



# Glossary & Investment Option Disclosures

<b>3-Year Risk Rating</b>	An annualized measure of a fund's downside volatility over a three-year period. Morningstar Risk Rating is derived directly from Morningstar Risk, which is an assessment of the variations in a fund's monthly returns, with an emphasis on downside variations, in comparison to similar funds. In each Morningstar Category, the top 10% of investments earn a High rating, the next 22.5% Above Average, the middle 35% Average, the next 22.5% Below Average, and the bottom 10% Low. Investments with less than three years of performance history are not rated.
<b>Alpha</b>	Alpha is a measure of the difference between a portfolio's actual returns and its expected performance, given its level of risk as measured by beta. A positive Alpha figure indicates the portfolio has performed better than its beta would predict. In contrast, a negative Alpha indicates the portfolio has underperformed, given the expectations established by beta.
<b>Beta</b>	Beta is a measure of a portfolio's sensitivity to market movements. The beta of the market is 1.00 by definition. Morningstar calculates beta by comparing a portfolio's excess return over T-bills to the benchmark's excess return over T-bills, so a beta of 1.10 shows that the portfolio has performed 10% better than its benchmark in up markets and 10% worse in down markets, assuming all other factors remain constant. Conversely, a beta of 0.85 indicates that the portfolio's excess return is expected to perform 15% worse than the benchmark's excess return during up markets and 15% better during down markets.
<b>Effective Duration</b>	Effective duration for all long fixed income positions in a portfolio. Morningstar asks fund companies to calculate and send average effective duration (also known as "option adjusted duration") for each of their fixed income or allocation funds. We ask for effective duration because the measure gives better estimation of how the price of bonds with embedded options, which are common in many mutual funds, will change as a result of changes in interest rates. Effective duration takes into account expected mortgage prepayment or the likelihood that embedded options will be exercised if a fund holds futures, other derivative securities, or other funds as assets, the aggregate effective duration should include the weighted impact of those exposures. Standard practice for calculating this data point requires determination of a security's option-adjusted spread, including the use of option models or Monte Carlo simulation, as well as interest-rate scenario testing Morningstar requests that the fund only report data in this field that has been specifically labeled effective or option-adjusted duration, or that fund is certain has been calculated in the fashion described.
<b>Effective Maturity</b>	Average effective maturity is a weighted average of all the maturities of the bonds in a portfolio, computed by weighting each bond's effective maturity by the market value of the security. Average effective maturity takes into consideration all mortgage prepayments, puts, and adjustable coupons. Longer-maturity funds are generally considered more interest-rate sensitive than their shorter counterparts. We list Average Effective Maturity for Taxable Fixed-Income and Hybrid funds and Average Nominal Maturity for Municipal Bond Funds.
<b>Fixed Income Style Box</b>	The model for the fixed income style box is based on the two pillars of fixed-income performance: interest-rate sensitivity and credit quality. The three interest sensitivity groups are limited, moderate and extensive and the three credit quality groups are high, medium and low. These groupings display a portfolio's effective duration and third party credit ratings to provide an overall representation of the fund's risk orientation given the sensitivity to interest rate and credit rating of bonds in the portfolio. On a monthly basis Morningstar calculates duration breakpoints based around the 3 year effective duration of the Morningstar Core Bond Index (MCBI). By using the MCBI as the duration benchmark, Morningstar is letting the effective duration bands to fluctuate in lock-steps with the market which will minimize market-driven style box changes. Municipal bond funds with duration of 4.5 years or less qualify as low; more than 4.5 years but less than 7 years, medium; and more than 7 years, high. For hybrid funds, both equity and fixed-income style boxes appear.
<b>Portfolio Turnover</b>	Portfolio turnover is a measure of the portfolio manager's trading activity which is computed by taking the lesser of purchases or sales (excluding all securities with maturities of less than one year) and dividing by average monthly net assets. A turnover ratio of 100% or more does not necessarily suggest that all securities in the portfolio have been traded. In practical terms, the resulting percentage loosely represents the percentage of the portfolio's holdings that have changed over the past year.
<b>R<sup>2</sup> R-squared</b>	R <sup>2</sup> , also known as the Coefficient of Determination, reflects the percentage of a portfolio's movement that can be explained by the movement of its primary benchmark over the past three years. An R-squared of 100 indicates that all movement of a fund can be explained by the movement of the index.
<b>Sharpe Ratio</b>	A risk-adjusted measure developed by Nobel Laureate William Sharpe. It is calculated by using standard deviation and excess return to determine reward per unit of risk. The higher the Sharpe Ratio, the better the fund's historical risk-adjusted performance. The Sharpe ratio is calculated for the past 36-month period by dividing a fund's annualized excess returns by the standard deviation of a fund's annualized excess returns. Since this ratio uses standard deviation as its risk measure, it is most appropriately applied when analyzing a fund that is an investor's sole holding. The Sharpe Ratio can be used to compare two funds directly on how much risk a fund had to bear to earn excess return over the risk-free rate.
<b>Standard Deviation</b>	Standard deviation is a statistical measurement of dispersion about an average, which, for a mutual fund, depicts how widely the returns varied over the past three years. Investors use the standard deviation of historical performance to try to predict the range of returns that are most likely for a given fund. When a fund has a high standard deviation, the predicted range of performance is wide, implying greater volatility. Standard deviation is most appropriate for measuring risk if it is for a fund that is an investor's only holding. The figure can not be combined for more than one fund because the standard deviation for a portfolio of multiple funds is a function of not only the individual standard deviations, but also of the degree of correlation among the funds' returns. If a fund's returns follow a normal distribution, then approximately 68 percent of the time they will fall within one standard deviation of the mean return for the fund, and 95 percent of the time within two standard deviations. Morningstar computes standard deviation using the trailing monthly total returns for the appropriate time period. All of the monthly standard deviations are then annualized.

