

Performance Update

As of October 31, 2020

MassMutual Capital Vantage[®]
variable annuity

- Not a bank or credit union deposit or obligation
- Not insured by any federal government agency
- Not FDIC or NCUA-insured
- Not guaranteed by any bank or credit union
- May go down in value

MassMutual Capital VantageSM

A deferred variable annuity is a long-term investment designed to help you accumulate assets for retirement. It also offers a broad array of investment choices and asset classes, death benefit choices and multiple annuity options to turn those assets into a stream of guaranteed income at some point in the future. Guarantees are based on the claims-paying ability of the issuing company and do not apply to the investment performance or the safety of amounts held in the variable investment choices. Variable annuities are not appropriate for everyone. There are fees and charges associated with owning an annuity. **Variable annuities are subject to market risk, including the potential loss of principal.** Withdrawals of earnings will be subject to income tax and may be subject to a 10 percent federal income tax penalty if taken prior to age 59 ½.

Capital Vantage has the following Share classes: a B-Share and an C-Share. Each share class is subject to different charges. The class that you select will be identified in your Contract. Not every share class or additional feature may be available to you.

MassMutual Capital Vantage first became available (in most states) on October 26, 2015, but many of the underlying funds were established before this date. For these funds, the total returns are computed using hypothetical variable annuity unit values which are based on the underlying fund's performance less separate account expenses for the periods shown, including periods before the product was available. For periods of one year or less, the total return is not annualized and is the percentage change in an Accumulation Unit. For periods greater than one year, the average annual total return for the time periods is shown.

Past performance is no indication of future results. This update contains the most recent month-end performance. Since performance changes daily, the current performance may be lower or higher than the performance reflected in this update. The investment return and principal value of an investment will fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original cost. For the most recent month-end performance information, visit our website at www.massmutual.com or call the MassMutual Customer Service Center at (800) 272-2216, Monday – Friday, 8 a.m. to 8 p.m. Eastern Time.

Investing involves risk, including the loss of principal. Each investment choice underlying the variable annuity contract has broad risks that apply to all investment choices, such as market risk, as well as specific risks inherent in particular types of investment choices that may subject your variable annuity contract to greater risk and volatility than the general market.

Before purchasing MassMutual Capital Vantage, investors should carefully consider the investment objectives, risks, charges and expenses of the variable annuity contract. For this and other information, obtain the [MassMutual Capital Vantage prospectus](#) from your registered representative. The prospectus should be read carefully before investing or sending money. You may also obtain the [prospectuses \(or summary prospectuses, if available\)](#) for its underlying investment choices from your registered representative.

Market Indices as of October 31, 2020

	YTD	1 Year	3 Years	5 Years	10 Years
S&P 500 Index	2.77%	9.71%	10.42%	11.71%	13.01%
Morgan Stanley Capital International World Index	-1.42%	4.36%	5.96%	8.13%	8.64%
Russell 2000 Total Return Index	-6.77%	-0.14%	2.19%	7.27%	9.64%
Barclays U.S. Aggregate Bond Index	6.32%	6.19%	5.06%	4.08%	3.55%

Market indices have been provided for informational purposes only; they are unmanaged and reflect no fees or expenses. Individuals cannot invest directly in an index.

The Standard & Poor's 500 Index is an unmanaged measure of common stock total return performance in the U.S.

The Morgan Stanley Capital International World Index is an unmanaged measure of total return performance in the global securities market.

The Russell 2000 Total Return Index is a broad based, unmanaged index comprised of 2000 of the smallest U.S. domiciled company common stocks (on the basis of capitalization) that are traded in the United States on the New York Stock Exchange, the American Stock Exchange, and NASDAQ.

The Barclays U.S. Aggregate Bond Index is an unmanaged index of U.S. corporate bond issues, U.S. Government Securities and mortgage-backed securities.

Total Returns reflect total annualized separate account expenses and all fund level expenses, including any 12(b)-1 fees. The performance in the chart below is representative of a B Share Class. This share class carries a static M&E of 1.00% for all years. These returns do not reflect the charges for any optional contract features, contingent deferred sales charges, the annual maintenance charge, or premium taxes, if any. Their inclusion would reduce the returns shown.

