



Historical Dividend Studies from Massachusetts Mutual Life Insurance Company (MassMutual®)

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As a mutual life insurance company, MassMutual does not have shareholders. Instead, the company operates for the benefit of its participating policyowners. Participating whole life policies issued by MassMutual are eligible to receive a dividend each year.

Company surplus results when overall actual experience is more favorable than the experience that was originally assumed in setting the premiums and guaranteed elements of policies. A portion is set aside to be paid or applied as policy dividends in the following years. When determining the dividend for an individual policy, the amount paid reflects the portion that each specific policy is considered to have contributed to surplus.

Although dividends are not guaranteed, MassMutual has paid them every year since 1869.

Dividend Interest Rate

Dividends primarily include an investment component, a mortality component and an expense component.

The Dividend Interest Rate (DIR) is used to calculate the investment component of policy dividends; it is not the rate of return on the policy. The DIR primarily represents the net investment return on the assets supporting the reserves and cash values for a certain block of policies.

The way companies quote and apply Dividend Interest Rates varies. For example, some quote their DIR before investment expenses and some, like MassMutual, quote their DIR net of these expenses. Therefore, Dividend Interest Rates should not be used as the sole basis for comparing one whole life policy to another.

PARTICIPATING WHOLE LIFE POLICIES Issued by Massachusetts Mutual Life Insurance Company Prior to March 1996

Year	Dividend Interest Rate	Year	Dividend Interest Rate	Year	Dividend Interest Rate
1980	8.27%	1995	9.00%	2010	6.85%
1981	8.27%	1996	8.40%	2011	6.80%
1982	8.27% ¹	1997	8.40%	2012	7.00%
1983	8.27% ¹	1998	8.40%	2013	7.00%
1984	11.60%	1999	8.40%	2014	7.10%
1985	12.20%	2000	8.30%	2015	7.10%
1986	12.20%	2001	8.30%	2016	7.10%
1987	12.20%	2002	8.10%	2017	6.70%
1988	11.35%	2003	7.90%	2018	6.40%
1989	11.15%	2004	7.50%	2019	6.40%
1990	10.50%	2005	7.00%	2020	6.20%
1991	10.50%	2006	7.55%	2021	6.00%
1992	9.95%	2007	7.55%	2022	6.00%
1993	9.45%	2008	7.90%	2023	6.00%
1994	9.30%	2009	7.45%	2024	6.10%

¹ Rate applies to Pre-8100 series rate. 8100 series rate was 9.22%.

Eligible participating policies issued by Massachusetts Mutual Life Insurance Company and the former Connecticut Mutual Life Insurance Company prior to March, 1996 are no longer sold. All rates shown assume an Adjustable Loan Rate starting in 1984. The merger between Massachusetts Mutual Life Insurance Company and the former Connecticut Mutual Life Insurance Company was completed in March, 1996.

The Portfolio Average Method

MassMutual's DIR is determined using a portfolio average method that reflects the portfolio earnings on all assets that support our participating permanent life insurance and participating annuity blocks. Each portfolio is made up of investments purchased over a number

