Using the Morningstar Global Risk Model Components

Morningstar Direct Cloud Editions
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Overview

The web-based versions of Morningstar DirectSM offer access to the Morningstar Global Equity Risk Model and the Global Multi-Asset Risk Model via a number of components. You can see graphical representations of the risk factor exposures and risk premiums, or view the information as a table.

Note: Before proceeding, you might want to read the Morningstar Global Risk Model Methodology, where the risk factors and risk premiums are defined.

This guide offers a number of exercises for screening for investments to analyze using the Risk Model components, as well as practice configuring and analyzing the data in those components.

The Global Risk Model offers a variety of components for analyzing a unique set of data.
Before beginning the exercises in this manual, be sure to read the following topics:

- What is a Risk Model? (page 5)
- What risk models are available? (page 6)
- What factors are contained in the Global Equity Risk Model? (page 7)
- What is the Global Multi-Asset Risk Model? (page 9)
- How are the yield curve factors reflected in the Global Multi-Asset Risk Model? (page 10)
- What are the yield curve risk factors? (page 10)
- What does the Multiple Risk Premiums component show me? (page 12)
- How can I learn more about using the Morningstar Global Risk Models? (page 50)

A risk model is a forecast of the joint distribution of returns for a set of assets. Using the Morningstar Global Risk Models, you can do the following:

- Make more informed account construction decisions
- Understand future return behavior, and
- Understand the impact of adding or subtracting a particular security.

The web-based versions of Morningstar Direct offer data from both the Morningstar Global Equity Risk Model and the Global Multi-Asset Risk Model.

Note: Before proceeding, you might want to read the Morningstar Global Risk Model Methodology, where the risk factors and risk premiums are defined. Further, using the Scenario Trend and Scenario Metrics components is covered in Working with the Scenario Analysis Worksheet.
Using the Morningstar Global Risk Model in the Morningstar DirectSM Cloud Editions

What risk models are available?

The risk models are as follows:

- Global Equity Model (USD)
- Global Multi-Asset Model (USD)
- Global Equity Model (EUR)
- Global Equity Model (GBP)
- Global Equity Model (CAD)
- UK Regional Model (GBP), and
- Eurozone Regional Model (EUR).

Note: The UK Regional Model or Eurozone Regional Risk Model are premium features. To request access, contact your Customer Success Manager.
The Global Equity Risk Model is comprised of 37 risk factors, grouped as follows:

- Style
- Region
- Sector, and
- Currency.

The risk factors are described in the following table:

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Style</strong></td>
<td><strong>Valuation</strong> The ratio of Morningstar’s quantitative fair value estimate for a company to its current market price</td>
</tr>
<tr>
<td><strong>Economic Moat</strong></td>
<td>A quantitative measure of the strength and sustainability of a firm’s competitive advantages</td>
</tr>
<tr>
<td><strong>Valuation Uncertainty</strong></td>
<td>The level of uncertainty embedded in the quantitative fair value estimate for a company</td>
</tr>
<tr>
<td><strong>Financial Health</strong></td>
<td>A quantitative measure of the strength of a firm’s financial position</td>
</tr>
<tr>
<td><strong>Ownership Risk</strong></td>
<td>A measure of the risk exhibited by the fund managers who own a company</td>
</tr>
<tr>
<td><strong>Ownership Popularity</strong></td>
<td>A measure of recent accumulation of shares by fund managers.</td>
</tr>
<tr>
<td><strong>Liquidity</strong></td>
<td>Share turnover of a company.</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>Market capitalization of a company.</td>
</tr>
<tr>
<td><strong>Value-Growth</strong></td>
<td>Value-Growth, where a value stock has a low price relative to its book value, earnings and yield</td>
</tr>
<tr>
<td><strong>Momentum</strong></td>
<td>How much a stock has risen in price over the past year relative to other stocks.</td>
</tr>
<tr>
<td><strong>Volatility</strong></td>
<td>Total return volatility as measured by largest minus smallest 1month returns in a trailing 12 month horizon</td>
</tr>
</tbody>
</table>
What factors are contained in the Global Equity Risk Model?

