

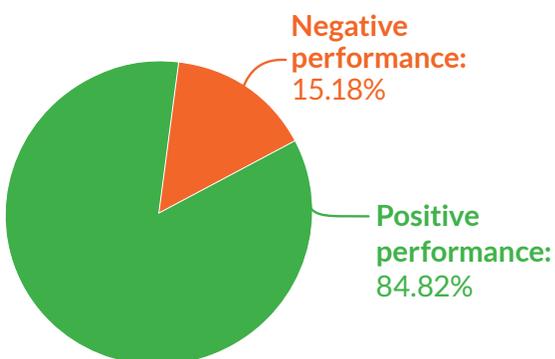
## S&P 500 2-Year Index Analysis

With a registered index-linked annuity from MassMutual Ascend Life Insurance Company, you can allocate funds to 2-year term indexed strategies that earn returns based on the S&P 500 Index. This index includes stocks issued by 500 of the top companies in leading industries in the U.S. economy. Let's take a closer look.

### S&P 500 returns using rolling periods

The data below uses 2-year rolling returns<sup>1</sup> of the S&P 500 price return index (SPX) from December 31, 2005 through December 31, 2025, for a total of 4,698<sup>2</sup> observations.

Positive Performance		Negative Performance		Average Performance		
Maximum Return <sup>3</sup>	Num of Gains	Minimum Return <sup>4</sup>	Num of Losses	Average Return	Average Gain	Average Loss
99.15%	3,985 (84.82%)	-51.77%	713 (15.18%)	19.90%	27.29%	-21.35%



### Key insights

- In over 84% of the 2-year periods over the last twenty years, the S&P 500 experienced positive performance.
- When the S&P 500 experienced positive performance, the average gain was over 27%.
- When the S&P 500 experienced negative performance, the average loss was -21.35%.

### Applying downside protection factors to a negative return

S&P 500 2-year term indexed strategies offer one type of downside protection factor – a 50% downside participation rate. Let's take a look at how this type of downside protection works, and how it would have protected against the average 2-year loss of -21.35%:

Downside protection factor	50% downside participation rate
How it works	Protects against half of index losses
How it protects against -21.35% average loss	Because the indexed strategy would have been protected from half of the index loss, the indexed strategy would have decreased by 10.67% (-21.35 x 50%)

**MassMutual Ascend offers several registered index-linked annuities, which have varying types of upside potential and partial downside protection. These solutions also offer benefits such as tax deferral and guaranteed lifetime income. Talk with your financial professional about how a registered index-linked annuity can fit into your portfolio and help you reach your goals.**

MassMutual Ascend first offered annuities with 2-year S&P 500 indexed strategies in May 2019.

<sup>1</sup>2-year rolling returns refers to every 2-year period that started on a business day after December 31, 2005 and ended before January 1, 2026.

<sup>2</sup>Zero flat 2-year periods, in which the S&P 500 return was 0%, are included in the number of total observations.

<sup>3</sup>Maximum return: 2-year period ending 3/23/2022

<sup>4</sup>Minimum return: 2-year period ending 3/9/2009

The information shown is reflective of point-to-point returns for a full two-year period. A withdrawal during a two-year term would be subject to an alternate valuation formula.

MassMutual Ascend's registered index-linked annuities can only be sold through a Broker/Dealer that is contracted with MassMutual Ascend<sup>SM</sup>. This material must be preceded or accompanied by a prospectus. To obtain a copy of the prospectus, please visit [MassMutualAscend.com/RILArates](https://MassMutualAscend.com/RILArates).

Annuities are long-term investments and may not be suitable for all investors. Withdrawals from an annuity contract may have tax consequences.

The "S&P 500 Index" is a product of S&P Dow Jones Indices LLC or its affiliates ("SPDJI") and has been licensed for use by MassMutual Ascend Life Insurance Company. S&P<sup>®</sup>, S&P 500<sup>®</sup>, US 500, The 500, iBoxx<sup>®</sup>, iTraxx<sup>®</sup> and CDX<sup>®</sup> are trademarks of S&P Global, Inc. or its affiliates ("S&P"); Dow Jones<sup>®</sup> is a registered trademark of Dow Jones Trademark Holdings LLC ("Dow Jones"); MassMutual Ascend Life Insurance Company's products are not sponsored, endorsed, sold or promoted by SPDJI, Dow Jones, S&P, their respective affiliates, and none of such parties make any representation regarding the advisability of investing in such product(s) nor do they have any liability for any errors, omissions, or interruptions of the S&P 500 Index.

**Principal Underwriter/Distributor: MM Ascend Life Investor Services, LLC, member FINRA and an affiliate of MassMutual Ascend.** Annuities issued by MassMutual Ascend Life Insurance Company<sup>SM</sup> (Cincinnati, Ohio), a wholly owned subsidiary of Massachusetts Mutual Life Insurance Company (MassMutual) under contract forms ICC24-P1825224NW and ICC24-P1833624NW. All guarantees subject to the claims-paying ability of MassMutual Ascend Life Insurance Company.

This content does not apply in the state of New York.

NOT A BANK OR CREDIT UNION DEPOSIT OR OBLIGATION • NOT FDIC OR NCUA-INSURED • NOT INSURED BY ANY FEDERAL GOVERNMENT AGENCY • MAY LOSE VALUE • NOT GUARANTEED BY ANY BANK OR CREDIT UNION

**∴ MassMutual Ascend**