25.52	-	-	-	18.97	-	33.70	-
Package Plan III.....	24.52	-	-	-	18.23	-	31.93	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Aggressive Allocation Sub-Account (Initial Class)		MML Aggressive Allocation Sub-Account (Service Class)		MML American Funds Core Allocation Sub-Account		MML American Funds Growth Sub-Account		MML Balanced Allocation Sub-Account (Initial Class)		MML Balanced Allocation Sub-Account (Service Class)		MML Blend Sub-Account (Service Class)	
	UNIT VALUE (continued)													
MassMutual Evolution SM														
Tier 1	24.52	-	20.83	46.21	18.23	-	29.46	-	-	-	-	-	-	
Tier 2	23.01	-	19.60	43.47	17.10	-	27.21	-	-	-	-	-	-	
Tier 3	22.11	-	18.86	41.83	16.43	-	25.90	-	-	-	-	-	-	
Tier 4	23.01	-	19.60	43.47	17.10	-	27.17	-	-	-	-	-	-	
Tier 5	21.58	-	18.43	40.89	16.05	-	25.10	-	-	-	-	-	-	
Tier 6	20.74	-	17.74	39.35	15.42	-	23.88	-	-	-	-	-	-	
Tier 7	22.64	-	19.30	42.81	16.83	-	26.75	-	-	-	-	-	-	
Tier 8	21.24	-	18.15	40.26	15.79	-	24.67	-	-	-	-	-	-	
Tier 9	-	21.11	18.72	41.52	-	15.73	-	24.96	-	-	-	-	-	
Tier 10	-	22.86	20.21	44.82	-	17.04	-	27.50	-	-	-	-	-	
Tier 11	-	19.81	17.60	39.05	-	14.76	-	23.02	-	-	-	-	-	
Tier 12	-	21.50	19.01	42.16	-	16.02	-	25.86	-	-	-	-	-	
Tier 13	-	18.62	16.56	36.72	-	13.88	-	21.65	-	-	-	-	-	
Tier 14	-	19.85	17.60	39.04	-	14.79	-	23.48	-	-	-	-	-	
MassMutual RetireEase Select SM														
Tier 1	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tier 2	-	-	-	-	-	-	-	-	-	-	-	-	-	
MassMutual Transitions Select SM														
Tier 1	26.13	-	22.15	49.13	19.43	-	33.25	-	-	-	-	-	-	
Tier 2	-	25.12	22.15	49.13	-	18.72	-	32.00	-	-	-	-	-	
MassMutual Equity Edge SM														
Tier 1	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tier 2	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tier 3	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tier 4	-	-	-	-	-	-	-	-	-	-	-	-	-	
MassMutual Transitions Select SM II														
Tier 1	-	16.67	15.39	28.64	-	13.39	-	16.26	-	-	-	-	-	
Tier 2	-	16.20	14.95	27.83	-	13.01	-	15.80	-	-	-	-	-	
Tier 3	-	16.67	15.39	28.64	-	13.39	-	16.26	-	-	-	-	-	
MassMutual Capital Vantage SM														
Tier 1	-	16.60	15.32	28.52	-	13.33	-	16.19	-	-	-	-	-	
Tier 2	-	17.08	15.77	29.35	-	13.72	-	16.66	-	-	-	-	-	
Tier 3	-	16.00	14.77	27.49	-	12.85	-	15.61	-	-	-	-	-	
Tier 4	-	16.60	15.32	28.52	-	13.33	-	16.19	-	-	-	-	-	
Tier 5	-	16.47	15.20	28.29	-	13.22	-	16.06	-	-	-	-	-	
Tier 6	-	17.08	15.77	29.35	-	13.72	-	16.66	-	-	-	-	-	
MassMutual Envision VA	-	10.40	10.32	11.03	-	9.87	-	10.31	-	-	-	-	-	

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Blue Chip Growth Sub-Account (Initial Class)	MML Blue Chip Growth Sub-Account (Service Class)	MML Conservative Allocation Sub-Account (Initial Class)	MML Conservative Allocation Sub-Account (Service Class)	MML Dynamic Bond Sub-Account (Service Class I)	MML Equity Sub-Account (Initial Class)	MML Equity Sub-Account (Service Class)	MML Equity Income Sub-Account (Initial Class)
ASSETS								
Investments								
Number of shares.....	2,909,252	10,539,264	6,075,059	26,887,376	1,458,905	828,872	3,072,674	10,794,389
Identified cost.....	\$ 48,168,351	\$ 162,530,432	\$ 56,964,837	\$ 247,410,338	\$ 13,982,828	\$ 21,168,303	\$ 76,009,748	\$ 105,220,024
Value.....	\$ 46,548,031	\$ 154,927,184	\$ 48,661,224	\$ 212,410,273	\$ 12,459,052	\$ 21,776,655	\$ 78,993,271	\$ 106,756,504
Dividends receivable.....	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company.....	-	-	-	-	-	-	-	-
Total assets	\$ 46,548,031	\$ 154,927,184	\$ 48,661,224	\$ 212,410,273	\$ 12,459,052	\$ 21,776,655	\$ 78,993,271	\$ 106,756,504
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	1,571	-	-	-	-	333	-	2,749
Payable to Massachusetts Mutual Life Insurance Company.....	127	23	34	17	73	10	10	113
Total liabilities	1,698	23	34	17	-	406	10	2,862
NET ASSETS	\$ 46,546,333	\$ 154,927,161	\$ 48,661,190	\$ 212,410,256	\$ 12,459,052	\$ 21,776,249	\$ 78,993,261	\$ 106,753,642
Net Assets:								
Accumulation units - value.....	\$ 45,446,116	\$ 154,921,884	\$ 48,485,976	\$ 212,331,806	\$ 12,459,052	\$ 20,981,862	\$ 78,993,261	\$ 103,000,206
Contracts in payout (annuitization) period.....	1,100,217	5,277	175,214	78,450	-	794,387	-	3,753,436
Net assets	\$ 46,546,333	\$ 154,927,161	\$ 48,661,190	\$ 212,410,256	\$ 12,459,052	\$ 21,776,249	\$ 78,993,261	\$ 106,753,642
Outstanding units								
Contract owners.....	794,854	5,915,497	2,694,952	13,893,472	1,249,453	720,763	3,418,217	3,189,746
UNIT VALUE								
Panorama Premier.....	\$ 64.62	\$ -	\$ 17.61	\$ -	\$ -	\$ 24.25	\$ -	\$ 40.15
Panorama Passage®								
Tier 1.....	63.43	-	17.35	-	-	26.81	-	39.41
Tier 2.....	61.37	-	16.92	-	-	25.94	-	38.13
Tier 3.....	66.79	-	18.06	-	-	28.49	-	41.50
Tier 4.....	63.30	-	17.33	-	-	27.00	-	39.33
MassMutual Artistry.....	67.63	-	18.23	-	-	29.19	-	42.02
MassMutual Transitions®								
Custom Plan.....	62.43	-	18.91	-	-	37.06	-	37.66
Package Plan I.....	62.43	-	18.91	-	-	37.06	-	37.66
Package Plan II.....	57.89	-	17.89	-	-	34.36	-	34.92
Package Plan III.....	54.85	-	17.19	-	-	32.56	-	33.09

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

UNIT VALUE (continued)	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML
	Blue Chip Growth Sub-Account (Initial Class)	Blue Chip Growth Sub-Account (Service Class)	Conservative Allocation Sub-Account (Initial Class)	Conservative Allocation Sub-Account (Service Class)	Dynamic Bond Sub-Account (Service Class I)	Equity Sub-Account (Initial Class)	Equity Sub-Account (Service Class)	Equity Income Sub-Account (Initial Class)	Equity Income Sub-Account (Service Class)	Equity Income Sub-Account (Initial Class)	Equity Income Sub-Account (Service Class)	Equity Income Sub-Account (Initial Class)	Equity Income Sub-Account (Service Class)
MassMutual Evolution SM													
Tier 1	50.37	-	17.19	-	-	29.97	-	-	-	-	29.97	-	30.52
Tier 2	46.53	-	16.13	-	-	27.69	-	-	-	-	27.69	-	28.19
Tier 3	44.28	-	15.50	-	-	26.35	-	-	-	-	26.35	-	26.83
Tier 4	46.45	-	16.13	-	-	27.64	-	-	-	-	27.64	-	28.15
Tier 5	42.91	-	15.13	-	-	25.54	-	-	-	-	25.54	-	26.00
Tier 6	40.83	-	14.54	-	-	24.30	-	-	-	-	24.30	-	24.74
Tier 7	45.73	-	15.87	-	-	27.21	-	-	-	-	27.21	-	27.71
Tier 8	42.17	-	14.89	-	-	25.10	-	-	-	-	25.10	-	25.55
Tier 9	-	42.66	-	14.80	-	-	25.40	-	-	-	25.40	-	-
Tier 10	-	46.99	-	16.02	-	-	27.98	-	-	-	27.98	-	-
Tier 11	-	39.35	-	13.88	-	-	23.43	-	-	-	23.43	-	-
Tier 12	-	44.20	-	15.07	-	-	26.32	-	-	-	26.32	-	-
Tier 13	-	37.00	-	13.06	-	-	22.03	-	-	-	22.03	-	-
Tier 14	-	40.12	-	13.91	-	-	23.89	-	-	-	23.89	-	-
MassMutual RetireEase Select SM													
Tier 1	38.87	-	-	-	-	20.20	-	-	-	-	20.20	-	21.09
Tier 2	42.23	-	-	-	-	21.95	-	-	-	-	21.95	-	22.92
MassMutual Transitions Select SM													
Tier 1	59.83	-	18.32	-	-	33.78	-	-	-	-	33.78	-	34.44
Tier 2	-	57.55	-	17.61	-	-	-	-	-	-	-	-	-
MassMutual Equity Edge SM													
Tier 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II													
Tier 1	-	22.90	-	12.69	9.98	-	17.85	-	-	-	17.85	-	-
Tier 2	-	22.25	-	12.34	9.69	-	17.34	-	-	-	17.34	-	-
Tier 3	-	22.90	-	12.69	9.98	-	17.85	-	-	-	17.85	-	-
MassMutual Capital Vantage SM													
Tier 1	-	22.80	-	12.64	9.94	-	17.77	-	-	-	17.77	-	-
Tier 2	-	23.46	-	13.01	10.22	-	18.29	-	-	-	18.29	-	-
Tier 3	-	21.98	-	12.19	9.58	-	17.13	-	-	-	17.13	-	-
Tier 4	-	22.80	-	12.64	9.94	-	17.77	-	-	-	17.77	-	-
Tier 5	-	22.62	-	12.54	9.85	-	17.63	-	-	-	17.63	-	-
Tier 6	-	23.46	-	13.01	10.22	-	18.29	-	-	-	18.29	-	-
MassMutual Envionist VA	-	10.74	-	9.75	9.31	-	10.53	-	-	-	10.53	-	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Equity Income Sub-Account (Service Class)	MML Equity Index Sub-Account (Class I)	MML Equity Index Sub-Account (Service Class I)	MML Equity Rotation Sub-Account (Service Class I)	MML Focused Equity Sub-Account (Service Class)	MML Foreign Sub-Account (Initial Class)	MML Foreign Sub-Account (Service Class)	MML Fundamental Equity Sub-Account
ASSETS								
Investments								
Number of shares.....	7,343,235	1,057,674	966,789	136,755	3,221,421	8,659,861	976,591	2,218,966
Identified cost	\$ 72,304,861	\$ 30,546,875	\$ 25,904,069	\$ 1,750,025	\$ 21,462,278	\$ 77,729,539	\$ 8,424,626	\$ 21,298,730
Value	\$ 71,229,374	\$ 31,814,845	\$ 27,437,474	\$ 1,683,459	\$ 21,905,663	\$ 82,528,470	\$ 9,248,312	\$ 21,435,216
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company	-	-	-	-	-	-	-	-
Total assets	\$ 71,229,374	\$ 31,814,845	\$ 27,437,474	\$ 1,683,459	\$ 21,905,663	\$ 82,528,470	\$ 9,248,312	\$ 21,435,216
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	-	964	-	-	-	1,979	-	-
Payable to Massachusetts Mutual Life Insurance Company	14	105	20	8	57	154	25	44
Total liabilities	14	1,069	20	8	57	2,133	25	44
NET ASSETS	\$ 71,229,360	\$ 31,813,776	\$ 27,437,454	\$ 1,683,451	\$ 21,905,606	\$ 82,526,337	\$ 9,248,287	\$ 21,435,172
Net Assets:								
Accumulation units - value.....	\$ 71,223,919	\$ 31,229,551	\$ 27,437,454	\$ 1,683,451	\$ 21,905,606	\$ 79,010,593	\$ 9,248,287	\$ 21,356,813
Contracts in payout (amuitization) period	5,441	584,225	-	-	-	3,515,744	-	78,359
Net assets	\$ 71,229,360	\$ 31,813,776	\$ 27,437,454	\$ 1,683,451	\$ 21,905,606	\$ 82,526,337	\$ 9,248,287	\$ 21,435,172
Outstanding units								
Contract owners	3,000,613	792,661	616,130	81,036	915,673	4,776,071	594,680	908,537
UNIT VALUE								
Panorama Premier.....	\$ -	\$ 35.70	\$ -	\$ -	\$ 33.17	\$ 16.38	\$ -	\$ 33.74
Panorama Passage®								
Tier 1	-	36.92	-	-	32.82	16.43	-	33.39
Tier 2	-	35.72	-	-	32.22	15.90	-	32.77
Tier 3	-	39.23	-	-	33.79	17.46	-	34.38
Tier 4	-	37.17	-	-	32.79	16.55	-	33.35
MassMutual Artistry.....	-	34.20	-	-	34.03	15.60	-	34.62
MassMutual Transitions®								
Custom Plan	-	50.53	-	-	34.96	19.71	-	35.56
Package Plan I	-	50.53	-	-	34.96	19.71	-	35.56
Package Plan II	-	46.85	-	-	33.56	18.27	-	34.14
Package Plan III	-	44.39	-	-	32.59	17.31	-	33.16

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Equity Income		MML Equity Index (Class I)		MML Equity Index (Service Class I)		MML Equity Rotation (Service Class I)		MML Focused Equity (Service Class I)		MML Foreign Equity (Initial Class)		MML Foreign Equity (Service Class)		MML Fundamental Equity (Service Class)	
	Sub-Account	(Service Class)	Sub-Account	(Class I)	Sub-Account	(Service Class I)	Sub-Account	(Service Class I)	Sub-Account	(Service Class I)	Sub-Account	(Initial Class)	Sub-Account	(Service Class)	Sub-Account	(Service Class)
UNIT VALUE (continued)																
MassMutual Evolution SM																
Tier 1	-		41.31	-	-	-	-	-	32.59	16.29	-	-	-	33.16		
Tier 2	-		38.16	-	-	-	-	-	31.11	15.04	-	-	-	31.64		
Tier 3	-		36.32	-	-	-	-	-	30.22	14.32	-	-	-	30.74		
Tier 4	-		38.10	-	-	-	-	-	31.11	15.02	-	-	-	31.64		
Tier 5	-		35.20	-	-	-	-	-	29.69	13.87	-	-	-	30.20		
Tier 6	-		33.50	-	-	-	-	-	28.84	13.20	-	-	-	29.33		
Tier 7	-		37.51	-	-	-	-	-	30.75	14.78	-	-	-	31.28		
Tier 8	-		34.59	-	-	-	-	-	29.35	13.64	-	-	-	29.85		
Tier 9	25.87		-	35.01	-	-	-	-	30.04	-	13.81	-	-	30.56		
Tier 10	28.49		-	38.56	-	-	-	-	31.84	-	15.21	-	-	32.39		
Tier 11	23.86		-	32.29	-	-	-	-	28.67	-	12.74	-	-	29.16		
Tier 12	26.80		-	36.27	-	-	-	-	30.39	-	14.31	-	-	30.91		
Tier 13	22.43		-	30.37	-	-	-	-	27.21	-	11.98	-	-	27.67		
Tier 14	24.32		-	32.92	-	-	-	-	28.50	-	12.99	-	-	28.99		
MassMutual RetireEase Select SM																
Tier 1	-		30.62	-	-	-	-	-	-	9.84	-	-	-	-		
Tier 2	-		33.27	-	-	-	-	-	-	10.70	-	-	-	-		
MassMutual Transitions Select SM																
Tier 1	-		47.86	-	-	-	-	-	34.15	18.63	-	-	-	34.74		
Tier 2	33.15		-	46.07	-	-	-	-	34.15	-	17.94	-	-	34.74		
MassMutual Equity Edge SM																
Tier 1	-		35.84	-	-	-	-	-	-	-	-	-	-	-		
Tier 2	-		36.48	-	-	-	-	-	-	-	-	-	-	-		
Tier 3	-		38.13	-	-	-	-	-	-	-	-	-	-	-		
Tier 4	-		38.13	-	-	-	-	-	-	-	-	-	-	-		
MassMutual Transitions Select SM II																
Tier 1	18.34		-	-	-	-	-	-	23.24	-	11.62	-	-	23.59		
Tier 2	17.82		-	-	-	-	-	-	22.58	-	11.29	-	-	22.93		
Tier 3	18.34		-	-	-	-	-	-	23.24	-	11.62	-	-	23.59		
MassMutual Capital Vantage SM																
Tier 1	18.26		-	-	-	-	-	23.22	23.14	-	11.57	-	-	23.49		
Tier 2	18.79		-	-	-	-	-	23.89	23.81	-	11.91	-	-	24.18		
Tier 3	17.60		-	-	-	-	-	22.38	22.31	-	11.15	-	-	22.65		
Tier 4	18.26		-	-	-	-	-	23.22	23.14	-	11.57	-	-	23.49		
Tier 5	18.12		-	-	-	-	-	23.03	22.95	-	11.47	-	-	23.30		
Tier 6	18.79		-	-	-	-	-	23.89	23.81	-	11.91	-	-	24.18		
MassMutual Envision VA	10.20		-	-	-	-	-	11.34	10.85	-	9.96	-	-	10.54		

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Fundamental Value Sub-Account	MML Global Sub-Account (Class I)	MML Global Sub-Account (Class II)	MML Global Sub-Account (Service Class I)	MML Growth Allocation Sub-Account (Initial Class)	MML Growth Allocation Sub-Account (Service Class)	MML High Yield Sub-Account	MML Income & Growth Sub-Account (Initial Class)
ASSETS								
Investments								
Number of shares.....	1,835,214	1,092,740	898,366	5,334,971	39,617,791	84,820,410	4,643,926	2,021,610
Identified cost	\$ 21,490,162	\$ 6,004,492	\$ 5,264,125	\$ 24,445,459	\$ 332,715,233	\$ 706,254,892	\$ 42,900,749	\$ 19,995,950
Value	\$ 21,398,596	\$ 4,644,146	\$ 4,141,467	\$ 21,339,885	\$ 285,644,273	\$ 604,769,526	\$ 39,426,929	\$ 20,337,399
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company	-	-	-	-	-	-	-	-
Total assets	\$ 21,398,596	\$ 4,644,146	\$ 4,141,467	\$ 21,339,885	\$ 285,644,273	\$ 604,769,526	\$ 39,426,929	\$ 20,337,399
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	-	-	5	-	-	-	82	221
Payable to Massachusetts Mutual Life Insurance Company	49	84	11	12	47	41	28	97
Total liabilities	49	84	16	12	47	41	110	318
NET ASSETS	\$ 21,398,547	\$ 4,644,062	\$ 4,141,451	\$ 21,339,873	\$ 285,644,226	\$ 604,769,485	\$ 39,426,819	\$ 20,337,081
Net Assets:								
Accumulation units - value.....	\$ 21,398,547	\$ 4,321,356	\$ 4,141,293	\$ 21,339,873	\$ 285,644,226	\$ 604,769,485	\$ 39,424,071	\$ 19,553,458
Contracts in payout (annuitization) period	-	322,706	158	-	-	-	2,748	783,623
Net assets	\$ 21,398,547	\$ 4,644,062	\$ 4,141,451	\$ 21,339,873	\$ 285,644,226	\$ 604,769,485	\$ 39,426,819	\$ 20,337,081
Outstanding units								
Contract owners	1,160,477	182,051	224,321	1,101,260	12,416,012	28,790,959	2,723,099	638,019
UNIT VALUE								
Panorama Premier.....	\$ 24.98	\$ -	\$ 21.06	\$ -	\$ 22.63	\$ -	\$ 18.27	\$ 35.68
Panorama Passage®								
Tier 1	24.72	-	20.32	-	22.31	-	18.04	27.38
Tier 2	24.26	-	19.66	-	21.74	-	17.65	26.49
Tier 3	25.45	-	21.59	-	23.21	-	18.67	29.09
Tier 4	24.69	-	20.46	-	22.27	-	18.02	27.57
MassMutual Artistry.....	25.63	-	15.23	-	23.44	-	18.82	26.26
MassMutual Transitions®								
Custom Plan	26.33	26.62	-	-	24.31	-	19.42	35.50
Package Plan I	26.33	26.62	-	-	24.31	-	19.42	35.50
Package Plan II	25.27	24.68	-	-	22.99	-	18.52	32.92
Package Plan III	24.55	23.39	-	-	22.09	-	17.90	31.19

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Fundamental Value		MML Global Sub-Account (Class I)		MML Global Sub-Account (Class II)		MML Global Sub-Account (Service Class I)		MML Growth Allocation Sub-Account (Initial Class)		MML Growth Allocation Sub-Account (Service Class)		MML High Yield Sub-Account		MML Income & Growth Sub-Account (Initial Class)	
	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account
UNIT VALUE (continued)																
MassMutual Evolution SM																
Tier 1	24.55	23.22	-	-	-	-	22.09	-	-	-	-	-	17.90	28.23	-	-
Tier 2	23.43	21.45	-	-	-	-	20.73	-	-	-	-	-	16.94	26.08	-	-
Tier 3	22.76	20.42	-	-	-	-	19.92	-	-	-	-	-	16.38	24.82	-	-
Tier 4	23.43	21.42	-	-	-	-	20.73	-	-	-	-	-	16.94	26.04	-	-
Tier 5	22.36	19.79	-	-	-	-	19.45	-	-	-	-	-	16.04	24.05	-	-
Tier 6	21.72	18.83	-	-	-	-	18.69	-	-	-	-	-	15.50	22.89	-	-
Tier 7	23.16	21.08	-	-	-	-	20.40	-	-	-	-	-	16.71	25.63	-	-
Tier 8	22.10	19.45	-	-	-	-	19.14	-	-	-	-	-	15.83	23.64	-	-
Tier 9	22.62	-	-	-	-	-	-	19.08	-	-	-	-	16.26	-	-	-
Tier 10	23.98	-	-	-	-	-	-	20.66	-	-	-	-	17.41	-	-	-
Tier 11	21.59	-	-	-	-	-	-	18.22	-	-	-	-	17.90	-	-	-
Tier 12	22.89	-	-	-	-	-	-	20.46	-	-	-	-	16.49	-	-	-
Tier 13	20.49	-	-	-	-	-	-	17.13	-	-	-	-	16.83	-	-	-
Tier 14	21.47	-	-	-	-	-	-	18.57	-	-	-	-	15.29	-	-	-
MassMutual RetireEase Select SM																
Tier 1	-	18.48	-	-	-	-	-	-	-	-	-	-	-	19.97	-	-
Tier 2	-	20.08	-	-	-	-	-	-	-	-	-	-	-	21.70	-	-
MassMutual Transitions Select SM																
Tier 1	25.72	28.62	-	-	-	-	23.55	-	-	-	-	-	18.90	32.32	-	-
Tier 2	25.72	-	-	-	-	-	-	27.65	-	-	-	-	18.90	-	-	-
MassMutual Equity Edge SM																
Tier 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II																
Tier 1	17.87	-	-	-	-	-	-	17.00	-	-	-	-	13.19	-	-	-
Tier 2	17.37	-	-	-	-	-	-	16.52	-	-	-	-	12.81	-	-	-
Tier 3	17.87	-	-	-	-	-	-	17.00	-	-	-	-	13.19	-	-	-
MassMutual Capital Vantage SM																
Tier 1	17.80	-	-	-	-	-	-	16.93	-	-	-	-	13.13	-	-	-
Tier 2	18.32	-	-	-	-	-	-	17.42	-	-	-	-	13.51	-	-	-
Tier 3	17.16	-	-	-	-	-	-	16.32	-	-	-	-	12.66	-	-	-
Tier 4	17.80	-	-	-	-	-	-	16.93	-	-	-	-	13.13	-	-	-
Tier 5	17.65	-	-	-	-	-	-	16.79	-	-	-	-	13.03	-	-	-
Tier 6	18.32	-	-	-	-	-	-	17.42	-	-	-	-	13.51	-	-	-
MassMutual Envision VA	10.71	-	-	-	-	-	-	10.00	-	-	-	-	10.05	-	-	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued) December 31, 2023

	MML Income & Growth Sub-Account (Service Class)	MML Inflation- Protected and Income Sub-Account (Initial Class)	MML Inflation- Protected and Income Sub-Account (Service Class)	MML International Equity Sub-Account	MML iShares® 60/40 Allocation Sub-Account	MML iShares® 80/20 Allocation Sub-Account	MML Large Cap Growth Sub-Account (Initial Class)	MML Large Cap Growth Sub-Account (Service Class)
ASSETS								
Investments								
Number of shares.....	2,869,481	9,876,179	4,648,769	954,031	1,279,561	3,806,566	1,096,353	2,205,500
Identified cost.....	\$ 27,688,027	\$ 100,968,389	\$ 47,841,396	\$ 8,699,987	\$ 11,804,633	\$ 34,693,983	\$ 12,770,713	\$ 25,844,243
Value	\$ 28,235,679	\$ 86,120,282	\$ 40,118,876	\$ 9,683,411	\$ 12,501,316	\$ 37,951,461	\$ 15,239,303	\$ 28,781,769
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company ..	-	-	-	-	-	1	-	-
Total assets	\$ 28,235,679	\$ 86,120,282	\$ 40,118,876	\$ 9,683,411	\$ 12,501,316	\$ 37,951,462	\$ 15,239,303	\$ 28,781,769
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	-	5,379	-	-	-	-	281	-
Payable to Massachusetts Mutual Life Insurance Company	18	268	12	28	1	-	85	3
Total liabilities	18	5,647	12	28	1	-	366	3
NET ASSETS	\$ 28,235,679	\$ 86,114,635	\$ 40,118,864	\$ 9,683,383	\$ 12,501,315	\$ 37,951,462	\$ 15,238,937	\$ 28,781,766
Net Assets:								
Accumulation units - value.....	\$ 28,235,679	\$ 83,158,876	\$ 40,114,633	\$ 9,683,383	\$ 12,501,315	\$ 37,951,462	\$ 15,093,076	\$ 28,781,766
Contracts in payout (annuitization) period	-	2,955,759	4,231	-	-	-	145,861	-
Net assets	\$ 28,235,679	\$ 86,114,635	\$ 40,118,864	\$ 9,683,383	\$ 12,501,315	\$ 37,951,462	\$ 15,238,937	\$ 28,781,766
Outstanding units								
Contract owners	1,338,100	6,094,042	3,388,684	759,728	1,239,115	3,671,842	348,658	1,115,328
UNIT VALUE								
Panorama Premier.....	\$ -	\$ 14.73	\$ -	\$ -	\$ -	\$ -	\$ 35.13	\$ -
Panorama Passage®	-	-	-	-	-	-	-	-
Tier 1	-	14.46	-	-	-	-	35.32	-
Tier 2	-	13.99	-	-	-	-	34.17	-
Tier 3	-	15.22	-	-	-	-	37.53	-
Tier 4	-	14.43	-	-	-	-	35.56	-
MassMutual Artistry.....	-	15.41	-	12.15	-	-	29.14	-
MassMutual Transitions®	-	-	-	-	-	-	-	-
Custom Plan	-	16.16	-	12.43	-	-	50.94	-
Package Plan I	-	16.16	-	12.43	-	-	50.94	-
Package Plan II	-	15.03	-	12.01	-	-	47.24	-
Package Plan III	-	14.28	-	11.73	-	-	44.76	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

UNIT VALUE (continued)	MML Income & Growth Sub-Account (Service Class)		MML Inflation-Protected and Income Sub-Account (Initial Class)		MML Inflation-Protected and Income Sub-Account (Service Class)		MML International Equity Sub-Account		MML iShares® 60/40 Allocation Sub-Account		MML iShares® 80/20 Allocation Sub-Account		MML Large Cap Growth Sub-Account (Initial Class)		MML Large Cap Growth Sub-Account (Service Class)	
MassMutual Evolution SM	-	-	13.39	-	-	-	11.73	-	-	-	-	-	-	42.37	-	-
Tier 1	-	-	12.37	-	-	-	11.28	-	-	-	-	-	-	39.14	-	-
Tier 2	-	-	11.77	-	-	-	11.01	-	-	-	-	-	-	37.24	-	-
Tier 3	-	-	12.35	-	-	-	11.28	-	-	-	-	-	-	39.08	-	-
Tier 4	-	-	11.40	-	-	-	10.85	-	-	-	-	-	-	36.10	-	-
Tier 5	-	-	10.85	-	-	-	10.60	-	-	-	-	-	-	34.35	-	-
Tier 6	-	-	12.15	-	-	-	11.17	-	-	-	-	-	-	38.47	-	-
Tier 7	-	-	11.21	-	-	-	10.75	-	-	-	-	-	-	35.48	-	-
Tier 8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 9	23.94	-	-	-	11.33	-	10.96	-	-	-	-	-	-	-	35.89	-
Tier 10	26.37	-	-	-	12.48	-	11.50	-	-	-	-	-	-	-	39.53	-
Tier 11	22.08	-	-	-	10.45	-	10.54	-	-	-	-	-	-	-	33.10	-
Tier 12	24.81	-	-	-	11.73	-	11.07	-	-	-	-	-	-	-	37.18	-
Tier 13	20.77	-	-	-	9.82	-	10.10	-	-	-	-	-	-	-	31.12	-
Tier 14	22.51	-	-	-	10.65	-	10.49	-	-	-	-	-	-	-	33.75	-
MassMutual RetireEase Select SM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 1	-	-	12.81	-	-	-	-	-	-	-	-	-	-	36.88	-	-
Tier 2	-	-	13.92	-	-	-	-	-	-	-	-	-	-	40.07	-	-
MassMutual Transitions Select SM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 1	-	-	14.48	-	-	-	12.19	-	-	-	-	-	-	53.28	-	-
Tier 2	-	-	-	-	13.92	-	12.19	-	-	-	-	-	-	-	51.25	-
MassMutual Equity Edge SM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 1	18.69	-	-	-	10.89	-	13.19	-	-	-	-	-	-	-	25.96	-
Tier 2	18.16	-	-	-	10.58	-	12.81	-	-	-	-	-	-	-	25.23	-
Tier 3	18.69	-	-	-	10.89	-	13.19	-	-	-	-	-	-	-	25.96	-
MassMutual Capital Vantage SM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 1	18.62	-	-	-	10.85	-	13.13	-	-	-	-	-	-	-	25.85	-
Tier 2	19.16	-	-	-	11.16	-	13.51	-	-	-	-	-	-	-	26.60	-
Tier 3	17.94	-	-	-	10.46	-	12.66	-	-	-	-	-	-	-	24.92	-
Tier 4	18.62	-	-	-	10.85	-	13.13	-	-	-	-	-	-	-	25.85	-
Tier 5	18.46	-	-	-	10.76	-	13.03	-	-	-	-	-	-	-	25.64	-
Tier 6	19.16	-	-	-	11.16	-	13.51	-	-	-	-	-	-	-	26.60	-
MassMutual Envision VA	10.74	-	-	-	9.19	-	10.26	-	10.09	-	10.34	-	-	-	12.17	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Managed Bond Sub-Account (Initial Class)	MML Managed Bond Sub-Account (Service Class)	MML Managed Volatility Sub-Account (Initial Class)	MML Managed Volatility Sub-Account (Service Class)	MML Mid Cap Growth Sub-Account (Initial Class)	MML Mid Cap Growth Sub-Account (Service Class)	MML Mid Cap Value Sub-Account (Initial Class)	MML Mid Cap Value Sub-Account (Service Class)
ASSETS								
Investments								
Number of shares.....	6,739,477	15,165,135	5,027,177	1,432,537	5,737,600	9,103,620	12,392,993	6,035,928
Identified cost	\$ 83,951,358	\$ 187,771,998	\$ 64,019,486	\$ 17,911,377	\$ 77,152,577	\$ 109,364,608	\$ 112,653,649	\$ 54,537,774
Value	\$ 73,155,604	\$ 163,963,288	\$ 61,465,617	\$ 17,363,298	\$ 61,851,323	\$ 87,758,898	\$ 97,904,648	\$ 46,054,127
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company	-	-	-	-	-	-	-	-
Total assets	\$ 73,150,962	\$ 163,963,276	\$ 61,463,479	\$ 17,363,284	\$ 61,848,174	\$ 87,758,884	\$ 97,900,075	\$ 46,054,106
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	4,408	-	1,902	-	2,760	-	4,334	-
Payable to Massachusetts Mutual Life Insurance Company	234	12	236	14	389	14	239	21
Total liabilities	4,642	12	2,138	14	3,149	14	4,573	21
NET ASSETS	\$ 73,150,962	\$ 163,963,276	\$ 61,463,479	\$ 17,363,284	\$ 61,848,174	\$ 87,758,884	\$ 97,900,075	\$ 46,054,106
Net Assets:								
Accumulation units - value.....	\$ 70,527,523	\$ 163,958,102	\$ 59,149,095	\$ 17,363,284	\$ 60,605,199	\$ 87,758,884	\$ 94,627,203	\$ 46,054,106
Contracts in payout (annuitization) period	2,623,439	5,174	2,314,384	-	1,242,975	-	3,272,872	-
Net assets	\$ 73,150,962	\$ 163,963,276	\$ 61,463,479	\$ 17,363,284	\$ 61,848,174	\$ 87,758,884	\$ 97,900,075	\$ 46,054,106
Outstanding units								
Contract owners	4,749,269	13,114,910	3,212,163	1,055,623	1,006,915	3,484,460	2,178,707	2,015,747
UNIT VALUE								
Panorama Premier.....	\$ -	\$ 12.42	\$ 17.47	\$ -	\$ 103.09	\$ -	\$ 55.96	\$ -
Panorama Passage®								
Tier 1	18.86	-	17.11	-	76.14	-	59.09	-
Tier 2	18.25	-	16.55	-	73.66	-	57.17	-
Tier 3	20.04	-	18.15	-	80.89	-	62.78	-
Tier 4	18.99	-	17.20	-	76.66	-	59.50	-
MassMutual Artistry.....	19.30	-	18.25	-	62.16	-	63.84	-
MassMutual Transitions®								
Custom Plan	17.93	-	23.07	-	70.83	-	51.94	-
Package Plan I	17.93	-	23.07	-	70.83	-	51.94	-
Package Plan II	16.63	-	21.39	-	65.68	-	48.16	-
Package Plan III	15.75	-	20.27	-	62.23	-	45.63	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML
	Managed Bond Sub-Account (Initial Class)	Managed Bond Sub-Account (Service Class)	Managed Volatility Sub-Account (Initial Class)	Managed Volatility Sub-Account (Service Class)	Mid Cap Growth Sub-Account (Initial Class)	Mid Cap Growth Sub-Account (Service Class)	Mid Cap Growth Sub-Account (Initial Class)	Mid Cap Growth Sub-Account (Service Class)	Mid Cap Value Sub-Account (Initial Class)	Mid Cap Value Sub-Account (Service Class)	Mid Cap Value Sub-Account (Initial Class)	Mid Cap Value Sub-Account (Service Class)
UNIT VALUE (continued)												
MassMutual Evolution SM												
Tier 1	14.15	-	17.61	-	41.21	-	39.91	-	36.86	-	36.86	-
Tier 2	13.07	-	16.27	-	38.40	-	35.08	-	36.81	-	36.81	-
Tier 3	12.44	-	15.48	-	38.40	-	34.00	-	32.35	-	32.35	-
Tier 4	13.05	-	16.24	-	35.78	-	34.24	-	36.23	-	36.23	-
Tier 5	12.05	-	15.00	-	37.74	-	35.17	-	33.41	-	33.41	-
Tier 6	11.47	-	14.28	-	-	-	-	-	-	-	-	-
Tier 7	12.84	-	15.99	-	-	-	-	-	-	-	-	-
Tier 8	11.84	-	14.75	-	-	-	-	-	-	-	-	-
Tier 9	-	11.99	-	14.93	-	35.24	-	33.81	-	33.81	-	33.81
Tier 10	-	13.21	-	16.44	-	38.49	-	37.24	-	37.24	-	37.24
Tier 11	-	11.06	-	13.77	-	32.84	-	31.18	-	31.18	-	31.18
Tier 12	-	12.42	-	15.47	-	36.20	-	35.03	-	35.03	-	35.03
Tier 13	-	10.40	-	12.95	-	30.88	-	29.33	-	29.33	-	29.33
Tier 14	-	11.28	-	14.04	-	33.14	-	31.80	-	31.80	-	31.80
MassMutual RetireEase Select SM												
Tier 1	13.05	-	12.74	-	35.34	-	27.54	-	27.54	-	27.54	-
Tier 2	14.17	-	13.85	-	38.40	-	29.92	-	29.92	-	29.92	-
MassMutual Transitions Select SM												
Tier 1	15.35	-	20.28	19.52	44.23	-	44.48	-	44.48	-	44.48	-
Tier 2	-	14.78	-	-	-	42.59	-	-	-	-	-	42.80
MassMutual Equity Edge SM												
Tier 1	-	-	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II												
Tier 1	-	10.02	-	12.59	-	19.67	-	17.56	-	17.56	-	17.56
Tier 2	-	9.74	-	12.23	-	19.12	-	17.07	-	17.07	-	17.07
Tier 3	-	10.02	-	12.59	-	19.67	-	17.56	-	17.56	-	17.56
MassMutual Capital Vantage SM												
Tier 1	-	9.98	-	12.53	-	19.59	-	17.49	-	17.49	-	17.49
Tier 2	-	10.27	-	12.90	-	20.16	-	18.00	-	18.00	-	18.00
Tier 3	-	9.62	-	12.08	-	18.89	-	16.86	-	16.86	-	16.86
Tier 4	-	9.98	-	12.53	-	19.59	-	17.49	-	17.49	-	17.49
Tier 5	-	9.90	-	12.43	-	19.43	-	17.35	-	17.35	-	17.35
Tier 6	-	10.27	-	12.90	-	20.16	-	18.00	-	18.00	-	18.00
MassMutual Envionist VA	-	9.18	-	10.18	-	10.60	-	10.22	-	10.22	-	10.22