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector</td>
<td>Measure the economic exposure of a company to the 11 Morningstar sectors. Must sum to 1 and must individually be between 0 and 1.</td>
</tr>
<tr>
<td>Energy</td>
<td></td>
</tr>
<tr>
<td>Financial Services</td>
<td></td>
</tr>
<tr>
<td>Consumer Defensive</td>
<td></td>
</tr>
<tr>
<td>Consumer Cyclical</td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td></td>
</tr>
<tr>
<td>Industrials</td>
<td></td>
</tr>
<tr>
<td>Healthcare</td>
<td></td>
</tr>
<tr>
<td>Communication Services</td>
<td></td>
</tr>
<tr>
<td>Real Estate</td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td></td>
</tr>
<tr>
<td>Region</td>
<td>Measure the partial economic exposure of a company or portfolio to seven geographic regions (Better approach than measuring geographic measuring risk according to where the stock is listed, incorporated, or headquartered).</td>
</tr>
<tr>
<td>Developed North America</td>
<td></td>
</tr>
<tr>
<td>Developed Europe</td>
<td></td>
</tr>
<tr>
<td>Developed Asia Pacific</td>
<td></td>
</tr>
<tr>
<td>Emerging Latin America</td>
<td></td>
</tr>
<tr>
<td>Emerging Europe</td>
<td></td>
</tr>
<tr>
<td>Emerging Asia Pacific</td>
<td></td>
</tr>
<tr>
<td>Emerging Middle East &amp; Africa</td>
<td></td>
</tr>
<tr>
<td>Equity Market</td>
<td></td>
</tr>
<tr>
<td>Currency</td>
<td>Measure the partial economic exposure of a company or portfolio to seven exchange rates. We estimate partial economic exposure of each company to all 7 exchange rates. To capture these partial exposures, we perform a time-series quantile regression over the past 5 years on a rolling, weekly frequency. These exposures generally fall between -1 and 1.</td>
</tr>
<tr>
<td>Euro</td>
<td></td>
</tr>
<tr>
<td>Japanese Yen</td>
<td></td>
</tr>
<tr>
<td>British Pound</td>
<td></td>
</tr>
<tr>
<td>Swiss Franc</td>
<td></td>
</tr>
<tr>
<td>Canadian Dollar</td>
<td></td>
</tr>
<tr>
<td>Australian Dollar</td>
<td></td>
</tr>
<tr>
<td>New Zealand Dollar</td>
<td></td>
</tr>
</tbody>
</table>
The Morningstar Global Multi-Asset Risk Model allows you to examine risk in multi-asset funds and portfolios (including fixed-income investments). It captures equity risk premiums across the global equity universe, and the interest-rate component of USD-, EUR-, GBP-, and CHF-denominated bonds in terms of the respective shift, twist, and curvature factors of the U.S., German, British, and Swiss government yield curves.

The Global Multi-Asset Risk Model includes the 36 risk factors from the Global Equity Risk Model, as well as 12 yield curve factors. To qualify for analysis with the Global Multi-Asset Risk Model, a fund or portfolio must meet the following requirements:

- Cannot be a fund-of-funds
- Must have a portfolio report date within the last six months
- Market capitalization > USD 1 million
- Liquidity > USD 10,000
- Region-size rank ≤ 500
- Sector-size rank ≤ 250
- Sector-region-size rank ≤ 50
- Sector-country-size rank ≤ 10, and
- United States-size rank ≤ 2,000.

Note: ADRs are not eligible.

At this time, the following investments are covered by the Multi-Asset Risk Model:

- noncallable corporate
- sovereign, and
- muni bonds denominated in four major currencies (USD, EUR, GBP, CHF).