Asset Category	Separate Account Sub-account	Fund Inception Date	Endnotes	Cumulative YTD	Average Annual				
					1 Year	3 Years	5 Years	10 Years	Since Inception
Asset Allocation	MML Conservative Allocation	8/31/2007	1, 2	-0.18%	2.04%	3.02%	3.73%	4.54%	3.92%
	MML Balanced Allocation	8/31/2007	1, 2	-0.47%	2.29%	3.13%	4.15%	5.18%	4.00%
	MML Moderate Allocation	8/31/2007	1, 2	-2.59%	0.73%	2.65%	4.27%	5.61%	4.11%
	MML American Funds Core Allocation	8/15/2008	1, *	-1.25%	2.97%	3.71%	5.56%	6.24%	5.11%
	MML Growth Allocation	8/31/2007	1, 2	-2.63%	1.51%	3.01%	5.00%	6.56%	4.37%
	MML Aggressive Allocation	8/31/2007	1, 2	-4.16%	0.73%	2.84%	5.46%	7.31%	4.54%
Money Market	MML U.S. Government Money Market <i>7-day yield: -1.08%</i>	12/16/1981	3	-0.60%	-0.58%	0.12%	-0.26%	-0.63%	2.74%
Fixed Income	Invesco Oppenheimer V.I. Global Strategic Income	5/3/1993	2	-3.99%	-2.63%	-0.01%	1.36%	1.60%	4.06%
	MML Dynamic Bond	5/15/2015		0.68%	0.65%	2.23%	2.41%	—	2.04%
	MML High Yield	5/3/2010	*	-3.20%	-1.45%	0.65%	3.86%	4.99%	5.31%
	MML Inflation-Protected and Income	8/30/2002	2	7.24%	7.43%	4.10%	3.21%	1.96%	2.89%
	MML Managed Bond	12/16/1981	2	3.87%	3.70%	3.54%	2.73%	2.38%	6.04%
	MML Short-Duration Bond	5/3/2010	*	-0.83%	-0.56%	0.81%	0.86%	0.79%	1.05%
	MML Total Return Bond	8/9/2010	2	5.96%	5.58%	4.03%	2.85%	2.04%	2.24%
Balanced	MML Blend	2/3/1984		1.36%	5.79%	5.75%	6.83%	8.03%	7.61%
Large Cap Value	MML Equity	12/31/1973	2, 4	-12.87%	-7.75%	-0.03%	3.61%	7.08%	8.45%
	MML Equity Income	5/31/2002	2, 5	-17.38%	-12.35%	-1.36%	3.92%	6.68%	4.04%
	MML Fundamental Value	8/9/2010	*	-14.94%	-9.80%	-1.65%	2.48%	6.70%	6.91%
	MML Income & Growth	8/31/1998	2, 5	-16.09%	-12.19%	-2.20%	3.54%	6.72%	3.46%
Large Cap Blend	Fidelity® VIP Contrafund®	7/5/1995	2	-0.28%	5.66%	6.72%	8.23%	10.13%	7.51%
	Invesco Oppenheimer V.I. Main Street	1/3/1995	2	15.97%	23.59%	12.64%	12.05%	11.77%	10.19%
	MML Focused Equity	12/8/2011	*	-2.15%	3.22%	9.63%	11.06%	—	12.57%
	MML Fundamental Equity	12/8/2011	*, **	4.91%	12.13%	12.10%	11.96%	—	13.05%
	MML Growth & Income	4/30/2003	2, 5	-1.31%	5.36%	7.69%	9.19%	10.58%	5.49%
Large Cap Growth	MML Blue Chip Growth	5/31/2002	2, 5	20.08%	28.55%	16.49%	15.69%	15.50%	10.62%
	MML American Funds® Growth	2/8/1984	6, *	22.74%	32.83%	16.67%	16.09%	13.67%	7.50%
	MML Large Cap Growth	8/31/1999	2, 5	17.02%	25.92%	14.76%	13.57%	12.61%	8.12%
Small / Mid Cap Value	MML Mid Cap Value	8/31/1999	2, 6	-13.52%	-8.37%	-0.75%	4.38%	8.54%	6.61%
	MML Small Company Value	2/27/2009	*	-12.83%	-8.33%	-1.67%	5.10%	7.21%	11.18%
	MML Small/Mid Cap Value	4/30/2003	2, 5	-16.48%	-11.78%	-4.68%	2.06%	6.54%	3.08%
Small/Mid Cap Blend	MML Small Cap Equity	6/1/1998	2	-4.45%	1.98%	2.17%	6.50%	9.48%	5.02%

Asset Category	Separate Account Sub-account	Fund Inception Date	Endnotes	Cumulative YTD	Average Annual				
					1 Year	3 Years	5 Years	10 Years	Since Inception
Small / Mid Cap Growth	Invesco Oppenheimer V.I. Discovery Mid Cap Growth	8/15/1986	2	17.29%	24.36%	15.03%	13.79%	13.70%	8.77%
	MML Mid Cap Growth	8/31/1998	2, 5	5.90%	12.50%	10.53%	11.18%	12.64%	9.47%
	MML Small Cap Growth Equity	5/3/1999	2	5.56%	13.22%	10.88%	11.48%	11.38%	7.87%
International / Global	Invesco Oppenheimer V.I. Global	11/12/1990	2	5.01%	12.68%	6.57%	8.78%	8.73%	8.63%
	Invesco Oppenheimer V.I. International Growth	5/13/1992	2	1.48%	8.97%	1.24%	4.00%	5.16%	5.90%
	MML Foreign	8/31/1999	2, 5	-14.77%	-11.57%	-7.15%	-1.87%	0.48%	-0.08%
	MML Global	8/31/1999	2, 5	-5.68%	-0.43%	3.76%	6.38%	8.03%	4.22%
	MML American Funds® International	5/1/1990	6, *	-7.25%	-2.33%	-0.65%	4.24%	3.28%	2.49%
	MML International Equity	1/7/2014		-23.01%	-19.01%	-10.37%	-1.43%	—	-2.02%
	MML Strategic Emerging Markets	8/27/2008	*	-1.91%	4.70%	2.45%	6.99%	-0.36%	2.00%
Specialty	BlackRock 60/40 Target Allocation ETF	4/30/2014	***	2.33%	5.97%	5.58%	6.06%	—	4.28%
	Ivy VIP Asset Strategy	4/20/1995	*	-1.15%	2.69%	4.65%	3.92%	4.03%	7.55%
	MML Asset Momentum	5/15/2015		4.14%	12.33%	7.12%	10.33%	—	8.62%
	MML Equity Rotation	5/15/2015		3.91%	10.35%	3.92%	9.67%	—	8.44%
	MML Managed Volatility	5/1/2000	2, 7	-1.88%	0.13%	1.07%	2.42%	4.59%	2.36%
	MML Special Situations	5/15/2015		4.25%	7.22%	6.53%	9.01%	—	5.57%