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML Moderate Allocation Sub-Account (Initial Class)	MML Moderate Allocation Sub-Account (Service Class)	MML Short-Duration Bond Sub-Account	MML Small Cap Equity Sub-Account (Initial Class)	MML Small Cap Equity Sub-Account (Service Class)	MML Small Cap Growth Equity Sub-Account (Initial Class)	MML Small Cap Growth Equity Sub-Account (Service Class)	MML Small Company Value Sub-Account
ASSETS								
Investments								
Number of shares.....	18,769,222	114,494,046	3,418,674	2,033,050	2,379,083	6,577,831	2,780,239	3,140,576
Identified cost	\$ 184,081,620	\$ 1,108,313,751	\$ 31,830,423	\$ 19,626,134	\$ 22,829,188	\$ 75,559,369	\$ 29,978,460	\$ 29,120,419
Value	\$ 159,163,004	\$ 956,025,288	\$ 30,357,829	\$ 22,208,086	\$ 25,292,956	\$ 64,466,880	\$ 23,420,831	\$ 24,402,276
Dividends receivable	-	-	-	-	-	-	-	-
Receivable from Massachusetts Mutual Life Insurance Company	-	-	-	-	-	-	-	-
Total assets	\$ 159,163,004	\$ 956,025,288	\$ 30,357,829	\$ 22,208,086	\$ 25,292,956	\$ 64,466,880	\$ 23,420,831	\$ 24,402,276
LIABILITIES								
Payable to Annuitant mortality fluctuation fund reserve.....	-	-	64	2,471	-	3,200	-	-
Payable to Massachusetts Mutual Life Insurance Company	79	39	43	198	14	243	22	30
Total liabilities	79	39	107	2,669	14	3,443	22	30
NET ASSETS	\$ 159,162,925	\$ 956,025,249	\$ 30,357,722	\$ 22,205,417	\$ 25,292,942	\$ 64,463,437	\$ 23,420,809	\$ 24,402,246
Net Assets:								
Accumulation units - value.....	\$ 159,162,925	\$ 955,929,648	\$ 30,355,591	\$ 21,915,330	\$ 25,292,942	\$ 61,865,290	\$ 23,420,809	\$ 24,402,246
Contracts in payout (annuitization) period	-	95,601	2,131	290,087	-	2,598,147	-	-
Net assets	\$ 159,162,925	\$ 956,025,249	\$ 30,357,722	\$ 22,205,417	\$ 25,292,942	\$ 64,463,437	\$ 23,420,809	\$ 24,402,246
Outstanding units								
Contract owners	7,711,185	52,943,371	2,987,098	489,705	1,093,197	1,504,269	943,464	1,095,035
UNIT VALUE								
Panorama Premier.....	\$ 20.18	\$ -	\$ 10.36	\$ 54.42	\$ -	\$ 56.55	\$ -	\$ -
Panorama Passage®								
Tier 1	19.89	-	10.23	48.85	-	49.79	-	-
Tier 2	19.39	-	10.01	47.26	-	48.17	-	-
Tier 3	20.70	-	10.59	51.91	-	52.90	-	-
Tier 4	19.86	-	10.22	49.19	-	50.13	-	-
MassMutual Artistry.....	20.90	-	10.67	47.73	-	36.00	-	39.84
MassMutual Transitions®								
Custom Plan	21.68	-	11.01	46.69	-	56.35	-	-
Package Plan I	21.68	-	11.01	46.69	-	56.35	-	-
Package Plan II	20.50	-	10.50	43.30	-	52.25	-	-
Package Plan III	19.70	-	10.15	41.02	-	49.50	-	-

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued)

December 31, 2023

	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML	MML
	Moderate Allocation Sub-Account (Initial Class)	Moderate Allocation Sub-Account (Service Class)	Short-Duration Bond Sub-Account	Small Cap Equity Sub-Account (Initial Class)	Small Cap Equity Sub-Account (Service Class)	Small Cap Growth Equity Sub-Account (Initial Class)	Small Cap Growth Equity Sub-Account (Service Class)	Small Cap Growth Equity Sub-Account (Initial Class)	Small Cap Growth Equity Sub-Account (Service Class)	Small Cap Growth Equity Sub-Account (Initial Class)	Small Cap Growth Equity Sub-Account (Service Class)	Small Cap Growth Equity Sub-Account (Initial Class)	Small Cap Growth Equity Sub-Account (Service Class)
UNIT VALUE (continued)													
MassMutual Evolution SM													
Tier 1	19.70	-	10.15	36.11	-	40.95	-	-	-	-	-	-	37.74
Tier 2	18.49	-	9.61	33.36	-	37.82	-	-	-	-	-	-	35.59
Tier 3	17.76	-	9.29	31.74	-	35.99	-	-	-	-	-	-	34.31
Tier 4	18.49	-	9.61	33.30	-	37.76	-	-	-	-	-	-	35.59
Tier 5	17.34	-	9.10	30.76	-	34.88	-	-	-	-	-	-	33.56
Tier 6	16.67	-	8.79	29.28	-	33.20	-	-	-	-	-	-	32.35
Tier 7	18.19	-	9.48	32.78	-	37.17	-	-	-	-	-	-	35.07
Tier 8	17.07	-	8.97	30.24	-	34.28	-	-	-	-	-	-	33.07
Tier 9	-	16.99	9.22	-	30.55	-	34.69	-	34.69	-	34.69	-	34.06
Tier 10	-	18.39	9.87	-	33.65	-	38.21	-	38.21	-	38.21	-	36.65
Tier 11	-	15.94	8.73	-	28.17	-	32.00	-	32.00	-	32.00	-	32.12
Tier 12	-	17.30	9.35	-	31.65	-	35.94	-	35.94	-	35.94	-	34.56
Tier 13	-	14.99	8.21	-	26.49	-	30.09	-	30.09	-	30.09	-	30.20
Tier 14	-	15.97	8.67	-	28.73	-	32.63	-	32.63	-	32.63	-	32.03
MassMutual RetireEase Select SM													
Tier 1	-	-	-	27.09	-	28.62	-	-	-	-	-	-	-
Tier 2	-	-	-	29.43	-	31.10	-	-	-	-	-	-	-
MassMutual Transitions Select SM													
Tier 1	21.00	-	10.72	43.03	-	50.70	-	-	-	-	-	-	40.02
Tier 2	-	20.21	10.72	-	41.34	-	48.79	-	48.79	-	48.79	-	40.02
MassMutual Equity Edge SM													
Tier 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 2	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 3	-	-	-	-	-	-	-	-	-	-	-	-	-
Tier 4	-	-	-	-	-	-	-	-	-	-	-	-	-
MassMutual Transitions Select SM II													
Tier 1	-	14.09	9.95	-	19.80	-	19.91	-	19.91	-	19.91	-	18.49
Tier 2	-	13.69	9.67	-	19.24	-	19.35	-	19.35	-	19.35	-	17.97
Tier 3	-	14.09	9.95	-	19.80	-	19.91	-	19.91	-	19.91	-	18.49
MassMutual Capital Vantage SM													
Tier 1	-	14.03	9.91	-	19.72	-	19.83	-	19.83	-	19.83	-	18.42
Tier 2	-	14.44	10.20	-	20.29	-	20.40	-	20.40	-	20.40	-	18.95
Tier 3	-	13.52	9.55	-	19.00	-	19.11	-	19.11	-	19.11	-	17.75
Tier 4	-	14.03	9.91	-	19.72	-	19.83	-	19.83	-	19.83	-	18.42
Tier 5	-	13.91	9.83	-	19.56	-	19.67	-	19.67	-	19.67	-	18.27
Tier 6	-	14.44	10.20	-	20.29	-	20.40	-	20.40	-	20.40	-	18.95
MassMutual Envision VA	-	10.00	9.80	-	10.53	-	9.95	-	9.95	-	9.95	-	10.11

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued) December 31, 2023

	MML Small/Mid Cap Value		MML Strategic Emerging Markets		MML Sustainable Equity		MML Sustainable Equity (Service Class)		MML Total Return Bond		MML U.S. Government Money Market		PIMCO Commodity RealReturn® Strategy	
	Sub-Account (Initial Class)	Sub-Account (Service Class)	Sub-Account (Initial Class)	Sub-Account (Service Class I)	Sub-Account (Initial Class)	Sub-Account (Service Class)	Sub-Account (Service Class)	Sub-Account (Service Class)	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account	Sub-Account
ASSETS														
Investments														
Number of shares.....	8,280,911	2,801,584	2,108,927		4,060,025	3,491,103			4,077,014		116,716,578			1,255,740
Identified cost	\$ 74,740,054	\$ 27,725,905	\$ 16,375,377		\$ 61,878,101	\$ 58,927,687			\$ 42,107,131		\$ 116,716,046			\$ 9,313,295
Value	\$ 74,279,769	\$ 24,597,903	\$ 11,198,405		\$ 59,763,562	\$ 50,481,351			\$ 36,326,198		\$ 116,716,576			\$ 6,856,345
Dividends receivable	-	-	-		-	-			-		-			-
Receivable from Massachusetts Mutual Life Insurance Company	-	-	-		-	-			-		-			-
Total assets	74,279,769	24,597,903	11,198,405		59,763,562	50,481,351			36,326,198		116,717,916			6,856,345
LIABILITIES														
Payable to Annuitant mortality fluctuation fund reserve.....	2,092				5,706						4,240			62
Payable to Massachusetts Mutual Life Insurance Company	234		69		234				28					106
Total liabilities	2,326		69		5,940				28		4,240			168
NET ASSETS	\$ 74,277,443	\$ 24,597,903	\$ 11,198,336		\$ 59,757,622	\$ 50,481,335			\$ 36,326,170		\$ 116,713,676			\$ 6,856,177
Net Assets:														
Accumulation units - value.....	\$ 71,376,724	\$ 24,597,903	\$ 11,198,336		\$ 59,386,595	\$ 50,481,335			\$ 36,326,170		\$ 115,998,628			\$ 6,634,973
Contracts in payout (annuitization) period	2,900,719				371,027						715,048			221,204
Net assets	\$ 74,277,443	\$ 24,597,903	\$ 11,198,336		\$ 59,757,622	\$ 50,481,335			\$ 36,326,170		\$ 116,713,676			\$ 6,856,177
Outstanding units														
Contract owners	2,046,774	1,126,743	986,758		1,321,303	2,038,182			3,711,823		12,230,273			985,786
UNIT VALUE														
Panorama Premier.....	\$ 47.15	\$ -	\$ -		\$ 45.55	\$ -			\$ 9.96		\$ 8.97			\$ 6.83
Panorama Passage®														
Tier 1	46.28				44.71				9.85		8.84			6.72
Tier 2	44.78				43.25				9.67		8.61			6.53
Tier 3	48.74				47.08				10.15		9.20			7.02
Tier 4	46.19				44.62				9.84		8.82			6.71
MassMutual Artistry.....	49.34		13.57		47.67				10.22		9.28			7.10
MassMutual Transitions®														
Custom Plan	51.75				49.99				10.50		9.63			7.39
Package Plan I	51.75				49.99				10.50		9.63			7.39
Package Plan II	48.14				46.50				10.08		9.11			6.95
Package Plan III	45.71				44.16				9.79		8.75			6.65

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued) December 31, 2023

UNIT VALUE (continued)	MML Small/Mid Cap Value		MML Small/Mid Cap Value		MML Strategic Emerging Markets		MML Sustainable Equity		MML Sustainable Equity		MML Total Return Bond		MML U.S. Government Money Market		PIMCO Commodity RealReturn® Strategy	
	Sub-Account	(Initial Class)	Sub-Account	(Service Class)	Sub-Account	(Service Class I)	Sub-Account	(Initial Class)	Sub-Account	(Service Class)	Sub-Account	(Service Class)	Sub-Account	(Service Class)	Sub-Account	(Service Class)
MassMutual Evolution SM																
Tier 1	32.82	-	10.46	33.73	-	9.79	8.75	6.65								
Tier 2	30.32	-	9.84	31.16	-	9.34	8.21	6.19								
Tier 3	28.85	-	9.47	29.65	-	9.07	7.89	5.92								
Tier 4	30.27	-	9.84	31.11	-	9.34	8.21	6.19								
Tier 5	27.96	-	9.26	28.73	-	8.91	7.71	5.77								
Tier 6	26.61	-	8.91	27.34	-	8.66	7.40	5.52								
Tier 7	29.80	-	9.69	30.62	-	9.23	8.08	6.09								
Tier 8	27.48	-	9.12	28.24	-	8.81	7.58	5.67								
Tier 9	-	27.82	9.40	-	28.57	9.02	7.84	5.90								
Tier 10	-	30.65	10.15	-	31.47	9.56	8.49	6.45								
Tier 11	-	25.66	8.84	-	26.35	8.61	7.36	5.50								
Tier 12	-	28.83	9.55	-	29.60	9.12	7.99	6.06								
Tier 13	-	24.13	8.31	-	24.78	8.17	6.92	5.17								
Tier 14	-	26.16	8.84	-	26.87	8.56	7.37	5.55								
MassMutual RetireEase Select SM																
Tier 1	21.46	-	-	26.26	-	-	8.96	6.68								
Tier 2	23.32	-	-	28.53	-	-	9.38	7.25								
MassMutual Transitions Select SM																
Tier 1	36.46	-	11.13	39.02	-	10.25	9.33	7.13								
Tier 2	-	35.10	11.13	-	37.54	10.25	9.33	7.13								
MassMutual Equity Edge SM																
Tier 1	-	-	-	-	-	-	8.86	-								
Tier 2	-	-	-	-	-	-	-	-								
Tier 3	-	-	-	-	-	-	-	-								
Tier 4	-	-	-	-	-	-	-	-								
MassMutual Transitions Select SM II																
Tier 1	-	17.39	11.55	-	22.09	9.72	9.88	-								
Tier 2	-	16.90	11.22	-	21.47	9.45	9.60	-								
Tier 3	-	17.39	11.55	-	22.09	9.72	9.88	-								
MassMutual Capital Vantage SM																
Tier 1	-	17.32	11.50	-	22.00	9.68	9.84	-								
Tier 2	-	17.82	11.83	-	22.64	9.96	10.13	-								
Tier 3	-	16.70	11.09	-	21.21	9.33	9.49	-								
Tier 4	-	17.32	11.50	-	22.00	9.68	9.84	-								
Tier 5	-	17.18	11.41	-	21.82	9.60	9.76	-								
Tier 6	-	17.82	11.83	-	22.64	9.96	10.13	-								
MassMutual Envision VA	-	10.16	8.48	11.13	-	9.11	10.34	-								

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued) December 31, 2023

	PIMCO Income Sub-Account	VY® CBRE Global Real Estate Sub-Account
ASSETS		
Investments		
Number of shares.....	212,462	894,674
Identified cost	\$ 2,076,415	\$ 9,426,920
Value	\$ 2,113,999	\$ 9,161,460
Dividends receivable	-	-
Receivable from Massachusetts Mutual Life Insurance Company ..	180	-
Total assets	2,114,179	9,161,460
LIABILITIES		
Payable to Annuitant mortality fluctuation fund reserve.....	-	55
Payable to Massachusetts Mutual Life Insurance Company	-	82
Total liabilities	-	137
NET ASSETS	\$ 2,114,179	\$ 9,161,323
Net Assets:		
Accumulation units - value	\$ 2,114,179	\$ 8,695,691
Contracts in payout (annuitization) period	-	465,632
Net assets	\$ 2,114,179	\$ 9,161,323
Outstanding units		
Contract owners	212,500	542,067
UNIT VALUE		
Panorama Premier.....	-	\$ 16.7
Panorama Passage®		
Tier 1	-	16.4
Tier 2	-	16.0
Tier 3	-	17.2
Tier 4	-	16.4
MassMutual Artistry.....	-	17.4
MassMutual Transitions®		
Custom Plan	-	18.1
Package Plan I	-	18.1
Package Plan II	-	17.0
Package Plan III	-	16.3

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF ASSETS AND LIABILITIES (Continued) December 31, 2023

	PIMCO Income Sub-Account	VY® CBRE Global Real Estate Sub-Account
UNIT VALUE (continued)		
MassMutual Evolution SM		
Tier 1	32.82	-
Tier 2	30.32	-
Tier 3	28.85	-
Tier 4	30.27	-
Tier 5	27.96	-
Tier 6	26.61	-
Tier 7	29.80	-
Tier 8	27.48	-
Tier 9	-	27.82
Tier 10	-	30.65
Tier 11	-	25.66
Tier 12	-	28.83
Tier 13	-	24.13
Tier 14	-	26.16
MassMutual RetireEase Select SM		
Tier 1	21.46	-
Tier 2	23.32	-
MassMutual Transitions Select SM		
Tier 1	36.46	-
Tier 2	-	35.10
MassMutual Equity Edge SM		
Tier 1	-	-
Tier 2	-	-
Tier 3	-	-
Tier 4	-	-
MassMutual Transitions Select SM II		
Tier 1	-	-
Tier 2	-	-
Tier 3	-	-
MassMutual Capital Vantage SM		
Tier 1	-	-
Tier 2	-	17.39
Tier 3	-	16.90
Tier 4	-	17.39
Tier 5	-	-
Tier 6	-	17.32
MassMutual Envision VA	-	17.82

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS For The Year Ended December 31, 2023

	BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	Choe Vest U.S. Large Cap 10% Buffer Strategies V.I. Sub-Account	Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Health Care Sub-Account	Fidelity® VIP Overseas Sub-Account (Service Class 2)	Fidelity® VIP Real Estate Sub-Account
Investment income								
Dividends.....\$	335,506	\$ -	228,800	\$ 835,624	\$ 549,089	\$ -	\$ 1,156	\$ 9,941
Expenses								
Mortality and expense risk fee and administrative charges	177,425	2,670	140,298	2,212,449	2,696,527	8,990	558	3,738
Net Investment income (loss)	158,081	(2,670)	88,502	(1,376,825)	(2,147,438)	(8,990)	598	6,203
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	28,252	280	(63,290)	9,383,835	7,157,514	(919)	12	(4,851)
Realized gain distribution	-	3,828	-	6,224,310	7,795,141	-	387	6,570
Realized gain (loss)	28,252	4,108	(63,290)	15,608,145	14,952,655	(919)	399	1,719
Change in net unrealized appreciation/ depreciation of investments	2,154,128	29,545	1,254,431	35,467,457	45,038,983	39,550	9,356	37,122
Net gain (loss) on investments	2,182,380	33,653	1,191,141	51,075,602	59,991,638	38,631	9,755	38,841
Net increase (decrease) in net assets resulting from operations	2,340,461	30,983	1,279,643	49,698,777	57,844,200	29,641	10,353	45,044
Capital transactions:								
Transfers of net premiums	800,851	462,023	217,872	1,174,846	8,454,485	472,009	143,726	309,371
Transfers due to death benefits	-	-	(88,514)	(3,055,994)	(2,102,699)	-	-	-
Transfers due to annuity benefit payments	-	-	-	(669,373)	(420)	-	-	-
Transfers due to withdrawal of funds	(1,014,571)	(64)	(1,273,906)	(19,495,263)	(24,133,091)	(4,311)	14	(164)
Transfers due to loans, net of repayments	-	-	-	8,526	-	-	-	-
Transfers due to changes for administrative and insurance costs	-	-	2,226	(495,944)	(187,266)	-	-	-
Transfers due to contingent deferred sales charges	-	(2,803)	(1,423)	(1,051)	(23,129)	(3,616)	(231)	(1,415)
Transfers due to net charge (credit) to annuitant mortality fluctuation	1	-	-	280,386	47	-	-	-
Transfers between Sub-Accounts and to/from General Account	271,554	(2,100)	79,010	(8,337,453)	(133,028)	128,847	134	26,311
Net increase (decrease) in net assets resulting from capital transactions	57,835	457,056	(1,064,735)	(30,591,320)	(18,125,101)	592,929	143,643	334,103
Total increase (decrease)	2,398,296	488,039	214,908	19,107,457	39,719,099	622,570	153,996	379,147
NET ASSETS, at beginning of the year	16,425,190	-	10,874,142	168,304,213	191,667,565	447,027	-	152,225
NET ASSETS, at end of the year	\$ 18,823,486	\$ 488,039	\$ 11,089,050	\$ 187,411,670	\$ 231,386,664	\$ 1,069,597	\$ 153,996	\$ 531,372

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	Fidelity® VIP Strategic Income Sub-Account	Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)	Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)	Invesco V.I. Capital Appreciation Sub-Account (Series I)	Invesco V.I. Capital Appreciation Sub-Account (Series II)	Invesco V.I. Conservative Balanced Sub-Account (Series I)	Invesco V.I. Conservative Balanced Sub-Account (Series II)	Invesco V.I. Core Plus Bond Sub-Account
Investment income								
Dividends.....	\$ 29,195	\$ 120,451	\$ 59,351	\$ -	\$ -	\$ 99,964	\$ 226	\$ 35,956
Expenses								
Mortality and expense risk fee and administrative charges	4,792	245,846	245,724	1,387,182	107,541	60,978	427	17,964
Net Investment income (loss)	24,403	(125,395)	(186,373)	(1,387,182)	(107,541)	38,986	(201)	17,992
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(1,421)	(784,661)	(772,395)	(7,981,198)	(776,244)	176,483	6,203	(23,359)
Realized gain distribution	-	-	-	-	-	-	-	-
Realized gain (loss)	(1,421)	(784,661)	(772,395)	(7,981,198)	(776,244)	176,483	6,203	(23,359)
Change in net unrealized appreciation/ depreciation of investments	14,746	4,663,626	4,400,291	42,395,373	3,214,244	355,762	(2,647)	67,752
Net gain (loss) on investments	13,325	3,878,965	3,627,896	34,414,175	2,438,000	532,245	3,556	44,393
Net increase (decrease) in net assets resulting from operations	37,728	3,753,570	3,441,523	33,026,993	2,330,459	571,231	3,355	62,385
Capital transactions:								
Transfers of net premiums	447,616	138,678	438,460	443,192	45,984	19,942	-	-
Transfers due to death benefits	-	(281,029)	(118,269)	(1,567,789)	(8,939)	(71,229)	-	(81,383)
Transfers due to annuity benefit payments	-	(65,687)	-	(306,035)	-	(3,954)	-	(41)
Transfers due to withdrawal of funds	(1,320)	(1,713,790)	(2,454,765)	(12,575,713)	(1,581,762)	(427,251)	(35,253)	(55,589)
Transfers due to loans, net of repayments	-	(2,142)	-	2,590	-	(198)	-	-
Transfers due to changes for administrative and insurance costs	-	(90,086)	(86,728)	(394,624)	(19,385)	(3,947)	3	-
Transfers due to contingent deferred sales charges	(3,091)	(226)	(1,725)	(428)	-	(48)	-	(26)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	(10,576)	-	48,123	-	(41)	-	8
Transfers between Sub-Accounts and to/from General Account	16,677	(813,155)	266,281	(5,865,461)	528,927	(40,404)	-	(673)
Net increase (decrease) in net assets resulting from capital transactions	459,882	(2,838,013)	(1,956,746)	(20,216,145)	(1,035,175)	(527,130)	(35,250)	(137,704)
Total increase (decrease)	497,610	915,557	1,484,777	12,810,848	1,295,284	44,101	(31,895)	(75,319)
NET ASSETS, at beginning of the year	201,143	20,298,479	18,848,749	103,556,439	7,405,869	5,338,477	45,427	1,419,773
NET ASSETS, at end of the year	698,753	\$ 21,214,036	\$ 20,333,526	\$ 116,367,287	\$ 8,701,153	\$ 5,382,578	\$ 13,532	\$ 1,344,454

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)	Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Diversified Dividend Sub-Account (Series II)	Invesco V.I. Global Sub-Account (Series I)	Invesco V.I. Global Sub-Account (Series II)	Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Strategic Income Sub-Account (Series II)
Investment income								
Dividends.....	\$ -	\$ -	\$ 84,978	\$ 149,624	\$ 268,590	\$ -	\$ -	\$ -
Expenses								
Mortality and expense risk fee and administrative charges	903,052	296,622	51,440	115,769	1,481,253	696,119	1,285,152	526,924
Net Investment income (loss)	(903,052)	(296,622)	33,538	33,855	(1,212,663)	(696,119)	(1,285,152)	(526,924)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(3,637,913)	(1,529,651)	(37,127)	(185,296)	(2,473,795)	(2,245,671)	(4,744,220)	(1,341,756)
Realized gain distribution	-	-	349,966	710,680	13,582,538	6,377,757	-	-
Realized gain (loss)	(3,637,913)	(1,529,651)	312,839	525,384	11,108,743	4,132,086	(4,744,220)	(1,341,756)
Change in net unrealized appreciation/ depreciation of investments	12,553,712	4,377,718	(28,749)	29,459	24,990,251	12,009,906	13,299,904	4,802,945
Net gain (loss) on investments	8,915,799	2,848,067	284,090	554,843	36,098,994	16,141,992	8,555,684	3,461,189
Net increase (decrease) in net assets resulting from operations	8,012,747	2,551,445	317,628	588,698	34,886,331	15,445,873	7,270,532	2,934,265
Capital transactions:								
Transfers of net premiums	352,755	1,338,725	96,817	43,096	666,762	1,329,874	559,455	383,955
Transfers due to death benefits	(757,126)	(167,654)	(21,388)	(79,886)	(2,044,181)	(522,398)	(1,884,936)	(388,601)
Transfers due to annuity benefit payments	(234,329)	(178)	(11,720)	-	(335,775)	(425)	(307,538)	-
Transfers due to withdrawal of funds	(8,193,830)	(1,867,419)	(589,720)	(1,326,971)	(12,759,321)	(6,971,294)	(11,686,565)	(4,156,207)
Transfers due to loans, net of repayments	(5,385)	-	(16,297)	-	3,383	-	2,938	-
Transfers due to changes for administrative and insurance costs	(271,343)	(13,289)	(8,102)	(5,359)	(336,764)	(148,852)	(456,364)	(275,400)
Transfers due to contingent deferred sales charges	(123)	(1,596)	-	-	(630)	(793)	(446)	(10)
Transfers due to net charge (credit) to annuitant mortality fluctuation	39,977	20	3,125	-	74,573	48	79,489	-
Transfers between Sub-Accounts and to/from General Account	4,233,963	(51,089)	50,754	(161,766)	(8,971,801)	(464,009)	(220,446)	378,468
Net increase (decrease) in net assets resulting from capital transactions	(4,835,441)	(762,480)	(496,531)	(1,530,886)	(23,703,754)	(6,777,849)	(13,914,413)	(4,057,795)
Total increase (decrease)	3,177,306	1,788,965	(178,903)	(942,188)	11,182,577	8,668,024	(6,643,881)	(1,123,530)
NET ASSETS, at beginning of the year	69,315,183	22,846,294	4,603,701	9,489,706	115,923,743	49,427,513	105,617,322	42,908,119
NET ASSETS, at end of the year	\$ 72,492,489	\$ 24,635,259	\$ 4,424,798	\$ 8,547,518	\$ 127,106,320	\$ 58,095,537	\$ 98,973,441	\$ 41,784,589

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	Invesco V.I. Health Care Sub-Account (Series I)	Invesco V.I. Health Care Sub-Account (Series II)	Invesco V.I. Main Street Sub-Account (Series I)	Invesco V.I. Main Street Sub-Account (Series II)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. U.S. Government Money Sub-Account	Janus Henderson Global Technology and Innovation Sub-Account
Investment income										
Dividends.....	\$ -	\$ -	\$ 234,871	\$ 97,444	\$ -	\$ -	\$ -	\$ -	\$ 271,935	\$ -
Expenses										
Mortality and expense risk fee and administrative charges	98,319	99,377	317,149	246,848	76,297	94,348	66,588	5,526		
Net Investment income (loss)	(98,319)	(99,377)	(82,278)	(149,404)	(76,297)	(94,348)	205,347	(5,526)		
Net realized and unrealized gain (loss) on investments										
Realized gain (loss) on sale of fund shares	(136,822)	(179,822)	(2,056,271)	(2,281,032)	(637,555)	(1,339,567)	-	(8,855)		
Realized gain distribution	-	-	1,909,803	1,391,303	-	-	-	-		
Realized gain (loss)	(136,822)	(179,822)	(146,468)	(889,729)	(637,555)	(1,339,567)	-	(8,855)		
Change in net unrealized appreciation/ depreciation of investments	373,053	369,508	5,838,277	4,886,764	3,108,300	4,124,012	-	181,473		
Net gain (loss) on investments	236,231	189,686	5,691,809	3,997,035	2,470,745	2,784,445	-	172,618		
Net increase (decrease) in net assets resulting from operations	137,912	90,309	5,609,531	3,847,631	2,394,448	2,690,097	205,347	167,092		
Capital transactions:										
Transfers of net premiums	97,305	68,282	90,002	306,678	143,423	78,544	95,018	254,391		
Transfers due to death benefits	(123,644)	(3,378)	(532,640)	(130,778)	(122,159)	(7,767)	(619,039)	-		
Transfers due to annuity benefit payments	(34,070)	-	(24,014)	-	(20,110)	(180)	(7,924)	-		
Transfers due to withdrawal of funds	(858,716)	(1,165,229)	(2,009,811)	(2,241,866)	(659,704)	(1,197,588)	(1,400,368)	234		
Transfers due to loans, net of repayments	881	-	2,652	-	(3)	-	-	-		
Transfers due to changes for administrative and insurance costs	(8,435)	(12,585)	(17,400)	(3,424)	(8,326)	(3,940)	25,644	-		
Transfers due to contingent deferred sales charges	(169)	-	(289)	-	(91)	-	(147)	-		
Transfers due to net charge (credit) to annuitant mortality fluctuation	10,043	-	4,755	-	7,921	21	1,835	-		
Transfers between Sub-Accounts and to/from General Account	64,995	(176,546)	(495,649)	(445,896)	662,106	252,018	988,284	39,935		
Net increase (decrease) in net assets resulting from capital transactions	(851,810)	(1,289,456)	(2,982,394)	(2,515,286)	3,057	(878,892)	(916,697)	292,029		
Total increase (decrease)	(713,898)	(1,199,147)	2,627,137	1,332,345	2,397,505	1,811,205	(711,350)	459,121		
NET ASSETS, at beginning of the year	8,993,115	8,644,331	26,861,840	18,959,328	5,414,369	6,511,762	6,701,851	244,729		
NET ASSETS, at end of the year	8,279,217	7,445,184	29,488,977	20,291,673	7,811,874	8,322,967	5,990,501	703,850		