Note that the following bond types are excluded from coverage:

- those denominated in currencies other than USD, EUR, GBP, and CHF
- callable bonds
- mortgage-backed securities, and
- interest derivatives.

In this manual, you will learn how to use the Global Multi-Asset Risk Model in a number of risk-model related components. To learn about using the Global Multi-Asset Risk Model in scenario analysis, please read Working with the Scenario Analysis Worksheet exercise guide.

To learn more about the Morningstar Global Multi-Asset Risk Model, please read Morningstar Risk Model Methodology.
A yield curve shows interest rates at a point in time with differing maturities. In normal markets, as the time to maturity increases, so does the yield. Interest-rate risk tends to increase with maturity, and investors expect compensation for this risk. Investors’ anticipation of future short-term rates also influences the shape of the yield curve, regardless of whether those fixed-income instruments are being issued by the federal government, municipal agencies, or corporations.

If investors believe short-term rates will fall in the near term, the yield curve may become flat, or even inverted, where long-term interest rates are lower than short-term rates. A flattening or inverted yield curve is often interpreted as a sign the economy is starting to cool and the Fed (or other central bank) may start to lower short-term rates. In contrast, a steepening yield curve usually points to a strong economy with increased expectations of inflation.

The yield curve risk factors in the Global Multi-Asset Risk Model are described in the following table:

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD - Shift</td>
<td>The Shift factor measures the degree to which the curve has moved up or down,</td>
</tr>
<tr>
<td>EUR - Shift</td>
<td>in parallel, across all maturities. Mathematically, it is the principal</td>
</tr>
<tr>
<td>GBP - Shift</td>
<td>component of daily par curve changes.</td>
</tr>
<tr>
<td>CHF - Shift</td>
<td></td>
</tr>
<tr>
<td>USD - Twist</td>
<td>The Twist factor measures the degree to which the curve has steepened or</td>
</tr>
<tr>
<td>EUR - Twist</td>
<td>flattened. Mathematically, it is the secondary component of daily par</td>
</tr>
<tr>
<td>GBP - Twist</td>
<td>curve changes.</td>
</tr>
<tr>
<td>CHF - Twist</td>
<td></td>
</tr>
<tr>
<td>USD - Curvature</td>
<td>The Curvature (or butterfly) factor measures the degree to which the curve</td>
</tr>
<tr>
<td>EUR - Curvature</td>
<td>term structure has become more or less curved. Mathematically, it is</td>
</tr>
<tr>
<td>GBP - Curvature</td>
<td>the third principal component of daily par curve changes.</td>
</tr>
<tr>
<td>CHF - Curvature</td>
<td></td>
</tr>
</tbody>
</table>

Note: USD represents the US Treasury yield curve; EUR represents the German government yield curve; GBP represents the UK government yield curve; and CHF represents the Swiss government yield curve.
In terms of interpreting the positive and negative values for the Yield Curve factor exposures, consider the following table:

<table>
<thead>
<tr>
<th>For this risk factor...</th>
<th>A positive factor exposure means...</th>
<th>While a negative factor exposure means...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift</td>
<td>The portfolio’s price decreases when the shift premium goes up. When the premium for shift is negative, the portfolio’s price increases.</td>
<td>The portfolio’s price increases when the shift premium goes up. When the premium for shift is negative, the portfolio’s price decreases.</td>
</tr>
<tr>
<td>Twist</td>
<td>The portfolio’s price decreases when the twist premium goes up. When the premium for twist is negative, the portfolio’s price increases.</td>
<td>The portfolio’s price increases when the twist premium goes up. When the premium for twist is negative, the portfolio’s price decreases.</td>
</tr>
<tr>
<td>Curvature</td>
<td>The portfolio’s price decreases when the curvature premium goes up. When the premium for curvature is negative, the portfolio’s price increases.</td>
<td>The portfolio’s price increases when the curvature premium goes up. When the premium for curvature is negative, the portfolio’s price decreases.</td>
</tr>
</tbody>
</table>
The Risk Premium worksheet is unique in the web-based versions of Morningstar Direct. The data in the Multiple Risk Premiums components found here are agnostic of any investment in a list, screen, or of portfolio objects like model portfolios or client accounts. The components here reflect information about the returns associated with the factors in the Global Risk Models themselves, and serve as a point of reference for investment analysis.