Total Returns reflect total annualized separate account expenses and all fund level expenses, including any 12(b)-1 fees. The performance in the chart below is representative of an C Share Class. This share class carries a tier M&E of 1.45% for the first 5 years and 1.00% thereafter. These returns do not reflect the charges for any optional contract features, contingent deferred sales charges, the annual maintenance charge, or premium taxes, if any. Their inclusion would reduce the returns shown.

Asset Category	Separate Account Sub-account	Fund Inception Date	Endnotes	Cumulative YTD	Average Annual				
					1 Year	3 Years	5 Years	10 Years	Since Inception
Asset Allocation	MML Conservative Allocation	8/31/2007	1, 2	-0.55%	1.58%	2.56%	3.27%	4.31%	3.74%
	MML Balanced Allocation	8/31/2007	1, 2	-0.84%	1.83%	2.67%	3.68%	4.94%	3.82%
	MML Moderate Allocation	8/31/2007	1, 2	-2.96%	0.28%	2.19%	3.80%	5.37%	3.93%
	MML American Funds Core Allocation	8/15/2008	1, *	-1.62%	2.51%	3.24%	5.09%	6.01%	4.92%
	MML Growth Allocation	8/31/2007	1, 2	-2.99%	1.06%	2.55%	4.53%	6.32%	4.19%
	MML Aggressive Allocation	8/31/2007	1, 2	-4.51%	0.27%	2.38%	4.99%	7.07%	4.36%
Money Market	MML U.S. Government Money Market <i>7-day yield: -1.53%</i>	12/16/1981	3	-0.97%	-1.02%	-0.33%	-0.70%	-0.85%	2.68%
Fixed Income	Invesco Oppenheimer V.I. Global Strategic Income	5/3/1993	2	-4.35%	-3.07%	-0.46%	0.91%	1.37%	3.97%
	MML Dynamic Bond	5/15/2015		0.30%	0.20%	1.77%	1.95%	—	1.58%
	MML High Yield	5/3/2010	*	-3.56%	-1.89%	0.20%	3.40%	4.75%	5.08%
	MML Inflation-Protected and Income	8/30/2002	2	6.84%	6.95%	3.63%	2.75%	1.73%	2.77%
	MML Managed Bond	12/16/1981	2	3.48%	3.23%	3.07%	2.27%	2.15%	5.98%
	MML Short-Duration Bond	5/3/2010	*	-1.20%	-1.01%	0.36%	0.41%	0.56%	0.83%
	MML Total Return Bond	8/9/2010	2	5.56%	5.11%	3.57%	2.39%	1.81%	2.01%
Balanced	MML Blend	2/3/1984		0.98%	5.32%	5.27%	6.35%	7.79%	7.54%
Large Cap Value	MML Equity	12/31/1973	2, 4	-13.20%	-8.16%	-0.48%	3.14%	6.84%	8.40%
	MML Equity Income	5/31/2002	2, 5	-17.69%	-12.74%	-1.80%	3.46%	6.44%	3.87%
	MML Fundamental Value	8/9/2010	*	-15.25%	-10.21%	-2.09%	2.02%	6.46%	6.68%
	MML Income & Growth	8/31/1998	2, 5	-16.40%	-12.58%	-2.64%	3.07%	6.48%	3.30%
Large Cap Blend	Fidelity® VIP Contrafund®	7/5/1995	2	-0.65%	5.19%	6.24%	7.75%	9.88%	7.42%
	Invesco Oppenheimer V.I. Main Street	1/3/1995	2	15.54%	23.03%	12.13%	11.55%	11.52%	10.09%
	MML Focused Equity	12/8/2011	*	-2.51%	2.76%	9.14%	10.56%	—	12.06%
	MML Fundamental Equity	12/8/2011	*, **	4.52%	11.63%	11.60%	11.45%	—	12.54%
	MML Growth & Income	4/30/2003	2, 5	-1.68%	4.89%	7.21%	8.70%	10.33%	5.32%
Large Cap Growth	MML Blue Chip Growth	5/31/2002	2, 5	19.63%	27.98%	15.97%	15.17%	15.24%	10.45%
	MML American Funds® Growth	2/8/1984	6, *	22.28%	32.23%	16.15%	15.57%	13.41%	7.44%
	MML Large Cap Growth	8/31/1999	2, 5	16.58%	25.35%	14.24%	13.06%	12.36%	7.95%
Small / Mid Cap Value	MML Mid Cap Value	8/31/1999	2, 6	-13.84%	-8.78%	-1.20%	3.91%	8.30%	6.44%
	MML Small Company Value	2/27/2009	*	-13.16%	-8.74%	-2.11%	4.63%	6.97%	10.97%
	MML Small/Mid Cap Value	4/30/2003	2, 5	-16.80%	-12.17%	-5.11%	1.60%	6.30%	2.91%
Small/Mid Cap Blend	MML Small Cap Equity	6/1/1998	2	-4.80%	1.52%	1.71%	6.02%	9.23%	4.91%