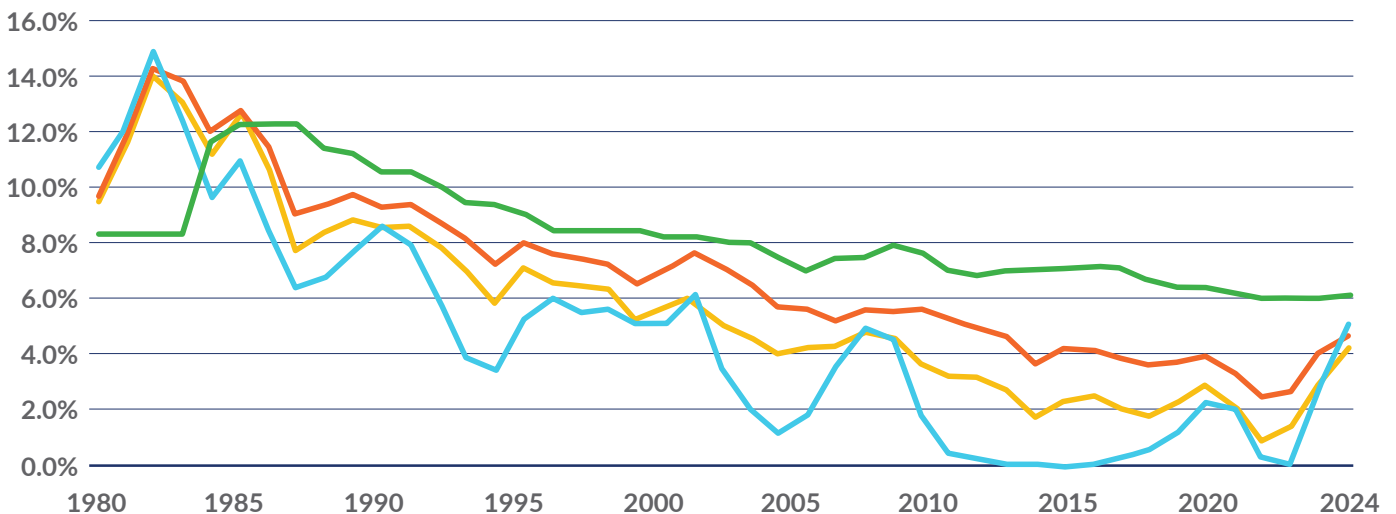
of years, so changes in new money interest rates have a gradual impact on the DIR. The stabilizing effect of the portfolio average method over time is among the reasons MassMutual and many other insurers use this approach to determine their Dividend Interest Rates.

MASSMUTUAL'S DIR COMPARED TO COMMON FIXED INCOME MEASURES

This graph shows the relative stability of MassMutual's Dividend Interest Rate compared to three common fixed income measures over an extended period of time. The values plotted in the graph are for each year from 1980-2024.

DIVIDEND SCHEDULE

- MM DIR²
- Moody's Seasoned Aaa Corporate Bond Yield, Percent, Annual, Not Seasonally Adjusted³
- Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, Percent, Annual, Not Seasonally Adjusted⁴
- Market Yield on U.S. Treasury Securities at 1-Year Constant Maturity, Percent, Annual, Not Seasonally Adjusted⁵



² Refers to the MM-block of business, which comprises policies issued prior to the merger of Massachusetts Mutual Life Insurance Company and the former Connecticut Mutual Life Insurance Company in 1996. Starting with the 2012 dividend schedule, there is a single Dividend Interest Rate for all blocks.

³ Moody's yield on seasoned Aaa corporate bonds for all industries, quoted for the year preceding the Dividend Interest Rate shown; for 2024, the rate is the average monthly rate from January to September for the preceding year. Moody's Aaa rates through December 6, 2001, are averages of Aaa utility and Aaa industrial bond rates. As of December 7, 2001, these rates are averages of Aaa industrial bonds only.

⁴ Market yield on U.S. Treasury securities at 10-year constant maturity, quoted for the year preceding the Dividend Interest Rate shown; for 2024, the rate is the average monthly rate from January to September for the preceding year.

⁵ Market yield on U.S. Treasury securities at 1-year constant maturity, quoted for the year preceding the Dividend Interest Rate shown; for 2024, the rate is the average monthly rate from January to September for the preceding year.

Historical Examples

The numeric tables on the following page illustrate MassMutual’s historical dividend information for different whole life insurance policies that were issued in 1995.

The summary for each policy compares what was **illustrated** in 1995 with what **actually** happened over 29 years. Dividends were used to buy paid-up additional whole life insurance, or paid-up additions.

Below is a description of the terms used in each summary.

- **Guaranteed Cash Value** — The amount of the cash value that is guaranteed under the policy.
 - **Total Dividends** — The total annual dividend, including dividends payable on paid-up additions.
 - **Total Cash Value** — The total cash value, including all guaranteed and non-guaranteed values.
 - **Total Death Benefit** — The total death benefit, including paid-up additions, that would be payable at the end of the policy year.
- **“IRR”** — The Internal Rate of Return (IRR) is the rate at which outlays up to that year must be compounded each and every year to generate the Total Cash Value or Total Death Benefit.

The results shown in the following tables are based on the actual experience of the company over the period of time primarily in terms of interest rates, mortality and expenses. Dividends paid in future years will be lower or higher than illustrated, depending on MassMutual’s actual experience. The examples used are a sample of the types of whole life policies MassMutual sold at that time.

Actual Historical Performance Summary Since 1995

Each of the three historical policy examples uses the best underwriting class (Preferred Nonsmoker) that was available at the time of

issue in 1995⁶ and is from the MM Block.⁷ The policy types and the issue ages are shown in the following examples.