Which of the 48 risk factors has had the highest positive returns over a particular time period, and which has had the largest negative returns? These questions can be answered by using the Multiple Risk Premiums component, which is found on the Risk Premium worksheet in the Equity Fund workbook. Remember, the values here reflect those of the Morningstar Global Risk Models, and not any specific investment you may have selected in the Grid View component.

The Risk Premium worksheet shows four instances of the Multiple Risk Premiums component. Each component, in turn, targets a selection of the 48 risk factors: Style, Region, Sector, and Currency. (The Yield Curve factors can also be shown in this component, but they do not appear here by default.) The values in the components represent how much a particular risk factor has influenced asset returns for a particular time period. For example, the component in the following screenshot shows that a single unit of exposure to the Momentum factor would result in a return of 6.9% for the time period being considered.
To view and analyze risk premium data in the Multiple Risk Premiums component, do the following:

1. Be sure the **Equity Fund** workbook is open.
2. Click the **Risk Premium** worksheet.
3. On the **Multiple Risk Premiums: Style** component, click the **Expand** icon. The component resizes to fill the screen. This will make it easier to read the data.

4. Click the **Component Settings** icon. The Component Settings menu opens.
5. From the Component Settings menu, select **Time Period**.
6. Click the **Start Date** option, then **scroll up** to select **1 Year**.
7. Click **Done**. The component updates.
8. Click the **Component Settings** icon to close the menu.

![Chart of risk factors](chart.png)

Move your cursor over the chart to view exact numbers for each month in the time period.

Take note of the risk factor with the highest and lowest returns for the past year. Will the funds from a screen or list you open (or create) reflect high exposure to the factors with strong returns, and low exposure to the factors with the weakest return? Or will the manager have taken a different approach?
In Global Settings, the default number of decimal points is 2, which is too small to display meaningful data for the factor exposures in the Global Multi-Asset Risk Model. In this exercise, to prepare for working with the Global Multi-Asset Risk Model, you will change the decimal place setting to 5. This change will impact nearly every numeric data point in the web-based version of Morningstar Direct, so consider changing this value back to 2 once you are done examining data for the Global Multi-Asset Risk Model.

Do the following:

1. On the header, click the Account icon, then select Global Settings. The Global Settings window opens.

2. Select Data Format. The Data Format options are displayed.

3. From the Decimal Places drop-down field, select 5.

4. Click Save. The Global Settings window closes.
In this exercise, you will do the following:

- Add a new worksheet to the Equity Fund workbook with four instances of the Multiple Risk Premiums component
- Display the Global Multi-Asset Risk Model in each component
- Display a different set of yield curve factors in each component, and
- Save the worksheet and workbook with a unique name.

The Equity Fund workbook should still be open. Do the following:

1. Click the **Add Worksheet** icon.

2. In the **Search Component** field, type **Multiple**.
3. **Drag-and-drop four** instances of the **Multiple Risk Premiums** component onto the worksheet. (By default, these show data for the Style factors, but you will change this.)

4. Click **Done** to close the Component Library.
5. In the top-left component, click the Component Settings icon and select Risk Models > Global Multi-Asset Model.

The Risk Premiums in the component now reflect the Yield Curve factors.
6. From the Component Settings menu, select Display Group > Yield Curve. In the Yield Curve menu, all risk factors are checked. Note: Factors from only one display group at a time can be shown in a component.

7. Click Clear All. All risk factors are deselected.

8. Click the checkbox for each USD Yield Curve risk factor.

9. Click Done.
10. Click away from the Component Settings menu to close it.

11. **Hover the cursor** over the chart to view the data for a particular date. A popup reveals the specific data for that date.