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	MML Aggressive Allocation Sub-Account (Initial Class)	MML Aggressive Allocation Sub-Account (Service Class)	MML American Funds Core Allocation Sub-Account	MML American Funds Growth Sub-Account	MML Balanced Allocation Sub-Account (Initial Class)	MML Balanced Allocation Sub-Account (Service Class)	MML Blend Sub-Account (Initial Class)	MML Blend Sub-Account (Service Class)
Investment income								
Dividends.....	\$ 763,010	\$ 1,792,157	\$ 25,340,067	\$ 3,043,123	\$ 1,744,712	\$ 7,467,948	\$ 855,642	\$ 2,598,291
Expenses								
Mortality and expense risk fee and administrative charges.....	316,616	841,692	8,702,428	2,675,950	722,922	3,286,951	616,663	2,253,778
Net Investment income (loss)	446,394	950,465	16,637,639	367,173	1,021,790	4,180,997	238,979	344,513
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares.....	(1,147,266)	(2,332,809)	(23,357,096)	(3,176,254)	(2,062,745)	(10,064,997)	(2,002,744)	(4,757,525)
Realized gain distribution.....	3,141,376	8,191,454	74,634,687	32,471,054	4,484,866	21,140,489	-	-
Realized gain (loss).....	1,994,110	5,858,645	51,277,591	29,294,800	2,422,121	11,075,492	(2,002,744)	(4,757,525)
Change in net unrealized appreciation/ depreciation of investments.....	1,654,005	3,732,575	12,762,460	35,768,361	2,406,622	11,117,082	9,377,779	30,809,868
Net gain (loss) on investments	3,648,115	9,591,220	64,040,051	65,063,161	4,828,743	22,192,574	7,375,035	26,052,343
Net increase (decrease) in net assets resulting from operations	4,094,509	10,541,685	80,677,690	65,430,334	5,850,533	26,373,571	7,614,014	26,396,856
Capital transactions:								
Transfers of net premiums.....	476,691	2,080,469	5,600,402	12,820,964	285,695	5,742,689	233,108	4,454,411
Transfers due to death benefits.....	(4,254)	(166,364)	(4,527,322)	(1,958,051)	(916,092)	(2,773,018)	(1,431,250)	(1,792,776)
Transfers due to annuity benefit payments.....	-	-	(35,172)	(21,699)	-	(7,799)	(105,398)	-
Transfers due to withdrawal of funds.....	(4,208,351)	(10,415,598)	(111,881,308)	(27,984,669)	(8,564,010)	(40,067,000)	(6,467,804)	(15,089,735)
Transfers due to loans, net of repayments.....	(4,371)	-	24,688	(6,340)	9,678	-	(8,481)	-
Transfers due to charges for administrative and insurance costs.....	(93,219)	(100,400)	(5,341,754)	(444,628)	(440,288)	(1,218,191)	(58,171)	(47,582)
Transfers due to contingent deferred sales charges.....	(5)	-	(48,238)	(58,729)	-	(13,578)	(744)	(17,468)
Transfers due to net charge (credit) to annuitant mortality fluctuation.....	-	-	7,291	2,693	-	817	(61,083)	-
Transfers between Sub-Accounts and to/from General Account.....	(89,482)	78,342	1,126,139	28,449	(413,413)	(2,930,521)	(199,989)	1,233,174
Net increase (decrease) in net assets resulting from capital transactions.....	(3,922,991)	(8,523,551)	(115,075,274)	(17,622,010)	(10,038,430)	(41,266,601)	(8,099,812)	(11,259,976)
Total increase (decrease)	171,518	2,018,134	(34,397,584)	47,808,324	(4,187,897)	(14,893,030)	(485,798)	15,136,880
NET ASSETS, at beginning of the year	26,453,572	68,477,846	692,811,278	187,123,822	58,629,976	267,376,596	51,298,275	172,514,255
NET ASSETS, at end of the year	26,625,090	70,495,980	658,413,694	234,932,146	54,442,079	252,483,566	50,812,477	187,651,135

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	MML Blue Chip Growth Sub-Account (Initial Class)	MML Blue Chip Growth Sub-Account (Service Class)	MML Conservative Allocation Sub-Account (Initial Class)	MML Conservative Allocation Sub-Account (Service Class)	MML Dynamic Bond Sub-Account (Service Class I)	MML Equity Sub-Account (Initial Class)	MML Equity Sub-Account (Service Class)	MML Equity Income Sub-Account (Initial Class)
Investment income								
Dividends.....\$	-	-	\$ 1,572,900	\$ 6,698,734	\$ 509,004	\$ 456,547	\$ 1,474,261	\$ 2,405,604
Expenses								
Mortality and expense risk fee and administrative charges.....	523,403	1,767,054	599,063	2,877,779	147,978	268,029	1,012,826	1,316,201
Net Investment income (loss)	(523,403)	(1,767,054)	973,837	3,820,955	361,026	188,518	461,435	1,089,403
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares.....	(1,931,615)	(8,800,208)	(2,065,831)	(9,694,518)	(329,684)	52,251	(1,948,485)	(2,703,032)
Realized gain distribution.....	-	-	3,529,951	16,509,017	-	1,739,740	6,504,460	8,645,605
Realized gain (loss).....	(1,931,615)	(8,800,208)	1,464,120	6,814,499	(329,684)	1,791,991	4,555,975	5,942,573
Change in net unrealized appreciation/ depreciation of investments.....	19,199,647	63,361,099	2,334,585	10,039,522	737,415	(329,235)	727,912	1,250,299
Net gain (loss) on investments	17,268,032	54,560,891	3,798,705	16,854,021	407,731	1,462,756	5,283,887	7,192,872
Net increase (decrease) in net assets resulting from operations	16,744,629	52,793,837	4,772,542	20,674,976	768,757	1,651,274	5,745,322	8,282,275
Capital transactions:								
Transfers of net premiums.....	329,069	4,320,675	92,483	2,811,327	739,207	128,315	1,093,295	507,067
Transfers due to death benefits.....	(731,433)	(1,314,927)	(105,465)	(4,103,353)	(38,995)	(306,946)	(311,471)	(1,352,911)
Transfers due to annuity benefit payments.....	(98,066)	(523)	(15,574)	(6,983)	-	(61,837)	-	(337,792)
Transfers due to withdrawal of funds.....	(5,164,684)	(15,660,692)	(7,755,542)	(34,471,497)	(1,440,121)	(1,907,479)	(11,837,091)	(13,281,142)
Transfers due to loans, net of repayments.....	(7,521)	-	-	-	-	3,621	-	(11,673)
Transfers due to changes for administrative and insurance costs.....	(64,134)	(64,339)	(414,377)	(1,068,669)	-	(46,936)	(270,590)	(391,914)
Transfers due to contingent deferred sales charges.....	(399)	(26,187)	(6)	(3,703)	(9,848)	(143)	(3,025)	(223)
Transfers due to net charge (credit) to annuitant mortality fluctuation.....	29,352	59	2,471	1,360	-	24,898	-	80,277
Transfers between Sub-Accounts and to/from General Account.....	(1,510,068)	(1,277,636)	1,237,961	(4,239,955)	545,311	(454,276)	(2,612,413)	391,409
Net increase (decrease) in net assets resulting from capital transactions.....	(7,217,884)	(14,023,570)	(6,958,049)	(41,081,473)	(204,446)	(2,620,783)	(13,941,295)	(14,396,902)
Total increase (decrease)	9,526,745	38,770,267	(2,185,507)	(20,406,497)	564,311	(969,509)	(8,195,973)	(6,114,627)
NET ASSETS, at beginning of the year	37,019,588	116,156,894	50,846,697	232,816,753	11,894,741	22,745,758	87,189,234	112,868,269
NET ASSETS, at end of the year\$	46,546,333	154,927,161	\$ 48,661,190	\$ 212,410,256	\$ 12,459,052	\$ 21,776,249	\$ 78,993,261	\$ 106,753,642

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	MML Equity Income Sub-Account (Service Class)	MML Equity Index Sub-Account (Class I)	MML Equity Index Sub-Account (Service Class I)	MML Equity Rotation Sub-Account (Service Class I)	MML Focused Equity Sub-Account	MML Foreign Sub-Account (Initial Class)	MML Foreign Sub-Account (Service Class)	MML Fundamental Equity Sub-Account
Investment income								
Dividends.....	\$ 1,483,820	\$ 375,603	\$ 284,275	\$ 26,997	\$ 174,709	\$ 1,137,707	\$ 113,003	\$ 154,835
Expenses								
Mortality and expense risk fees and administrative charges	930,507	381,446	359,677	19,860	271,584	1,054,599	115,106	255,764
Net Investment income (loss)	553,313	(5,843)	(75,402)	7,137	(96,875)	83,108	(2,103)	(100,929)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(3,052,626)	187,774	(724,460)	(89,087)	542,247	(2,297,790)	(249,869)	(431,614)
Realized gain distribution.....	6,074,701	2,776,996	2,846,180	2,821	2,060,558	-	-	-
Realized gain (loss).....	3,022,075	2,964,770	2,121,720	(86,266)	2,602,805	(2,297,790)	(249,869)	(431,614)
Change in net unrealized appreciation/ depreciation of investments	1,722,592	3,594,585	4,215,810	407,709	(766,537)	13,616,161	1,481,723	4,418,895
Net gain (loss) on investments	4,744,667	6,559,355	6,337,530	321,443	1,836,268	11,318,371	1,231,854	3,987,281
Net increase (decrease) in net assets resulting from operations	5,297,980	6,553,512	6,262,128	328,580	1,739,393	11,401,479	1,229,751	3,886,352
Capital transactions:								
Transfers of net premiums	1,463,163	294,705	117,230	164,536	1,280,261	333,381	108,410	861,025
Transfers due to death benefits.....	(526,571)	(370,220)	(118,574)	(26,040)	(111,310)	(890,522)	(82,526)	(139,012)
Transfers due to annuity benefit payments	(586)	(109,006)	-	-	-	(313,399)	-	(9,690)
Transfers due to withdrawal of funds	(10,478,680)	(3,339,807)	(8,032,854)	(561,139)	(2,324,407)	(9,854,374)	(904,602)	(2,801,568)
Transfers due to loans, net of repayments	-	4,192	-	-	-	(4,559)	-	-
Transfers due to charges for administrative and insurance costs	(347,746)	(16,925)	(100,508)	-	119	(381,312)	(72,202)	(402)
Transfers due to contingent deferred sales charges	(6,206)	(270)	-	(2,345)	(4,100)	(52)	(129)	(957)
Transfers due to net charge (credit) to annuitant mortality fluctuation	67	(123,875)	-	-	-	61,823	-	1,881
Transfers between Sub-Accounts and to/from General Account	(2,583,977)	1,099,618	(329,714)	(84,347)	(261,059)	(7,261,854)	146,177	896,830
Net increase (decrease) in net assets resulting from capital transactions	(12,480,536)	(2,561,588)	(8,464,420)	(509,335)	(1,420,496)	(18,310,868)	(804,872)	(1,191,893)
Total increase (decrease)	(7,182,556)	3,991,924	(2,202,292)	(180,755)	318,897	(6,909,389)	424,879	2,694,459
NET ASSETS, at beginning of the year	78,411,916	27,821,852	29,639,746	1,864,206	21,586,709	89,435,726	8,823,408	18,740,713
NET ASSETS, at end of the year	\$ 71,229,360	\$ 31,813,776	\$ 27,437,454	\$ 1,683,451	\$ 21,905,606	\$ 82,526,337	\$ 9,248,287	\$ 21,435,172

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	MML Fundamental Value Sub-Account	MML Global Sub-Account (Class I)	MML Global Sub-Account (Class II)	MML Global Sub-Account (Service Class I)	MML Growth Allocation Sub-Account (Initial Class)	MML Growth Allocation Sub-Account (Service Class)	MML High Yield Sub-Account	MML Income & Growth Sub-Account (Initial Class)
Investment income								
Dividends.....	\$ 230,159	\$ 40,232	\$ 33,820	\$ 169,993	\$ 8,248,879	\$ 15,769,825	\$ 2,520,925	\$ 421,826
Expenses								
Mortality and expense risk fees and administrative charges	256,219	50,534	52,438	258,572	3,651,810	7,219,225	465,087	236,902
Net Investment income (loss)	(26,060)	(10,302)	(18,618)	(88,579)	4,597,069	8,550,600	2,055,838	184,924
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(562,255)	(874,429)	(919,351)	(4,906,565)	(9,349,681)	(18,077,377)	(1,375,246)	(299,293)
Realized gain distribution.....	1,284,440	281,910	233,464	1,376,521	35,934,536	75,625,592	-	2,545,666
Realized gain (loss).....	722,185	(592,519)	(685,887)	(3,530,044)	26,584,855	57,548,215	(1,375,246)	2,246,373
Change in net unrealized appreciation/ depreciation of investments.....	1,638,351	1,145,088	1,202,798	6,063,474	7,114,365	13,303,559	3,423,428	(888,514)
Net gain (loss) on investments	2,360,536	552,569	516,911	2,533,430	33,699,220	70,851,774	2,048,182	1,357,859
Net increase (decrease) in net assets resulting from operations	2,334,476	542,267	498,293	2,444,851	38,296,289	79,402,374	4,104,020	1,542,783
Capital transactions:								
Transfers of net premiums	1,258,815	14,690	44,781	1,079,562	2,394,141	9,244,641	1,042,323	146,295
Transfers due to death benefits.....	(260,664)	(33,530)	(64,742)	(74,820)	(1,649,388)	(3,221,497)	(635,404)	(477,768)
Transfers due to annuity benefit payments	-	(35,074)	(32)	-	-	-	(506)	(85,562)
Transfers due to withdrawal of funds	(2,629,335)	(281,377)	(321,255)	(1,623,354)	(28,671,051)	(56,320,830)	(5,085,697)	(2,100,367)
Transfers due to loans, net of repayments	65	-	4,819	-	8,741	-	6,415	322
Transfers due to changes for administrative and insurance costs	788	(16,268)	-	(68,766)	(4,044,211)	(6,289,577)	2,741	(30,239)
Transfers due to contingent deferred sales charges	(5,981)	-	(107)	(3,551)	(223)	(43,775)	(2,475)	(365)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	14,358	7	-	-	-	248	(15,965)
Transfers between Sub-Accounts and to/from General Account	69,663	341,869	3,282	(40,390)	(2,746,670)	(1,720,663)	2,506,646	242,842
Net increase (decrease) in net assets resulting from capital transactions	(1,566,649)	4,668	(33,245)	(731,319)	(34,708,661)	(58,351,701)	(2,165,709)	(2,320,807)
Total increase (decrease)	767,827	546,935	165,048	1,713,532	3,587,628	21,050,673	1,938,311	(778,024)
NET ASSETS, at beginning of the year	20,630,720	4,097,127	3,976,403	19,626,341	282,056,598	583,718,812	37,488,508	21,115,105
NET ASSETS, at end of the year	\$ 21,398,547	\$ 4,644,062	\$ 4,141,451	\$ 21,339,873	\$ 285,644,226	\$ 604,769,485	\$ 39,426,819	\$ 20,337,081

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	MML Income & Growth Sub-Account (Service Class)	MML Inflation- Protected and Income Sub-Account (Initial Class)	MML Inflation- Protected and Income Sub-Account (Service Class)	MML International Equity Sub-Account	MML iShares® 60/40 Allocation Sub-Account	MML iShares® 80/20 Allocation Sub-Account	MML Large Cap Growth Sub-Account (Initial Class)	MML Large Cap Growth Sub-Account (Service Class)
Investment income								
Dividends.....	\$ 513,069	\$ 4,107,884	\$ 1,819,353	\$ 100,166	\$ 191,861	\$ 469,537	\$ -	\$ -
Expenses								
Mortality and expense risk fees and administrative charges	343,435	1,152,429	535,486	106,614	110,772	358,540	153,880	294,302
Net Investment income (loss)	169,634	2,955,455	1,283,867	(6,448)	81,089	110,997	(153,880)	(294,302)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(467,185)	(2,866,814)	(1,394,378)	11,168	(16,767)	(127,733)	572,711	341,943
Realized gain distribution.....	3,537,920	-	-	-	-	-	983,474	1,707,712
Realized gain (loss).....	3,070,735	(2,866,814)	(1,394,378)	11,168	(16,767)	(127,733)	1,556,185	2,049,655
Change in net unrealized appreciation/ depreciation of investments	(1,295,894)	3,379,201	1,605,287	1,332,707	1,047,039	4,443,400	4,114,460	7,120,537
Net gain (loss) on investments	1,774,841	512,387	210,909	1,343,875	1,030,272	4,315,667	5,670,645	9,170,192
Net increase (decrease) in net assets resulting from operations	1,944,475	3,467,842	1,494,776	1,337,427	1,111,361	4,426,664	5,516,765	8,875,890
Capital transactions:								
Transfers of net premiums	1,158,964	466,330	1,600,054	634,263	6,390,304	15,331,247	102,757	1,834,772
Transfers due to death benefits.....	(221,361)	(1,726,456)	(283,744)	(36,853)	(19,297)	-	(99,060)	(194,404)
Transfers due to annuity benefit payments	-	(298,644)	(476)	-	-	-	(10,925)	-
Transfers due to withdrawal of funds	(2,909,361)	(10,882,635)	(4,766,688)	(597,355)	(61,201)	(119,531)	(2,002,259)	(1,347,495)
Transfers due to loans, net of repayments	-	1,538	-	(6,073)	-	-	2,940	-
Transfers due to changes for administrative and insurance costs	(28,189)	(377,307)	(137,593)	349	-	-	(12,271)	(6,291)
Transfers due to contingent deferred sales charges	(4,035)	(28)	(24,129)	(3,210)	(96,060)	(383,160)	(169)	(4,975)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	69,863	55	-	-	-	3,506	-
Transfers between Sub-Accounts and to/from General Account	(123,117)	6,526,597	(878,968)	568,730	101,417	71,697	479,115	1,659,722
Net increase (decrease) in net assets resulting from capital transactions	(2,127,099)	(6,220,742)	(4,491,489)	559,851	6,315,163	14,900,253	(1,536,366)	1,941,329
Total increase (decrease)	(182,624)	(2,752,900)	(2,996,713)	1,897,278	7,426,524	19,326,917	3,980,399	10,817,219
NET ASSETS, at beginning of the year	28,418,303	88,867,535	43,115,577	7,786,105	5,074,791	18,624,545	11,258,538	17,964,547
NET ASSETS, at end of the year	\$ 28,235,679	\$ 86,114,635	\$ 40,118,864	\$ 9,683,383	\$ 12,501,315	\$ 37,951,462	\$ 15,238,937	\$ 28,781,766

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	MML Managed Bond Sub-Account (Initial Class)	MML Managed Bond Sub-Account (Service Class)	MML Managed Volatility Sub-Account (Initial Class)	MML Managed Volatility Sub-Account (Service Class)	MML Mid Cap Growth Sub-Account (Initial Class)	MML Mid Cap Growth Sub-Account (Service Class)	MML Mid Cap Value Sub-Account (Initial Class)	MML Mid Cap Value Sub-Account (Service Class)
Investment income								
Dividends.....	\$ 2,963,630	\$ 6,282,117	\$ 364,524	\$ 49,436	\$ -	\$ -	\$ 2,525,730	\$ 1,130,263
Expenses								
Mortality and expense risk fees and administrative charges	937,389	2,163,597	820,846	236,009	695,501	1,063,626	1,210,233	597,366
Net Investment income (loss)	2,026,241	4,118,520	(456,322)	(186,573)	(695,501)	(1,063,626)	1,315,497	532,897
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(2,259,706)	(6,460,151)	1,101,466	448,707	(4,699,133)	(10,770,475)	(5,436,318)	(3,410,367)
Realized gain distribution.....	-	-	11,567,188	3,326,001	-	-	15,168,462	7,571,864
Realized gain (loss).....	(2,259,706)	(6,460,151)	12,668,654	3,774,708	(4,699,133)	(10,770,475)	9,732,144	4,161,497
Change in net unrealized appreciation/ depreciation of investments.....	4,039,191	10,551,914	(5,323,343)	(1,644,433)	16,870,232	27,774,668	(6,571,471)	(2,801,158)
Net gain (loss) on investments	1,779,485	4,091,763	7,345,311	2,130,275	12,171,099	17,004,193	3,160,673	1,360,339
Net increase (decrease) in net assets resulting from operations	3,805,726	8,210,283	6,888,989	1,943,702	11,475,598	15,940,567	4,476,170	1,893,236
Capital transactions:								
Transfers of net premiums	526,777	5,379,996	271,092	239,566	480,196	2,366,708	475,172	1,905,884
Transfers due to death benefits.....	(1,350,522)	(1,916,884)	(843,737)	(103,031)	(1,116,066)	(634,563)	(1,643,817)	(462,320)
Transfers due to annuity benefit payments	(239,871)	(573)	(224,104)	-	(130,362)	-	(306,093)	-
Transfers due to withdrawal of funds	(9,291,686)	(32,918,171)	(7,419,268)	(3,243,762)	(5,300,287)	(10,741,152)	(10,958,098)	(5,800,385)
Transfers due to loans, net of repayments	3,980	-	2,143	-	(8,483)	-	5,411	-
Transfers due to changes for administrative and insurance costs	(248,704)	(864,433)	(311,758)	(87,157)	(74,359)	(155,900)	(327,282)	(105,687)
Transfers due to contingent deferred sales charges	(144)	(21,812)	(255)	-	(1,191)	(11,390)	(1,618)	(6,670)
Transfers due to net charge (credit) to annuitant mortality fluctuation	56,262	66	38,403	-	10,165	-	64,145	-
Transfers between Sub-Accounts and to/from General Account	3,515,356	5,137,420	(437,591)	(665,892)	(1,049,361)	(52,139)	1,353,022	(1,673,506)
Net increase (decrease) in net assets resulting from capital transactions	(7,028,552)	(25,204,391)	(8,925,075)	(3,860,276)	(7,189,748)	(9,228,436)	(11,339,158)	(6,142,684)
Total increase (decrease)	(3,222,826)	(16,994,108)	(2,036,086)	(1,916,574)	4,285,850	6,712,131	(6,862,988)	(4,249,448)
NET ASSETS, at beginning of the year	76,373,788	180,957,384	63,499,565	19,279,858	57,562,324	81,046,753	104,763,063	50,303,554
NET ASSETS, at end of the year	\$ 73,150,962	\$ 163,963,276	\$ 61,463,479	\$ 17,363,284	\$ 61,848,174	\$ 87,758,884	\$ 97,900,075	\$ 46,054,106

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	MML Moderate Allocation Sub-Account (Initial Class)	MML Moderate Allocation Sub-Account (Service Class)	MML Short-Duration Bond Sub-Account	MML Small Cap Equity Sub-Account (Initial Class)	MML Small Cap Equity Sub-Account (Service Class)	MML Small Cap Growth Equity Sub-Account (Initial Class)	MML Small Cap Growth Equity Sub-Account (Service Class)	MML Small Company Value Sub-Account
Investment income								
Dividends.....	\$ 5,253,921	\$ 29,646,564	\$ 984,089	\$ 274,451	\$ 248,123	\$ -	\$ -	\$ 201,235
Expenses								
Mortality and expense risk fees and administrative charges	1,993,743	12,725,925	361,883	241,920	297,172	782,158	280,537	295,481
Net Investment income (loss)	3,260,178	16,920,639	622,206	32,531	(49,049)	(782,158)	(280,537)	(94,246)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(5,585,220)	(52,618,353)	(672,791)	464,368	20,281	(4,934,899)	(2,376,965)	(4,021,572)
Realized gain distribution.....	15,826,168	98,261,489	-	-	-	-	-	59,615
Realized gain (loss).....	10,240,948	45,643,136	(672,791)	464,368	20,281	(4,934,899)	(2,376,965)	(3,961,957)
Change in net unrealized appreciation/ depreciation of investments.....	5,157,005	50,844,336	1,603,135	2,787,104	3,673,532	14,637,404	5,818,332	7,265,882
Net gain (loss) on investments	15,397,953	96,487,472	930,344	3,251,472	3,693,813	9,702,505	3,441,367	3,303,925
Net increase (decrease) in net assets resulting from operations	18,658,131	113,408,111	1,552,550	3,284,003	3,644,764	8,920,347	3,160,830	3,209,679
Capital transactions:								
Transfers of net premiums	813,855	9,986,192	3,389,867	127,153	670,562	1,360,532	489,553	522,810
Transfers due to death benefits.....	(1,840,512)	(11,199,082)	(148,908)	(244,454)	(241,389)	(748,082)	(530,833)	(236,233)
Transfers due to annuity benefit payments	-	(4,337)	(405)	(26,715)	-	(220,222)	-	-
Transfers due to withdrawal of funds	(17,927,219)	(190,446,381)	(4,105,732)	(2,057,599)	(3,023,135)	(7,043,662)	(2,467,615)	(2,432,589)
Transfers due to loans, net of repayments	26,722	-	-	(1,137)	-	(7,837)	-	6,608
Transfers due to changes for administrative and insurance costs	(1,813,619)	(6,476,116)	484	(21,265)	(31,888)	(263,885)	(41,829)	(19,371)
Transfers due to contingent deferred sales charges	(5)	(20,377)	(6,835)	(386)	(653)	(5,916)	-	(1,588)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	(10,379)	203	6,290	-	34,717	-	-
Transfers between Sub-Accounts and to/from General Account	142,498	(3,711,017)	327,503	(273,289)	657,349	2,024,072	160,783	(415,754)
Net increase (decrease) in net assets resulting from capital transactions	(20,598,280)	(201,881,497)	(543,823)	(2,491,402)	(1,969,154)	(4,870,283)	(2,389,941)	(2,576,117)
Total increase (decrease)	(1,940,149)	(88,473,386)	1,008,727	792,601	1,675,610	4,050,064	770,889	633,562
NET ASSETS, at beginning of the year	161,103,074	1,044,498,635	29,348,995	21,412,816	23,617,332	60,413,373	22,649,920	23,768,684
NET ASSETS, at end of the year	\$ 159,162,925	\$ 956,025,249	\$ 30,357,722	\$ 22,205,417	\$ 25,292,942	\$ 64,463,437	\$ 23,420,809	\$ 24,402,246

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	MML Small/Mid Cap Value Sub-Account (Initial Class)	MML Small/Mid Cap Value Sub-Account (Service Class)	MML Strategic Emerging Markets Sub-Account	MML Sustainable Equity Sub-Account (Initial Class)	MML Sustainable Equity Sub-Account (Service Class)	MML Total Return Bond Sub-Account	MML U.S. Government Money Market Sub-Account	PIMCO Commodity RealReturn® Strategy Sub-Account
Investment income								
Dividends.....	\$ 774,841	\$ 199,242	\$ -	\$ 550,710	\$ 324,085	\$ 762,741	\$ 5,525,061	\$ 1,264,216
Expenses								
Mortality and expense risk fees and administrative charges	891,831	292,754	136,622	616,592	596,497	445,938	1,498,253	98,101
Net Investment income (loss)	(116,990)	(93,512)	(136,622)	(65,882)	(272,412)	316,803	4,026,808	1,166,115
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(3,030,369)	(1,310,343)	(2,060,408)	4,524,035	310,967	(1,302,544)	347	(233,858)
Realized gain distribution.....	8,916,199	3,026,006	-	17,662,152	14,495,443	-	-	-
Realized gain (loss).....	5,885,830	1,715,663	(2,060,408)	22,186,187	14,806,410	(1,302,544)	347	(233,858)
Change in net unrealized appreciation/ depreciation of investments.....	4,659,468	1,747,590	3,179,801	(10,157,739)	(4,754,225)	2,373,357	(347)	(1,695,592)
Net gain (loss) on investments	10,545,298	3,463,253	1,119,393	12,028,448	10,052,185	1,070,813	-	(1,929,450)
Net increase (decrease) in net assets resulting from operations	10,428,308	3,369,741	982,771	11,962,566	9,779,773	1,387,616	4,026,808	(763,335)
Capital transactions:								
Transfers of net premiums	335,272	396,123	393,281	282,301	252,745	2,299,122	4,668,859	124,385
Transfers due to death benefits.....	(802,613)	(183,216)	(33,462)	(554,720)	(230,043)	(394,840)	(2,069,097)	(46,669)
Transfers due to annuity benefit payments	(257,956)	-	-	(44,114)	-	-	(65,843)	(17,750)
Transfers due to withdrawal of funds	(8,173,301)	(2,570,409)	(1,174,257)	(5,644,655)	(5,722,974)	(3,942,575)	(40,519,754)	(967,252)
Transfers due to loans, net of repayments	(3,097)	-	120	(2,602)	-	478	9,672	10,675
Transfers due to changes for administrative and insurance costs	(277,845)	(62,852)	(24,399)	(62,648)	(53,628)	3,752	(170,846)	(38,500)
Transfers due to contingent deferred sales charges	(11)	(3,741)	(2,424)	(385)	(1,012)	(16,769)	(8,280)	(8)
Transfers due to net charge (credit) to annuitant mortality fluctuation	56,728	-	-	20,575	-	-	16,380	5,030
Transfers between Sub-Accounts and to/from General Account	542,311	218,782	117,177	(1,436,070)	(117,308)	1,014,705	19,519,907	(545,666)
Net increase (decrease) in net assets resulting from capital transactions	(8,580,512)	(2,205,313)	(723,964)	(7,442,318)	(5,872,220)	(1,036,127)	(18,619,002)	(1,475,755)
Total increase (decrease)	1,847,796	1,164,428	258,807	4,520,248	3,907,553	351,489	(14,592,194)	(2,239,090)
NET ASSETS, at beginning of the year	72,429,647	23,433,475	10,939,529	55,237,374	46,573,782	35,974,681	131,305,870	9,095,267
NET ASSETS, at end of the year	\$ 74,277,443	\$ 24,597,903	\$ 11,198,336	\$ 59,757,622	\$ 50,481,335	\$ 36,326,170	\$ 116,713,676	\$ 6,856,177

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2023

	PIMCO Income Sub-Account	VY® CBRE Global Real Estate Sub-Account
Investment income		
Dividends.....	\$ 82,750	\$ 157,412
Expenses		
Mortality and expense risk fees and administrative charges	20,328	110,512
Net Investment income (loss)	62,422	46,900
Net realized and unrealized gain (loss) on investments		
Realized gain (loss) on sale of fund shares	(2,034)	(392,710)
Realized gain distribution	-	94,261
Realized gain (loss).....	(2,034)	(298,449)
Change in net unrealized appreciation/ depreciation of investments	47,958	1,174,809
Net gain (loss) on investments	45,924	876,360
Net increase (decrease) in net assets resulting from operations	108,346	923,260
Capital transactions:		
Transfers of net premiums	1,129,941	96,630
Transfers due to death benefits.....	-	(30,516)
Transfers due to annuity benefit payments	-	(35,602)
Transfers due to withdrawal of funds	(2,732)	(976,880)
Transfers due to loans, net of repayments	-	685
Transfers due to charges for administrative and insurance costs	-	(47,488)
Transfers due to contingent deferred sales charges	(6,592)	(11)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	10,397
Transfers between Sub-Accounts and to/from General Account	49,912	85,466
Net increase (decrease) in net assets resulting from capital transactions	1,170,529	(897,319)
Total increase (decrease)	1,278,875	25,941
NET ASSETS, at beginning of the year	835,304	9,135,382
NET ASSETS, at end of the year	\$ 2,114,179	\$ 9,161,323

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS For The Year Ended December 31, 2022

	BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Healthcare Sub-Account	Fidelity® VIP Real Estate Sub-Account	Fidelity® VIP Strategic Income Sub-Account	Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)
Investment income								
Dividends.....	\$ 320,512	\$ 179,708	\$ 950,970	\$ 563,283	\$ -	\$ 1,940	\$ 7,277	\$ -
Expenses								
Mortality and expense risk fees and administrative charges	170,295	148,246	2,361,541	2,757,795	2,611	1,194	1,160	256,255
Net Investment income (loss)	150,217	31,462	(1,410,571)	(2,194,512)	(2,611)	746	6,117	(256,255)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	28,994	(82,769)	8,181,837	6,018,068	(1,485)	(1,144)	(963)	(269,507)
Realized gain distribution.....	5,391	905,928	9,053,292	10,647,705	-	-	-	4,027,371
Realized gain (loss).....	34,385	823,159	17,235,129	16,665,773	(1,485)	(1,144)	(963)	3,757,864
Change in net unrealized appreciation/ depreciation of investments.....	(3,156,743)	(2,946,196)	(82,508,846)	(90,565,756)	2,501	(30,728)	(8,854)	(11,532,497)
Net gain (loss) on investments	(3,122,358)	(2,123,037)	(65,273,717)	(73,899,983)	1,016	(31,872)	(9,817)	(7,774,633)
Net increase (decrease) in net assets resulting from operations	(2,972,141)	(2,091,575)	(66,684,288)	(76,094,495)	(1,595)	(31,126)	(3,700)	(8,030,888)
Capital transactions:								
Transfers of net premiums	1,698,829	592,631	1,251,792	9,772,320	461,484	182,862	214,580	195,720
Transfers due to death benefits.....	(33,215)	(95,423)	(2,344,813)	(1,432,762)	(4,198)	(3,795)	-	(104,352)
Transfers due to annuity benefit payments	-	-	(680,190)	(409)	-	-	-	(73,728)
Transfers due to withdrawal of funds	(553,451)	(897,868)	(17,623,733)	(18,120,816)	(601)	(291)	(219)	(1,386,146)
Transfers due to loans, net of repayments	-	-	(11,411)	-	-	-	-	(4,339)
Transfers due to cost of insurance.....	-	2,639	(480,267)	(152,366)	-	-	-	(84,985)
Transfers due to contingent deferred sales charges	-	(628)	(1,033)	(5,558)	(956)	(389)	(1,063)	(218)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	-	122,880	42	-	-	-	27,512
Transfers between Sub-Accounts and to/from General Account	(243,515)	17,771	3,989,314	(1,353,734)	(7,127)	4,964	(8,455)	1,021,878
Net increase (decrease) in net assets resulting from capital transactions.....	866,648	(380,878)	(15,777,461)	(11,293,283)	448,622	183,351	204,843	(408,658)
Total increase (decrease)	(2,105,493)	(2,472,453)	(82,461,749)	(87,387,778)	447,027	152,225	201,143	(8,439,546)
NET ASSETS, at beginning of the year	18,530,683	13,346,595	250,765,962	279,055,343	-	-	-	28,738,025
NET ASSETS, at end of the year	16,425,190	10,874,142	168,304,213	191,667,565	447,027	152,225	201,143	20,298,479

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)	Invesco V.I. Capital Appreciation Sub-Account (Series I)	Invesco V.I. Capital Appreciation Sub-Account (Series II)	Invesco V.I. Conservative Balanced Sub-Account (Series I)	Invesco V.I. Conservative Balanced Sub-Account (Series II)	Invesco V.I. Core Plus Bond Sub-Account	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)
Investment income								
Dividends.....	\$ -	\$ -	\$ -	\$ 79,929	\$ 566	\$ 60,700	\$ -	\$ -
Expenses								
Mortality and expense risk fees and administrative charges	241,752	1,523,565	122,507	66,742	565	20,118	1,015,239	322,211
Net investment income (loss)	(241,752)	(1,523,565)	(122,507)	13,187	1	40,582	(1,015,239)	(322,211)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(339,301)	2,207,214	369,000	214,251	402	(4,666)	244,767	(93,794)
Realized gain distribution.....	3,501,346	42,264,421	3,118,548	435,543	3,740	928	21,561,207	7,714,901
Realized gain (loss).....	3,162,045	44,471,635	3,487,548	649,794	4,142	(3,738)	21,805,974	7,621,107
Change in net unrealized appreciation/ depreciation of investments.....	(10,105,086)	(93,017,304)	(7,392,458)	(1,879,814)	(14,325)	(301,045)	(54,795,681)	(18,346,399)
Net gain (loss) on investments	(6,943,041)	(48,545,669)	(3,904,910)	(1,230,020)	(10,183)	(304,783)	(32,989,707)	(10,725,292)
Net increase (decrease) in net assets resulting from operations	(7,184,793)	(50,069,234)	(4,027,417)	(1,216,833)	(10,182)	(264,201)	(34,004,946)	(11,047,503)
Capital transactions:								
Transfers of net premiums	523,653	468,903	114,707	8,403	-	-	389,143	1,358,389
Transfers due to death benefits.....	(251,788)	(1,686,703)	(63,592)	(79,482)	-	(10,439)	(868,892)	(91,024)
Transfers due to annuity benefit payments	-	(313,102)	-	(6,080)	-	(45)	(242,681)	(191)
Transfers due to withdrawal of funds	(1,930,305)	(13,256,465)	(1,463,496)	(333,546)	(1,153)	(77,940)	(8,170,233)	(1,822,620)
Transfers due to loans, net of repayments	-	7,648	-	(235)	-	-	(9,893)	-
Transfers due to cost of insurance.....	(70,497)	(384,997)	(15,247)	(4,758)	46	-	(266,240)	(11,316)
Transfers due to contingent deferred sales charges	(577)	(436)	-	(49)	-	(28)	(136)	(346)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	44,148	-	529	-	10	35,692	20
Transfers between Sub-Accounts and /from General Account	1,713,598	7,280,226	(632,089)	(16,793)	-	-	6,805,582	128,577
Net increase (decrease) in net assets resulting from capital transactions.....	(15,916)	(7,840,778)	(2,059,717)	(432,011)	(1,107)	(88,442)	(2,327,658)	(438,511)
Total increase (decrease)	(7,200,709)	(57,910,012)	(6,087,134)	(1,648,844)	(11,289)	(352,643)	(36,332,604)	(11,486,014)
NET ASSETS, at beginning of the year	26,049,458	161,466,451	13,493,003	6,987,321	56,716	1,772,416	105,647,787	34,332,308
NET ASSETS, at end of the year	\$ 18,848,749	\$ 103,556,439	\$ 7,405,869	\$ 5,338,477	\$ 45,427	\$ 1,419,773	\$ 69,315,183	\$ 22,846,294

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Diversified Dividend Sub-Account (Series II)	Invesco V.I. Global Sub-Account (Series I)	Invesco V.I. Global Sub-Account (Series II)	Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Strategic Income Sub-Account (Series II)	Invesco V.I. Health Care Sub-Account (Series I)	Invesco V.I. Health Care Sub-Account (Series II)
Investment income								
Dividends.....	\$ 88,923	\$ 165,443	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Expenses								
Mortality and expense risk fees and administrative charges	56,165	138,284	1,587,882	717,701	1,492,984	599,892	108,183	120,049
Net Investment income (loss)	32,758	27,159	(1,587,882)	(717,701)	(1,492,984)	(599,892)	(108,183)	(120,049)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	51,389	92,077	2,676,058	467,643	(6,074,013)	(2,340,498)	5,215	69,809
Realized gain distribution.....	583,379	1,251,212	22,633,364	9,776,023	-	-	1,265,290	1,357,316
Realized gain (loss).....	634,768	1,343,289	25,309,422	10,243,666	(6,074,013)	(2,340,498)	1,270,505	1,427,125
Change in net unrealized appreciation/ depreciation of investments.....	(802,461)	(1,749,671)	(80,778,404)	(34,677,208)	(10,232,913)	(4,356,125)	(2,800,020)	(3,027,263)
Net gain (loss) on investments	(167,693)	(406,382)	(55,468,982)	(24,433,542)	(16,306,926)	(6,696,623)	(1,529,515)	(1,600,138)
Net increase (decrease) in net assets resulting from operations	(134,935)	(379,223)	(57,056,864)	(25,151,243)	(17,799,910)	(7,296,515)	(1,637,698)	(1,720,187)
Capital transactions:								
Transfers of net premiums	82,504	207,911	820,458	1,324,053	660,589	652,640	122,963	142,016
Transfers due to death benefits.....	(73,015)	(8,473)	(1,714,520)	(197,068)	(1,902,074)	(503,591)	(126,244)	(56,901)
Transfers due to annuity benefit payments	(18,401)	-	(322,198)	(412)	(331,195)	-	(41,064)	-
Transfers due to withdrawal of funds	(269,885)	(2,015,348)	(12,764,595)	(6,379,593)	(12,200,177)	(4,279,835)	(762,707)	(1,365,653)
Transfers due to loans, net of repayments	(7,276)	-	9,864	-	682	-	4,199	-
Transfers due to cost of insurance.....	(8,672)	(3,965)	(322,603)	(127,030)	(481,356)	(294,741)	(9,547)	(12,934)
Transfers due to contingent deferred sales charges	(3)	-	(611)	(94)	(451)	-	(176)	-
Transfers due to net charge (credit) to annuitant mortality fluctuation	3,252	-	73,696	43	58,221	-	10,694	-
Transfers between Sub-Accounts and to/from General Account	110,250	343,749	11,145,889	2,483,654	(5,810,127)	(2,698,820)	35,897	(42,685)
Net increase (decrease) in net assets resulting from capital transactions.....	(181,246)	(1,476,126)	(3,074,620)	(2,896,447)	(20,005,888)	(7,124,347)	(765,985)	(1,336,157)
Total increase (decrease)	(316,181)	(1,855,349)	(60,131,484)	(28,047,690)	(37,805,798)	(14,420,862)	(2,403,683)	(3,056,344)
NET ASSETS, at beginning of the year	4,919,882	11,345,055	176,055,227	77,475,203	143,423,120	57,328,981	11,396,798	11,700,675
NET ASSETS, at end of the year	4,603,701	9,489,706	115,923,743	49,427,513	105,617,322	42,908,119	8,993,115	8,644,331

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	Invesco V.I. Main Street Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. Main Street Sub-Account (Series II)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	U.S. Government Money Sub-Account	Janus Henderson Global Technology and Innovation Sub-Account	MML Aggressive Allocation Sub-Account (Initial Class)	MML Aggressive Allocation Sub-Account (Service Class)
Investment income										
Dividends.....	\$ 435,222	\$ 231,685	\$ -	\$ -	\$ 85,981	\$ -	\$ -	\$ 587,102	\$ 1,423,938	
Expenses										
Mortality and expense risk fees and administrative charges	337,050	262,495	79,194	113,307	72,458	1,494	1,494	344,553	965,479	
Net Investment income (loss)	98,172	(30,810)	(79,194)	(113,307)	13,523	(1,494)	(1,494)	242,549	458,459	
Net realized and unrealized gain (loss) on investments										
Realized gain (loss) on sale of fund shares	(108,049)	207,322	(326,480)	(326,480)	-	(4,731)	-	210,985	(1,458,792)	
Realized gain distribution.....	11,217,934	8,051,790	3,389,938	3,389,938	-	22,771	-	3,975,094	11,286,908	
Realized gain (loss).....	11,109,885	7,714,241	3,063,458	3,063,458	-	18,040	-	4,186,079	9,828,116	
Change in net unrealized appreciation/ depreciation of investments.....	(18,859,727)	(13,170,083)	(7,963,463)	(7,963,463)	-	(52,224)	-	(10,319,199)	(26,573,983)	
Net gain (loss) on investments	(7,749,842)	(5,455,842)	(3,807,586)	(4,900,005)	13,523	(34,184)	-	(6,133,120)	(16,745,867)	
Net increase (decrease) in net assets resulting from operations	(7,651,670)	(5,486,652)	(3,886,780)	(5,013,312)	13,523	(35,678)	13,523	(5,890,571)	(16,287,408)	
Capital transactions:										
Transfers of net premiums	95,091	577,796	125,143	70,220	113,229	277,453	113,229	529,391	1,502,980	
Transfers due to death benefits.....	(424,954)	(62,055)	(157,069)	(62,194)	(25,747)	-	(25,747)	(234,782)	(44,841)	
Transfers due to annuity benefit payments	(20,387)	-	(20,140)	(184)	(8,132)	-	(8,132)	-	-	
Transfers due to withdrawal of funds	(1,853,203)	(1,859,977)	(480,941)	(1,167,284)	(626,152)	(275)	(626,152)	(4,220,255)	(10,815,755)	
Transfers due to loans, net of repayments	(3,851)	-	154	-	133	-	133	(8,306)	-	
Transfers due to cost of insurance.....	(20,923)	(2,542)	(8,661)	(3,116)	23,089	-	23,089	(92,688)	(92,676)	
Transfers due to contingent deferred sales charges	(343)	-	(93)	-	(149)	(547)	(149)	(5)	-	
Transfers due to net charge (credit) to annuitant mortality fluctuation	934	-	8,975	19	1,887	-	1,887	-	-	
Transfers between Sub-Accounts and to/from General Account	(440,303)	(530,438)	(4,996)	(122,803)	1,397,356	3,776	1,397,356	53,868	(842,632)	
Net increase (decrease) in net assets resulting from capital transactions.....	(2,667,939)	(1,877,216)	(537,628)	(1,285,342)	875,514	280,407	875,514	(3,972,777)	(10,292,924)	
Total increase (decrease)	(10,319,609)	(7,363,868)	(4,424,408)	(6,298,654)	889,037	244,729	889,037	(9,863,348)	(26,580,332)	
NET ASSETS, at beginning of the year	37,181,449	26,323,196	9,838,777	12,810,416	5,812,814	-	5,812,814	36,316,920	95,058,178	
NET ASSETS, at end of the year	\$ 26,861,840	\$ 18,959,328	\$ 5,414,369	\$ 6,511,762	\$ 6,701,851	\$ 244,729	\$ 6,701,851	\$ 26,453,572	\$ 68,477,846	

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	MML American Funds Core Allocation Sub-Account	MML American Funds Growth Sub-Account	MML American Funds International Sub-Account	MML Balanced Allocation Sub-Account (Initial Class)	MML Balanced Allocation Sub-Account (Service Class)	MML Blend Sub-Account (Initial Class)	MML Blend Sub-Account (Service Class)	MML Blue Chip Growth Sub-Account (Initial Class)
Investment income								
Dividends.....	\$ 16,292,698	\$ 938,241	\$ 7,469,097	\$ 2,357,662	\$ 10,095,633	\$ 773,236	\$ 2,126,739	\$ -
Expenses								
Mortality and expense risk fees and administrative charges	9,997,557	2,752,809	490,764	853,829	3,875,238	693,771	2,399,426	548,391
Net Investment income (loss)	6,295,141	(1,814,568)	6,978,333	1,503,833	6,220,395	79,465	(272,687)	(548,391)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(11,274,379)	4,181,111	(19,713,164)	(512,630)	(5,266,691)	(1,475,511)	(6,106,369)	190,183
Realized gain distribution.....	50,493,008	48,180,028	1,038,955	4,593,925	21,485,501	1,035,412	3,532,153	8,224,405
Realized gain (loss).....	39,218,629	52,361,139	(18,674,209)	4,081,295	16,218,810	(440,099)	(2,574,216)	8,414,588
Change in net unrealized appreciation/ depreciation of investments.....	(178,198,783)	(137,680,141)	(3,430,385)	(17,723,177)	(79,262,906)	(11,414,506)	(36,424,621)	(33,927,687)
Net gain (loss) on investments	(138,980,154)	(85,319,002)	(22,104,594)	(13,641,882)	(63,044,096)	(11,854,605)	(38,998,837)	(25,513,099)
Net increase (decrease) in net assets resulting from operations	(132,685,013)	(87,133,570)	(15,126,261)	(12,138,049)	(56,823,701)	(11,775,140)	(39,271,524)	(26,061,490)
Capital transactions:								
Transfers of net premiums	14,724,366	10,520,931	878,369	536,870	8,035,321	394,293	13,607,936	314,456
Transfers due to death benefits.....	(5,137,564)	(1,495,031)	(234,432)	(745,021)	(3,213,335)	(682,408)	(1,427,476)	(363,818)
Transfers due to annuity benefit payments	(36,194)	(21,427)	-	-	(8,186)	(213,240)	-	(94,703)
Transfers due to withdrawal of funds	(91,370,924)	(20,695,044)	(3,043,411)	(7,082,083)	(37,134,145)	(5,147,904)	(12,776,660)	(3,826,384)
Transfers due to loans, net of repayments	12,554	(1,626)	1,972	4,205	-	(8,861)	-	(13,951)
Transfers due to cost of insurance.....	(5,565,329)	(413,955)	(204,303)	(471,409)	(1,252,274)	(62,294)	(42,804)	(59,283)
Transfers due to contingent deferred sales charges	(16,616)	(8,187)	(841)	-	-	(741)	(2,476)	(385)
Transfers due to net charge (credit) to annuitant mortality fluctuation	7,132	2,357	-	-	804	40,192	-	30,206
Transfers between Sub-Accounts and to/from General Account	(6,227,813)	3,741,160	(39,863,815)	(425,722)	(5,332,079)	(228,539)	(4,863,694)	159,913
Net increase (decrease) in net assets resulting from capital transactions.....	(93,610,388)	(8,370,822)	(42,466,461)	(8,183,160)	(38,903,894)	(5,909,502)	(5,505,174)	(3,853,949)
Total increase (decrease)	(226,295,401)	(95,504,392)	(57,592,722)	(20,321,209)	(95,727,595)	(17,684,642)	(44,776,698)	(29,915,439)
NET ASSETS, at beginning of the year	919,106,679	282,628,214	57,592,722	78,951,185	363,104,191	68,982,917	217,290,953	66,935,027
NET ASSETS, at end of the year	692,811,278	187,123,822	-	58,629,976	267,376,596	51,298,275	172,514,255	37,019,588

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	MML Blue Chip Growth Sub-Account (Service Class)	MML Conservative Allocation Sub-Account (Initial Class)	MML Conservative Allocation Sub-Account (Service Class)	MML Dynamic Bond Sub-Account (Service Class I)	MML Equity Sub-Account (Initial Class)	MML Equity Sub-Account (Service Class)	MML Equity Sub-Account (Initial Class)	MML Equity Sub-Account (Service Class)
Investment income								
Dividends.....	\$ -	\$ 2,193,895	\$ 9,438,491	\$ 445,452	\$ 371,569	\$ 1,250,749	\$ 2,092,308	\$ 1,245,550
Expenses								
Mortality and expense risk fees and administrative charges	1,839,523	699,395	3,419,660	149,876	285,407	1,181,581	1,556,637	1,051,021
Net Investment income (loss)	(1,839,523)	1,494,500	6,018,831	295,576	86,162	69,168	535,671	194,529
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(4,232,177)	(591,943)	(4,217,391)	(153,673)	357,380	(11,168)	1,008,497	(570,411)
Realized gain distribution.....	27,920,807	4,624,225	21,589,285	-	2,483,756	10,101,366	16,328,982	11,451,665
Realized gain (loss).....	23,688,630	4,032,282	17,371,894	(153,673)	2,841,136	10,090,198	17,337,479	10,881,254
Change in net unrealized appreciation/ depreciation of investments.....	(103,168,053)	(15,805,406)	(72,053,206)	(2,244,985)	(4,427,572)	(16,384,726)	(24,040,052)	(15,423,353)
Net gain (loss) on investments	(79,479,423)	(11,773,124)	(54,681,312)	(2,398,658)	(1,586,436)	(6,494,528)	(6,702,573)	(4,542,099)
Net increase (decrease) in net assets resulting from operations	(81,318,946)	(10,278,624)	(48,662,481)	(2,103,082)	(1,500,274)	(6,425,360)	(6,166,902)	(4,347,570)
Capital transactions:								
Transfers of net premiums	5,737,759	938,395	3,048,920	1,197,859	237,774	2,460,298	636,870	2,185,476
Transfers due to death benefits.....	(890,897)	(1,436,013)	(4,145,456)	(92,068)	(172,362)	(980,439)	(1,650,240)	(505,839)
Transfers due to annuity benefit payments	(517)	(15,449)	(2,888)	-	(67,528)	-	(362,440)	(610)
Transfers due to withdrawal of funds	(10,517,008)	(5,713,904)	(36,917,918)	(618,990)	(1,767,949)	(9,972,143)	(12,959,583)	(7,812,330)
Transfers due to loans, net of repayments	-	357	-	-	6,803	-	3,424	-
Transfers due to cost of insurance.....	(51,297)	(422,114)	(1,142,599)	-	(52,631)	(308,806)	(424,915)	(384,734)
Transfers due to contingent deferred sales charges	(9,018)	(9)	(200)	(2,267)	(158)	(199)	(222)	(1,675)
Transfers due to net charge (credit) to annuitant mortality fluctuation	53	3,119	(11,579)	-	33,902	-	89,591	62
Transfers between Sub-Accounts and to/from General Account	(255,553)	2,033,996	6,212,807	(62,687)	428,163	(2,543,995)	(11,815,196)	666,121
Net increase (decrease) in net assets resulting from capital transactions.....	(5,986,478)	(4,611,622)	(32,958,913)	421,847	(1,353,986)	(11,345,284)	(26,482,711)	(5,853,529)
Total increase (decrease)	(87,305,424)	(14,890,246)	(81,621,394)	(1,681,235)	(2,854,260)	(17,770,644)	(32,649,613)	(10,201,099)
NET ASSETS, at beginning of the year	203,462,318	65,736,943	314,438,147	13,575,976	25,600,018	104,959,878	145,517,882	88,613,015
NET ASSETS, at end of the year	\$ 116,156,894	\$ 50,846,697	\$ 232,816,753	\$ 11,894,741	\$ 22,745,758	\$ 87,189,234	\$ 112,868,269	\$ 78,411,916

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	MML Equity Index Sub-Account (Class I)	MML Equity Index Sub-Account (Service Class I)	MML Equity Momentum Sub-Account (Service Class I)	MML Equity Rotation Sub-Account (Service Class I)	MML Focused Equity Sub-Account	MML Foreign Sub-Account (Initial Class)	MML Foreign Sub-Account (Service Class)	MML Fundamental Equity Sub-Account
Investment income								
Dividends.....	\$ 312,763	\$ 282,087	\$ 9,607	\$ -	\$ 130,936	\$ 3,468,489	\$ 236,272	\$ 73,760
Expenses								
Mortality and expense risk fees and administrative charges	394,588	445,629	14,570	19,978	254,837	1,210,321	88,584	255,297
Net Investment income (loss)	(81,825)	(163,542)	(4,963)	(19,978)	(123,901)	2,258,168	147,688	(181,537)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	588,121	538,021	(391,327)	(53,862)	827,892	(796,212)	(44,738)	(457,468)
Realized gain distribution.....	1,839,889	2,246,951	-	219,825	1,660,896	6,461,151	479,118	3,456,380
Realized gain (loss).....	2,428,010	2,784,972	(391,327)	165,963	2,488,788	5,664,939	434,380	2,998,912
Change in net unrealized appreciation/ depreciation of investments.....	(9,504,297)	(11,119,540)	108,143	(520,198)	(3,697,730)	(24,860,390)	(1,690,038)	(8,057,419)
Net gain (loss) on investments	(7,076,287)	(8,334,568)	(283,184)	(354,235)	(1,208,942)	(19,195,451)	(1,255,658)	(5,058,507)
Net increase (decrease) in net assets resulting from operations	(7,158,112)	(8,498,110)	(288,147)	(374,213)	(1,332,843)	(16,937,283)	(1,107,970)	(5,240,044)
Capital transactions:								
Transfers of net premiums	342,363	138,296	152,614	111,285	1,412,105	350,653	33,911	1,503,370
Transfers due to death benefits.....	(429,799)	(42,297)	(6,574)	(94,805)	(75,414)	(997,738)	(71,914)	(19,125)
Transfers due to annuity benefit payments	(321,722)	-	-	-	-	(320,546)	-	(9,659)
Transfers due to withdrawal of funds	(2,242,436)	(6,329,183)	(419,637)	(248,331)	(1,662,916)	(10,316,763)	(618,001)	(1,522,874)
Transfers due to loans, net of repayments	(39,386)	-	-	-	-	1,779	-	-
Transfers due to cost of insurance.....	(20,167)	(106,479)	-	-	31	(387,361)	(26,619)	(1,122)
Transfers due to contingent deferred sales charges	(264)	-	(215)	(214)	(1,267)	(48)	(20)	(158)
Transfers due to net charge (credit) to annuitant mortality fluctuation	(95,127)	-	-	-	-	59,354	-	1,740
Transfers between Sub-Accounts and to/from General Account	(249,845)	(1,697,624)	(1,599,775)	(14,262)	1,154,023	2,405,390	2,548,341	48,705
Net increase (decrease) in net assets resulting from capital transactions.....	(3,056,383)	(8,037,287)	(1,873,587)	(246,327)	826,562	(9,205,280)	1,865,698	877
Total increase (decrease)	(10,214,495)	(16,535,397)	(2,161,734)	(620,540)	(506,281)	(26,142,563)	757,728	(5,239,167)
NET ASSETS, at beginning of the year	38,036,347	46,175,143	2,161,734	2,484,746	22,092,990	115,578,289	8,065,680	23,979,880
NET ASSETS, at end of the year	\$ 27,821,852	\$ 29,639,746	\$ -	\$ 1,864,206	\$ 21,586,709	\$ 89,435,726	\$ 8,823,408	\$ 18,740,713

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	MML Fundamental Value Sub-Account	MML Global Sub-Account (Class I)	MML Global Sub-Account (Class II)	MML Global Sub-Account (Service Class I)	MML Growth Allocation Sub-Account (Initial Class)	MML Growth Allocation Sub-Account (Service Class)	MML High Yield Sub-Account	MML Income & Growth Sub-Account (Initial Class)
Investment income								
Dividends.....	\$ 171,934	\$ 61,331	\$ 67,416	\$ 226,353	\$ 8,230,410	\$ 15,113,854	\$ 3,012,613	\$ 316,198
Expenses								
Mortality and expense risk fees and administrative charges	252,383	48,057	52,602	215,115	4,017,053	7,806,650	515,207	256,290
Net Investment income (loss)	(80,449)	13,274	14,814	11,238	4,213,357	7,307,204	2,497,406	59,908
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(580,697)	(241,946)	(167,340)	(1,422,941)	(4,224,664)	(10,584,026)	(1,087,332)	162,190
Realized gain distribution.....	3,693,954	2,681,213	2,537,527	10,270,001	34,015,506	70,506,702	-	2,407,045
Realized gain (loss).....	3,113,257	2,439,267	2,370,187	8,847,061	29,790,842	59,922,677	(1,087,332)	2,569,235
Change in net unrealized appreciation/ depreciation of investments.....	(4,387,722)	(3,390,765)	(3,304,604)	(12,235,088)	(94,165,932)	(189,978,162)	(7,554,326)	(3,013,042)
Net gain (loss) on investments	(1,274,465)	(951,498)	(934,417)	(3,388,028)	(64,375,090)	(130,055,486)	(8,641,658)	(443,807)
Net increase (decrease) in net assets resulting from operations	(1,354,914)	(938,224)	(919,603)	(3,376,790)	(60,161,733)	(122,748,282)	(6,144,252)	(383,899)
Capital transactions:								
Transfers of net premiums	1,744,339	9,934	47,682	586,834	3,019,271	12,447,825	1,912,837	184,774
Transfers due to death benefits.....	(36,064)	(9,980)	(88,816)	(63,604)	(1,949,590)	(4,386,708)	(594,927)	(263,310)
Transfers due to annuity benefit payments	-	(35,242)	(32)	-	-	-	(526)	(93,947)
Transfers due to withdrawal of funds	(1,827,771)	(292,069)	(135,075)	(1,516,864)	(22,768,729)	(61,585,836)	(4,366,581)	(1,270,856)
Transfers due to loans, net of repayments	(567)	-	(13,098)	-	(4,499)	-	(6,809)	(1,373)
Transfers due to cost of insurance.....	580	(15,977)	-	(45,246)	(4,017,555)	(6,055,687)	3,471	(32,860)
Transfers due to contingent deferred sales charges	(1,199)	-	(105)	(417)	(211)	(8,169)	(194)	(369)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	14,216	5	-	-	-	268	32,355
Transfers between Sub-Accounts and to/from General Account	1,585,735	236,412	107,967	4,580,100	(6,032,187)	2,543,394	(1,388,712)	(521,974)
Net increase (decrease) in net assets resulting from capital transactions.....	1,465,053	(92,706)	(81,472)	3,540,803	(31,753,500)	(57,045,181)	(4,441,173)	(1,967,560)
Total increase (decrease)	110,139	(1,030,930)	(1,001,075)	164,013	(91,915,233)	(179,793,463)	(10,585,425)	(2,351,459)
NET ASSETS, at beginning of the year	20,520,581	5,128,057	4,977,478	19,462,328	373,971,831	763,512,275	48,073,933	23,466,564
NET ASSETS, at end of the year	\$ 20,630,720	\$ 4,097,127	\$ 3,976,403	\$ 19,626,341	\$ 282,056,598	\$ 583,718,812	\$ 37,488,508	\$ 21,115,105

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	MML Income & Growth Sub-Account (Service Class)	MML Inflation- Protected and Income Sub-Account (Initial Class)	MML Inflation- Protected and Income Sub-Account (Service Class)	MML International Equity Sub-Account	MML iShares 60/40 Allocation Sub-Account	MML iShares 80/20 Allocation Sub-Account	MML Large Cap Growth Sub-Account (Initial Class)	MML Large Cap Growth Sub-Account (Service Class)
Investment income								
Dividends.....	\$ 359,104	\$ 2,644,118	\$ 1,162,237	\$ 61,536	\$ 78,194	\$ 254,629	\$ -	\$ -
Expenses								
Mortality and expense risk fees and administrative charges	371,680	1,363,701	614,274	87,560	38,678	129,739	142,941	260,621
Net Investment income (loss)	(12,576)	1,280,417	547,963	(26,024)	39,516	124,890	(142,941)	(260,621)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(196,524)	(1,054,347)	(412,746)	(231,361)	(12,439)	(78,108)	220,283	(26,054)
Realized gain distribution.....	3,306,589	7,434,466	3,610,305	374,357	-	-	1,281,549	2,077,210
Realized gain (loss).....	3,110,065	6,380,119	3,197,559	142,996	(12,439)	(78,108)	1,501,832	2,051,156
Change in net unrealized appreciation/ depreciation of investments	(3,778,763)	(24,621,003)	(11,525,229)	(1,430,412)	(350,356)	(1,185,921)	(6,186,619)	(9,191,691)
Net gain (loss) on investments	(668,698)	(18,240,884)	(8,327,670)	(1,287,416)	(362,795)	(1,264,029)	(4,684,787)	(7,140,535)
Net increase (decrease) in net assets resulting from operations	(681,274)	(16,960,467)	(7,779,707)	(1,313,440)	(323,279)	(1,139,139)	(4,827,728)	(7,401,156)
Capital transactions:								
Transfers of net premiums	927,083	512,293	3,846,674	656,848	5,453,085	19,920,614	135,556	1,007,276
Transfers due to death benefits.....	(392,720)	(2,039,691)	(503,146)	(244,317)	-	(7,546)	(77,601)	(128,139)
Transfers due to annuity benefit payments	-	(335,105)	(521)	-	-	-	(13,439)	-
Transfers due to withdrawal of funds	(2,218,417)	(11,985,993)	(4,762,961)	(530,771)	(25,786)	(30,118)	(1,216,920)	(1,386,466)
Transfers due to loans, net of repayments	-	7,025	-	-	-	-	(12,163)	-
Transfers due to cost of insurance.....	(34,753)	(397,333)	(140,414)	42	-	-	(13,164)	(5,324)
Transfers due to contingent deferred sales charges	(817)	(30)	(8,707)	(828)	(29,230)	(119,060)	(188)	(1,254)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	59,992	53	-	-	-	3,165	-
Transfers between Sub-Accounts and to/from General Account	(742,522)	(6,902,058)	(531,613)	910,659	1	(206)	(375,337)	(18,476)
Net increase (decrease) in net assets resulting from capital transactions	(2,462,146)	(21,080,900)	(2,100,635)	791,633	5,398,070	19,763,684	(1,570,091)	(532,383)
Total increase (decrease)	(3,143,420)	(38,041,367)	(9,880,342)	(521,807)	5,074,791	18,624,545	(6,397,819)	(7,933,539)
NET ASSETS, at beginning of the year	31,561,723	126,908,902	52,995,919	8,307,912	-	-	17,656,357	25,898,086
NET ASSETS, at end of the year	\$ 28,418,303	\$ 88,867,535	\$ 43,115,577	\$ 7,786,105	\$ 5,074,791	\$ 18,624,545	\$ 11,258,538	\$ 17,964,547