Asset Category	Separate Account Sub-account	Fund Inception Date	Endnotes	Cumulative YTD	Average Annual				
					1 Year	3 Years	5 Years	10 Years	Since Inception
Small / Mid Cap Growth	Invesco Oppenheimer V.I. Discovery Mid Cap Growth	8/15/1986	2	16.86%	23.81%	14.52%	13.28%	13.45%	8.70%
	MML Mid Cap Growth	8/31/1998	2, 5	5.51%	12.00%	10.03%	10.68%	12.39%	9.30%
	MML Small Cap Growth Equity	5/3/1999	2	5.17%	12.71%	10.38%	10.98%	11.13%	7.75%
International / Global	Invesco Oppenheimer V.I. Global	11/12/1990	2	4.62%	12.18%	6.09%	8.29%	8.48%	8.55%
	Invesco Oppenheimer V.I. International Growth	5/13/1992	2	1.10%	8.49%	0.78%	3.53%	4.93%	5.82%
	MML Foreign	8/31/1999	2, 5	-15.09%	-11.96%	-7.56%	-2.31%	0.25%	-0.24%
	MML Global	8/31/1999	2, 5	-6.03%	-0.87%	3.29%	5.90%	7.79%	4.06%
	MML American Funds® International	5/1/1990	6, *	-7.60%	-2.77%	-1.10%	3.77%	3.05%	2.41%
	MML International Equity	1/7/2014		-23.30%	-19.38%	-10.77%	-1.88%	—	-2.46%
Speciality	MML Strategic Emerging Markets	8/27/2008	*	-2.28%	4.23%	1.99%	6.51%	-0.59%	1.81%
	BlackRock 60/40 Target Allocation ETF	4/30/2014		1.95%	5.50%	5.10%	5.58%	—	3.81%
	Ivy VIP Asset Strategy	4/20/1995	*	-1.52%	2.23%	4.18%	3.46%	3.79%	7.45%
	MML Asset Momentum	5/15/2015		3.75%	11.83%	6.64%	9.84%	—	8.14%
	MML Equity Rotation	5/15/2015		3.53%	9.86%	3.45%	9.18%	—	7.95%
	MML Managed Volatility	5/1/2000	2, 7	-2.25%	-0.32%	0.61%	1.96%	4.35%	2.25%
	MML Special Situations	5/15/2015		3.86%	6.74%	6.05%	8.52%	—	5.10%

Standardized Total Returns - With Full Surrender - B-Share
For the Period Ending: September 30, 2020

Standardized Returns assume a single \$1,000 purchase payment made at the beginning of the periods shown, and full surrender on the last business day of the most recent calendar quarter. Standardized returns reflect total annualized separate account expenses, all fund level expenses including any 12(b)-1, annual maintenance charge (contract level charges) of \$40.00 allocated proportionately for each investment option, and Contingent Sales Charges (CDSC). Number of Full Years

from Application of Purchase Payment: 0 1 2 3 4 5+
7% 7% 6% 5% 4% 0%

The performance in the chart below is representative of a B Share Class. This share class carries a static M&E of 1.00% for all years. These returns do not reflect charges for optional contract features or premium taxes, if any. Their inclusion would reduce the returns shown.