![Chart showing multiple risk premiums for different currencies]

The dotted line shows the location on the chart for that specific date.

12. In the remaining three components on the new worksheet, **repeat** step 5 through step 10, selecting a different set of risk factors (EUR, GBP, and CHF) in each component. Your result should look something like the following illustration.

What common trends and discrepancies do you see across the four components?
13. To rename the worksheet, click the **Untitled** tab and select **Rename**.

![](image1.png)

14. Name the worksheet **Yield Curve Risk Premiums**, then click **Save**.

15. To save the workbook, click the **workbook menu** and select **Save As**.

![](image2.png)

16. Type **Multi-Asset Risk Model** and click **Save**.

   **Note**: At this point, you may want to use the Global Settings menu to change the number of decimal places back to 2.
To begin understanding data from the Morningstar Global Equity Risk Model, create a screen for equity funds to be analyzed. In this exercise, the focus will be on large-cap open-end funds meeting the following criteria:

- must be a member of the US Fund Large Blend, US Fund Large Growth, or US Fund Large Value Morningstar Category
- must have at least three years of history
- must have at least $500MM in assets
- cannot be a fund-of-funds, and
- only a single share class (namely, the oldest) of each fund will be shown.

In this exercise, the first step is to create a workbook and not a screen. If you were to create a screen, the Grid View workbook would open upon completing it, and that workbook does not contain the worksheets needed to see Morningstar Global Risk Model components; the Equity Fund workbook has these. Creating a screen would require you to save the screen, open the Equity Fund workbook, and then open the saved screen. Because the Equity Fund workbook already contains several worksheets related to the Global Risk Model, creating an instance of that workbook and creating a screen from there saves several steps.

To create this screen, do the following:

1. On the header, click the Create icon, then select Workbook. The Select an existing workbook to start from window opens.

2. Click Equity Fund. A window opens, asking you to select a list or screen.

3. Click New Screen. The Screener window opens.
4. In the Investment Type area, click **Open-End Fund**, then click **OK**. The Add Criteria area for the next element to screen on opens.

5. To find a single instance of each fund, in the **Search for data points** field, type **old**. Select **Oldest Share Class**. Some additional fields now appear.

6. The option for Yes should be selected already; click **OK**.

7. To find large-cap funds, in the **Search for data points** field, type **peer**.
8. Select **Morningstar Category**. Some additional fields now appear.

9. In the Value area **Search** field, type **large**. The list of available categories updates to match your search term.

10. Select **Large Blend**, **Large Growth**, and **Large Value**.

11. Click **OK**.

12. To find funds with at least $500MM in assets, in the **Search for data points** field, type **size**.

13. Select **Fund Size**.
14. The Operator field defaults to Greater than or Equal to. In the Value field, type 500000000.

15. Click OK.

16. To find funds with at least three years of history, in the Search for data points field, type inception.

17. Select Inception Date of Oldest Share Class.

18. The Operator field defaults to Before. In the Value field, enter the previous month-end date from three years ago in MM/DD/YYYY format (Example: 02/28/2016).

19. Click OK.

20. Click Done. The Screener window closes and the Equity Fund workbook opens, displaying the Grid View worksheet.
21. Click the Lists & Screens menu and select Save. A dialog box opens.

22. In the Name field, type Large Cap Subset.
23. Click Save. The name of the screen updates automatically.

To view and analyze risk premium data, do the following:

1. Click the Risk Premium worksheet.
2. On the Multiple Risk Premiums: Style component, click the Expand icon. The component resizes to fill the screen.
3. Click the Component Settings icon. The Component Settings menu opens.
4. From the Component Settings menu, select Time Period.
5. Click the **Start Date** option, then scroll up to select **1 Year**.

![Screen capture showing the risk factor chart with time period options]

Use this field to change the time period being reflected in the chart.