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	MML Moderate Allocation Sub-Account (Initial Class)	MML Moderate Allocation Sub-Account (Service Class)	MML Short-Duration Bond Sub-Account	MML Small Cap Equity Sub-Account (Initial Class)	MML Small Cap Equity Sub-Account (Service Class)	MML Small Cap Growth Equity Sub-Account (Initial Class)	MML Small Cap Growth Equity Sub-Account (Service Class)	MML Small Company Value Sub-Account
Investment income								
Dividends.....	\$ 5,839,701	\$ 35,183,820	\$ 924,413	\$ 170,461	\$ 108,874	\$ -	\$ -	\$ -
Expenses								
Mortality and expense risk fees and administrative charges	2,242,005	15,240,729	380,086	271,472	317,307	882,645	324,584	327,432
Net Investment income (loss)	3,597,696	19,943,091	544,327	(101,011)	(208,433)	(882,645)	(324,584)	(327,432)
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(2,083,491)	(39,501,884)	(642,556)	653,101	120,647	(4,727,587)	(2,363,800)	(1,878,844)
Realized gain distribution.....	16,004,361	106,939,391	-	2,853,652	3,044,656	19,915,164	8,085,294	14,125,072
Realized gain (loss).....	13,920,870	67,437,507	(642,556)	3,506,753	3,165,303	15,187,577	5,721,494	12,246,228
Change in net unrealized appreciation/ depreciation of investments.....	(50,999,577)	(315,136,382)	(2,978,754)	(8,197,033)	(8,097,183)	(34,947,506)	(13,245,058)	(16,705,438)
Net gain (loss) on investments	(37,078,707)	(247,698,875)	(3,621,310)	(4,690,280)	(4,931,880)	(19,759,929)	(7,523,564)	(4,459,210)
Net increase (decrease) in net assets resulting from operations	(33,481,011)	(227,755,784)	(3,076,983)	(4,791,291)	(5,140,313)	(20,642,574)	(7,848,148)	(4,786,642)
Capital transactions:								
Transfers of net premiums	784,269	15,562,400	1,194,786	136,880	634,123	587,092	1,037,911	691,865
Transfers due to death benefits.....	(643,371)	(9,374,398)	(327,975)	(150,218)	(106,509)	(808,430)	(181,516)	(187,003)
Transfers due to annuity benefit payments	-	(1,054)	(422)	(27,608)	-	(226,745)	-	-
Transfers due to withdrawal of funds	(18,901,719)	(178,329,361)	(4,659,651)	(2,301,600)	(2,116,782)	(7,326,801)	(2,043,108)	(1,893,834)
Transfers due to loans, net of repayments	27,975	-	-	1,312	-	(3,881)	-	1,422
Transfers due to cost of insurance.....	(1,818,848)	(6,759,388)	61	(24,407)	(20,452)	(263,332)	(44,280)	(21,059)
Transfers due to contingent deferred sales charges	(5)	(6,284)	(1,520)	(373)	(257)	(1,063)	-	(314)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	32	212	11,490	-	38,732	-	-
Transfers between Sub-Accounts and to/from General Account	392,545	(9,837,995)	2,194,637	(639,272)	78,306	1,360,397	(935,587)	74,253
Net increase (decrease) in net assets resulting from capital transactions.....	(20,159,154)	(188,746,048)	(1,599,872)	(2,993,796)	(1,531,571)	(6,644,031)	(2,166,580)	(1,334,670)
Total increase (decrease)	(53,640,165)	(416,501,832)	(4,676,855)	(7,785,087)	(6,671,884)	(27,286,605)	(10,014,728)	(6,121,312)
NET ASSETS, at beginning of the year	214,743,239	1,461,000,467	34,025,850	29,197,903	30,289,216	87,699,978	32,664,648	29,889,996
NET ASSETS, at end of the year	\$ 161,103,074	\$ 1,044,498,635	\$ 29,348,995	\$ 21,412,816	\$ 23,617,332	\$ 60,413,373	\$ 22,649,920	\$ 23,768,684

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	MML Small/Mid Cap Value Sub-Account (Initial Class)	MML Small/Mid Cap Value Sub-Account (Service Class)	MML Special Situations Sub-Account (Service Class I)	MML Strategic Emerging Markets Sub-Account (Service Class I)	MML Sustainable Equity Sub-Account (Initial Class)	MML Sustainable Equity Sub-Account (Service Class)	MML Total Return Bond Sub-Account	MML U.S. Government Money Market Sub-Account
Investment income								
Dividends.....	\$ 1,013,963	\$ 255,938	\$ -	\$ 353,251	\$ 577,250	\$ 351,727	\$ 524,115	\$ 1,411,465
Expenses								
Mortality and expense risk fees and administrative charges	1,030,798	320,170	6,333	146,664	657,155	638,855	494,129	1,241,844
Net Investment income (loss)	(16,835)	(64,232)	(6,333)	206,587	(79,905)	(287,128)	29,986	169,621
Net realized and unrealized gain (loss) on investments								
Realized gain (loss) on sale of fund shares	(1,572,508)	(444,476)	(487,767)	(1,239,663)	5,267,909	1,237,956	(920,383)	374
Realized gain distribution.....	22,055,964	7,050,264	23,065	3,930,101	8,765,580	7,480,195	-	-
Realized gain (loss).....	20,483,456	6,605,788	(464,702)	2,690,438	14,033,489	8,718,151	(920,383)	374
Change in net unrealized appreciation/ depreciation of investments.....	(36,482,132)	(11,583,320)	124,858	(7,222,659)	(26,950,571)	(19,477,341)	(6,323,165)	(373)
Net gain (loss) on investments	(15,998,676)	(4,977,532)	(339,844)	(4,532,221)	(12,917,082)	(10,759,190)	(7,243,548)	1
Net increase (decrease) in net assets resulting from operations	(16,015,511)	(5,041,764)	(346,177)	(4,325,634)	(12,996,987)	(11,046,318)	(7,213,562)	169,622
Capital transactions:								
Transfers of net premiums	436,428	1,041,972	18,686	435,284	375,264	1,260,705	2,622,478	6,447,849
Transfers due to death benefits.....	(964,540)	(95,929)	-	(119,198)	(1,040,060)	(114,248)	(394,394)	(896,021)
Transfers due to annuity benefit payments	(269,122)	-	-	-	(49,900)	-	-	(67,753)
Transfers due to withdrawal of funds	(8,382,824)	(1,621,556)	(152,965)	(862,395)	(4,572,549)	(2,915,616)	(3,820,645)	(39,500,067)
Transfers due to loans, net of repayments	1,571	-	-	(48)	(3,344)	-	(1,457)	(13,312)
Transfers due to cost of insurance.....	(284,820)	(58,643)	-	(24,237)	(68,396)	(57,055)	1,955	(25,525)
Transfers due to contingent deferred sales charges	(11)	(1,065)	-	(646)	(368)	(408)	(3,357)	(1,454)
Transfers due to net charge (credit) to annuitant mortality fluctuation	56,239	-	-	-	22,317	-	-	21,660
Transfers between Sub-Accounts and to/from General Account	(1,571,522)	(734,038)	(600,792)	485,392	(1,000,924)	(1,513,288)	(2,613,419)	74,399,116
Net increase (decrease) in net assets resulting from capital transactions.....	(10,978,601)	(1,469,259)	(735,071)	(85,848)	(6,337,960)	(3,339,910)	(4,208,839)	40,364,493
Total increase (decrease)	(26,994,112)	(6,511,023)	(1,081,248)	(4,411,482)	(19,334,947)	(14,386,228)	(11,422,401)	40,534,115
NET ASSETS, at beginning of the year	99,423,759	29,944,498	1,081,248	15,351,011	74,572,321	60,960,010	47,397,082	90,771,755
NET ASSETS, at end of the year	\$ 72,429,647	\$ 23,433,475	\$ -	\$ 10,939,529	\$ 55,237,374	\$ 46,573,782	\$ 35,974,681	\$ 131,305,870

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

STATEMENTS OF OPERATIONS AND CHANGES IN NET ASSETS (Continued) For The Year Ended December 31, 2022

	PIMCO Commodity RealReturn® Strategy Sub-Account	PIMCO Income Sub-Account	VY® CBRE Global Real Estate Sub-Account
Investment income			
Dividends.....	\$ 2,136,455	\$ 6,683	\$ 324,182
Expenses			
Mortality and expense risk fees and administrative charges	126,080	2,027	134,862
Net Investment income (loss)	2,010,375	4,656	189,320
Net realized and unrealized gain (loss) on investments			
Realized gain (loss) on sale of fund shares	760,141	(521)	(190,175)
Realized gain distribution.....	-	6	555,389
Realized gain (loss).....	760,141	(515)	365,214
Change in net unrealized appreciation/ depreciation of investments.....	(2,178,525)	(10,374)	(4,015,670)
Net gain (loss) on investments	(1,418,384)	(10,889)	(3,650,456)
Net increase (decrease) in net assets resulting from operations	591,991	(6,233)	(3,461,136)
Capital transactions:			
Transfers of net premiums	144,108	847,627	126,995
Transfers due to death benefits.....	(111,424)	-	(83,459)
Transfers due to annuity benefit payments	(25,399)	-	(42,494)
Transfers due to withdrawal of funds	(1,368,790)	(891)	(1,101,455)
Transfers due to loans, net of repayments	731	-	1,970
Transfers due to cost of insurance.....	(43,835)	-	(47,659)
Transfers due to contingent deferred sales charges	(9)	(1,005)	(13)
Transfers due to net charge (credit) to annuitant mortality fluctuation	-	-	-
Transfers between Sub-Accounts	8,760	-	14,705
and to/from General Account	1,335,095	(4,194)	103,860
Net increase (decrease) in net assets resulting from capital transactions.....	(60,763)	841,537	(1,027,550)
Total increase (decrease)	531,228	835,304	(4,488,686)
NET ASSETS, at beginning of the year	8,564,039	-	13,624,068
NET ASSETS, at end of the year	\$ 9,095,267	\$ 835,304	\$ 9,135,382

See Notes to Financial Statements.

Massachusetts Mutual Variable Annuity Separate Account 4

Notes To Financial Statements

1. ORGANIZATION

Massachusetts Mutual Variable Annuity Separate Account 4 (“the Separate Account”) is a separate investment account of Massachusetts Mutual Life Insurance Company (“MassMutual”) established on July 9, 1998. The Separate Account is registered as a unit investment trust under the Investment Company Act of 1940 (“the 1940 Act”).

MassMutual maintains eleven segments within the Separate Account: Panorama Premier, Panorama Passage®, MassMutual Artistry, MassMutual Transitions®, MassMutual EvolutionSM, MassMutual RetireEase SelectSM, MassMutual Transitions SelectSM, MassMutual Equity EdgeSM, MassMutual Transitions SelectSM II, MassMutual Capital Vantage® and MassMutual EnvisionSM. Seven of the eleven segments within the Separate Account have multiple tiers: Panorama Passage®, MassMutual EvolutionSM, MassMutual RetireEase SelectSM, MassMutual Transitions SelectSM, MassMutual EquityEdgeSM, MassMutual Transitions SelectSM II and MassMutual Capital Vantage®. The unit values of these tiers differ based on the associated expense ratios.

The assets and liabilities of the Separate Account are clearly identified and distinguished from MassMutual’s other assets and liabilities. The Separate Account 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

For the year or period ended December 31, 2023, the Separate Account consists of ninety-eight sub-accounts which invest in the following mutual funds. All of the sub-accounts may not be available to all of the eleven segments of the Separate Account:

Sub-Accounts	The sub-account listed in the first column invests in the fund in this column
BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	BlackRock 60/40 Target Allocation ETF V.I. Fund (Class III) ⁷
Cboe Vest U.S. Large Cap 10% Buffer Strategies V.I. Sub-Account ¹⁵	Cboe Vest U.S. Large Cap 10% Buffer Strategies V.I. Portfolio ^{14, 15}
Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Delaware Ivy VIP Asset Strategy Portfolio (Class II) ⁶
Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Portfolio (Initial Class) ¹
Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Contrafund® Portfolio (Service Class 2) ¹
Fidelity® VIP Health Care Sub-Account ¹¹	Fidelity® VIP Health Care Portfolio ^{1, 11}
Fidelity® VIP Overseas Sub-Account (Service Class 2) ¹⁵	Fidelity® VIP Overseas Portfolio (Service Class 2) ^{1, 15}
Fidelity® VIP Real Estate Sub-Account ¹¹	Fidelity® VIP Real Estate Portfolio ^{1, 11}
Fidelity® VIP Strategic Income Sub-Account ¹¹	Fidelity® VIP Strategic Income Portfolio ^{1, 11}
Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)	Invesco Oppenheimer V.I. International Growth Fund (Series I) ³
Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)	Invesco Oppenheimer V.I. International Growth Fund (Series II) ³
Invesco V.I. Capital Appreciation Sub-Account (Series I)	Invesco V.I. Capital Appreciation Fund (Series I) ³
Invesco V.I. Capital Appreciation Sub-Account (Series II)	Invesco V.I. Capital Appreciation Fund (Series II) ³
Invesco V.I. Conservative Balanced Sub-Account (Series I)	Invesco V.I. Conservative Balanced Fund (Series I) ³
Invesco V.I. Conservative Balanced Sub-Account (Series II)	Invesco V.I. Conservative Balanced Fund (Series II) ³
Invesco V.I. Core Plus Bond Sub-Account	Invesco V.I. Core Plus Bond Fund ^{3, 12}
Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)	Invesco V.I. Discovery Mid Cap Growth Fund (Series I) ³
Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)	Invesco V.I. Discovery Mid Cap Growth Fund (Series II) ³
Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Diversified Dividend Fund (Series I) ³
Invesco V.I. Diversified Dividend Sub-Account (Series II)	Invesco V.I. Diversified Dividend Fund (Series II) ³
Invesco V.I. Global Sub-Account (Series I)	Invesco V.I. Global Fund (Series I) ³
Invesco V.I. Global Sub-Account (Series II)	Invesco V.I. Global Fund (Series II) ³
Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Strategic Income Fund (Series I) ³
Invesco V.I. Global Strategic Income Sub-Account (Series II)	Invesco V.I. Global Strategic Income Fund (Series II) ³
Invesco V.I. Health Care Sub-Account (Series I)	Invesco V.I. Health Care Fund (Series I) ³
Invesco V.I. Health Care Sub-Account (Series II)	Invesco V.I. Health Care Fund (Series II) ³
Invesco V.I. Main Street Sub-Account (Series I)	Invesco V.I. Main Street Fund® (Series I) ³
Invesco V.I. Main Street Sub-Account (Series II)	Invesco V.I. Main Street Fund® (Series II) ³
Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Fund (Series I) ³
Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. Technology Fund (Series II) ³
Invesco V.I. U.S. Government Money Sub-Account	Invesco V.I. U.S. Government Money Portfolio ³
Janus Henderson Global Technology and Innovation Sub-Account ¹¹	Janus Henderson Global Technology and Innovation Fund ^{11, 13}
MML Aggressive Allocation Sub-Account (Initial Class)	MML Aggressive Allocation Fund (Initial Class) ⁴
MML Aggressive Allocation Sub-Account (Service Class)	MML Aggressive Allocation Fund (Service Class) ⁴
MML American Funds Core Allocation Sub-Account	MML American Funds Core Allocation Fund ⁴
MML American Funds Growth Sub-Account	MML American Funds Growth Fund ⁴

Notes To Financial Statements (Continued)

MML Balanced Allocation Sub-Account (Initial Class)	MML Balanced Allocation Fund (Initial Class) ⁴
MML Balanced Allocation Sub-Account (Service Class)	MML Balanced Allocation Fund (Service Class) ⁴
MML Blend Sub-Account (Initial Class)	MML Blend Fund (Initial Class) ⁴
MML Blend Sub-Account (Service Class)	MML Blend Fund (Service Class) ⁴
MML Blue Chip Growth Sub-Account (Initial Class)	MML Blue Chip Growth Fund (Initial Class) ⁴
MML Blue Chip Growth Sub-Account (Service Class)	MML Blue Chip Growth Fund (Service Class) ⁴
MML Conservative Allocation Sub-Account (Initial Class)	MML Conservative Allocation Fund (Initial Class) ⁴
MML Conservative Allocation Sub-Account (Service Class)	MML Conservative Allocation Fund (Service Class) ⁴
MML Dynamic Bond Sub-Account (Service Class I)	MML Dynamic Bond Fund (Service Class I) ⁴
MML Equity Sub-Account (Initial Class)	MML Equity Fund (Initial Class) ⁴
MML Equity Sub-Account (Service Class)	MML Equity Fund (Service Class) ⁴
MML Equity Income Sub-Account (Initial Class)	MML Equity Income Fund (Initial Class) ⁴
MML Equity Income Sub-Account (Service Class)	MML Equity Income Fund (Service Class) ⁴
MML Equity Index Sub-Account (Class I)	MML Equity Index Fund (Class I) ⁴
MML Equity Index Sub-Account (Service Class I)	MML Equity Index Fund (Service Class I) ⁴
MML Equity Rotation Sub-Account (Service Class I)	MML Equity Rotation Fund (Service Class I) ⁴
MML Focused Equity Sub-Account	MML Focused Equity Fund (Initial Class) ⁴
MML Foreign Sub-Account (Initial Class)	MML Foreign Fund (Initial Class) ⁴
MML Foreign Sub-Account (Service Class)	MML Foreign Fund (Service Class) ⁴
MML Fundamental Equity Sub-Account	MML Fundamental Equity Fund (Initial Class) ⁴
MML Fundamental Value Sub-Account	MML Fundamental Value Fund (Initial Class) ⁴
MML Global Sub-Account (Class I)	MML Global Fund (Class I) ⁴
MML Global Sub-Account (Class II)	MML Global Fund (Class II) ⁴
MML Global Sub-Account (Service Class I)	MML Global Fund (Service Class I) ⁴
MML Growth Allocation Sub-Account (Initial Class)	MML Growth Allocation Fund (Initial Class) ⁴
MML Growth Allocation Sub-Account (Service Class)	MML Growth Allocation Fund (Service Class) ⁴
MML High Yield Sub-Account	MML High Yield Fund ⁴
MML Income & Growth Sub-Account (Initial Class)	MML Income & Growth Fund (Initial Class) ⁴
MML Income & Growth Sub-Account (Service Class)	MML Income & Growth Fund (Service Class) ⁴
MML Inflation-Protected and Income Sub-Account (Initial Class)	MML Inflation-Protected and Income Fund (Initial Class) ⁴
MML Inflation-Protected and Income Sub-Account (Service Class)	MML Inflation-Protected and Income Fund (Service Class) ⁴
MML International Equity Sub-Account	MML International Equity Fund ⁴
MML iShares® 60/40 Allocation Sub-Account ¹¹	MML iShares® 60/40 Allocation Fund ^{4, 11}
MML iShares® 80/20 Allocation Sub-Account ¹¹	MML iShares® 80/20 Allocation Fund ^{4, 11}
MML Large Cap Growth Sub-Account (Initial Class)	MML Large Cap Growth Fund (Initial Class) ⁴
MML Large Cap Growth Sub-Account (Service Class)	MML Large Cap Growth Fund (Service Class) ⁴
MML Managed Bond Sub-Account (Initial Class)	MML Managed Bond Fund (Initial Class) ⁴
MML Managed Bond Sub-Account (Service Class)	MML Managed Bond Fund (Service Class) ⁴
MML Managed Volatility Sub-Account (Initial Class)	MML Managed Volatility Fund (Initial Class) ⁴
MML Managed Volatility Sub-Account (Service Class)	MML Managed Volatility Fund (Service Class) ⁴
MML Mid Cap Growth Sub-Account (Initial Class)	MML Mid Cap Growth Fund (Initial Class) ⁴
MML Mid Cap Growth Sub-Account (Service Class)	MML Mid Cap Growth Fund (Service Class) ⁴
MML Mid Cap Value Sub-Account (Initial Class)	MML Mid Cap Value Fund (Initial Class) ⁴
MML Mid Cap Value Sub-Account (Service Class)	MML Mid Cap Value Fund (Service Class) ⁴
MML Moderate Allocation Sub-Account (Initial Class)	MML Moderate Allocation Fund (Initial Class) ⁴
MML Moderate Allocation Sub-Account (Service Class)	MML Moderate Allocation Fund (Service Class) ⁴

Notes To Financial Statements (Continued)

MML Short-Duration Bond Sub-Account	MML Short-Duration Bond Fund ⁴
MML Small Cap Equity Sub-Account (Initial Class)	MML Small Cap Equity Fund (Initial Class) ⁴
MML Small Cap Equity Sub-Account (Service Class)	MML Small Cap Equity Fund (Service Class) ⁴
MML Small Cap Growth Equity Sub-Account (Initial Class)	MML Small Cap Growth Equity Fund (Initial Class) ⁴
MML Small Cap Growth Equity Sub-Account (Service Class)	MML Small Cap Growth Equity Fund (Service Class) ⁴
MML Small Company Value Sub-Account	MML Small Company Value Fund ⁴
MML Small/Mid Cap Value Sub-Account (Initial Class)	MML Small/Mid Cap Value Fund (Initial Class) ⁴
MML Small/Mid Cap Value Sub-Account (Service Class)	MML Small/Mid Cap Value Fund (Service Class) ⁴
MML Strategic Emerging Markets Sub-Account (Service Class I)	MML Strategic Emerging Markets Fund (Service Class I) ⁴
MML Sustainable Equity Sub-Account (Initial Class)	MML Sustainable Equity Fund (Initial Class) ^{4,8}
MML Sustainable Equity Sub-Account (Service Class) ⁸	MML Sustainable Equity Fund (Service Class) ^{4,9}
MML Total Return Bond Sub-Account ⁹	MML Total Return Bond Fund ⁴
MML U.S. Government Money Market Sub-Account	MML U.S. Government Money Market Fund ⁴
PIMCO CommodityRealReturn® Strategy Sub-Account	PIMCO CommodityRealReturn® Strategy Portfolio ⁵
PIMCO Income Sub-Account ¹¹	PIMCO Income Portfolio ^{5,11}
VY® CBRE Global Real Estate Sub-Account ¹⁰	VY® CBRE Global Real Estate Fund ^{2,10}

In addition to the ninety-eight sub-accounts, 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.

¹Fidelity Management & Research Company LLC is the investment adviser to this Portfolio.

²Voya Investments, LLC is the investment adviser to this Portfolio.

³Invesco Advisers, Inc. is the investment adviser to this Fund.

⁴MML Investment Advisers, LLC is the investment adviser to this Fund.

⁵Pacific Investment Management Company LLC is the investment adviser to this Portfolio.

⁶Delaware Management Company, a series of Macquarie Investment Management Business Trust, is the investment adviser to this Portfolio.

⁷BlackRock Advisors, LLC is the investment adviser for this Fund.

⁸Prior to April 29, 2022, known as MML Growth & Income Sub-Account/Fund (Initial Class).

⁹Prior to April 29, 2022, known as MML Growth & Income Sub-Account/Fund (Service Class).

¹⁰Prior to May 1, 2022, known as VY® Clarion Global Real Estate Sub-Account/Fund.

¹¹This Sub-Account/Fund became available to the Separate Account as an investment option on February 28, 2022.

¹²After the close of business on April 29, 2022, Invesco V.I. Core Plus Bond Fund acquired all the net assets of Invesco V.I. Core Bond Fund pursuant to a plan of reorganization approved by the Board of Trustees of the Invesco V.I. Core Plus Bond Fund on December 1, 2021 and by the shareholders of the Invesco V.I. Core Bond Fund on March 31, 2022. The acquisition was accomplished by a tax-free exchange as of the close of business on April 29, 2022. Shares of Invesco V.I. Core Bond Fund were exchanged for the like class of shares of Invesco V.I. Core Plus Bond Fund, based on the relative net asset value of the two funds which resulted in Invesco V.I. Core Bond Fund receiving 1.15816327 shares of Invesco V.I. Core Plus Bond Fund in exchange of 1 share of Invesco V.I. Core Bond Fund. As a result of the underlying fund merger, the subaccount name changed from Invesco V.I. Core Bond Fund to Invesco V.I. Core Plus Bond Fund.

¹³Janus Henderson Investors US, LLC is the investment adviser to this Fund.

¹⁴Cboe VestSM Financial LLC is the investment adviser to this Fund.

¹⁵This Sub-Account/Fund became available to the Separate Account as an investment option on May 1, 2023.

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. Massachusetts Mutual Variable Annuity Separate Account 4 follows the accounting and reporting guidance in FASB Accounting Standards Codification 946.

A. Investment Valuation

Investments in the underlying funds held by each sub-account are carried at fair value which is based on 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 funds.

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 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 at 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. Loans

If the certificate is a tax-sheltered annuity ("TSA"), the participants may be able to take a loan under their certificate. All such loans must conform to the requirements of the Internal Revenue Code. There are limitations on the amount of the loan the participants can take, and there is a required loan repayment schedule. When a loan is made, the Separate Account transfers the amount of the loan to MassMutual, thereby decreasing both the investments and net assets of the Separate Account by an equal amount. The contract owner is charged interest on the outstanding loan amount based on the interest rate then in effect.

Notes To Financial Statements (Continued)

G. Annuitant Mortality Fluctuation

The Separate Account contributes to an Annuitant Mortality Fluctuation Fund (AMFF) reserve maintained by MassMutual as required by regulatory authorities to provide for mortality losses incurred. The AMFF 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 AMFF reserve which is held in the Separate Account. Net transfers from the MassMutual to the Separate Account totaled \$948,840 and \$1,031,370 for the years ended December 31, 2023 and 2022, respectively. The AMFF 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 AMFF reserve is not available to owners of the contracts except to the extent necessary to cover mortality losses under the contracts.

H. Annuity Reserves

Annuity reserves are developed by using accepted actuarial methods and are computed using the 1994 MGDB table, except for the MassMutual RetireEase Select SM Segment which uses the Annuity 2000 table.

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 investments of the Separate Account are measured at fair value. All the investments are categorized as Level 1 as of December 31, 2023. There have been no transfers between levels for the year ended December 31, 2023.

5. RELATED PARTY TRANSACTIONS

A. Sales Agreements

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

Notes To Financial Statements (Continued)

Both MMLIS and MSD are registered with the Securities and Exchange Commission (the “SEC”) as broker-dealers under the Securities and 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.

B. Receivable from/Payable to MassMutual

Certain fees such as mortality and expense risk fees are charges paid between the General Account and Separate Account. The General Account is not registered as an investment company under the 1940 Act.

Notes To Financial Statements (Continued)

6. PURCHASES AND SALES OF INVESTMENTS

The cost of purchases and proceeds from sales of investments for each of the years in the two-year period ended December 31, 2023 were as follows:

2023	BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	Choe Vest U.S. Large Cap 10% Buffer Strategies V.I. Sub-Account	Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Health Care Sub-Account	Fidelity® VIP Overseas Sub-Account (Service Class 2)	Fidelity® VIP Real Estate Sub-Account
Cost of purchases	\$ 1,408,248	\$ 465,572	\$ 512,195	\$ 11,045,437	\$ 19,845,188	\$ 608,368	\$ 145,843	\$ 363,521
Proceeds from sales	(1,192,333)	(7,358)	(1,488,450)	(36,788,207)	(32,322,582)	(24,429)	(1,210)	(16,641)
2023 (Continued)	Fidelity® VIP Strategic Income Sub-Account	Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)	Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)	Invesco V.I. Capital Appreciation Sub-Account (Series I)	Invesco V.I. Capital Appreciation Sub-Account (Series II)	Invesco V.I. Conservative Balanced Sub-Account (Series I)	Invesco V.I. Conservative Balanced Sub-Account (Series II)	Invesco V.I. Core Plus Bond Sub-Account
Cost of purchases	\$ 517,514	\$ 463,946	\$ 1,328,341	\$ 5,988,728	\$ 745,568	\$ 123,415	\$ 227	\$ 36,176
Proceeds from sales	(33,236)	(3,427,319)	(3,471,443)	(27,590,740)	(1,888,281)	(611,536)	(35,678)	(155,889)
2023 (Continued)	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)	Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Diversified Dividend Sub-Account (Series II)	Invesco V.I. Global Sub-Account (Series I)	Invesco V.I. Global Sub-Account (Series II)	Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Strategic Income Sub-Account (Series II)
Cost of purchases	\$ 5,956,629	\$ 2,064,650	\$ 783,671	\$ 1,187,934	\$ 14,872,907	\$ 9,661,292	\$ 4,382,891	\$ 1,756,553
Proceeds from sales	(11,695,206)	(3,123,755)	(896,666)	(1,974,283)	(26,205,538)	(10,757,487)	(19,582,716)	(6,341,266)
2023 (Continued)	Invesco V.I. Health Care Sub-Account (Series I)	Invesco V.I. Health Care Sub-Account (Series II)	Invesco V.I. Main Street Sub-Account (Series I)	Invesco V.I. Main Street Sub-Account (Series II)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. U.S. Government Money Sub-Account	Janus Henderson Global Technology and Innovation Sub-Account
Cost of purchases	\$ 322,993	\$ 182,116	\$ 2,372,466	\$ 2,154,255	\$ 1,032,349	\$ 677,423	\$ 1,861,345	\$ 321,303
Proceeds from sales	(1,273,222)	(1,570,948)	(3,527,250)	(3,427,627)	(1,105,256)	(1,650,668)	(2,571,561)	(34,810)

Notes To Financial Statements (Continued)

6. PURCHASES AND SALES OF INVESTMENTS (Continued)

2023 (Continued)									
Cost of purchases	\$ 4,513,061	\$ 12,555,132	\$ 108,562,080	\$ 53,998,707	\$ 7,285,252	\$ 35,887,918	\$ 1,634,929	\$ 9,656,752	
Proceeds from sales	(4,848,262)	(11,936,760)	(132,364,921)	(38,782,479)	(11,817,024)	(51,833,026)	(9,495,746)	(20,572,217)	
2023 (Continued)									
Cost of purchases	\$ 1,281,389	\$ 7,334,611	\$ 7,884,760	\$ 30,132,742	\$ 2,170,509	\$ 2,739,711	\$ 10,705,707	\$ 16,922,914	
Proceeds from sales	(9,022,334)	(23,125,220)	(10,339,019)	(50,884,223)	(2,013,929)	(3,432,228)	(17,681,104)	(21,584,808)	
2023 (Continued)									
Cost of purchases	\$ 11,083,453	\$ 5,109,783	\$ 3,747,374	\$ 299,613	\$ 4,869,194	\$ 4,532,896	\$ 1,083,293	\$ 2,634,588	
Proceeds from sales	(16,935,976)	(4,900,033)	(9,441,003)	(798,981)	(4,325,992)	(22,760,528)	(1,890,264)	(3,927,387)	
2023 (Continued)									
Cost of purchases	\$ 4,290,671	\$ 748,663	\$ 441,664	\$ 3,338,227	\$ 47,341,099	\$ 101,334,041	\$ 6,782,921	\$ 3,784,211	
Proceeds from sales	(4,598,924)	(472,388)	(560,061)	(2,781,610)	(41,518,153)	(75,509,560)	(6,892,787)	(3,374,419)	

Notes To Financial Statements (Continued)

6. PURCHASES AND SALES OF INVESTMENTS (Continued)

2023 (Continued)										
Cost of purchases	MML Income & Growth Sub-Account (Service Class)	MML Inflation-Protected and Income Sub-Account (Initial Class)	MML Inflation-Protected and Income Sub-Account (Service Class)	MML International Equity Sub-Account	MML iShares® 60/40 Allocation Sub-Account	MML iShares® 80/20 Allocation Sub-Account	MML Large Cap Growth Sub-Account (Initial Class)	MML Large Cap Growth Sub-Account (Service Class)		
Proceeds from sales	6,536,306 \$ (4,955,845)	13,308,684 \$ (16,573,698)	4,717,110 \$ (7,924,161)	1,769,768 \$ (1,216,375)	6,658,858 \$ (262,603)	17,747,705 \$ (2,736,453)	2,257,133 \$ (2,963,835)	6,292,436 \$ (2,937,703)		
2023 (Continued)										
Cost of purchases	MML Managed Bond Sub-Account (Initial Class)	MML Managed Bond Sub-Account (Service Class)	MML Managed Volatility Sub-Account (Initial Class)	MML Managed Volatility Sub-Account (Service Class)	MML Mid Cap Growth Sub-Account (Initial Class)	MML Mid Cap Growth Sub-Account (Service Class)	MML Mid Cap Value Sub-Account (Initial Class)	MML Mid Cap Value Sub-Account (Service Class)		
Proceeds from sales	8,067,912 \$ (13,070,622)	16,778,620 \$ (37,864,477)	14,095,459 \$ (11,909,607)	3,856,363 \$ (4,577,203)	790,566 \$ (8,675,724)	3,521,879 \$ (13,813,944)	24,672,465 \$ (19,528,048)	11,909,398 \$ (9,947,322)		
2023 (Continued)										
Cost of purchases	MML Moderate Allocation Sub-Account (Initial Class)	MML Moderate Allocation Sub-Account (Service Class)	MML Short-Duration Bond Sub-Account	MML Small Cap Equity Sub-Account (Initial Class)	MML Small Cap Equity Sub-Account (Service Class)	MML Small Cap Growth Equity Sub-Account (Initial Class)	MML Small Cap Growth Equity Sub-Account (Service Class)	MML Small Company Value Sub-Account		
Proceeds from sales	24,122,948 \$ (25,634,865)	140,656,460 \$ (227,355,739)	6,252,387 \$ (6,174,004)	606,888 \$ (3,065,607)	2,299,808 \$ (4,317,999)	5,399,898 \$ (11,052,205)	953,581 \$ (3,624,049)	1,445,599 \$ (4,056,341)		
2023 (Continued)										
Cost of purchases	MML Small/Mid Cap Value Sub-Account (Initial Class)	MML Small/Mid Cap Value Sub-Account (Service Class)	MML Strategic Emerging Markets Sub-Account (Service Class I)	MML Sustainable Equity Sub-Account (Initial Class)	MML Sustainable Equity Sub-Account (Service Class)	MML Total Return Bond Sub-Account	MML U.S. Government Money Market Sub-Account	MML Commodity RealReturn® Strategy Sub-Account		
Proceeds from sales	12,826,743 \$ (12,607,938)	4,420,416 \$ (3,693,240)	996,804 \$ (1,857,338)	18,695,587 \$ (8,541,008)	16,391,572 \$ (8,040,734)	5,119,535 \$ (5,838,837)	41,619,200 \$ (56,212,686)	1,861,740 \$ (2,171,415)		

Notes To Financial Statements (Continued)

6. PURCHASES AND SALES OF INVESTMENTS (Continued)

	PIMCO Income Sub-Account	VY® CBRE Global Real Estate Sub-Account
2023 (Continued)		
Cost of purchases	1,265,650	\$ 809,966
Proceeds from sales	(32,871)	(1,566,092)

Notes To Financial Statements (Continued)