Asset Category	Separate Account Sub-account	Date Added to Separate Account	Endnotes	Cumulative YTD	Average Annual				
					1 Year	3 Years	5 Years	10 Years	Since Date Added to Separate Account
Asset Allocation	MML Conservative Allocation	1/22/2008	1, 2	-6.38%	-3.67%	1.72%	4.48%	4.78%	4.12%
	MML Balanced Allocation	1/22/2008	1, 2	-6.54%	-3.22%	1.94%	5.06%	5.46%	4.36%
	MML Moderate Allocation	1/22/2008	1, 2	-8.37%	-4.27%	1.57%	5.33%	5.94%	4.64%
	MML American Funds Core Allocation	9/8/2008	1, *	-6.56%	-1.14%	2.85%	6.92%	6.62%	5.46%
	MML Growth Allocation	1/22/2008	1, 2	-8.22%	-3.15%	2.08%	6.32%	6.98%	5.15%
	MML Aggressive Allocation	1/22/2008	1, 2	-9.46%	-3.50%	2.08%	7.06%	7.78%	5.57%
Money Market	MML U.S. Government Money Market 7-day yield: -1.08%	5/1/2006	3	-7.56%	-7.51%	-1.65%	-0.34%	-0.71%	-0.12%
Fixed Income	Invesco Oppenheimer V.I. Global Strategic Income	8/31/1999	2	-10.47%	-8.19%	-1.70%	1.58%	1.75%	3.82%
	MML Dynamic Bond	8/24/2015		-5.91%	-5.80%	0.57%	—	—	1.54%
	MML High Yield	5/3/2010	*	-9.98%	-8.45%	-1.06%	4.24%	5.21%	5.29%
	MML Inflation-Protected and Income		2	0.37%	0.61%	2.53%	3.31%	2.19%	2.78%
	MML Managed Bond	9/30/1999	2	-3.32%	-3.25%	1.77%	2.76%	2.33%	3.93%
	MML Short-Duration Bond	5/3/2010	*	-8.06%	-7.60%	-1.06%	0.71%	0.72%	0.95%
	MML Total Return Bond	5/1/2012	2	-1.09%	-1.25%	2.28%	2.84%	—	2.16%
Balanced	MML Blend	4/30/1999		-3.84%	1.94%	5.06%	8.36%	8.43%	4.38%
Large Cap Value	MML Equity	4/30/1999	2, 4	-18.15%	-12.35%	-1.15%	5.18%	7.61%	2.60%
	MML Equity Income	5/31/2002	2, 5	-22.90%	-17.88%	-2.58%	5.59%	6.95%	4.66%
	MML Fundamental Value	5/1/2012	*	-20.48%	-14.48%	-2.85%	4.11%	—	5.90%
	MML Income & Growth	8/31/1998	2, 5	-21.40%	-16.92%	-3.19%	5.22%	7.08%	4.10%
Large Cap Blend	Fidelity® VIP Contrafund®	8/31/1999	2	-4.85%	2.43%	5.43%	10.44%	10.91%	4.62%
	Invesco Oppenheimer V.I. Main Street	8/31/1998	2	11.36%	22.23%	12.53%	14.44%	12.50%	8.67%
	MML Focused Equity	5/1/2012	*	-5.13%	-0.65%	9.48%	14.11%	—	11.87%
	MML Fundamental Equity	5/1/2012	*, **	0.14%	9.00%	12.40%	14.46%	—	12.28%
	MML Growth & Income	4/30/2003	2, 5	-5.83%	0.96%	7.66%	11.23%	11.20%	7.18%
Large Cap Growth	MML Blue Chip Growth	5/31/2002	2, 5	14.43%	24.62%	17.15%	18.42%	16.38%	9.65%
	MML American Funds® Growth	9/8/2008	6, *	17.38%	32.54%	17.09%	18.59%	14.44%	11.49%
	MML Large Cap Growth	8/31/1999	2, 5	11.74%	22.24%	14.96%	15.85%	13.36%	4.95%
Small / Mid Cap Value	MML Mid Cap Value	8/31/1999	2, 6	-19.85%	-14.63%	-2.23%	5.66%	8.63%	6.41%
	MML Small Company Value	5/1/2009	*	-21.82%	-16.68%	-4.28%	5.65%	7.08%	8.94%
	MML Small/Mid Cap Value	4/30/2003	2, 5	-25.47%	-20.94%	-7.06%	2.28%	6.43%	6.39%
Small / Mid Cap Blend	MML Small Cap Equity	8/31/1998	2	-13.00%	-5.63%	-0.06%	7.01%	9.63%	6.38%

Asset Category	Separate Account Sub-account	Date Added to Separate Account	Endnotes	Cumulative YTD	Average Annual				
					1 Year	3 Years	5 Years	10 Years	Since Date Added to Separate Account
Small / Mid Cap Growth	Invesco Oppenheimer V.I. Discovery Mid Cap Growth	8/31/1999	2	8.49%	16.71%	14.57%	14.67%	14.11%	5.02%
	MML Mid Cap Growth	8/31/1998	2, 5	-1.17%	5.06%	9.54%	12.55%	13.01%	10.73%
	MML Small Cap Growth Equity	5/3/1999	2	-5.67%	3.43%	7.99%	11.49%	11.15%	7.69%
International / Global	Invesco Oppenheimer V.I. Global	8/31/1999	2	0.02%	12.79%	6.79%	10.94%	9.36%	7.29%
	Invesco Oppenheimer V.I. International Growth	8/31/1998	2	-2.72%	8.96%	1.08%	5.96%	5.71%	5.62%
	MML Foreign	8/31/1999	2, 5	-17.03%	-10.64%	-7.03%	0.21%	1.25%	1.51%
	MML Global	8/31/1999	2, 5	-8.70%	-2.31%	3.74%	8.76%	8.87%	2.84%
	MML American Funds® International	9/8/2008	6, *	-13.94%	-6.14%	-1.69%	5.43%	3.51%	3.23%
	MML International Equity	5/1/2014		-26.46%	-18.49%	-10.90%	0.84%	—	-2.28%
	MML Strategic Emerging Markets	9/8/2008	*	-9.15%	1.60%	1.33%	8.68%	-0.11%	2.35%
Specialty	BlackRock 60/40 Target Allocation ETF	8/24/2015		-3.53%	1.43%	4.59%	4.59%	—	5.36%
	Ivy VIP Asset Strategy	10/31/2012	*	-5.84%	-0.05%	4.18%	5.72%	—	4.51%
	MML Asset Momentum	8/24/2015		-0.06%	11.31%	7.76%	7.76%	—	10.18%
	MML Equity Rotation	8/24/2015		-1.47%	6.38%	3.64%	3.64%	—	9.41%
	MML Managed Volatility	4/30/2000	2, 7	-7.68%	-4.78%	-0.13%	3.07%	4.90%	2.40%
	MML Special Situations	8/24/2015		-4.53%	3.13%	5.20%	5.20%	—	7.81%