6. Click **Done**. The component updates.

7. Click the **Component Settings** icon to close the menu.

![Screen capture of the component settings dialog]

Move your cursor over the chart to view exact numbers for each month in the time period.

Take note of the risk factor with the highest and lowest returns for the past year. Will the funds from the screen reflect high exposure to the factor with strong returns, and low exposure to the factor with the weakest return? Or will the managers have taken a different approach altogether?
To see the size of a fund’s exposure to various risk factors and to understand how a fund’s risk exposures compare to a benchmark, as well as to see its historical exposure to the risk factors, use the components on the Risk Factor worksheet.

Note: Before beginning this exercise, ensure you have constituent rights enabled via the Content Catalog (found under the Account icon on the header) to compare the holdings of the fund to the benchmark you want to use in this exercise. Your Customer Success Manager can assist you with this, if needed. Alternatively, use a Morningstar Index, or an ETF proxy.

Do the following:

1. Select the Risk Factor worksheet.
2. In the Grid View, scroll to find the fund that had the best Total Ret % Rank Cat 1Y value from Exercise 4 on page 22.
3. Click once on the fund’s name. A blue line should appear underneath the fund, and the other two components on the worksheet update to reflect that this is the fund in focus.
4. Expand the Risk Exposure Snapshot component. Note that only one set of factors (in this case, the Style factors) is shown at a time.
5. Click the **Component Settings** icon to change the **Data View** to a **Table**.

![Image of Component Settings](image1)

6. Click the +/- column header to sort by that column. To which factors does the fund have the greatest underexposure and overexposure compared to the benchmark? Take note of these two risk factor names.

![Image of Risk Factor Table](image2)

7. Click the **Expand** icon again to collapse the Risk Exposure Snapshot component.

8. **Expand** the Historical Risk Exposure component. This component shows only one risk factor at a time. You can see the fund’s exposure (the blue bar), the benchmark’s exposure (the black line), and the Risk Premium for the factor (the red line).

![Image of Historical Risk Exposure](image3)
9. The chart defaults to showing data for the trailing one-year time period, and the risk premium as points in time. It can be more helpful to see the premium returns as a cumulative value, rather than as periodic returns. Additionally, the risk factor needs to be changed to reflect the information discovered in the Risk Exposure Snapshot component. A longer time horizon will be useful as well, in understanding the manager’s exposure to a component. Click the **Component Settings** icon to make the following changes:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Period</td>
<td>Last 2 Years</td>
</tr>
<tr>
<td>Risk Factor Exposures</td>
<td>Select the factor with either the greatest overexposure or underexposure from <strong>step 6 on page 29</strong>.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Risk Premium</td>
<td>Cumulative Returns</td>
</tr>
</tbody>
</table>

10. Click the **Component Settings** icon to close the menu. Consider the following questions for the risk factor being displayed:

- Has the fund’s exposure to this factor been consistently positive (or negative) during this time period?
- Has the fund’s exposure to this factor been consistently greater or less than that of the benchmark during this time period?
- Did the manager change the fund’s approach in response to the factor premium as it changed over time? Or was the approach to the factor consistent, regardless of what the factor’s premium was?

11. After analyzing the manager’s approach with this risk factor over time, click the **Component Settings** icon to change the **Risk Factors Exposure** value to the other risk factor from **step 6 on page 29** and consider the same bulleted questions in **step 10**.
The Holdings Risk Factor, Risk Decomposition, and all Risk Exposure components provide a picture of what is happening at the fund level. But which holdings in a fund’s portfolio have the greatest exposure to different risk factors? The Holdings Risk Factor component shows this information, but this component does not appear by default on any worksheet. Create a custom worksheet to display this data. Do the following:

1. Near the top-right corner of the window, click the Add Worksheet icon (+). A worksheet named Untitled 1 is added, and the Component Library opens.