6. PURCHASES AND SALES OF INVESTMENTS (Continued)

	BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Healthcare Sub-Account	Fidelity® VIP Real Estate Sub-Account	Fidelity® VIP Strategic Income Sub-Account	Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)
2022								
Cost of purchases	\$ 2,554,902	\$ 1,954,988	\$ 19,530,330	\$ 26,001,389	\$ 466,103	\$ 196,967	\$ 222,268	\$ 5,484,471
Proceeds from sales	(1,532,645)	(1,398,464)	(27,667,404)	(28,841,489)	(20,092)	(12,874)	(11,301)	(2,122,186)
	Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)	Invesco V.I. Capital Appreciation Sub-Account (Series I)	Invesco V.I. Capital Appreciation Sub-Account (Series II)	Invesco V.I. Conservative Balanced Sub-Account (Series I)	Invesco V.I. Conservative Balanced Sub-Account (Series II)	Invesco V.I. Core Plus Bond Sub-Account	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)
2022 (Continued)								
Cost of purchases	\$ 6,848,332	\$ 51,714,769	\$ 3,351,030	\$ 568,390	\$ 4,349	\$ 61,719	\$ 33,352,710	\$ 10,410,476
Proceeds from sales	(3,604,668)	(18,815,019)	(2,414,713)	(551,694)	(1,719)	(108,656)	(15,136,294)	(3,456,290)
	Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Diversified Dividend Sub-Account (Series II)	Invesco V.I. Global Sub-Account (Series I)	Invesco V.I. Global Sub-Account (Series II)	Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Strategic Income Sub-Account (Series II)	Invesco V.I. Health Care Sub-Account (Series I)	Invesco V.I. Health Care Sub-Account (Series II)
2022 (Continued)								
Cost of purchases	\$ 1,070,403	\$ 2,427,901	\$ 36,265,118	\$ 14,735,294	\$ 1,462,361	\$ 1,661,279	\$ 1,724,667	\$ 1,973,266
Proceeds from sales	(635,538)	(2,625,659)	(18,294,943)	(8,573,412)	(22,958,183)	(9,385,500)	(1,333,797)	(2,072,156)
	Invesco V.I. Main Street Sub-Account (Series I)	Invesco V.I. Main Street Sub-Account (Series II)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. U.S. Government Money Sub-Account	Janus Henderson Global Technology and Innovation Sub-Account	MML Aggressive Allocation Sub-Account (Initial Class)	MML Aggressive Allocation Sub-Account (Service Class)
2022 (Continued)								
Cost of purchases	\$ 11,880,801	\$ 9,213,436	\$ 2,972,065	\$ 3,686,465	\$ 1,799,306	\$ 308,876	\$ 6,616,890	\$ 15,694,788
Proceeds from sales	(3,231,854)	(3,069,684)	(1,086,351)	(1,695,172)	(911,914)	(7,182)	(6,372,038)	(14,242,336)

Notes To Financial Statements (Continued)

6. PURCHASES AND SALES OF INVESTMENTS (Continued)

2022 (Continued)										
Cost of purchases	MML Income & Growth Sub-Account (Service Class)	MML Inflation-Protected and Income Sub-Account (Initial Class)	MML Inflation-Protected and Income Sub-Account (Service Class)	MML International Equity Sub-Account	MML iShares 60/40 Allocation Sub-Account	MML iShares 80/20 Allocation Sub-Account	MML Large Cap Growth Sub-Account (Initial Class)	MML Large Cap Growth Sub-Account (Service Class)		
Proceeds from sales	6,170,988 \$ (5,339,118)	12,921,559 \$ (25,284,905)	13,137,631 \$ (11,080,559)	2,360,905 \$ (1,220,916)	6,124,696 \$ (687,112)	21,027,372 \$ (1,138,800)	1,653,896 \$ (2,085,471)	3,773,297 \$ (2,489,083)		
2022 (Continued)										
Cost of purchases	MML Managed Bond Sub-Account (Initial Class)	MML Managed Bond Sub-Account (Service Class)	MML Managed Volatility Sub-Account (Initial Class)	MML Managed Volatility Sub-Account (Service Class)	MML Mid Cap Growth Sub-Account (Initial Class)	MML Mid Cap Growth Sub-Account (Service Class)	MML Mid Cap Value Sub-Account (Initial Class)	MML Mid Cap Value Sub-Account (Service Class)		
Proceeds from sales	6,084,626 \$ (18,263,237)	14,274,715 \$ (42,351,971)	1,114,622 \$ (17,529,263)	1,577,667 \$ (5,151,220)	19,859,720 \$ (8,512,086)	33,163,456 \$ (12,452,152)	30,331,014 \$ (27,522,781)	19,179,135 \$ (9,903,303)		
2022 (Continued)										
Cost of purchases	MML Moderate Allocation Sub-Account (Initial Class)	MML Moderate Allocation Sub-Account (Service Class)	MML Short-Duration Bond Sub-Account	MML Small Cap Equity Sub-Account (Initial Class)	MML Small Cap Equity Sub-Account (Service Class)	MML Small Cap Growth Equity Sub-Account (Initial Class)	MML Small Cap Growth Equity Sub-Account (Service Class)	MML Small Company Value Sub-Account		
Proceeds from sales	25,447,152 \$ (26,004,262)	159,930,784 \$ (221,794,394)	7,020,660 \$ (8,076,198)	3,259,130 \$ (3,501,051)	4,921,625 \$ (3,616,982)	24,985,559 \$ (12,597,778)	9,904,791 \$ (4,310,658)	15,923,749 \$ (3,460,791)		
2022 (Continued)										
Cost of purchases	MML Small/Mid Cap Value Sub-Account (Initial Class)	MML Small/Mid Cap Value Sub-Account (Service Class)	MML Special Situations Sub-Account (Service Class I)	MML Strategic Emerging Markets Sub-Account (Service Class I)	MML Sustainable Equity Sub-Account (Initial Class)	MML Sustainable Equity Sub-Account (Service Class)	MML Total Return Bond Sub-Account	MML U.S. Government Money Market Sub-Account		
Proceeds from sales	24,794,452 \$ (13,733,662)	9,057,098 \$ (3,540,318)	84,719 \$ (803,058)	5,875,571 \$ (1,824,764)	10,274,803 \$ (7,928,875)	9,959,031 \$ (6,105,886)	3,866,228 \$ (8,045,100)	96,739,029 \$ (56,206,203)		

Notes To Financial Statements (Continued)

6. PURCHASES AND SALES OF INVESTMENTS (Continued)

	PIMCO Commodity RealReturn® Strategy Sub-Account	PIMCO Income Sub-Account	VY® CBRE Global Real Estate Sub-Account
2022 (Continued)			
Cost of purchases	5,833,550	\$ 854,640	\$ 1,511,554
Proceeds from sales	(3,883,899)	(8,450)	(1,794,455)

Notes To Financial Statements (Continued)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS

The changes in outstanding units for the two years ended December 31, 2023 were as follows:

	BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	Choe Vest U.S. Large Cap 10% Buffer Strategies V.I. Sub-Account	Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Health Care Sub-Account	Fidelity® VIP Overseas Sub-Account (Service Class 2)	Fidelity® VIP Real Estate Sub-Account
2023								
Units purchased	75,966	44,509	20,515	35,377	647,341	46,113	14,630	37,360
Units withdrawn	(70,450)	(261)	(87,372)	(473,574)	(963,721)	(802)	(23)	(195)
Units transferred between Sub-Accounts and to/from the Fixed Account	(768)	(200)	(6,183)	(168,906)	119,851	12,855	13	3,293
Net increase (decrease)	4,748	44,048	(73,040)	(607,103)	(196,529)	58,166	14,620	40,458
	Fidelity® VIP Strategic Income Sub-Account	Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)	Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)	Invesco V.I. Capital Appreciation Sub-Account (Series I)	Invesco V.I. Capital Appreciation Sub-Account (Series II)	Invesco V.I. Conservative Balanced Sub-Account (Series I)	Invesco V.I. Conservative Balanced Sub-Account (Series II)	Invesco V.I. Core Plus Bond Sub-Account
2023 (Continued)								
Units purchased	48,029	7,058	69,627	16,223	1,349	1,284	-	1
Units withdrawn	(487)	(83,881)	(178,269)	(418,829)	(47,740)	(28,735)	(2,173)	(9,860)
Units transferred between Sub-Accounts and to/from the Fixed Account	1,722	(27,831)	18,080	(135,544)	18,869	(2,289)	-	(47)
Net increase (decrease)	49,264	(104,654)	(90,562)	(538,150)	(27,522)	(29,740)	(2,173)	(9,906)
	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)	Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)	Invesco V.I. Diversified Dividend Sub-Account (Series I)	Invesco V.I. Diversified Dividend Sub-Account (Series II)	Invesco V.I. Global Income Sub-Account (Series I)	Invesco V.I. Global Income Sub-Account (Series II)	Invesco V.I. Global Strategic Income Sub-Account (Series I)	Invesco V.I. Global Strategic Income Sub-Account (Series II)
2023 (Continued)								
Units purchased	16,962	118,931	7,131	3,453	22,224	145,976	41,222	87,699
Units withdrawn	(270,262)	(118,587)	(45,451)	(106,477)	(412,832)	(388,183)	(926,606)	(397,794)
Units transferred between Sub-Accounts and to/from the Fixed Account	125,494	4,249	3,077	(14,949)	(252,398)	(598)	1,338	7,914
Net increase (decrease)	(127,806)	4,593	(35,243)	(117,973)	(643,006)	(242,805)	(884,046)	(302,181)
	Invesco V.I. Health Care Sub-Account (Series I)	Invesco V.I. Health Care Sub-Account (Series II)	Invesco V.I. Main Street Sub-Account (Series I)	Invesco V.I. Main Street Sub-Account (Series II)	Invesco V.I. Technology Sub-Account (Series I)	Invesco V.I. Technology Sub-Account (Series II)	Invesco V.I. U.S. Government Money Sub-Account	Janus Henderson Global Technology and Innovation Sub-Account
2023 (Continued)								
Units purchased	3,542	1,941	3,148	30,050	9,525	1,990	7,637	25,201
Units withdrawn	(29,588)	(35,973)	(73,235)	(136,000)	(39,183)	(30,968)	(192,455)	(271)
Units transferred between Sub-Accounts and to/from the Fixed Account	2,536	(5,515)	(13,987)	(3,027)	16,011	6,373	93,126	3,817
Net increase (decrease)	(23,510)	(39,547)	(84,074)	(108,977)	(13,647)	(22,605)	(91,692)	28,747

Notes To Financial Statements (Continued)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS (Continued)

2023 (Continued)	MML Aggressive Allocation Sub-Account (Initial Class)	MML Aggressive Allocation Sub-Account (Service Class)	MML American Funds Core Allocation Sub-Account	MML American Funds Growth Sub-Account	MML Balanced Allocation Sub-Account (Initial Class)	MML Balanced Allocation Sub-Account (Service Class)	MML Blend Sub-Account (Initial Class)	MML Blend Sub-Account (Service Class)
Units purchased	20,498	158,859	354,195	1,056,639	16,296	534,552	9,217	488,355
Units withdrawn	(179,907)	(546,308)	(6,485,414)	(925,146)	(556,796)	(2,907,212)	(272,188)	(1,029,778)
Units transferred between Sub-Accounts and to/from the Fixed Account.....	(4,793)	4,169	50,070	59,638	(21,375)	(167,964)	(8,593)	2,686
Net increase (decrease)	(164,202)	(383,280)	(6,081,149)	191,131	(561,875)	(2,540,624)	(271,564)	(538,737)
2023 (Continued)	MML Blue Chip Growth Sub-Account (Initial Class)	MML Blue Chip Growth Sub-Account (Service Class)	MML Conservative Allocation Sub-Account (Initial Class)	MML Conservative Allocation Sub-Account (Service Class)	MML Dynamic Bond Sub-Account (Service Class I)	MML Equity Sub-Account (Initial Class)	MML Equity Sub-Account (Service Class)	MML Equity Income Sub-Account (Initial Class)
Units purchased	6,622	368,782	7,019	309,248	170,594	5,686	102,634	19,757
Units withdrawn	(117,042)	(766,078)	(488,076)	(2,865,731)	(180,690)	(80,960)	(568,999)	(491,709)
Units transferred between Sub-Accounts and to/from the Fixed Account.....	(24,777)	21,980	71,714	(156,342)	(6,127)	(12,383)	(77,407)	18,576
Net increase (decrease)	(135,197)	(375,316)	(409,343)	(2,712,825)	(16,223)	(87,657)	(543,772)	(453,376)
2023 (Continued)	MML Equity Income Sub-Account (Service Class)	MML Equity Index Sub-Account (Class I)	MML Equity Index Sub-Account (Service Class I)	MML Equity Rotation Sub-Account (Service Class I)	MML Focused Equity Sub-Account	MML Foreign Sub-Account (Initial Class)	MML Foreign Sub-Account (Service Class)	MML Fundamental Equity Sub-Account
Units purchased	145,659	9,042	2,941	14,878	113,199	25,794	18,788	97,598
Units withdrawn	(591,498)	(105,034)	(200,779)	(35,219)	(143,704)	(702,709)	(87,309)	(129,645)
Units transferred between Sub-Accounts and to/from the Fixed Account.....	(17,147)	33,339	(6,614)	3,823	9,959	(472,592)	10,881	30,614
Net increase (decrease)	(462,986)	(62,653)	(204,452)	(16,518)	(20,546)	(1,149,507)	(57,640)	(1,433)
2023 (Continued)	MML Fundamental Value Sub-Account	MML Global Sub-Account (Class I)	MML Global Sub-Account (Class II)	MML Global Sub-Account (Service Class I)	MML Growth Allocation Sub-Account (Initial Class)	MML Growth Allocation Sub-Account (Service Class)	MML High Yield Sub-Account	MML Income & Growth Sub-Account (Initial Class)
Units purchased	146,714	1,330	3,713	88,873	112,187	722,388	302,182	5,936
Units withdrawn	(210,919)	(14,756)	(23,468)	(95,174)	(1,609,402)	(3,361,658)	(418,133)	(87,930)
Units transferred between Sub-Accounts and to/from the Fixed Account.....	11,110	13,997	(143)	(463)	(128,703)	(47,120)	9,054	8,354
Net increase (decrease)	(53,095)	571	(19,898)	(6,764)	(1,625,918)	(2,686,390)	(106,897)	(73,640)

Notes To Financial Statements (Continued)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS (Continued)

2023 (Continued)	MML Income & Growth Sub-Account (Service Class)	MML Inflation- Protected and Income Sub-Account (Initial Class)	MML Inflation- Protected and Income Sub-Account (Service Class)	MML International Equity Sub-Account	MML iShares® 60/40 Allocation Sub-Account	MML iShares® 80/20 Allocation Sub-Account	MML Large Cap Growth Sub-Account (Initial Class)	MML Large Cap Growth Sub-Account (Service Class)
Units purchased	122,429	36,913	224,327	92,200	676,164	1,613,468	3,418	230,678
Units withdrawn	(198,813)	(961,935)	(551,259)	(73,434)	(18,734)	(52,155)	(54,796)	(97,369)
Units transferred between Sub-Accounts and to/from the Fixed Account.....	5,204	482,863	(10,199)	40,411	10,724	7,650	13,848	8,771
Net increase (decrease)	(71,180)	(442,159)	(337,131)	59,177	668,154	1,568,963	(37,530)	142,080
2023 (Continued)	MML Managed Bond Sub-Account (Initial Class)	MML Managed Bond Sub-Account (Service Class)	MML Managed Volatility Sub-Account (Initial Class)	MML Managed Volatility Sub-Account (Service Class)	MML Mid Cap Growth Sub-Account (Initial Class)	MML Mid Cap Growth Sub-Account (Service Class)	MML Mid Cap Value Sub-Account (Initial Class)	MML Mid Cap Value Sub-Account (Service Class)
Units purchased	37,445	671,056	18,242	25,609	10,092	224,962	12,623	172,305
Units withdrawn	(751,475)	(2,809,634)	(483,656)	(252,460)	(127,368)	(472,611)	(310,361)	(356,864)
Units transferred between Sub-Accounts and to/from the Fixed Account.....	255,063	287,528	(19,780)	(16,229)	(12,082)	(1,369)	39,091	(7,239)
Net increase (decrease)	(458,967)	(1,851,050)	(485,194)	(243,080)	(129,358)	(249,018)	(258,647)	(191,798)
2023 (Continued)	MML Moderate Allocation Sub-Account (Initial Class)	MML Moderate Allocation Sub-Account (Service Class)	MML Short-Duration Bond Sub-Account	MML Small Cap Equity Sub-Account (Initial Class)	MML Small Cap Equity Sub-Account (Service Class)	MML Small Cap Growth Equity Sub-Account (Initial Class)	MML Small Cap Growth Equity Sub-Account (Service Class)	MML Small Company Value Sub-Account
Units purchased	42,339	829,091	457,051	3,438	117,688	127,110	44,529	53,541
Units withdrawn	(1,124,713)	(12,210,700)	(536,580)	(56,978)	(148,737)	(196,577)	(127,905)	(161,659)
Units transferred between Sub-Accounts and to/from the Fixed Account.....	9,732	(84,764)	35,697	(5,787)	(17,180)	62,034	368	321
Net increase (decrease)	(1,072,642)	(11,466,373)	(43,832)	(59,327)	(48,229)	(7,433)	(83,008)	(107,797)
2023 (Continued)	MML Small/Mid Cap Value Sub-Account (Initial Class)	MML Small/Mid Cap Value Sub-Account (Service Class)	MML Strategic Emerging Markets Sub-Account (Service Class I)	MML Sustainable Equity Sub-Account (Initial Class)	MML Sustainable Equity Sub-Account (Service Class)	MML Total Return Bond Sub-Account	MML U.S. Government Money Market Sub-Account	PIMCO Commodity RealReturn® Strategy Sub-Account
Units purchased	12,019	69,380	74,073	8,021	75,324	365,993	1,789,357	18,945
Units withdrawn	(296,976)	(156,463)	(145,846)	(155,778)	(312,859)	(505,255)	(5,068,783)	(147,190)
Units transferred between Sub-Accounts and to/from the Fixed Account.....	25,019	13,652	9,728	(33,492)	(11,558)	49,594	1,218,644	(73,682)
Net increase (decrease)	(259,938)	(73,431)	(62,045)	(181,249)	(249,093)	(89,668)	(2,060,782)	(201,927)

Notes To Financial Statements (Continued)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS (Continued)

	PIMCO Income Sub-Account	VY® CBRE Global Real Estate Sub-Account
2023 (Continued)		
Units purchased	118,671	7,316
Units withdrawn	(1,002)	(70,669)
Units transferred between Sub-Accounts and to/from the Fixed Account	5,193	6,190
Net increase (decrease)	<u>122,862</u>	<u>(57,163)</u>

Notes To Financial Statements (Continued)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS (Continued)

	BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)	Delaware Ivy VIP Asset Strategy Sub-Account (Class II)	Fidelity® VIP Contrafund® Sub-Account (Initial Class)	Fidelity® VIP Contrafund® Sub-Account (Service Class 2)	Fidelity® VIP Healthcare Sub-Account	Fidelity® VIP Real Estate Sub-Account	Fidelity® VIP Strategic Income Sub-Account	Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)
2022								
Units purchased	152,856	73,114	34,154	686,645	44,996	18,312	23,316	10,582
Units withdrawn	(98,603)	(74,617)	(440,309)	(734,089)	(565)	(447)	(221)	(64,507)
Units transferred between Sub-Accounts and to/from the General Account	6,886	(6,556)	95,731	(55,817)	(711)	618	(939)	41,614
Net increase (decrease)	61,139	(8,059)	(310,424)	(103,261)	43,720	18,483	22,156	(12,311)
	Invesco							
	Oppenheimer V.I.							
	International Growth Sub-Account (Series II)							
Units purchased	93,064	18,373	3,541	677	-	1	18,077	124,521
Units withdrawn	(144,381)	(442,453)	(45,930)	(23,495)	(72)	(6,068)	(254,499)	(121,461)
Units transferred between Sub-Accounts and to/from the General Account	71,350	214,029	(18,303)	(983)	-	-	169,868	3,169
Net increase (decrease)	20,033	(210,051)	(60,692)	(23,801)	(72)	(6,067)	(66,554)	6,229
	Invesco V.I.							
	Diversified Dividend Sub-Account (Series I)							
Units purchased	6,148	15,727	30,143	180,669	57,854	118,867	4,307	4,249
Units withdrawn	(26,249)	(152,663)	(426,707)	(296,147)	(984,562)	(480,763)	(26,210)	(42,235)
Units transferred between Sub-Accounts and to/from the General Account	6,676	24,658	335,751	50,656	(393,513)	(173,900)	1,163	487
Net increase (decrease)	(13,425)	(112,278)	(60,813)	(64,822)	(1,320,221)	(535,796)	(20,740)	(37,499)
	Invesco V.I.							
	Diversified Dividend Sub-Account (Series I)							
Units purchased	6,148	15,727	30,143	180,669	57,854	118,867	4,307	4,249
Units withdrawn	(26,249)	(152,663)	(426,707)	(296,147)	(984,562)	(480,763)	(26,210)	(42,235)
Units transferred between Sub-Accounts and to/from the General Account	6,676	24,658	335,751	50,656	(393,513)	(173,900)	1,163	487
Net increase (decrease)	(13,425)	(112,278)	(60,813)	(64,822)	(1,320,221)	(535,796)	(20,740)	(37,499)
	Invesco V.I.							
	Main Street Sub-Account (Series I)							
Units purchased	5,152	50,874	8,978	1,801	11,506	31,947	23,284	129,010
Units withdrawn	(69,988)	(126,294)	(23,639)	(30,404)	(62,143)	(71)	(192,927)	(600,472)
Units transferred between Sub-Accounts and to/from the General Account	(12,632)	(3,300)	7,982	(3,904)	136,254	478	2,321	(39,388)
Net increase (decrease)	(77,468)	(78,720)	(6,679)	(32,507)	85,617	32,354	(167,322)	(510,850)
	Invesco V.I.							
	Main Street Sub-Account (Series I)							
Units purchased	5,152	50,874	8,978	1,801	11,506	31,947	23,284	129,010
Units withdrawn	(69,988)	(126,294)	(23,639)	(30,404)	(62,143)	(71)	(192,927)	(600,472)
Units transferred between Sub-Accounts and to/from the General Account	(12,632)	(3,300)	7,982	(3,904)	136,254	478	2,321	(39,388)
Net increase (decrease)	(77,468)	(78,720)	(6,679)	(32,507)	85,617	32,354	(167,322)	(510,850)

Notes To Financial Statements (Continued)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS (Continued)

	MML American Funds Core Allocation Sub-Account	MML American Funds Growth Sub-Account	MML American Funds International Sub-Account	MML Balanced Allocation Sub-Account (Initial Class)	MML Balanced Allocation Sub-Account (Service Class)	MML Blend Sub-Account (Initial Class)	MML Blend Sub-Account (Service Class)	MML Blue Chip Growth Sub-Account (Initial Class)
2022 (Continued)								
Units purchased	1,114,004	715,509	127,178	29,189	846,081	14,990	945,670	7,673
Units withdrawn	(5,602,776)	(679,293)	(1,348,898)	(462,914)	(2,937,773)	(204,107)	(1,038,676)	(87,727)
Units transferred between Sub-Accounts and to/from the General Account.....	(153,891)	63,034	(2,353,997)	(23,163)	(197,548)	(12,556)	(32,115)	10,704
Net increase (decrease)	(4,642,663)	99,250	(3,575,717)	(456,888)	(2,289,240)	(201,673)	(125,121)	(69,350)

	MML Blue Chip Growth Sub-Account (Service Class)	MML Conservative Allocation Sub-Account (Initial Class)	MML Conservative Allocation Sub-Account (Service Class)	MML Conservative Allocation Sub-Account (Service Class I)	MML Dynamic Bond Sub-Account (Service Class I)	MML Equity Sub-Account (Initial Class)	MML Equity Sub-Account (Service Class)	MML Equity Sub-Account (Initial Class)	MML Equity Sub-Account (Service Class)
2022 (Continued)									
Units purchased	548,850	38,166	980,597	164,011	10,151	177,319	26,269	348,570	
Units withdrawn	(503,617)	(447,243)	(2,914,844)	(119,337)	(72,894)	(573,117)	(488,623)	(427,388)	
Units transferred between Sub-Accounts and to/from the General Account.....	(21,438)	126,959	(9,780)	1,654	14,150	(30,849)	(371,358)	(33,877)	
Net increase (decrease)	23,795	(282,118)	(1,944,027)	46,328	(48,593)	(426,647)	(833,712)	(112,695)	

	MML Equity Index Sub-Account (Class I)	MML Equity Index Sub-Account (Service Class I)	MML Equity Momentum Sub-Account (Service Class I)	MML Equity Rotation Sub-Account (Service Class I)	MML Focused Equity Sub-Account	MML Foreign Equity Sub-Account (Initial Class)	MML Foreign Equity Sub-Account (Service Class)	MML Fundamental Equity Sub-Account
2022 (Continued)								
Units purchased	11,884	3,458	11,626	12,779	184,710	34,703	19,766	134,427
Units withdrawn	(92,681)	(165,521)	(104,587)	(20,346)	(135,861)	(769,869)	(56,860)	(125,640)
Units transferred between Sub-Accounts and to/from the General Account.....	(7,610)	(47,195)	(3,501)	(92)	21,419	218,756	169,222	11,135
Net increase (decrease)	(88,407)	(209,258)	(96,462)	(7,659)	70,268	(516,410)	132,128	19,922

	MML Fundamental Value Sub-Account	MML Global Sub-Account (Class I)	MML Global Sub-Account (Class II)	MML Global Sub-Account (Service Class I)	MML Growth Allocation Sub-Account (Initial Class)	MML High Yield Sub-Account	MML Income & Growth Sub-Account (Initial Class)
2022 (Continued)							
Units purchased	257,437	1,165	3,590	183,965	922,206	206,954	8,622
Units withdrawn	(228,858)	(14,931)	(13,729)	(90,431)	(3,757,620)	(484,610)	(56,409)
Units transferred between Sub-Accounts and to/from the General Account.....	68,965	10,873	9,276	125,904	(290,695)	(13,060)	(18,186)
Net increase (decrease)	97,544	(2,893)	(863)	219,438	(1,523,926)	(290,716)	(65,973)

Notes To Financial Statements (Continued)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS (Continued)

2022 (Continued)	MML Income & Growth Sub-Account (Service Class)	MML Inflation- Protected and Income Sub-Account (Initial Class)	MML Inflation- Protected and Income Sub-Account (Service Class)	MML International Equity Sub-Account	MML iShares 60/40 Allocation Sub-Account	MML iShares 80/20 Allocation Sub-Account	MML Large Cap Growth Sub-Account (Initial Class)	MML Large Cap Growth Sub-Account (Service Class)
Units purchased	134,010	52,107	568,183	143,411	576,599	2,122,312	4,996	98,725
Units withdrawn	(193,861)	(1,024,030)	(647,479)	(95,824)	(5,638)	(19,543)	(38,376)	(100,898)
Units transferred between Sub-Accounts and to/from the General Account	(27,744)	(484,883)	(17,061)	32,409	-	110	(9,148)	(2,947)
Net increase (decrease)	(87,595)	(1,456,806)	(96,357)	79,996	570,961	2,102,879	(42,528)	(5,120)
2022 (Continued)	MML Managed Bond Sub-Account (Initial Class)	MML Managed Bond Sub-Account (Service Class)	MML Managed Volatility Sub-Account (Initial Class)	MML Managed Volatility Sub-Account (Service Class)	MML Mid Cap Growth Sub-Account (Initial Class)	MML Mid Cap Growth Sub-Account (Service Class)	MML Mid Cap Value Sub-Account (Initial Class)	MML Mid Cap Value Sub-Account (Service Class)
Units purchased	41,586	434,662	23,371	104,191	8,802	248,065	16,627	281,466
Units withdrawn	(780,898)	(2,443,028)	(503,517)	(237,883)	(111,618)	(412,031)	(305,889)	(311,590)
Units transferred between Sub-Accounts and to/from the General Account	(206,887)	(367,493)	(392,433)	(57,577)	(7,543)	17,663	(293,398)	(12,265)
Net increase (decrease)	(946,199)	(2,375,859)	(872,579)	(191,269)	(110,359)	(146,302)	(582,660)	(42,389)
2022 (Continued)	MML Moderate Allocation Sub-Account (Initial Class)	MML Moderate Allocation Sub-Account (Service Class)	MML Short-Duration Bond Sub-Account	MML Small Cap Equity Sub-Account (Initial Class)	MML Small Cap Equity Sub-Account (Service Class)	MML Small Cap Growth Equity Sub-Account (Initial Class)	MML Small Cap Growth Equity Sub-Account (Service Class)	MML Small Company Value Sub-Account
Units purchased	41,762	1,299,748	206,961	3,803	59,648	40,428	70,240	77,190
Units withdrawn	(1,110,602)	(11,029,528)	(687,131)	(61,546)	(135,008)	(194,640)	(131,357)	(131,363)
Units transferred between Sub-Accounts and to/from the General Account	21,347	(505,738)	322,828	(16,364)	18,204	35,390	(8,574)	11,056
Net increase (decrease)	(1,047,493)	(10,235,518)	(157,342)	(74,107)	(57,156)	(118,822)	(69,691)	(43,117)
2022 (Continued)	MML Small/Mid Cap Value Sub-Account (Initial Class)	MML Small/Mid Cap Value Sub-Account (Service Class)	MML Special Situations Sub-Account (Service Class I)	MML Strategic Emerging Markets Sub-Account (Service Class I)	MML Sustainable Equity Sub-Account (Initial Class)	MML Sustainable Equity Sub-Account (Service Class)	MML Return Bond Sub-Account	MML U.S. Government Money Market Sub-Account
Units purchased	17,619	105,501	4,075	109,057	11,173	101,663	281,935	4,210,643
Units withdrawn	(303,018)	(142,035)	(61,180)	(109,641)	(147,384)	(223,387)	(570,562)	(5,021,648)
Units transferred between Sub-Accounts and to/from the General Account	(47,784)	(2,530)	-	(12,719)	(25,354)	(11,107)	(97,868)	5,196,805
Net increase (decrease)	(333,183)	(39,064)	(57,105)	(13,303)	(161,565)	(132,831)	(386,495)	4,385,800

Notes To Financial Statements (Continued)

7. NET INCREASE (DECREASE) IN OUTSTANDING UNITS (Continued)

	PIMCO Commodity RealReturn® Strategy Sub-Account	PIMCO Income Sub-Account	VY® CBRE Global Real Estate Sub-Account
2022 (Continued)			
Units purchased	19,908	90,359	8,221
Units withdrawn	(190,221)	(261)	(74,763)
Units transferred between Sub-Accounts and to/from the General Account.....	162,183	(461)	4,924
Net increase (decrease)	<u>(8,130)</u>	<u>89,637</u>	<u>(61,618)</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 years in the five-year period ended December 31, 2023 follows:

	At December 31,		For the Years Ended December 31,					
	Units	Unit Value ³ (Lowest to Highest)	Net Assets	Investment Income Ratio ¹	Expense Ratio ² (Lowest to Highest)	Total Return ³ (Lowest to Highest)		
BlackRock 60/40 Target Allocation ETF V.I. Sub-Account (Class III)								
2023	1,201,079	\$ 14.69 to \$ 15.69	\$ 18,823,486	1.91 %	1.00 % to 1.80 %	13.26 % to 14.17 %		
2022	1,196,331	12.97 to 13.40	16,425,190	1.90	1.00 to 1.80	(16.55) to (16.17)		
2021	1,135,192	15.55 to 16.33	18,530,683	2.15	1.00 to 1.80	9.71 to 10.59		
2020	603,542	14.17 to 14.77	8,908,234	1.89	1.00 to 1.80	12.31 to 13.21		
2019	274,313	12.62 to 13.05	3,575,830	4.15	1.00 to 1.80	19.06 to 20.02		
Choe Vest U.S. Large Cap 10% Buffer Strategies V.I. Sub-Account⁸								
2023	44,048	- - 11.08	488,039	-	1.00 - 1.80	- - -		
Delaware Ivy VIP Asset Strategy Sub-Account (Class II)								
2023	760,284	13.09 to 14.41	11,089,050	2.11	1.00 to 3.10	10.47 to 12.81		
2022	833,323	11.85 to 12.77	10,874,142	1.57	1.00 to 3.10	(17.34) to (15.59)		
2021	841,382	14.34 to 15.13	13,346,595	1.55	1.00 to 3.10	7.07 to 9.34		
2020	904,514	13.39 to 13.84	13,270,558	2.02	1.00 to 3.10	10.40 to 12.74		
2019	943,855	12.13 to 12.27	12,403,360	2.13	1.00 to 3.10	18.06 to 20.57		
Fidelity® VIP Contrafund® Sub-Account (Initial Class)								
2023	3,269,827	41.22 to 66.62	187,411,670	0.46	0.95 to 2.60	30.04 to 32.19		
2022	3,876,930	31.70 to 50.39	168,304,213	0.49	0.95 to 2.60	(28.20) to (27.01)		
2021	4,187,353	44.15 to 69.04	250,765,962	0.06	0.95 to 2.60	24.56 to 26.63		
2020	4,994,284	35.45 to 54.52	237,247,151	0.24	0.95 to 2.60	27.22 to 29.33		
2019	6,319,467	27.86 to 42.16	232,111,397	0.45	0.95 to 2.60	28.20 to 30.33		
Fidelity® VIP Contrafund® Sub-Account (Service Class 2)								
2023	8,181,542	23.92 to 37.37	231,386,664	0.26	1.00 to 3.10	29.07 to 31.80		
2022	8,378,070	18.15 to 28.95	191,667,565	0.26	1.00 to 3.10	(28.73) to (27.22)		
2021	8,481,331	24.94 to 40.62	279,055,343	0.03	1.00 to 3.10	23.62 to 26.24		
2020	8,326,913	19.76 to 32.86	229,257,699	0.08	1.00 to 3.10	26.26 to 28.94		
2019	8,336,046	15.32 to 26.03	191,552,509	0.22	1.00 to 3.10	27.27 to 29.97		
Fidelity® VIP Health Care Sub-Account⁷								
2023	101,885	- - 10.50	1,069,597	-	1.00 to 3.10	- - 2.67		
2022	43,720	- - 10.22	447,027	-	1.00 to 3.10	- - -		
Fidelity VIP Overseas Portfolio (Service Class 2)⁸								
2023	14,620	- - 10.53	153,996	1.48	1.00 to 3.10	- - -		
Fidelity® VIP Real Estate Sub-Account⁷								
2023	58,941	- - 9.02	531,372	3.41	1.00 to 3.10	- - 9.46		
2022	18,483	- - 8.24	152,225	1.70	1.00 to 3.10	- - -		
Fidelity® VIP Strategic Income Sub-Account⁷								
2023	71,420	- - 9.78	698,753	7.82	0.95 to 3.10	- - 7.77		
2022	22,156	- - 9.08	201,143	6.33	0.95 to 3.10	- - -		
Invesco Oppenheimer V.I. International Growth Sub-Account (Series I)								
2023	740,991	21.25 to 32.39	21,214,036	0.58	0.95 to 2.60	17.97 to 19.92		
2022	845,645	18.01 to 27.01	20,298,479	-	0.95 to 2.60	(29.00) to (27.82)		
2021	857,957	25.37 to 37.42	28,738,025	-	0.95 to 2.60	7.39 to 9.18		
2020	1,029,713	23.62 to 34.27	32,043,570	0.93	0.95 to 2.60	18.38 to 20.35		
2019	1,267,445	19.95 to 28.48	32,768,962	1.05	0.95 to 2.60	25.30 to 27.39		