Standardized Returns assume a single \$1,000 purchase payment made at the beginning of the periods shown. Standardized returns reflect total annualized separate account expenses, all fund level expenses including any 12(b)-1, annual maintenance charge (contract level charges) of \$40.00 allocated proportionately for each investment option.

The performance in the chart below is representative of an C Share Class. This share class carries a tier M&E of 1.45% for the first 5 years and 1.00% thereafter. These returns do not reflect charges for any optional contract features or premium taxes, if any. Their inclusion would reduce the returns shown.

Asset Category	Separate Account Sub-account	Date Added to Separate Account	Endnotes	Cumulative YTD	Average Annual				
					1 Year	3 Years	5 Years	10 Years	Since Date Added to Separate Account
Asset Allocation	MML Conservative Allocation	1/22/2008	1, 2	0.33%	3.11%	3.01%	4.01%	4.54%	3.94%
	MML Balanced Allocation	1/22/2008	1, 2	0.16%	3.60%	3.23%	4.58%	5.22%	4.18%
	MML Moderate Allocation	1/22/2008	1, 2	-1.80%	2.47%	2.86%	4.86%	5.70%	4.45%
	MML American Funds Core Allocation	9/8/2008	1, *	0.13%	5.82%	4.15%	6.44%	6.38%	5.26%
	MML Growth Allocation	1/22/2008	1, 2	-1.64%	3.67%	3.37%	5.84%	6.73%	4.96%
	MML Aggressive Allocation	1/22/2008	1, 2	-2.97%	3.30%	3.37%	6.57%	7.54%	5.38%
Money Market	MML U.S. Government Money Market 7-day yield: -1.53%	5/1/2006	3	-0.93%	-0.99%	-0.40%	-0.79%	-0.94%	-0.28%
Fixed Income	Invesco Oppenheimer V.I. Global Strategic Income	8/31/1999	2	-4.05%	-1.72%	-0.46%	1.12%	1.52%	3.71%
	MML Dynamic Bond	8/24/2015		0.83%	0.83%	1.84%	—	—	1.92%
	MML High Yield	5/3/2010	*	-3.53%	-2.00%	0.20%	3.77%	4.97%	5.06%
	MML Inflation-Protected and Income			7.56%	7.69%	3.83%	2.85%	1.96%	2.64%
	MML Managed Bond	9/30/1999	2	3.61%	3.57%	3.06%	2.29%	2.10%	3.82%
	MML Short-Duration Bond	5/3/2010	*	-1.47%	-1.10%	0.20%	0.26%	0.49%	0.73%
	MML Total Return Bond	5/1/2012	2	5.99%	5.71%	3.58%	2.38%	—	1.70%
Balanced	MML Blend	4/30/1999		3.05%	9.12%	6.39%	7.87%	8.18%	4.27%
Large Cap Value	MML Equity	4/30/1999	2, 4	-12.29%	-6.17%	0.10%	4.70%	7.37%	2.49%
	MML Equity Income	5/31/2002	2, 5	-17.37%	-12.09%	-1.35%	5.11%	6.70%	4.53%
	MML Fundamental Value	5/1/2012	*	-14.79%	-8.46%	-1.61%	3.64%	—	5.42%
	MML Income & Growth	8/31/1998	2, 5	-15.77%	-11.07%	-1.96%	4.74%	6.84%	4.00%
Large Cap Blend	Fidelity® VIP Contrafund®	8/31/1999	2	1.97%	9.64%	6.76%	9.94%	10.66%	4.51%
	Invesco Oppenheimer V.I. Main Street	8/31/1998	2	19.34%	30.84%	13.96%	13.93%	12.24%	8.56%
	MML Focused Equity	5/1/2012	*	1.67%	6.35%	10.87%	13.60%	—	11.37%
	MML Fundamental Equity	5/1/2012	*, **	7.32%	16.67%	13.82%	13.94%	—	11.77%
	MML Growth & Income	4/30/2003	2, 5	0.91%	8.07%	9.02%	10.73%	10.95%	7.04%
Large Cap Growth	MML Blue Chip Growth	5/31/2002	2	22.63%	33.40%	18.63%	17.88%	16.12%	9.52%
	MML American Funds® Growth	9/8/2008	6, *	25.80%	41.88%	18.58%	18.05%	14.18%	11.28%
	MML Large Cap Growth	8/31/1999	2	19.74%	30.85%	16.42%	15.33%	13.11%	4.83%
Small/Mid Cap Value	MML Mid Cap Value	8/31/1999	2, 6	-14.11%	-8.61%	-0.99%	5.19%	8.38%	6.29%
	MML Small Company Value	5/1/2009	*	-16.22%	-10.81%	-3.07%	5.17%	6.83%	8.72%
	MML Small/Mid Cap Value	4/30/2003	2, 5	-20.13%	-15.38%	-5.89%	1.82%	6.19%	6.25%
Small/Mid Cap Blend	MML Small Cap Equity	8/31/1998	2	-6.77%	1.02%	1.21%	6.52%	9.38%	6.27%