All Glossary terms are sourced from Morningstar, Inc., except "Fixed" and/or "Stable Value" when shown.

## Securities offered or distributed through GWFS Equities, Inc., Member FINRA/SIPC and a subsidiary of Great-West Life & Annuity Insurance Company.

Funds may impose redemption fees and/or transfer restrictions, if assets are held for less than the published holding period. For more information, see the fund's prospectus and/or disclosure documents.

The trademarks, logos, service marks and design elements used are owned by their respective owners and are used by permission.

Holdings and composition of holdings are subject to change.

A collective fund is not a mutual fund and is exempt from SEC registration. Designed for and exclusively sold to qualified retirement plans and their participants, the funds are not available to individual retail investors.

GWFS Equities, Inc., or one or more of its affiliates, may receive a fee from the investment option provider for providing certain recordkeeping, distribution and administrative services.

The responsibility for the content contained in the website(s) provided (if shown) is entirely that of the website owner. Endorsement is neither declared nor implied. Fee and performance information on the website(s) listed may differ for funds offered through an individual or group variable annuity.

The Inception Date listed is the date the fund began operations. The Data Effective Date is the date for which the most current data is available. The Period Ending Date is the date for which the fund fact sheet is produced.

A benchmark index, if shown, is not actively managed, does not have a defined investment objective, and does not incur fees or expenses. Therefore, performance of a fund will generally be less than its benchmark index. You cannot invest directly in a benchmark index.

U.S. Treasury securities, where listed, are guaranteed as to the timely payment of principal and interest if held to maturity. Investment options are neither issued nor guaranteed by the U.S. government.

Although data is gathered from reliable sources, the completeness or accuracy of the data shown cannot be guaranteed. All information is the most current as it is provided by the data source. Where data obtained from Morningstar, ©2018 Morningstar, Inc. All Rights Reserved. The data: (1) is proprietary to Morningstar and/or its content providers; (2) may not be copied or distributed; and (3) is not warranted to be accurate, complete or timely. Neither Morningstar nor its content providers are responsible for any damages or losses arising from any use of this information. Past performance is no guarantee of future results.

Great-West Financial®, Empower Retirement and Great-West Investments™ are the marketing names of Great-West Life & Annuity Insurance Company, Corporate Headquarters: Greenwood Village, CO; Great-West Life & Annuity Insurance Company of New York, Home Office: New York, NY, and their subsidiaries and affiliates, including registered investment advisers Advised Assets Group, LLC and Great-West Capital Management, LLC.

<sup>1</sup>The allocations shown here are subject to change. The fund allocations are based on an investment strategy based on risk and return.

<sup>2</sup> Morningstar seeks credit rating information from fund companies on a periodic basis (e.g., quarterly). In compiling credit rating information, Morningstar

# Glossary & Investment Option Disclosures

instructs fund companies to only use ratings that have been assigned by a Nationally Recognized Statistical Rating Organization (NRSRO). If two NRSROs have rated a security, fund companies are to report the lowest rating; if three or more NRSROs have rated the same security differently, fund companies are to report the rating that is in the middle. For example, if NRSRO X rates a security AA-, NRSRO Y rates the same security an A and NRSRO Z rates it a BBB+, the fund company should use the credit rating of 'A' in its reporting to Morningstar. Additionally, Morningstar accepts foreign credit ratings from widely recognized or registered ratings agencies. An NRSRO rating on a fixed-income security can change from time-to-time. PLEASE NOTE: Morningstar, Inc. is not itself an NRSRO nor does it issue a credit rating on a fund's fixed-income securities. For a list of all NRSROs, please visit <https://www.sec.gov/answers/nrsro.htm>.