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,						
	Units	Unit Value ³		Net Assets	Investment		Expense Ratio ²		Total Return ³		
		(Lowest to Highest)			Income Ratio ¹	(Lowest to Highest)		(Lowest to Highest)			
Invesco Oppenheimer V.I. International Growth Sub-Account (Series II)											
2023	1,072,463	\$ 13.43 to \$	19.27	\$ 20,333,526	0.30 %	1.00 % to	3.10 %	16.97 % to	19.44 %		
2022	1,163,026	11.24 to	16.48	18,848,749	-	1.00 to	3.10	(29.39) to	(27.89)		
2021	1,142,992	15.59 to	23.33	26,049,458	-	1.00 to	3.10	6.76 to	9.02		
2020	1,189,787	14.30 to	21.85	25,837,159	0.62	1.00 to	3.10	17.35 to	19.84		
2019	1,376,480	11.94 to	18.62	26,966,589	0.71	1.00 to	3.10	24.05 to	26.68		
Invesco V.I. Capital Appreciation Sub-Account (Series I)											
2023	2,847,791	30.03 to	44.88	116,367,287	-	0.95 to	2.60	31.92 to	34.10		
2022	3,385,941	22.76 to	33.47	103,556,439	-	0.95 to	2.60	(32.56) to	(31.44)		
2021	3,595,992	33.75 to	48.81	161,466,451	-	0.95 to	2.60	19.42 to	21.41		
2020	4,332,520	28.26 to	40.20	160,848,549	-	0.95 to	2.60	33.08 to	35.30		
2019	5,846,107	21.24 to	29.72	161,347,994	0.06	0.95 to	2.60	32.70 to	34.91		
Invesco V.I. Capital Appreciation Sub-Account (Series II)											
2023	223,386	27.21 to	41.86	8,701,153	-	1.15 to	3.10	30.92 to	33.49		
2022	250,907	20.79 to	31.36	7,405,869	-	1.15 to	3.10	(33.07) to	(31.75)		
2021	311,599	31.06 to	45.94	13,493,003	-	1.15 to	3.10	18.55 to	20.88		
2020	366,591	26.20 to	38.01	13,216,783	-	1.15 to	3.10	32.08 to	34.68		
2019	481,175	19.83 to	28.22	12,888,583	-	1.15 to	3.10	31.70 to	34.29		
Invesco V.I. Conservative Balanced Sub-Account (Series I)⁵											
2023	287,172	12.56 to	20.28	5,382,578	1.86	0.95 to	2.60	9.72 to	11.54		
2022	316,912	11.44 to	18.18	5,338,477	1.36	0.95 to	2.60	(18.99) to	(17.64)		
2021	340,713	14.13 to	22.07	6,987,321	1.47	0.95 to	2.60	7.79 to	9.59		
2020	377,168	13.10 to	20.14	7,060,991	2.07	0.95 to	2.60	11.91 to	13.77		
2019	417,214	11.71 to	17.70	6,873,042	2.24	0.95 to	2.60	14.50 to	16.40		
Invesco V.I. Conservative Balanced Sub-Account (Series II)											
2023	797	12.10 to	16.98	13,532	0.61	1.15 to	2.80	9.38 to	11.03		
2022	2,970	11.07 to	15.29	45,427	1.15	1.15 to	2.80	(19.19) to	(17.97)		
2021	3,042	13.69 to	18.64	56,716	0.99	1.15 to	2.80	7.41 to	9.04		
2020	4,777	12.75 to	17.10	76,534	1.88	1.15 to	2.65	11.59 to	13.28		
2019	5,079	11.42 to	15.09	71,711	2.00	1.15 to	2.65	14.15 to	15.88		
Invesco V.I. Core Plus Bond Sub-Account⁵											
2023	94,073	- -	14.29	1,344,454	2.60	- -	1.40	- -	4.67		
2022	103,980	- -	13.65	1,419,773	1.93	- -	1.40	- -	(15.22)		
2021	110,047	- -	16.11	1,772,416	2.05	- -	1.40	- -	(3.02)		
2020	120,583	- -	16.61	2,002,482	3.09	- -	1.40	- -	8.18		
2019	129,518	- -	15.35	1,988,167	3.32	- -	1.40	- -	8.00		
Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series I)											
2023	2,017,336	29.03 to	42.42	72,492,489	-	0.95 to	2.60	10.26 to	12.08		
2022	2,145,143	26.33 to	37.84	69,315,183	-	0.95 to	2.60	(32.75) to	(31.63)		
2021	2,211,697	39.15 to	55.35	105,647,787	-	0.95 to	2.60	16.04 to	17.97		
2020	2,592,033	33.74 to	46.92	106,383,035	0.04	0.95 to	2.60	37.08 to	39.36		
2019	3,582,421	24.61 to	33.67	106,476,690	-	0.95 to	2.60	35.79 to	38.05		
Invesco V.I. Discovery Mid Cap Growth Sub-Account (Series II)											
2023	1,137,821	20.40 to	26.30	24,635,259	-	1.00 to	3.10	9.42 to	11.73		
2022	1,133,228	18.26 to	24.03	22,846,294	-	1.00 to	3.10	(33.23) to	(31.82)		
2021	1,126,999	26.78 to	35.99	34,332,308	-	1.00 to	3.10	15.17 to	17.61		
2020	1,067,971	22.77 to	31.25	28,338,933	-	1.00 to	3.10	35.96 to	38.85		
2019	875,114	16.40 to	22.99	18,022,291	-	1.00 to	3.10	34.77 to	37.63		

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,						
	Units	Unit Value ³ (Lowest to Highest)		Net Assets	Investment Income Ratio ¹		Expense Ratio ² (Lowest to Highest)		Total Return ³ (Lowest to Highest)		
Invesco V.I. Diversified Dividend Sub-Account (Series I)											
2023	282,594	\$ 10.66	to \$ 17.09	\$ 4,424,798	1.97 %	0.95 %	to 2.60 %	6.25 %	to 8.02 %		
2022	317,837	10.04	to 15.82	4,603,701	1.89	0.95	to 2.60	(4.20)	to (2.61)		
2021	331,261	10.48	to 16.24	4,919,882	1.76	0.95	to 2.60	15.84	to 17.77		
2020	483,803	9.04	to 13.79	6,302,426	3.18	0.95	to 2.60	(2.43)	to (0.81)		
2019	517,444	9.27	to 13.91	6,771,474	2.90	0.95	to 2.60	21.88	to 23.91		
Invesco V.I. Diversified Dividend Sub-Account (Series II)											
2023	610,808	9.69	to 15.02	8,547,518	1.71	1.15	to 3.10	5.46	to 7.53		
2022	728,781	9.19	to 13.97	9,489,706	1.58	1.15	to 3.10	(4.91)	to (3.04)		
2021	841,059	9.66	to 14.40	11,345,055	1.94	1.15	to 3.10	14.98	to 17.24		
2020	945,327	8.40	to 12.29	10,939,473	2.70	1.15	to 3.10	(3.18)	to (1.28)		
2019	1,203,871	8.68	to 12.44	14,181,904	2.53	1.15	to 3.10	20.97	to 23.35		
Invesco V.I. Global Sub-Account (Series I)											
2023	2,990,290	29.59	to 48.24	127,106,320	0.22	0.95	to 2.60	31.29	to 33.47		
2022	3,633,296	22.54	to 36.14	115,923,743	-	0.95	to 2.60	(33.52)	to (32.41)		
2021	3,694,110	33.90	to 53.48	176,055,227	-	0.95	to 2.60	12.53	to 14.40		
2020	4,227,403	30.13	to 46.75	176,607,524	0.67	0.95	to 2.60	24.36	to 26.43		
2019	5,325,923	24.23	to 36.97	176,050,964	0.89	0.95	to 2.60	28.41	to 30.54		
Invesco V.I. Global Sub-Account (Series II)											
2023	2,263,619	18.67	to 26.83	58,095,537	-	1.00	to 3.10	30.36	to 33.11		
2022	2,506,424	14.03	to 20.58	49,427,513	-	1.00	to 3.10	(34.01)	to (32.61)		
2021	2,571,246	20.81	to 31.19	77,475,203	-	1.00	to 3.10	11.66	to 14.02		
2020	2,759,316	18.25	to 27.94	75,781,828	0.44	1.00	to 3.10	23.45	to 26.07		
2019	3,054,222	14.48	to 22.63	69,852,655	0.64	1.00	to 3.10	27.44	to 30.15		
Invesco V.I. Global Strategic Income Sub-Account (Series I)											
2023	6,098,483	12.05	to 20.49	98,973,441	-	0.95	to 2.60	6.10	to 7.86		
2022	6,982,530	11.36	to 18.99	105,617,322	-	0.95	to 2.60	(13.73)	to (12.30)		
2021	8,302,751	13.17	to 21.66	143,423,120	4.69	0.95	to 2.60	(5.89)	to (4.33)		
2020	8,478,804	13.99	to 22.64	154,124,943	5.81	0.95	to 2.60	0.75	to 2.42		
2019	9,820,494	13.89	to 22.10	174,837,228	3.80	0.95	to 2.60	7.96	to 9.76		
Invesco V.I. Global Strategic Income Sub-Account (Series II)											
2023	3,221,166	10.18	to 10.91	41,784,589	-	1.00	to 3.10	5.29	to 7.52		
2022	3,523,347	9.46	to 10.36	42,908,119	-	1.00	to 3.10	(14.40)	to (12.59)		
2021	4,059,143	10.83	to 12.11	57,328,981	4.29	1.00	to 3.10	(6.51)	to (4.52)		
2020	4,076,835	11.34	to 12.95	61,117,704	5.16	1.00	to 3.10	(0.15)	to 1.97		
2019	4,957,887	11.12	to 12.97	74,928,822	3.39	1.00	to 3.10	7.23	to 9.51		
Invesco V.I. Health Care Sub-Account (Series I)											
2023	237,830	25.29	to 39.40	8,279,217	-	0.95	to 2.60	0.39	to 2.05		
2022	261,340	25.20	to 38.61	8,993,115	-	0.95	to 2.60	(15.54)	to (14.14)		
2021	282,080	29.83	to 44.97	11,396,798	0.20	0.95	to 2.60	9.42	to 11.24		
2020	309,109	27.26	to 40.42	11,325,826	0.31	0.95	to 2.60	11.52	to 13.38		
2019	355,234	24.45	to 35.65	11,544,579	0.04	0.95	to 2.60	29.10	to 31.25		
Invesco V.I. Health Care Sub-Account (Series II)											
2023	221,061	22.94	to 35.84	7,445,184	-	1.15	to 3.10	(0.36)	to 1.59		
2022	260,608	23.02	to 35.28	8,644,331	-	1.15	to 3.10	(16.17)	to (14.52)		
2021	298,106	27.46	to 41.27	11,700,675	-	1.15	to 3.10	8.62	to 10.76		
2020	350,828	25.28	to 37.26	12,414,240	0.09	1.15	to 3.10	10.71	to 12.89		
2019	424,441	22.83	to 33.00	13,391,320	-	1.15	to 3.10	28.15	to 30.67		

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,					
	Units	Unit Value ³ (Lowest to Highest)		Net Assets	Investment Income Ratio ¹		Expense Ratio ² (Lowest to Highest)		Total Return ³ (Lowest to Highest)	
Invesco V.I. Main Street Sub-Account (Series I)										
2023	778,371	\$ 29.06	to \$ 43.45	\$ 29,488,977	0.83 %	0.95 %	to	2.60 %	20.07 %	to 22.06 %
2022	862,445	24.21	to 35.60	26,861,840	1.45	0.95	to	2.60	(22.18)	to (20.89)
2021	939,913	31.10	to 45.00	37,181,449	0.70	0.95	to	2.60	24.30	to 26.36
2020	1,047,878	25.02	to 35.61	33,044,884	1.49	0.95	to	2.60	11.02	to 12.87
2019	1,159,288	22.54	to 31.55	32,594,095	1.06	0.95	to	2.60	28.69	to 30.83
Invesco V.I. Main Street Sub-Account (Series II)										
2023	881,293	20.38	to 26.34	20,291,673	0.49	1.00	to	3.10	19.09	to 21.61
2022	990,269	16.76	to 22.12	18,959,328	1.09	1.00	to	3.10	(22.74)	to (21.10)
2021	1,068,989	21.24	to 28.63	26,323,196	0.52	1.00	to	3.10	23.35	to 25.97
2020	1,040,875	16.86	to 23.21	21,292,780	1.17	1.00	to	3.10	10.22	to 12.56
2019	1,022,590	14.98	to 21.06	19,582,090	0.81	1.00	to	3.10	27.72	to 30.43
Invesco V.I. Technology Sub-Account (Series I)										
2023	341,037	32.39	to 45.06	7,811,874	-	0.95	to	2.60	43.19	to 45.56
2022	354,685	22.62	to 30.95	5,414,369	-	0.95	to	2.60	(41.49)	to (40.52)
2021	361,364	38.66	to 52.04	9,838,777	-	0.95	to	2.60	11.47	to 13.33
2020	381,843	34.68	to 45.92	9,461,356	-	0.95	to	2.60	42.37	to 44.74
2019	409,274	24.36	to 31.73	7,407,278	-	0.95	to	2.60	32.39	to 34.59
Invesco V.I. Technology Sub-Account (Series II)										
2023	181,352	29.36	to 51.98	8,322,967	-	1.15	to	3.10	42.26	to 45.05
2022	203,958	20.64	to 35.84	6,511,762	-	1.15	to	3.10	(41.94)	to (40.80)
2021	236,464	35.55	to 60.54	12,810,416	-	1.15	to	3.10	10.60	to 12.77
2020	274,028	32.15	to 53.68	13,181,326	-	1.15	to	3.10	41.35	to 44.13
2019	300,092	22.74	to 37.25	10,156,434	-	1.15	to	3.10	31.42	to 34.01
Invesco V.I. U.S. Government Money Sub-Account										
2023	559,667	7.69	to 10.71	5,990,501	4.40	0.95	to	2.60	1.85	to 3.54
2022	651,358	7.55	to 10.35	6,701,851	1.29	0.95	to	2.60	(1.31)	to 0.33
2021	565,742	7.65	to 10.31	5,812,814	0.01	0.95	to	2.60	(2.56)	to (0.94)
2020	657,647	7.85	to 10.41	6,847,355	0.22	0.95	to	2.60	(2.35)	to (0.73)
2019	673,998	8.04	to 10.49	7,061,758	1.70	0.95	to	2.60	(0.90)	to 0.75
Janus Henderson Global Technology and Innovation Sub-Account⁷										
2023	61,103	-	- 11.52	703,850	-	0.95	to	2.60	-	- 52.29
2022	32,355	-	- 7.56	244,729	-	0.95	to	2.60	-	-
MML Aggressive Allocation Sub-Account (Initial Class)										
2023	1,027,797	20.74	to 26.98	26,625,090	2.88	0.95	to	2.60	15.29	to 17.20
2022	1,192,000	17.99	to 23.02	26,453,572	2.02	0.95	to	2.60	(18.05)	to (16.69)
2021	1,359,322	21.95	to 27.63	36,316,920	1.25	0.95	to	2.60	13.65	to 15.54
2020	1,451,095	19.32	to 23.92	33,588,339	1.67	0.95	to	2.60	10.44	to 12.27
2019	1,821,022	17.49	to 21.30	37,508,768	1.99	0.95	to	2.60	20.75	to 22.76
MML Aggressive Allocation Sub-Account (Service Class)										
2023	3,406,635	17.08	to 18.62	70,495,980	2.61	1.00	to	3.10	14.38	to 16.80
2022	3,789,915	14.63	to 16.28	68,477,846	1.81	1.00	to	3.10	(18.68)	to (16.96)
2021	4,300,766	17.61	to 20.02	95,058,178	1.03	1.00	to	3.10	12.85	to 15.25
2020	4,774,344	15.28	to 17.74	93,600,335	1.38	1.00	to	3.10	9.63	to 11.95
2019	5,325,759	13.65	to 16.18	95,636,402	1.71	1.00	to	3.10	19.87	to 22.42

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,						
	Units	Unit Value ³ (Lowest to Highest)		Net Assets	Investment Income Ratio ¹	Expense Ratio ² (Lowest to Highest)		Total Return ³ (Lowest to Highest)			
MML American Funds Core Allocation Sub-Account											
2023	33,354,597	\$ 15.77	to \$ 16.56	\$ 658,413,694	3.79 %	1.00 %	to 3.10 %	10.89 %	to 13.24 %		
2022	39,435,747	13.93	to 14.93	692,811,278	2.13	1.00	to 3.10	(16.33)	to (14.56)		
2021	44,078,410	16.30	to 17.84	919,106,679	1.31	1.00	to 3.10	9.41	to 11.73		
2020	49,211,939	14.59	to 16.31	930,308,860	1.73	1.00	to 3.10	7.99	to 10.28		
2019	57,034,873	13.23	to 15.10	989,500,489	2.39	1.00	to 3.10	14.51	to 16.94		
MML American Funds Growth Sub-Account											
2023	7,531,821	29.35	to 36.72	234,932,146	1.43	1.00	to 3.10	33.76	to 36.59		
2022	7,340,690	21.49	to 27.45	187,123,822	0.43	1.00	to 3.10	(32.42)	to (30.98)		
2021	7,241,440	31.13	to 40.62	282,628,214	-	1.00	to 3.10	17.84	to 20.34		
2020	7,372,819	25.87	to 34.47	249,753,195	0.72	1.00	to 3.10	46.80	to 49.91		
2019	8,104,921	17.26	to 23.48	191,745,889	0.32	1.00	to 3.10	26.25	to 28.93		
MML American Funds International Sub-Account⁶											
2023	-	-	to -	-	-	-	to -	-	to -		
2022	-	-	to -	-	-	-	to -	-	to -		
2021	3,575,717	13.26	to 14.27	57,592,722	0.13	1.00	to 3.10	(4.95)	to (2.93)		
2020	3,496,882	13.95	to 14.70	58,820,176	1.03	1.00	to 3.10	9.98	to 12.31		
2019	4,069,542	12.69	to 13.09	61,510,006	2.74	1.00	to 3.10	18.58	to 21.09		
MML Balanced Allocation Sub-Account (Initial Class)											
2023	2,873,841	15.42	to 20.06	54,442,079	3.13	0.95	to 2.60	9.59	to 11.41		
2022	3,435,716	14.07	to 18.00	58,629,976	3.59	0.95	to 2.60	(16.91)	to (15.53)		
2021	3,892,604	16.93	to 21.31	78,951,185	1.25	0.95	to 2.60	7.16	to 8.94		
2020	4,442,634	15.80	to 19.56	83,010,888	2.67	0.95	to 2.60	8.09	to 9.89		
2019	5,809,475	14.62	to 17.80	99,026,168	2.57	0.95	to 2.60	13.75	to 15.65		
MML Balanced Allocation Sub-Account (Service Class)											
2023	15,847,072	13.72	to 13.88	252,483,566	2.90	1.00	to 3.10	8.84	to 11.15		
2022	18,387,696	12.34	to 12.75	267,376,596	3.34	1.00	to 3.10	(17.56)	to (15.81)		
2021	20,676,935	14.66	to 15.47	363,104,191	1.01	1.00	to 3.10	6.35	to 8.61		
2020	22,692,373	13.50	to 14.54	373,173,046	2.42	1.00	to 3.10	7.27	to 9.54		
2019	26,645,694	12.32	to 13.56	408,910,548	2.31	1.00	to 3.10	13.05	to 15.45		
MML Blend Sub-Account (Initial Class)											
2023	1,626,991	23.88	to 36.34	50,812,477	1.69	0.95	to 2.60	14.61	to 16.51		
2022	1,898,554	20.84	to 31.19	51,298,275	1.35	0.95	to 2.60	(18.73)	to (17.38)		
2021	2,100,227	25.64	to 37.75	68,982,917	2.11	0.95	to 2.60	12.07	to 13.94		
2020	2,246,956	22.88	to 33.14	65,024,452	-	0.95	to 2.60	9.97	to 11.80		
2019	2,419,280	20.81	to 29.64	62,980,806	2.43	0.95	to 2.60	18.27	to 20.23		
MML Blend Sub-Account (Service Class)											
2023	10,381,369	16.66	to 21.65	187,651,135	1.45	1.00	to 3.10	13.75	to 16.16		
2022	10,920,106	14.35	to 19.03	172,514,255	1.12	1.00	to 3.10	(19.34)	to (17.63)		
2021	11,045,227	17.42	to 23.60	217,290,953	1.97	1.00	to 3.10	11.24	to 13.60		
2020	10,470,381	15.33	to 21.21	185,705,276	-	1.00	to 3.10	9.14	to 11.45		
2019	9,995,211	13.76	to 19.44	161,858,732	2.20	1.00	to 3.10	17.38	to 19.87		
MML Blue Chip Growth Sub-Account (Initial Class)											
2023	794,854	40.83	to 62.43	46,546,333	-	0.95	to 2.60	45.71	to 48.13		
2022	930,051	28.02	to 42.15	37,019,588	-	0.95	to 2.60	(41.05)	to (40.07)		
2021	999,401	47.54	to 70.33	66,935,027	-	0.95	to 2.60	13.35	to 15.24		
2020	1,113,935	41.94	to 61.03	64,905,396	-	0.95	to 2.60	30.96	to 33.13		
2019	1,289,749	32.02	to 45.84	56,366,432	-	0.95	to 2.60	26.51	to 28.62		

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,				
	Units	Unit Value ³		Net Assets	Investment Income Ratio ¹	Expense Ratio ²		Total Return ³	
		(Lowest to Highest)				(Lowest to Highest)	(Lowest to Highest)	(Lowest to Highest)	
MML Blue Chip Growth Sub-Account (Service Class)									
2023	5,915,497	\$ 23.46 to \$	37.00	\$ 154,927,161	- %	1.00 % to	3.10 %	44.56 % to	47.61 %
2022	6,290,813	15.90 to	25.60	116,156,894	-	1.00 to	3.10	(41.49) to	(40.25)
2021	6,267,018	26.60 to	43.75	203,462,318	-	1.00 to	3.10	12.54 to	14.92
2020	6,214,398	23.15 to	38.87	181,685,317	-	1.00 to	3.10	29.91 to	32.66
2019	5,915,556	17.45 to	29.92	137,333,697	-	1.00 to	3.10	25.60 to	28.27
MML Conservative Allocation Sub-Account (Initial Class)									
2023	2,694,952	14.54 to	18.91	48,661,190	3.24	0.95 to	2.60	8.80 to	10.60
2022	3,104,296	13.37 to	17.10	50,846,697	3.88	0.95 to	2.60	(16.92) to	(15.54)
2021	3,386,413	16.09 to	20.25	65,736,943	1.18	0.95 to	2.60	5.81 to	7.57
2020	4,208,998	15.20 to	18.82	76,130,207	2.60	0.95 to	2.60	7.11 to	8.89
2019	4,480,056	14.19 to	17.29	74,794,028	2.68	0.95 to	2.60	12.24 to	14.11
MML Conservative Allocation Sub-Account (Service Class)									
2023	13,893,472	13.01 to	13.06	212,410,256	3.02	1.00 to	3.10	7.93 to	10.21
2022	16,606,296	11.80 to	12.10	232,816,753	3.59	1.00 to	3.10	(17.50) to	(15.75)
2021	18,550,323	14.01 to	14.66	314,438,147	0.93	1.00 to	3.10	5.02 to	7.25
2020	21,085,898	13.06 to	13.96	338,139,060	2.48	1.00 to	3.10	6.32 to	8.58
2019	20,930,050	12.03 to	13.13	312,722,144	2.47	1.00 to	3.10	11.42 to	13.79
MML Dynamic Bond Sub-Account (Service Class I)									
2023	1,249,453	9.58 to	10.22	12,459,052	4.19	1.00 to	1.80	5.87 to	6.72
2022	1,265,675	9.05 to	9.58	11,894,741	3.60	1.00 to	1.80	(15.78) to	(15.11)
2021	1,219,346	10.74 to	11.28	13,575,976	3.53	1.00 to	1.80	(1.96) to	(1.18)
2020	1,102,442	10.96 to	11.42	12,453,262	0.34	1.00 to	1.80	1.67 to	2.48
2019	918,215	10.78 to	11.14	10,144,350	3.42	1.00 to	1.80	6.59 to	7.45
MML Equity Sub-Account (Initial Class)									
2023	720,763	24.30 to	37.06	21,776,249	2.11	0.95 to	2.60	6.53 to	8.29
2022	808,421	22.81 to	34.22	22,745,758	1.60	0.95 to	2.60	(7.09) to	(5.55)
2021	857,014	24.55 to	36.23	25,600,018	1.66	0.95 to	2.60	26.92 to	29.03
2020	925,884	19.34 to	28.08	21,590,756	2.35	0.95 to	2.60	0.38 to	2.05
2019	1,097,055	19.27 to	27.51	25,084,965	2.04	0.95 to	2.60	22.69 to	24.73
MML Equity Sub-Account (Service Class)									
2023	3,418,217	18.29 to	22.03	78,993,261	1.85	1.00 to	3.10	5.73 to	7.97
2022	3,961,989	16.94 to	20.84	87,189,234	1.35	1.00 to	3.10	(7.78) to	(5.83)
2021	4,388,637	17.99 to	22.60	104,959,878	1.47	1.00 to	3.10	25.97 to	28.64
2020	4,851,758	13.98 to	17.94	94,339,624	2.14	1.00 to	3.10	(0.37) to	1.75
2019	4,923,227	13.74 to	18.01	97,057,943	1.82	1.00 to	3.10	21.78 to	24.36
MML Equity Income Sub-Account (Initial Class)									
2023	3,189,746	24.74 to	37.66	106,753,642	2.28	0.95 to	2.60	6.74 to	8.51
2022	3,643,121	23.18 to	34.71	112,868,269	1.68	0.95 to	2.60	(6.04) to	(4.48)
2021	4,476,832	24.67 to	36.34	145,517,882	2.19	0.95 to	2.60	22.36 to	24.39
2020	5,424,458	20.16 to	29.21	141,959,006	2.46	0.95 to	2.60	(1.26) to	0.38
2019	5,987,062	20.42 to	29.10	157,019,262	2.28	0.95 to	2.60	23.21 to	25.26
MML Equity Income Sub-Account (Service Class)									
2023	3,000,613	18.79 to	22.43	71,229,360	2.03	1.00 to	3.10	5.96 to	8.20
2022	3,463,599	17.37 to	21.17	78,411,916	1.51	1.00 to	3.10	(6.75) to	(4.77)
2021	3,576,293	18.24 to	22.71	88,613,015	2.04	1.00 to	3.10	21.36 to	23.93
2020	3,974,069	14.72 to	18.71	82,700,285	2.20	1.00 to	3.10	(1.92) to	0.16
2019	4,049,182	14.69 to	19.07	86,738,940	2.07	1.00 to	3.10	22.27 to	24.86

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,					
	Units	Unit Value ³		Net Assets	Investment		Expense Ratio ²		Total Return ³	
		(Lowest to Highest)			Income Ratio ¹	(Lowest to Highest)	(Lowest to Highest)			
MML Equity Index Sub-Account (Class I)										
2023	792,661	\$ 33.50	to \$ 50.53	\$ 31,813,776	1.25 %	0.95 %	to 2.60 %	22.54 %	to 24.57 %	
2022	855,314	27.34	to 40.56	27,821,852	1.01	0.95	to 2.60	(20.58)	to (19.26)	
2021	943,721	34.42	to 50.24	38,036,347	1.27	0.95	to 2.60	24.90	to 26.98	
2020	1,036,338	27.56	to 39.57	32,974,512	1.64	0.95	to 2.60	15.03	to 16.94	
2019	1,204,817	23.96	to 33.84	33,045,075	2.57	0.95	to 2.60	27.50	to 29.62	
MML Equity Index Sub-Account (Service Class I)										
2023	616,130	30.37	to 46.07	27,437,454	0.97	1.15	to 3.10	21.63	to 24.01	
2022	820,581	24.97	to 37.15	29,639,746	0.78	1.15	to 3.10	(21.17)	to (19.61)	
2021	1,029,840	31.67	to 46.21	46,175,143	1.15	1.15	to 3.10	23.96	to 26.40	
2020	1,247,806	25.55	to 36.56	44,360,172	1.46	1.15	to 3.10	14.14	to 16.39	
2019	1,507,010	22.38	to 31.41	45,972,770	2.57	1.15	to 3.10	26.57	to 29.06	
MML Equity Momentum Sub-Account (Service Class I)⁶										
2023	-	--	-	-	-	-	-	-	-	
2022	-	--	-	-	-	-	-	-	-	
2021	96,460	21.35	to 22.43	2,161,734	-	1.00	to 1.80	19.43	to 20.39	
2020	109,941	17.88	to 18.63	2,048,092	0.01	1.00	to 1.80	17.86	to 18.81	
2019	120,799	15.17	to 15.68	1,893,686	0.68	1.00	to 1.80	35.06	to 36.14	
MML Equity Rotation Sub-Account (Service Class I)										
2023	81,036	22.38	to 23.89	1,683,451	1.40	1.00	to 1.80	18.47	to 19.42	
2022	97,555	18.89	to 20.01	1,864,206	-	1.00	to 1.80	(15.99)	to (15.31)	
2021	105,214	22.49	to 23.63	2,484,746	0.43	1.00	to 1.80	25.72	to 26.73	
2020	108,233	17.89	to 18.64	2,017,490	1.39	1.00	to 1.80	20.39	to 21.35	
2019	113,361	14.86	to 15.36	1,741,305	0.19	1.00	to 1.80	14.22	to 15.14	
MML Focused Equity Sub-Account										
2023	915,673	27.21	to 34.96	21,905,606	0.79	0.95	to 3.10	6.35	to 8.65	
2022	936,219	25.58	to 32.17	21,586,709	0.63	0.95	to 3.10	(7.91)	to (5.91)	
2021	865,951	27.78	to 34.19	22,092,990	0.92	0.95	to 3.10	18.16	to 20.73	
2020	881,782	23.51	to 28.32	18,957,860	0.64	0.95	to 3.10	9.10	to 11.47	
2019	887,636	21.55	to 25.41	17,679,923	0.05	0.95	to 3.10	25.77	to 28.50	
MML Foreign Sub-Account (Initial Class)										
2023	4,776,071	13.20	to 19.71	82,526,337	1.39	0.95	to 2.60	13.25	to 15.12	
2022	5,925,578	11.66	to 17.12	89,435,726	3.71	0.95	to 2.60	(16.77)	to (15.39)	
2021	6,441,988	14.01	to 20.23	115,578,289	2.54	0.95	to 2.60	10.14	to 11.98	
2020	7,346,537	12.72	to 18.07	118,344,969	3.10	0.95	to 2.60	3.21	to 4.93	
2019	8,271,919	12.32	to 17.22	128,108,301	1.79	0.95	to 2.60	10.26	to 12.10	
MML Foreign Sub-Account (Service Class)										
2023	594,680	11.91	to 11.98	9,248,287	1.21	1.00	to 3.10	12.44	to 14.82	
2022	652,319	10.37	to 10.65	8,823,408	3.38	1.00	to 3.10	(17.47)	to (15.72)	
2021	520,191	12.30	to 12.91	8,065,680	2.30	1.00	to 3.10	9.51	to 11.83	
2020	584,504	11.00	to 11.79	8,319,183	2.84	1.00	to 3.10	2.34	to 4.52	
2019	700,188	10.52	to 11.52	9,815,416	1.52	1.00	to 3.10	9.34	to 11.66	
MML Fundamental Equity Sub-Account										
2023	908,537	27.67	to 35.56	21,435,172	0.76	0.95	to 3.10	19.02	to 21.60	
2022	909,971	23.25	to 29.24	18,740,713	0.36	0.95	to 3.10	(22.86)	to (21.19)	
2021	890,049	30.14	to 37.10	23,979,880	0.33	0.95	to 3.10	23.50	to 26.18	
2020	880,974	24.41	to 29.41	19,006,450	-	0.95	to 3.10	15.94	to 18.46	
2019	797,684	21.05	to 24.82	14,803,275	0.44	0.95	to 3.10	29.26	to 32.07	