Asset Category	Separate Account Sub-account	Date Added to Separate Account	Endnotes	Cumulative YTD	Average Annual				
					1 Year	3 Years	5 Years	10 Years	Since Date Added to Separate Account
Small / Mid Cap Growth	Invesco Oppenheimer V.I. Discovery Mid Cap Growth	8/31/1999	2	16.26%	24.93%	16.02%	14.16%	13.85%	4.90%
	MML Mid Cap Growth	8/31/1998	2, 5	5.91%	12.46%	10.93%	12.04%	12.76%	10.62%
	MML Small Cap Growth Equity	5/3/1999	2	1.08%	10.72%	9.36%	10.99%	10.90%	7.58%
International / Global	Invesco Oppenheimer V.I. Global	8/31/1999	2	7.19%	20.73%	8.14%	10.44%	9.12%	7.17%
	Invesco Oppenheimer V.I. International Growth	8/31/1998	2	4.25%	16.63%	2.36%	5.49%	5.47%	5.52%
	MML Foreign	8/31/1999	2, 5	-11.08%	-4.35%	-5.86%	-0.24%	1.02%	1.40%
	MML Global	8/31/1999	2, 5	-2.16%	4.57%	5.05%	8.27%	8.62%	2.73%
	MML American Funds® International	9/8/2008	6, *	-7.78%	0.47%	-0.44%	4.95%	3.27%	3.03%
	MML International Equity	5/1/2014		-21.19%	-12.75%	-9.78%	0.39%	—	-2.72%
	MML Strategic Emerging Markets	9/8/2008	*	-2.64%	8.76%	2.62%	8.19%	-0.33%	2.15%
Specialty	BlackRock 60/40 Target Allocation ETF	8/24/2015		3.38%	8.57%	5.91%	5.91%	—	5.76%
	Ivy VIP Asset Strategy	10/31/2012	*	0.91%	6.99%	5.50%	5.25%	—	4.04%
	MML Asset Momentum	8/24/2015		7.10%	19.15%	9.13%	9.13%	—	10.60%
	MML Equity Rotation	8/24/2015		5.59%	13.87%	4.95%	4.95%	—	9.82%
	MML Managed Volatility	4/30/2000	2, 8	-1.07%	1.93%	1.14%	2.61%	4.67%	2.29%
	MML Special Situations	8/24/2015		2.31%	10.40%	6.53%	6.53%	—	8.22%

MML Asset Allocation Funds
For the Period Ending: October 31, 2020

The MassMutual Capital Vantage variable annuity contract contains six MML Asset Allocation Funds ("funds of funds") that are designed to help investors meet their financial goals. These funds consist of certain, but not all, underlying funds available within the MassMutual Capital Vantage variable annuity contract. The percentages below represent the approximation of assets as of the report date and are rounded so they may not total 100%. The percentages may vary from the target allocation, which can be found in the corresponding fund prospectus.