2. From the Database section, click-and-drag the Grid component to the left. The Grid View automatically appears.
3. In the Component Library, scroll down and from the Risk Model area, click-and-drag the Holdings Risk Factor component into place at the right of the component you just added. The Grid component resizes.

4. In the Component Library, also under the Risk Model area, click-and-drag the Risk Exposure Snapshot and drop it below the Holdings Risk Factor component.

5. Click Done. The Component Library closes.

6. In the Untitled 1 worksheet name, click down arrow, then select Rename. A dialog box opens.

7. Enter Holdings Risk Factors, then click Save.

Note: You cannot change the position of the worksheets within a workbook.
8. In the upper-left corner of the window, click `*Untitled Workbook`, then select `Save`. A dialog box opens.

![Screenshot of Workbook Menu]

9. Enter the name `Global Risk Model Workbook`, then click `Save`. The name of the workbook updates to reflect your change.

![Screenshot of Workbook Name]

10. Expand the Holdings Risk Factors component.
11. Click the **Portfolio Weight** column header to sort in descending order. The stocks held by the fund are ranked by their size in the portfolio. Among the larger holdings in the portfolio, which risk factors have significant positive and negative exposures?

   Note: Be sure to check for large short positions, too, which appear as negative numbers in the Portfolio Weight column. Short positions are subtracted from a fund’s exposure to a risk factor. Therefore, what looks like a positive exposure is actually negative, and a negative exposure to a factor would be even greater.

12. Click the **column header** of the risk factor with the greatest overexposure relative to the benchmark (from Exercise 9 on page 36). Which holdings represent the source of this overexposure?
The Analyst Research worksheet offers an easy way to see what articles have been written by Morningstar analysts about the investments you are viewing in a workbook. To see this content, do the following:

1. Select the Analyst Research worksheet.

2. In the Morningstar Research component, click the name of an article to view it. The article opens in the component.

If no Morningstar Analyst report exists for a fund, you can still click an article here to read more about the fund.
To create a set of fixed-income investments you can use for evaluating the Global Multi-Asset Risk Model, do the following:

1. Select the Grid View worksheet.
2. From the Lists & Screens menu, select Create New > Screen.
3. Select the following criteria for the screen:

<table>
<thead>
<tr>
<th>Data Point</th>
<th>Operator</th>
<th>Value(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Type</td>
<td>n/a</td>
<td>Exchange-Traded Fund, Open-End Fund</td>
</tr>
<tr>
<td>Domicile</td>
<td>n/a</td>
<td>United States</td>
</tr>
<tr>
<td>Morningstar Analyst Rating</td>
<td>Include</td>
<td>Bronze, Gold, Silver</td>
</tr>
<tr>
<td>Oldest Share Class</td>
<td>n/a</td>
<td>Yes</td>
</tr>
</tbody>
</table>

4. After entering the criteria, click Done.
5. Use the Lists & Screens menu to save the screen with the name Analyst-Rated Fixed Income Funds.
In this exercise, you will change the components on the Risk Factor worksheet to display the Multi-Asset Risk Model to evaluate the funds in the screen you just created.

Do the following:

1. Be sure the Analyst-Rated Fixed Income Funds screen is open.
2. Select the Risk Factor worksheet. Note the following:
   - The Risk Exposure Snapshot component displays the Yield Curve factors, and
   - The Historical Risk Exposure component displays the Shift factor.
3. Select a fund.
In this exercise, you will learn to simultaneously view data from two Global Risk Models in the Risk Exposure Snapshot. The Equity Fund workbook should still be open and displaying the expanded Risk Exposure Snapshot component.

Do the following:

1. In the Risk Exposure Snapshot, click the **Component Settings** icon and select **Data View > Table**.

2. Click the **Component Settings** icon to close the menu.
3. In the table view, you can see all risk factors (including those from the Global Equity Risk Model). However, because your selected fund contains only fixed-income investments, the Equity Global Risk Model factors display 0.00000.