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,			For the Years Ended December 31,					
	Units	Unit Value ³		Net Assets	Investment			Total Return ³	
		(Lowest to Highest)			Income Ratio ¹	Expense Ratio ²		(Lowest to Highest)	
MML Fundamental Value Sub-Account									
2023	1,160,477	\$ 20.49 to	\$ 26.33	\$ 21,398,547	1.12 %	0.95 % to	3.10 %	9.96 % to	12.34 %
2022	1,213,572	18.63 to	23.44	20,630,720	0.84	0.95 to	3.10	(7.92) to	(5.92)
2021	1,116,028	20.24 to	24.91	20,520,581	1.64	0.95 to	3.10	25.73 to	28.46
2020	1,019,772	16.10 to	19.39	14,865,608	1.08	0.95 to	3.10	(0.76) to	1.40
2019	1,016,383	16.22 to	19.12	15,050,102	1.71	0.95 to	3.10	18.75 to	21.33
MML Global Sub-Account (Class I)									
2023	182,051	18.83 to	26.62	4,644,062	0.91	0.95 to	2.60	11.58 to	13.43
2022	181,481	16.87 to	23.47	4,097,127	1.46	0.95 to	2.60	(19.89) to	(18.56)
2021	184,374	21.06 to	28.82	5,128,057	0.88	0.95 to	2.60	14.31 to	16.21
2020	214,433	18.43 to	24.80	5,164,484	1.09	0.95 to	2.60	11.09 to	12.94
2019	266,210	16.59 to	21.96	5,717,821	0.68	0.95 to	2.60	27.24 to	29.36
MML Global Sub-Account (Class II)									
2023	224,321	15.23 to	19.66	4,141,451	0.82	1.18 to	1.65	12.51 to	13.03
2022	244,219	13.47 to	17.48	3,976,403	1.63	1.18 to	1.65	(19.06) to	(18.68)
2021	245,084	16.57 to	21.59	4,977,478	0.90	1.18 to	1.65	15.50 to	16.05
2020	256,171	14.28 to	18.69	4,487,312	1.05	1.18 to	1.65	12.10 to	12.63
2019	274,411	12.68 to	16.68	4,316,103	0.60	1.18 to	1.65	28.45 to	29.05
MML Global Sub-Account (Service Class I)									
2023	1,101,260	17.13 to	17.42	21,339,873	0.82	1.00 to	3.10	10.61 to	12.95
2022	1,108,024	15.42 to	15.49	19,626,341	1.34	1.00 to	3.10	(20.50) to	(18.81)
2021	888,586	19.00 to	19.48	19,462,328	0.76	1.00 to	3.10	13.58 to	15.99
2020	924,023	16.38 to	17.15	18,084,268	0.90	1.00 to	3.10	10.23 to	12.57
2019	944,518	14.55 to	15.56	17,104,721	0.35	1.00 to	3.10	26.30 to	28.98
MML Growth Allocation Sub-Account (Initial Class)									
2023	12,416,012	18.69 to	24.31	285,644,226	2.92	0.95 to	2.60	13.01 to	14.89
2022	14,041,930	16.54 to	21.16	282,056,598	2.65	0.95 to	2.60	(17.47) to	(16.10)
2021	15,565,856	20.04 to	25.22	373,971,831	1.56	0.95 to	2.60	11.40 to	13.25
2020	18,484,124	17.99 to	22.27	393,392,881	2.15	0.95 to	2.60	9.87 to	11.69
2019	26,884,888	16.37 to	19.94	514,011,956	2.27	0.95 to	2.60	18.10 to	20.06
MML Growth Allocation Sub-Account (Service Class)									
2023	28,790,959	15.84 to	16.83	604,769,485	2.68	1.00 to	3.10	12.30 to	14.68
2022	31,477,349	13.81 to	14.99	583,718,812	2.38	1.00 to	3.10	(18.03) to	(16.29)
2021	34,135,820	16.50 to	18.28	763,512,275	1.29	1.00 to	3.10	10.45 to	12.79
2020	39,460,627	14.63 to	16.55	788,648,224	1.88	1.00 to	3.10	9.04 to	11.35
2019	53,783,791	13.13 to	15.18	978,800,276	2.03	1.00 to	3.10	17.24 to	19.73
MML High Yield Sub-Account									
2023	2,723,099	14.48 to	19.42	39,426,819	6.72	0.95 to	3.10	9.38 to	11.75
2022	2,829,996	13.24 to	17.38	37,488,508	7.26	0.95 to	3.10	(14.65) to	(12.80)
2021	3,120,712	15.51 to	19.93	48,073,933	8.60	0.95 to	3.10	4.59 to	6.86
2020	2,894,882	14.83 to	18.65	42,643,144	0.02	0.95 to	3.10	2.16 to	4.38
2019	2,982,701	14.52 to	17.87	43,189,753	6.00	0.95 to	3.10	8.45 to	10.80
MML Income & Growth Sub-Account (Initial Class)									
2023	638,019	22.89 to	35.50	20,337,081	2.10	0.95 to	2.60	6.40 to	8.16
2022	711,659	21.51 to	32.82	21,115,105	1.46	0.95 to	2.60	(2.87) to	(1.25)
2021	777,632	22.15 to	33.24	23,466,564	1.74	0.95 to	2.60	23.03 to	25.08
2020	893,631	18.00 to	26.57	21,695,092	2.03	0.95 to	2.60	0.38 to	2.05
2019	1,014,616	17.93 to	26.04	24,198,302	1.99	0.95 to	2.60	21.24 to	23.26

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,					
	Unit Value ³		Net Assets	Investment	Income	Expense Ratio ²		Total Return ³		
	Units	(Lowest to Highest)				Ratio ¹	(Lowest to Highest)	(Lowest to Highest)	(Lowest to Highest)	
MML Income & Growth Sub-Account (Service Class)										
2023	1,338,100	\$ 19.16 to \$ 20.77	\$ 28,235,679	1.89 %	1.00 % to 3.10 %	5.66 % to 7.90 %				
2022	1,409,280	17.75 to 19.65	28,418,303	1.23	1.00 to 3.10	(3.62) to (1.58)				
2021	1,496,875	18.04 to 20.39	31,561,723	1.61	1.00 to 3.10	22.10 to 24.69				
2020	1,567,693	14.47 to 16.70	27,009,775	1.83	1.00 to 3.10	(0.35) to 1.76				
2019	1,681,966	14.22 to 16.76	29,439,298	1.78	1.00 to 3.10	20.35 to 22.90				
MML Inflation-Protected and Income Sub-Account (Initial Class)										
2023	6,094,042	10.85 to 16.16	86,114,635	4.62	0.95 to 2.60	2.73 to 4.44				
2022	6,536,201	10.56 to 15.48	88,867,535	2.51	0.95 to 2.60	(15.57) to (14.17)				
2021	7,993,007	12.51 to 18.03	126,908,902	1.07	0.95 to 2.60	3.67 to 5.39				
2020	8,662,812	12.07 to 17.11	130,964,666	0.11	0.95 to 2.60	8.26 to 10.06				
2019	9,934,572	11.15 to 15.54	137,121,414	2.38	0.95 to 2.60	5.53 to 7.29				
MML Inflation-Protected and Income Sub-Account (Service Class)										
2023	3,388,684	9.82 to 11.16	40,118,864	4.34	1.00 to 3.10	1.85 to 4.01				
2022	3,725,815	9.64 to 10.73	43,115,577	2.41	1.00 to 3.10	(16.22) to (14.45)				
2021	3,822,173	11.51 to 12.54	52,995,919	0.86	1.00 to 3.10	2.88 to 5.06				
2020	3,431,376	11.19 to 11.94	46,199,752	0.11	1.00 to 3.10	7.49 to 9.77				
2019	3,451,539	10.41 to 10.88	43,237,327	2.22	1.00 to 3.10	4.76 to 6.98				
MML International Equity Sub-Account										
2023	759,728	10.10 - 12.43	9,683,383	1.14	0.95 to 3.10	14.68 - 17.16				
2022	700,551	8.80 to 10.61	7,786,105	0.84	0.95 to 3.10	(17.93) to (16.15)				
2021	620,555	10.73 to 12.65	8,307,912	0.50	0.95 to 3.10	8.09 to 10.44				
2020	562,014	9.92 to 11.45	6,833,772	3.20	0.95 to 3.10	1.86 to 4.07				
2019	571,549	9.74 to 11.01	6,643,432	1.79	0.95 to 3.10	20.55 to 23.17				
MML iShares® 60/40 Allocation Sub-Account⁷										
2023	1,239,115	- - 10.09	12,501,315	2.23	0.95 to 3.10	- - 13.51				
2022	570,961	- - 8.89	5,074,791	2.14	0.95 to 3.10	- - -				
MML iShares® 80/20 Allocation Sub-Account⁷										
2023	3,671,842	- - 10.34	37,951,462	1.69	0.95 to 3.10	- - 16.70				
2022	2,102,879	- - 8.86	18,624,545	2.12	0.95 to 3.10	- - -				
MML Large Cap Growth Sub-Account (Initial Class)										
2023	348,658	34.35 to 50.94	15,238,937	-	0.95 to 2.60	47.83 to 50.28				
2022	386,186	23.24 to 33.90	11,258,538	-	0.95 to 2.60	(29.41) to (28.23)				
2021	428,715	32.92 to 47.24	17,656,357	0.05	0.95 to 2.60	15.38 to 17.30				
2020	492,342	28.53 to 40.27	17,478,633	0.33	0.95 to 2.60	28.40 to 30.53				
2019	577,917	22.22 to 30.85	15,827,567	0.58	0.95 to 2.60	28.60 to 30.74				
MML Large Cap Growth Sub-Account (Service Class)										
2023	1,115,328	26.60 to 31.12	28,781,766	-	1.00 to 3.10	46.77 to 49.87				
2022	973,248	17.75 to 21.21	17,964,547	-	1.00 to 3.10	(29.94) to (28.45)				
2021	978,368	24.81 to 30.27	25,898,086	-	1.00 to 3.10	14.48 to 16.91				
2020	965,919	21.22 to 26.44	22,228,571	0.17	1.00 to 3.10	27.52 to 30.22				
2019	896,562	16.30 to 20.73	16,390,792	0.46	1.00 to 3.10	27.64 to 30.35				
MML Managed Bond Sub-Account (Initial Class)										
2023	4,749,269	11.47 to 17.93	73,150,962	3.97	0.95 to 2.60	3.97 to 5.69				
2022	5,208,236	11.03 to 16.96	76,373,788	3.00	0.95 to 2.60	(17.19) to (15.81)				
2021	6,154,434	13.32 to 20.15	107,430,616	3.16	0.95 to 2.60	(1.77) to (0.14)				
2020	6,518,330	13.56 to 20.18	114,405,900	0.10	0.95 to 2.60	4.95 to 6.69				
2019	7,123,945	12.92 to 18.91	117,808,474	3.67	0.95 to 2.60	6.99 to 8.77				

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,				
	Units	Unit Value ³		Net Assets	Investment	Expense Ratio ²		Total Return ³	
		(Lowest to Highest)			Income Ratio ¹	(Lowest to Highest)		(Lowest to Highest)	
MML Managed Bond Sub-Account (Service Class)									
2023	13,114,910	\$ 10.27 to \$	10.40	\$ 163,963,276	3.67 %	1.00 % to	3.10 %	3.19 % to	5.38 %
2022	14,965,961	9.75 to	10.08	180,957,384	2.73	1.00 to	3.10	(17.80) to	(16.06)
2021	17,341,820	11.61 to	12.26	253,912,380	2.96	1.00 to	3.10	(2.51) to	(0.44)
2020	17,765,196	11.66 to	12.58	266,777,188	0.10	1.00 to	3.10	4.16 to	6.37
2019	18,130,096	10.96 to	12.07	260,703,020	3.46	1.00 to	3.10	6.19 to	8.45
MML Managed Volatility Sub-Account (Initial Class)									
2023	3,212,163	14.28 to	23.07	61,463,479	0.57	0.95 to	2.60	9.98 to	11.81
2022	3,697,357	12.98 to	20.63	63,499,565	0.47	0.95 to	2.60	(14.30) to	(12.88)
2021	4,569,936	15.15 to	23.68	90,531,793	0.97	0.95 to	2.60	8.68 to	10.49
2020	5,170,638	13.94 to	21.43	93,221,623	1.40	0.95 to	2.60	3.94 to	5.67
2019	5,894,344	13.41 to	20.28	101,210,212	1.62	0.95 to	2.60	9.03 to	10.84
MML Managed Volatility Sub-Account (Service Class)									
2023	1,055,623	12.90 to	12.95	17,363,284	0.27	1.00 to	3.10	9.16 to	11.47
2022	1,298,703	11.57 to	11.86	19,279,858	0.19	1.00 to	3.10	(14.94) to	(13.14)
2021	1,489,972	13.32 to	13.94	25,981,811	0.71	1.00 to	3.10	7.87 to	10.16
2020	1,669,075	12.09 to	12.93	26,903,885	1.15	1.00 to	3.10	3.17 to	5.36
2019	1,951,793	11.48 to	12.53	30,590,858	1.37	1.00 to	3.10	8.21 to	10.51
MML Mid Cap Growth Sub-Account (Initial Class)									
2023	1,006,915	34.24 to	70.83	61,848,174	-	0.95 to	2.60	19.50 to	21.48
2022	1,136,273	28.65 to	58.31	57,562,324	-	0.95 to	2.60	(27.03) to	(25.82)
2021	1,246,633	39.26 to	78.60	85,664,131	-	0.95 to	2.60	10.31 to	12.14
2020	1,454,733	35.60 to	70.09	89,949,266	0.08	0.95 to	2.60	22.35 to	24.38
2019	1,710,217	29.09 to	56.35	83,592,878	0.02	0.95 to	2.60	27.93 to	30.05
MML Mid Cap Growth Sub-Account (Service Class)									
2023	3,484,460	20.16 to	30.88	87,758,884	-	1.00 to	3.10	18.61 to	21.12
2022	3,733,478	16.65 to	26.04	81,046,753	-	1.00 to	3.10	(27.59) to	(26.05)
2021	3,879,781	22.51 to	35.95	118,152,584	-	1.00 to	3.10	9.54 to	11.87
2020	4,168,210	20.12 to	32.82	117,785,877	-	1.00 to	3.10	21.43 to	24.01
2019	4,497,792	16.23 to	27.03	108,799,560	-	1.00 to	3.10	27.01 to	29.71
MML Mid Cap Value Sub-Account (Initial Class)									
2023	2,178,707	32.35 to	51.94	97,900,075	2.60	0.95 to	2.60	3.26 to	4.97
2022	2,437,354	31.33 to	49.48	104,763,063	2.02	0.95 to	2.60	(3.86) to	(2.26)
2021	3,020,014	32.59 to	50.63	132,262,516	1.40	0.95 to	2.60	20.15 to	22.15
2020	3,707,481	27.13 to	41.45	133,181,143	1.82	0.95 to	2.60	(0.90) to	0.75
2019	4,044,150	27.37 to	41.14	144,980,289	1.62	0.95 to	2.60	25.82 to	27.91
MML Mid Cap Value Sub-Account (Service Class)									
2023	2,015,747	18.00 to	29.33	46,054,106	2.40	1.00 to	3.10	2.48 to	4.65
2022	2,207,545	17.20 to	28.62	50,303,554	1.88	1.00 to	3.10	(4.56) to	(2.54)
2021	2,249,934	17.65 to	29.98	55,688,323	1.25	1.00 to	3.10	19.20 to	21.72
2020	2,406,081	14.50 to	25.16	51,269,948	1.58	1.00 to	3.10	(1.62) to	0.47
2019	2,380,279	14.43 to	25.57	53,222,998	1.44	1.00 to	3.10	24.97 to	27.62
MML Moderate Allocation Sub-Account (Initial Class)									
2023	7,711,185	16.67 to	21.68	159,162,925	3.30	0.95 to	2.60	10.98 to	12.82
2022	8,783,827	15.02 to	19.21	161,103,074	3.27	0.95 to	2.60	(17.15) to	(15.78)
2021	9,831,320	18.13 to	22.81	214,743,239	1.34	0.95 to	2.60	9.12 to	10.94
2020	11,897,524	16.61 to	20.57	235,097,461	2.55	0.95 to	2.60	7.71 to	9.50
2019	17,179,709	15.42 to	18.78	310,792,789	2.52	0.95 to	2.60	15.54 to	17.46

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,		For the Years Ended December 31,					
	Units	Unit Value ³	Net Assets	Investment	Expense Ratio ²		Total Return ³	
		(Lowest to Highest)		Income Ratio ¹	(Lowest to Highest)		(Lowest to Highest)	
MML Moderate Allocation Sub-Account (Service Class)								
2023	52,943,371	\$ 14.44 to \$ 14.99	\$ 956,025,249	2.99 %	1.00 % to 3.10 %	10.16 % to 12.50 %		
2022	64,409,744	12.83 to 13.60	1,044,498,635	2.96	1.00 to 3.10	(17.71) to (15.96)		
2021	74,645,263	15.27 to 16.53	1,461,000,467	1.11	1.00 to 3.10	8.26 to 10.56		
2020	87,882,437	13.81 to 15.27	1,575,429,932	2.23	1.00 to 3.10	6.80 to 9.07		
2019	105,177,875	12.66 to 14.30	1,752,110,801	2.26	1.00 to 3.10	14.75 to 17.18		
MML Short-Duration Bond Sub-Account								
2023	2,987,098	8.21 to 11.01	30,357,722	3.37	0.95 to 3.10	3.45 to 5.70		
2022	3,030,930	7.94 to 10.42	29,348,995	3.02	0.95 to 3.10	(10.80) to (8.86)		
2021	3,188,272	8.90 to 11.43	34,025,850	2.93	0.95 to 3.10	(1.41) to 0.73		
2020	4,150,563	9.03 to 11.35	44,272,880	-	0.95 to 3.10	(1.75) to 0.39		
2019	3,025,222	9.19 to 11.31	32,173,643	3.11	0.95 to 3.10	0.99 to 3.19		
MML Small Cap Equity Sub-Account (Initial Class)								
2023	489,705	29.28 to 46.69	22,205,417	1.28	0.95 to 2.60	14.80 to 16.70		
2022	549,032	25.50 to 40.01	21,412,816	0.71	0.95 to 2.60	(18.04) to (16.67)		
2021	623,139	31.11 to 48.02	29,197,903	0.44	0.95 to 2.60	19.60 to 21.59		
2020	706,873	26.01 to 39.49	27,259,529	0.53	0.95 to 2.60	17.60 to 19.55		
2019	831,548	22.12 to 33.03	26,710,657	0.47	0.95 to 2.60	23.22 to 25.27		
MML Small Cap Equity Sub-Account (Service Class)								
2023	1,093,197	20.29 to 26.49	25,292,942	1.04	1.00 to 3.10	13.94 to 16.35		
2022	1,141,426	17.44 to 23.25	23,617,332	0.43	1.00 to 3.10	(18.65) to (16.92)		
2021	1,198,581	20.99 to 28.58	30,289,216	0.27	1.00 to 3.10	18.71 to 21.23		
2020	1,169,902	17.31 to 24.08	25,344,927	0.30	1.00 to 3.10	16.72 to 19.20		
2019	1,184,188	14.53 to 20.63	22,694,629	0.26	1.00 to 3.10	22.30 to 24.89		
MML Small Cap Growth Equity Sub-Account (Initial Class)								
2023	1,504,269	33.20 to 56.35	64,463,437	-	0.95 to 2.60	13.85 to 15.74		
2022	1,511,703	29.16 to 48.69	60,413,373	-	0.95 to 2.60	(25.13) to (23.88)		
2021	1,630,525	38.94 to 63.96	87,699,978	-	0.95 to 2.60	4.55 to 6.29		
2020	1,790,589	37.25 to 60.18	90,992,101	-	0.95 to 2.60	32.15 to 34.34		
2019	2,488,164	28.19 to 44.79	94,744,872	-	0.95 to 2.60	30.88 to 33.06		
MML Small Cap Growth Equity Sub-Account (Service Class)								
2023	943,464	20.40 to 30.09	23,420,809	-	1.00 to 3.10	13.00 to 15.39		
2022	1,026,472	17.68 to 26.63	22,649,920	-	1.00 to 3.10	(25.69) to (24.11)		
2021	1,096,162	23.30 to 35.83	32,664,648	-	1.00 to 3.10	3.77 to 5.98		
2020	1,072,366	21.98 to 34.53	31,164,764	-	1.00 to 3.10	31.16 to 33.94		
2019	1,127,320	16.41 to 26.33	26,026,111	-	1.00 to 3.10	29.90 to 32.66		
MML Small Company Value Sub-Account								
2023	1,095,035	18.95 to 30.20	24,402,246	0.86	1.00 to 3.10	12.39 to 14.77		
2022	1,202,832	16.51 to 26.87	23,768,684	-	1.00 to 3.10	(17.65) to (15.90)		
2021	1,245,949	19.64 to 32.63	29,889,996	0.19	1.00 to 3.10	21.30 to 23.88		
2020	1,280,052	15.85 to 26.90	25,549,702	0.06	1.00 to 3.10	5.60 to 7.84		
2019	1,254,816	14.70 to 25.47	24,665,122	0.08	1.00 to 3.10	21.43 to 24.01		
MML Small/Mid Cap Value Sub-Account (Initial Class)								
2023	2,046,774	26.61 to 51.75	74,277,443	1.09	0.95 to 2.60	14.13 to 16.02		
2022	2,306,713	23.31 to 44.60	72,429,647	1.24	0.95 to 2.60	(17.85) to (16.49)		
2021	2,639,896	28.38 to 53.41	99,423,759	1.01	0.95 to 2.60	32.46 to 34.66		
2020	3,498,522	21.43 to 39.66	97,698,172	1.10	0.95 to 2.60	1.96 to 3.66		
2019	3,898,914	21.01 to 38.26	105,702,814	0.61	0.95 to 2.60	17.19 to 19.14		

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,				For the Years Ended December 31,						
	Units	Unit Value ³ (Lowest to Highest)		Net Assets	Investment Income Ratio ¹	Expense Ratio ² (Lowest to Highest)		Total Return ³ (Lowest to Highest)			
MML Small/Mid Cap Value Sub-Account (Service Class)											
2023	1,126,743	\$ 17.82	to \$ 24.13	\$ 24,597,903	0.85 %	1.00 %	to 3.10 %	13.33 %	to 15.73 %		
2022	1,200,173	15.40	to 21.29	23,433,475	1.00	1.00	to 3.10	(18.46)	to (16.73)		
2021	1,239,236	18.50	to 26.11	29,944,498	0.88	1.00	to 3.10	31.51	to 34.29		
2020	1,139,563	13.77	to 19.86	22,292,450	0.84	1.00	to 3.10	1.14	to 3.29		
2019	1,156,012	13.34	to 19.63	23,286,750	0.39	1.00	to 3.10	16.32	to 18.78		
MML Special Situations Sub-Account (Service Class D)⁶											
2023	-	-	to -	-	-	-	to -	-	to -		
2022	-	-	to -	-	-	-	to -	-	to -		
2021	57,104	18.03	to 18.94	1,081,248	-	1.00	to 1.80	(0.39)	to 0.41		
2020	50,391	18.10	to 18.87	950,460	0.03	1.00	to 1.80	26.93	to 27.95		
2019	56,690	14.26	to 14.75	835,745	-	1.00	to 1.80	21.29	to 22.27		
MML Strategic Emerging Markets Sub-Account (Service Class I)											
2023	986,758	8.31	to 11.83	11,198,336	-	1.00	to 3.10	0.07	to 0.09		
2022	1,048,803	7.77	to 10.83	10,939,529	0.03	1.00	to 3.10	(0.29)	to (0.28)		
2021	1,062,107	10.95	to 14.95	15,351,011	-	1.00	to 3.10	(11.15)	to (9.26)		
2020	1,017,814	12.33	to 16.47	16,215,171	0.20	1.00	to 3.10	13.68	to 16.09		
2019	1,150,619	10.84	to 14.19	15,739,019	0.01	1.00	to 3.10	21.36	to 23.93		
MML Sustainable Equity Sub-Account (Initial Class)⁴											
2023	1,321,303	27.34	to 49.99	59,757,622	0.96	0.95	to 2.60	21.32	to 23.33		
2022	1,502,553	22.54	to 40.53	55,237,374	0.54	0.95	to 2.60	(19.14)	to (17.80)		
2021	1,664,117	27.87	to 49.30	74,572,321	0.81	0.95	to 2.60	23.88	to 25.94		
2020	1,995,917	22.50	to 39.15	71,531,066	0.91	0.95	to 2.60	11.57	to 13.43		
2019	2,322,666	20.17	to 34.51	73,362,599	0.94	0.95	to 2.60	28.71	to 30.85		
MML Sustainable Equity Sub-Account (Service Class)⁴											
2023	2,038,182	22.64	to 24.78	50,481,335	0.68	1.00	to 3.10	20.42	to 22.96		
2022	2,287,275	18.41	to 20.58	46,573,782	0.69	1.00	to 3.10	(19.72)	to (18.02)		
2021	2,420,106	22.46	to 25.64	60,960,010	0.66	1.00	to 3.10	22.91	to 25.52		
2020	2,420,663	17.89	to 20.86	49,795,171	0.72	1.00	to 3.10	10.75	to 13.10		
2019	2,471,418	15.82	to 18.83	45,996,901	0.76	1.00	to 3.10	27.79	to 30.51		
MML Total Return Bond Sub-Account											
2023	3,711,823	8.17	to 10.50	36,326,170	0.02	0.95	to 3.10	0.02	to 0.04		
2022	3,801,490	8.01	to 10.07	35,974,681	0.01	0.95	to 3.10	(0.17)	to (0.16)		
2021	4,187,985	9.71	to 11.95	47,397,082	0.02	0.95	to 3.10	(0.05)	to (0.02)		
2020	4,106,252	10.17	to 12.25	47,980,688	3.09	0.95	to 3.10	5.28	to 7.57		
2019	2,936,027	9.66	to 11.39	31,973,807	3.02	0.95	to 3.10	5.34	to 7.63		
MML U.S. Government Money Market Sub-Account											
2023	12,230,273	6.92	to 9.63	116,713,676	4.52	0.95	to 3.10	1.45	to 3.65		
2022	14,291,056	6.82	to 9.29	131,305,870	1.38	0.95	to 3.10	(1.86)	to 0.26		
2021	9,905,255	6.95	to 9.27	90,771,755	-	0.95	to 3.10	(3.05)	to (0.95)		
2020	15,675,879	7.17	to 9.36	143,711,817	0.17	0.95	to 3.10	(2.83)	to (0.72)		
2019	8,074,717	7.37	to 9.42	75,534,222	1.69	0.95	to 3.10	(1.40)	to 0.75		
Openheimer Global Multi-Alternatives Sub-Account											
2023	-	-	to -	-	-	-	to -	-	to -		
2022	-	-	to -	-	-	-	to -	-	to -		
2021	-	-	to -	-	-	-	to -	-	to -		
2020	-	-	to -	-	-	-	to -	-	to -		
2019 ⁶	2	8.54	to 9.51	-	1.11	0.95	to 3.10	2.36	to 3.08		
PIMCO CommodityRealReturn® Strategy Sub-Account											
2023	985,786	5.17	to 7.39	6,856,177	16.20	0.95	to 3.10	(10.74)	to (8.80)		
2022	1,187,713	5.79	to 8.10	9,095,267	21.08	0.95	to 3.10	5.36	to 7.64		
2021	1,195,842	5.50	to 7.53	8,564,039	4.06	0.95	to 3.10	29.05	to 31.85		
2020	1,401,409	4.26	to 5.71	7,627,491	6.33	0.95	to 3.10	(1.86)	to 0.27		
2019	1,661,426	4.34	to 5.70	9,033,874	4.33	0.95	to 3.10	7.95	to 10.30		
PIMCO Income Sub-Account⁷											
2023	212,500	-	to 9.95	2,114,179	5.24	0.95	to 3.10	-	to 6.77		
2022	89,638	-	to 9.32	835,304	3.28	0.95	to 3.10	-	to -		

Notes To Financial Statements (Continued)

8. FINANCIAL HIGHLIGHTS (Continued)

	At December 31,			For the Years Ended December 31,						
	Units	Unit Value ³ (Lowest to Highest)		Net Assets	Investment Income Ratio ¹	Expense Ratio ² (Lowest to Highest)			Total Return ³ (Lowest to Highest)	
VY® CBRE Global Real Estate Sub-Account⁴										
2023	542,067	\$ 12.65	to \$ 18.08	\$ 9,161,323	1.78 %	0.95 %	to	3.10 %	8.91 %	to 11.27 %
2022	599,231	11.61	to 16.25	9,135,382	3.01	0.95	to	3.10	(27.41)	to (25.83)
2021	660,849	16.00	to 21.91	13,624,068	2.65	0.95	to	3.10	30.05	to 32.87
2020	807,288	12.30	to 16.49	12,571,760	5.83	0.95	to	3.10	(7.94)	to (5.94)
2019	948,461	13.36	to 17.53	15,751,756	2.58	0.95	to	3.10	20.55	to 23.17

¹The investment income ratios represent the dividends, excluding distributions of capital gains, received by the sub-accounts from the underlying mutual fund, 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 sub-accounts is affected by the timing of the declaration of dividends by the underlying fund in which the sub-account invests.

²The expense ratios represent the annualized contract expense of the sub-accounts 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.

³The 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. As the total return is presented as a range of minimum to maximum values, based on the product grouping representing the related minimum and maximum expense ratio amounts, some individual contract total returns and unit values are not within the ranges presented.

⁴See Note 2 to the financial statements for the previous name of this Sub-Account.

⁵After the close of business on April 29, 2022, Invesco V.I. Core Plus Bond Fund acquired all the net assets of Invesco V.I. Core Bond Fund pursuant to a plan of reorganization approved by the Board of Trustees of the Invesco V.I. Core Plus Bond Fund on December 1, 2021 and by the shareholders of the Invesco V.I. Core Bond Fund on March 31, 2022. The acquisition was accomplished by a tax-free exchange as of the close of business on April 29, 2022. Shares of Invesco V.I. Core Bond Fund were exchanged for the like class of shares of Invesco V.I. Core Plus Bond Fund, based on the relative net asset value of the two funds which resulted in Invesco V.I. Core Bond Fund receiving 1.15816327 shares of Invesco V.I. Core Plus Bond Fund in exchange of 1 share of Invesco V.I. Core Bond Fund. As a result of the underlying fund merger, the subaccount name changed from Invesco V.I. Core Bond to Invesco V.I. Core Plus Bond. Financial highlights for the years 2018-2021 correspond to the Invesco V.I. Core Bond Sub-Account.

⁶For the period January 1, 2022 to November 4, 2022. Effective November 4, 2022 this Sub-Account liquidated and any contract value in the Sub-Account after the close of the New York Stock Exchange on November 4, 2022 was automatically transferred to the MML U.S. Government Money Market Sub-Account.

⁷This fund/sub-account became available to the Separate Account as an investment option on February 28, 2022, but it is presented from the year when the investment or unit activity has been started.

⁸This fund/sub-account became available to the Separate Account as an investment option on May 1, 2023, but it is presented from the year when the investment or unit activity has been started.

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. The assessment of charges is based on the actual product and additional benefits or riders purchased.

<p>Mortality and Expense Risk Charge*</p> <p>This charge is assessed through a reduction in unit values.</p>	<p>This charge is equal, on an annual basis, to 0.80% - 1.60% of the daily value of the assets invested in each fund.</p>
<p>Administrative Charge**</p> <p>This charge is assessed through a reduction in 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>Administrative Contract Maintenance Charge***</p> <p>This charge is assessed through the redemption of units.</p>	<p>\$0 - \$40 per contract, annually.</p>
<p>Contingent Deferred Sales Charge/Surrender Charge</p> <p>This charge is assessed through the redemption of units.</p>	<p>0% - 8%</p>
<p>Payment Protector Charge</p> <p>This charge is assessed through a reduction in unit values.</p>	<p>This charge is equal, on an annual basis, to 0.00% - 0.50% of the daily value of the assets invested in each fund.</p>
<p>Additional Death Benefit Options These charges are annualized and are assessed through either a reduction in unit values or the redemption of units.</p>	
<p>A. Reset Death Benefit****</p>	<p>0.00% - 0.20%</p>
<p>B. Ratchet Death Benefit*****</p>	<p>0.00% - 0.70%</p>
<p>C. 5% roll Up Death Benefit</p>	<p>0.00% - 0.40%</p>
<p>D. Basic Death Benefit with Combination Feature</p>	<p>0.00% - 0.45%</p>
<p>E. Return of Purchase Payment</p>	<p>0.00% - 0.35%</p>

Notes To Financial Statements (Continued)

8. Financial Highlights (Continued)

Rider Charges	
These charges are annualized and are assessed through either a reduction in unit values or the redemption of units.	
A. Equalizer Benefit	0.00% - 0.50%
B. Nursing Home Waiver	0.00% - 0.05%
C. Earnings Enhancement Benefit	0.00% - 0.30%
D. 10% / 20% Free Withdrawal Amount	0.00% - 0.25%
E. 15% / 30% Free Withdrawal Amount	0.00% - 0.15%
F. Guaranteed Minimum Income Benefit (GMIB)	0.00% - 1.50%
G. Guaranteed Minimum Accumulation Benefit (GMAB)	0.00% - 1.40%
H. Guaranteed Lifetime Withdrawal Benefit (GLWB)	0.00% - 1.60%

* For MM Artistry the charges are 1.03% but right reserved to increase to 1.25%.

** Right reserved to increase to .25%.

*** Right reserved to increase to \$60.

**** For Panorama Passage the charge for the Reset Death Benefit is 0.10% on an annual basis of the daily value of the certificate value allocated to the funds and the fixed accounts, unless the charge exceeds the maximum charge, in which case, the charge is the maximum charge. The maximum charge is 0.20% on an annual basis of the daily value of the certificate value allocated to the funds.

***** The Ratchet Death Benefit is 0.25% for Panorama Passage and 0.15% for Panorama Premier on an annual basis of the daily value of the certificate value allocated to the funds and the fixed accounts, unless that charge exceeds the maximum, in this case the charge is the maximum charge. The maximum charge is 0.35% if age 60 or less at certificate issue, 0.50% if age 61 through age 70 at certificate issue, and 0.70% if age 71 or older at certificate issue, of the certificate value allocated to the funds.

Certain contracts may offer credits which will result in the purchase of units.

9. SUBSEQUENT EVENTS

The Separate Account's management has reviewed events occurring through March 7, 2024, the date the financial statements were issued, and no subsequent events occurred requiring accrual or disclosure.

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