MassMutual Ascend
Life Insurance Company

SPDR Gold Shares 1-Year ETF Analysis

With a fixed-indexed or registered index-linked annuity from MassMutual Ascend Life Insurance Company, you can allocate funds to 1-year term indexed strategies that earn returns based on the SPDR Gold Shares ETF. This ETF is designed to reflect the market value of gold bullion. Let's take a closer look.

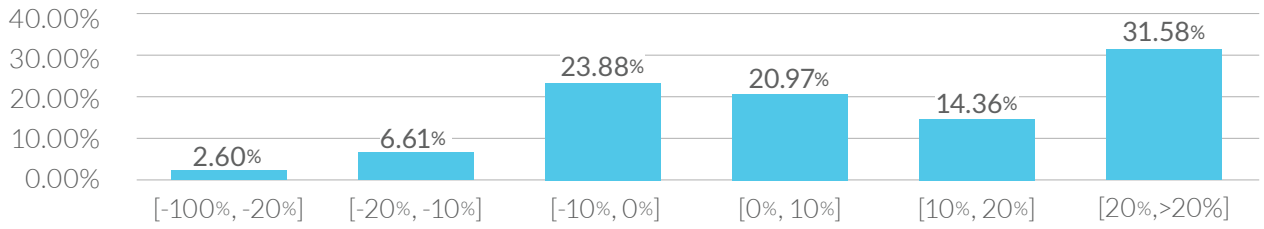
SPDR Gold Shares ETF returns using rolling periods

The data below uses 1-year rolling returns[1] of the SPDR Gold Shares ETF from December 31, 2005 through December 31, 2025, for a total of 4,959[2] observations.

Average Performance			Positive Performance		Negative Performance	
Average Return	Average Gain	Average Loss	Maximum Return[3]	Num of Gains	Minimum Return[4]	Num of Losses
10.51%	19.69%	-8.05%	71.66%	3,318 (67%)	-29.28%	1,638 (33%)

SPDR Gold Shares ETF return distribution

Using the same data set and assumptions, the return distribution graph below illustrates how frequently the annualized returns fell into specific ranges. The table below the graph shows the average return by range.



Return Range	[-100%, -20%]	[-20%, -10%]	[-10%, 0%]	[0%, 10%]	[10%, 20%]	[20%, >20%]
Average SPDR Gold Shares ETF Return by Range	-25.30%	-13.66%	-4.59%	4.70%	15.08%	31.74%

[1] 1-year rolling returns refers to every 1-year period that started on a business day after December 30, 2005 and ended before January 1, 2026.

[2] Three flat years, in which the SPDR Gold Shares ETF return was 0%, is included in the number of total observations.

[3] Maximum return: 1-year period ending 12/23/2025

[4] Minimum return: 1-year period ending 11/26/2013

MassMutual Ascend offers several types of annuities, which have varying levels of upside potential and downside protection. Annuities also offer benefits such as tax deferral and guaranteed lifetime income. Talk with your financial professional about how an annuity can fit into your portfolio and help you reach your goals.

The launch date of the SPDR Gold Shares ETF was November 18, 2004. Indexed strategies are based on the price change of the ETF during the term. Returns are limited by a cap or participation rate.

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

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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℠ (Cincinnati, Ohio), a wholly owned subsidiary of Massachusetts Mutual Life Insurance Company (MassMutual) under contract forms ICC24-P1825224NW, ICC24-P1833624NW, ICC24-P1850824NW, ICC24-P1841624NW, ICC25-P1470025NW, ICC21-P1152121NW, ICC21-P1476721NW , ICC21-P1152021NW, P1074514NW, P1074514ID, P1074514OR, ICC20-P1144420NW, ICC20-P1144420NW-NoMVA, ICC20-P1144520NW, ICC20-P1144520NW-NoMVA, ICC20-P1474420NW, ICC20-P1474420NW-NoMVA, P1140119NW, P1140119ID, P1140119OR, P1140219NW, P1140219ID, P1140219OR, P1146620NW, P1146620ID, P1146620OR, P1110416NW, P1110416ID, P1110416OR, P1129918NW, P1129918ID, P1129918OR, ICC25-P1178825NW, ICC20-P1140219NW and ICC20-P1146620NW. Form numbers may vary by state. Products and features may vary by state. Not available in all states.

All guarantees subject to the claims-paying ability of MassMutual Ascend Life Insurance Company.

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