HYPOTHETICAL POLICY 1 – \$250,000 CONVERTIBLE LIFE POLICY, \$4,625 PREMIUM – MALE AGE 45, NONSMOKER

With Paid-up Additions Option⁸

Year	Guaranteed Cash Value	Actual Dividends Paid	Total Cash Value ⁹	Total Death Benefit ⁹	Year	Guaranteed Cash Value	Actual Dividends Paid	Total Cash Value ⁹	Total Death Benefit ⁹	
1996	\$0	\$0	\$0	\$250,000	2011	\$69,435	\$3,679	\$97,035	\$302,084	
1997	\$500	\$213	\$713	\$250,641	2012	\$74,968	\$4,401	\$108,842	\$311,592	
1998	\$4,800	\$244	\$5,263	\$251,351	2013	\$80,553	\$5,060	\$121,629	\$322,238	
1999	\$9,210	\$332	\$10,021	\$252,286	2014	\$86,175	\$5,826	\$134,736	\$333,394	
2000	\$13,730	\$413	\$14,980	\$253,411	2015	\$91,823	\$6,654	\$148,177	\$345,063	
2001	\$18,360	\$505	\$20,157	\$254,746	2016	\$97,173	\$7,155	\$161,992	\$357,299	
2002	\$23,095	\$755	\$25,706	\$256,675	2017	\$102,520	\$7,019	\$175,845	\$369,012	
2003	\$27,923	\$995	\$31,613	\$259,139	2018	\$107,870	\$6,923	\$189,775	\$380,290	
2004	\$32,840	\$1,164	\$37,813	\$261,933	2019	\$113,223	\$7,473	\$204,423	\$392,183	
2005	\$37,833	\$1,283	\$44,244	\$264,917	2020	\$118,578	\$7,427	\$219,201	\$403,735	
2006	\$42,905	\$1,741	\$51,256	\$268,845	2021	\$123,920	\$7,486	\$234,187	\$415,122	
2007	\$48,050	\$2,238	\$58,892	\$273,747	2022	\$129,223	\$7,737	\$249,534	\$426,639	
2008	\$53,273	\$2,933	\$67,372	\$279,985	2023	\$134,450	\$8,320	\$265,521	\$438,766	
2009	\$58,580	\$3,238	\$76,333	\$286,674	2024	\$139,568	\$14,233 ⁹	\$282,426	\$451,958	
2010	\$63,970	\$3,163	\$86,270	\$293,894	Termination Dividend		\$5,000			
								IRR 29 Years	4.60%	7.24%

⁶ Assumes policy was issued with an adjustable loan rate. No loans were taken.

⁷ MM Block refers to eligible participating policies issued by Massachusetts Mutual Life Insurance Company prior to the merger with the former Connecticut Mutual Life Insurance Company in 1996. Policies in this block of business are no longer sold.

⁸ Assumes no paid-up additions are surrendered.

⁹ Numbers include termination dividend in 2024 for total dividends. Termination dividend payable in Total Cash Value and Total Death Benefit beginning in year 15. Termination dividends are only available upon full policy surrender or death.

**HYPOTHETICAL POLICY 2 – \$250,000 LIFE PAID-UP AT 65
WHOLE LIFE POLICY, \$4,077.50 PREMIUM – FEMALE AGE 35, NONSMOKER**