At the top of the component, click the **down arrow** at the top of the Risk Factors column to collapse all premiums.

4. Click the **right-facing arrow** in the Yield Curve row to display its risk factors.
Only the Yield Curve risk factors are displayed.

In your results, which risk factor indicates the greatest impact? Which indicates the least impact?

5. In the upper-right corner of the component, click the Collapse icon. The component returns to its original size.
In this exercise, you will use the Historical Risk Exposure component to examine the past Yield Curve risk factors for fixed-income funds. The Equity Fund workbook should still be open and displaying the Risk Factor worksheet.

Do the following:

1. In the upper-right corner of the window, click **Edit** to open the **Component Library**.

2. **Delete** the **Risk Exposure Snapshot** component.
3. In the Component Library, drag the **Historical Risk Exposure** component into the component area, placing it at the bottom of the existing Historical Risk Exposure component. You now have two instances of the Historical Risk Exposure component.

4. **Create** a third instance of the **Historical Risk Exposure** beneath the second Historical Risk Exposure component.
5. In the upper-right corner of the window, click Done to close the Component Library. You see three instances of the Historical Risk Exposure component, all displaying the USD Yield Curve Shift data.

You might want to drag these separators up and down to make all three components the same size (more or less).
6. In the middle component, click the Component Settings icon and select Risk Factor Exposures > Yield Curve > USD - Twist.

Note the highlighted selections.
7. In the bottom component, click the **Component Settings** icon and select **Risk Factor Exposures** > **Yield Curve** > **USD - Curvature**.
8. Click the **Component Settings** icon to close the menu.

Each of the Historical Risk Exposure components shows a different risk factor — Shift, Twist, and Curvature — for the same fund, covering the same time period.

![Graphs showing historical risk exposure with Shift, Twist, and Curvature](image_url)

*Note the highlighted selections.*
The UK and Eurozone regional models do the following:

- Account for region-specific market conditions using the underlying Morningstar Global Risk Model methodology, and
- Help regional asset managers analyze their portfolios of local securities with more accuracy and forecast risk attributed to the local market factors.

The UK and Eurozone regional models are found in the following risk model components:

- Historical Risk Exposures
- Holdings Risk Factor
- Multiple Risk Exposures
- Multiple Risk Premiums
- Risk Decomposition, and
- Risk Exposure Snapshot.

To access the UK and Eurozone Regional Models, do the following:

1. In one of the supported Risk Model components, click the **Component Settings** menu.
2. Select **Risk Models**.
3. Select one of the following:
   - **UK Regional Model**, or
   - **Eurozone Regional Model**.

4. **Click away** from the Component Settings menu to close it.
Note that when the UK Regional Model or Eurozone Regional Risk Model is selected, Equity Market is the only risk factor available in Component Settings > Display Group > Region.
The Equity Market risk factor improves the data surfaced by various Sector and Region factors by doing the following:

- approximates the overall equity market return over the designated time period, and
- strongly correlates with a broad-based market index (FTSE All World Index for the global equity model).

The Equity Market factor is found in the Region premium in the following risk model components:

- Historical Risk Exposures
- Holdings Risk Factor
- Multiple Risk Exposures
- Multiple Risk Premiums
- Risk Decomposition, and

Note: The Risk Decomposition component defaults to display all risk factors, including the Equity Market factor.

- Risk Exposure Snapshot.

To access the Equity Market factor, do the following:

1. In one of the supported Risk Model components (with the exception of Risk Decomposition), click the Component Settings menu.
2. Sector Display Group > Region > Equity Market.
3. Click Done.

4. Click away from the Component Settings menu to close it.

The following image shows all regions.

In addition to using the worksheets and components mentioned in this guide, be sure to also read the Working with the Scenario Analysis Worksheet to familiarize yourself with that capability. The components on this worksheet use data from the Morningstar Global Risk Models based on past market events to predict a fund’s future performance if certain market conditions should arise again.