<sup>3</sup>A fund that is Actively Managed uses a management approach for the investment strategy that relies on analytic research, judgment and experience for investment decisions. The Passive management investment approach seeks to replicate the returns of an index, where a fund manager makes as few portfolio decisions as possible, in order to minimize transaction costs, including capital gains. Many passively managed funds mimic the performance of an externally specified index. A benchmark index is not actively managed, does not have a defined investment objective, and does not incur fees or expenses. Therefore, performance of a fund will generally be less than its benchmark index. You cannot invest directly in a benchmark index.

<sup>4</sup>The Morningstar Style Box™ reveals a fund's investment strategy. For equity funds the vertical axis shows the market capitalization of the long stocks owned and the horizontal axis shows investment style (value, blend, or growth). A darkened square in the style box indicates the weighted average of the portfolio. For fixed-income funds, the vertical axis shows interest rate sensitivity as measured by a bond's effective duration.

Morningstar seeks credit rating information from fund companies on a periodic basis (e.g., quarterly). In compiling credit rating information, Morningstar accepts credit ratings reported by fund companies that have been issued by all Nationally Recognized Statistical Rating Organizations (NRSROs). For a list of all NRSROs, please visit <https://www.sec.gov/ocr>. Additionally, Morningstar accepts foreign credit ratings from widely recognized or registered rating agencies. If two rating organizations/agencies have rated a security, fund companies are to report the lower rating; if three or more organizations/agencies have rated a security, fund companies are to report the median rating, and in cases where there are more than two organization/agency ratings and a median rating does not exist, fund companies are to use the lower of the two middle ratings. PLEASE NOTE: Morningstar, Inc. is not itself an NRSRO nor does it issue a credit rating on the fund. An NRSRO or rating agency ratings can change from time to time.

For credit quality, Morningstar combines the credit rating information provided by the fund companies with an average default rate calculation to come up with a weighted-average credit quality. The weighted-average credit quality is currently a letter that roughly corresponds to the scale used by a leading NRSRO. Bond funds are assigned a style box placement of "low", "medium" or "high" based on their average credit quality. Funds with a low credit quality are those whose weighted-average credit quality is determined to be less than "BBB-"; medium are those less than "AA-", but greater or equal to "BBB-"; and high are those with a weighted-average credit quality of "AA-" or higher. When classifying a bond portfolio, Morningstar first maps the NRSRO credit ratings of the underlying holdings to their respective default rates (as determined by Morningstar's analysis of actual historical default rates). Morningstar then averages these default rates to determine the average default rate for the entire bond fund. Finally, Morningstar maps this average default rate to its corresponding credit rating along a convex curve.

For interest-rate sensitivity, Morningstar obtains from fund companies the average effective duration. Generally, Morningstar classifies a fixed-income fund's interest-rate sensitivity based on the effective duration of the Morningstar Core Bond Index (MCBI), which is currently three years. The classification of Limited will be assigned to those funds whose average effective duration is between 25% to 75% of MCBI's average effective duration; funds whose average effective duration is between 75% to 125% of the MCBI will be classified as Moderate; and those that are at 125% or greater of the average effective duration of the MCBI will be classified as Extensive.

For municipal bond funds, Morningstar also obtains from fund companies the average effective duration. In these cases static breakpoints are utilized. These breakpoints are as follows: (i) Limited: 4.5 years or less; (ii) Moderate: more than 4.5 years but less than 7 years; and (iii) Extensive: more than 7 years. In addition, for non-US taxable and non-US domiciled fixed income funds static

duration breakpoints are used: (i) Limited: less than or equal to 3.5 years; (ii) Moderate: greater than 3.5 and less than equal to 6 years; (iii) Extensive: greater than 6 years.

Interest-rate sensitivity for non-US domiciled funds (excluding funds in convertible categories) may be measured with modified duration when effective duration is not available.

**Unless otherwise noted, investments are not deposits, insured by the FDIC or any federal government agency, or bank guaranteed and may lose value.**

©2018 Great-West Life & Annuity Insurance Company. All rights reserved.