With Paid-up Additions Option⁸

Year	Guaranteed Cash Value	Actual Dividends Paid	Total Cash Value ⁹	Total Death Benefit ⁹	Year	Guaranteed Cash Value	Actual Dividends Paid	Total Cash Value ⁹	Total Death Benefit ⁹	
1996	\$0	\$135	\$135	\$250,607	2011	\$54,735	\$2,648	\$73,753	\$303,284	
1997	\$0	\$161	\$300	\$251,306	2012	\$59,293	\$3,133	\$82,021	\$311,803	
1998	\$3,353	\$180	\$3,843	\$252,065	2013	\$63,983	\$3,564	\$90,957	\$321,212	
1999	\$6,843	\$233	\$7,583	\$253,016	2014	\$68,803	\$4,096	\$100,677	\$331,712	
2000	\$10,435	\$269	\$11,468	\$254,074	2015	\$73,763	\$4,605	\$111,183	\$343,178	
2001	\$14,133	\$318	\$15,518	\$255,290	2016	\$78,868	\$4,837	\$122,220	\$354,879	
2002	\$17,930	\$523	\$19,884	\$257,224	2017	\$84,133	\$4,573	\$133,321	\$365,629	
2003	\$21,840	\$727	\$24,584	\$259,828	2018	\$89,573	\$4,372	\$144,560	\$375,616	
2004	\$25,865	\$869	\$29,565	\$262,845	2019	\$95,203	\$4,596	\$156,378	\$385,820	
2005	\$30,013	\$955	\$34,785	\$266,060	2020	\$101,035	\$4,433	\$168,416	\$395,384	
2006	\$33,835	\$1,303	\$40,061	\$270,311	2021	\$107,078	\$4,319	\$180,724	\$404,440	
2007	\$37,773	\$1,649	\$45,843	\$275,528	2022	\$113,325	\$4,457	\$193,547	\$413,525	
2008	\$41,830	\$2,171	\$52,322	\$282,188	2023	\$119,773	\$4,629	\$206,908	\$422,700	
2009	\$46,008	\$2,331	\$59,155	\$289,125	2024	\$126,415	\$4,963	\$220,959	\$432,268	
2010	\$50,308	\$2,334	\$66,193	\$295,864	Termination Dividend		\$0			
								IRR 29 Years	4.88%	8.59%

**HYPOTHETICAL POLICY 3 – \$250,000 10 PAYMENT
WHOLE LIFE POLICY, \$14,445.00 PREMIUM – MALE AGE 50, NONSMOKER**

With Paid-up Additions Option⁸

Year	Guaranteed Cash Value	Actual Dividends Paid	Total Cash Value ⁹	Total Death Benefit ⁹	Year	Guaranteed Cash Value	Actual Dividends Paid	Total Cash Value ⁹	Total Death Benefit ⁹	
1996	\$1,410	\$1,143	\$2,553	\$252,743	2011	\$154,223	\$8,387	\$239,517	\$388,266	
1997	\$14,020	\$1,307	\$16,503	\$255,790	2012	\$157,680	\$9,425	\$254,312	\$403,209	
1998	\$27,070	\$1,526	\$31,152	\$259,248	2013	\$161,133	\$10,123	\$270,003	\$418,915	
1999	\$40,590	\$1,969	\$46,759	\$263,583	2014	\$164,578	\$11,056	\$286,832	\$435,709	
2000	\$54,593	\$2,221	\$63,157	\$268,338	2015	\$168,015	\$11,936	\$304,759	\$453,470	
2001	\$69,120	\$2,540	\$80,463	\$273,628	2016	\$171,435	\$12,701	\$323,663	\$471,991	
2002	\$84,213	\$3,196	\$99,063	\$280,109	2017	\$174,823	\$12,213	\$342,272	\$489,456	
2003	\$99,915	\$4,155	\$119,321	\$288,310	2018	\$178,155	\$11,986	\$360,782	\$506,275	
2004	\$116,295	\$4,508	\$140,725	\$296,979	2019	\$181,410	\$12,979	\$380,353	\$524,162	
2005	\$133,410	\$4,495	\$162,975	\$305,402	2020	\$184,570	\$12,959	\$399,938	\$541,715	
2006	\$136,848	\$7,027	\$174,201	\$318,239	2021	\$187,630	\$13,033	\$419,601	\$559,080	
2007	\$140,310	\$7,553	\$186,162	\$331,698	2022	\$190,595	\$13,721	\$439,953	\$577,078	
2008	\$143,790	\$8,775	\$199,554	\$346,954	2023	\$193,478	\$14,630	\$461,236	\$595,982	
2009	\$147,273	\$8,578	\$212,965	\$361,515	2024	\$196,293	\$15,962	\$483,910	\$616,312	
2010	\$150,753	\$7,933	\$225,930	\$374,671	Termination Dividend		\$0			
								IRR 29 Years	5.23%	6.26%

MassMutual...

Helping you secure what matters most.

Since 1851, our business decisions have been guided by our customers' needs. Today, we offer a wide range of financial products and services to help people secure their future and protect the ones they love.

Participating whole life insurance policies issued by Massachusetts Mutual Life Insurance Company (MassMutual), Springfield, MA 01111-0001 and its subsidiary, C.M. Life Insurance Company, Enfield, CT 06082.



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