Asset Class Underlying Funds	MML Conservative Allocation Fund	MML Balanced Allocation Fund	MML Moderate Allocation Fund	MML American Funds® Core Allocation Fund	MML Growth Allocation Fund	MML Aggressive Allocation Fund
Fixed Income						
MML Dynamic Bond Fund (DoubleLine)	13%	11%	9%		4%	1%
MML High Yield Fund (Barings)	2%	2%	2%		1%	1%
MML Inflation-Protected and Income Fund (Barings)	4%	3%	2%		4%	2%
MML Managed Bond Fund (Barings)	20%	17%	13%		8%	3%
MML Total Return Bond Fund (MetWest)	11%	9%	7%		4%	1%
MML Short-Duration Bond Fund (Barings)	5%	5%	4%		3%	2%
American Funds Insurance Series® – Bond				34%		
Total Fixed Income	57%	49%	38%	34%	25%	11%
Large Cap Equity						
Invesco Oppenheimer V.I. Main Street Fund	1%	1%	1%			1%
MML Blue Chip Growth Fund (T. Rowe Price)	3%	4%	5%		6%	7%
MML Equity Income Fund (T. Rowe Price)	3%	3%	4%		5%	5%
MML Equity Index (Northern Trust)	1%	1%	1%		1%	1%
MML Focused Equity Fund (Wellington)	4%	5%	6%		7%	9%
MML Fundamental Growth Fund (Wellington)	2%	4%	3%		4%	5%
MML Fundamental Value Fund (Wellington)	3%	3%	4%		5%	5%
MML Income & Growth Fund (Barrow Hanley)	3%	3%	4%		5%	6%
MML Large Cap Growth Fund (Loomis Sayles)	1%	2%	2%		2%	2%
American Funds Insurance Series® – Blue Chip Income & Growth				27%		
American Funds Insurance Series® – Growth-Income				27%		
	21%	26%	30%	54%	35%	41%
Mid Cap Equity						
Invesco Oppenheimer V.I. Discovery Mid Cap Growth	1%	1%	1%		1%	1%
MML Mid Cap Growth Fund (T. Rowe Price)	3%	4%	5%		6%	8%
MML Mid Cap Value Fund (American Century)	3%	4%	4%		5%	5%
	7%	9%	10%	0%	12%	14%
Small Cap Equity						
MML Small Cap Growth Equity Fund (Wellington)	1%	1%	1%		1%	1%
MML Small Company Value Fund (T. Rowe Price)	1%	1%	1%		2%	2%
MML Small/Mid Cap Value Fund (AllianceBernstein)	1%	1%	1%		1%	1%
	3%	3%	3%	0%	4%	4%
International/Global						
Invesco Oppenheimer V.I. Global Fund	1%	1%	1%		2%	3%
Invesco Oppenheimer V.I. International Growth Fund	1%	1%	1%		1%	1%
MML Foreign Fund (Templeton)	2%	2%	3%		3%	4%
MML Global Fund (MFS®)	5%	5%	8%		10%	11%
MML International Equity Fund (Harris)	2%	3%	3%		4%	5%
MML Strategic Emerging Markets Fund (Oppenheimer)	1%	1%	3%		4%	6%
American Funds Insurance Series® – International				12%		
	12%	13%	19%	12%	24%	30%
Total Equity	43%	51%	62%	66%	75%	89%
Total Allocation	100%	100%	100%	100%	100%	100%

Endnotes

- 1 Funds offered in a fund-of-funds structure may have higher expenses than a direct investment in the underlying funds because a fund-of-funds bears its own expenses and indirectly bears its proportionate share of expenses of the underlying funds in which it invests.
 - 2 The fund established a new class of shares, which is available with this contract, after it began its initial investment operations. The performance for the period prior to offering the new class shows the historical returns for the original class of shares, which were not subject to a 12b-1 fee. The performance shown from the inception date of the class available with this contract includes the fees and expenses of that share class, including a 12b-1 fee. A 12b-1 fee reduces a fund's performance.
 - 3 **An investment in the Fund is neither insured nor guaranteed by the Federal Deposit Insurance Corporation or by any other government agency. Although the Fund seeks to maintain a stable net asset value per share, it is possible to lose money by investing in the Fund.**

The yield quotation more closely reflects the current earnings of the Fund than the total return quotation. It is an annualized rate based on results over the last seven days of the period, and is net of all recurring contract fees and charges.

The MML Money Market Fund does not have a 12b-1 fee.
 - 4 Although the MML Equity Fund commenced operations on 9/15/1971, the information necessary to calculate returns is available only for 1974 and later years.
 - 5 The historical performance shown reflects a combination of the current underlying fund's performance, as well as the performance of a prior fund. The current fund's performance is reflected beginning on 5/1/06. The prior fund's performance covers the period between the date listed in the performance table and 4/30/06.
 - 6 The underlying MML Fund does not buy investment securities directly, but instead invests in shares of a corresponding American Funds® "master" fund, which in turn purchases investment securities. The performance of the MML Fund will be lower than the American Funds® master fund because it represents an investment in the American Funds® master fund reduced by the MML Fund's fees. The performance for the period prior to inception of the MML Fund on August 15, 2008, shows the historical returns for the American Funds® master fund adjusted to reflect the MML Fund's fees at its inception (0.70%).
 - 7 Formerly known as MML Large Cap Value Fund. The Fund's name, investment objective, and investment strategy changed on April 29, 2013. The performance results prior to April 29, 2013 would not necessarily have been achieved had the Fund's current strategy been in effect during that period.
- * Performance reflects share classes with 12(b)-1 fees from inception which reduces the fund's performance. Please see the fund prospectus for more information about this fee.
- ** Formerly known as American Century VP Income & Growth.

MassMutual Capital VantageSM [Contract Form #FPDV15-NVA and ICC15-FPVDA15-NVA(NC)] is a variable annuity contract issued by Massachusetts Mutual Life Insurance Company, 1295 State Street, Springfield, MA 01111-0001. The Contract may not be available in all states.

Principal Underwriters:

MML Investors Services, LLC
MML Strategic Distributors, LLC

Subsidiaries of Massachusetts Mutual Life Insurance Company, 1295 State Street, Springfield, MA 01111-0001

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