Using the Morningstar Global Risk Model Components

Morningstar Direct Cloud Editions



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Using the Morningstar Global Risk Model in the Morningstar DirectSM Cloud Editions

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.

Overview

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:

What is a Risk Model?

- 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. 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:

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

What factors are contained in the Global Equity Risk Model?

	Risk Factor	Description						
Sector	Basic Materials	Measure the economic exposure of a						
	Energy	company to the 11 Morningstar sectors. Must sum to 1 and must individually be between 0						
	Financial Services	and 1.						
	Consumer Defensive							
	Consumer Cyclical							
	Technology							
	Industrials							
	Healthcare							
	Communication Services							
	Real Estate							
	Utilities							
Region	Developed North America	Measure the partial economic exposure of a						
	Developed Europe	company or portfolio to seven geographic regions (Better approach than measuring						
	Developed Asia Pacific	geographic measuring risk according to where the stock is listed, incorporated, or headquartered).						
	Emerging Latin America							
	Emerging Europe							
	Emerging Asia Pacific							
	Emerging Middle East & Africa							
	Equity Market							
Currency	Euro	Measure the partial economic exposure of a						
	Japanese Yen	company or portfolio to seven exchange rates. we estimate partial economic exposure						
	British Pound	of each company to all 7 exchange rates. To capture these partial exposures, we perform						
	Swiss Franc	a time-series quantile regression over the						
	Canadian Dollar	past 5 years on a rolling, weekly frequency. These exposures generally fall between -1						
	Australian Dollar	and 1.						
-	New Zealand Dollar							

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 \leq 500
- Sector-size rank ≤ 250
- Sector-region-size rank ≤ 50
- Sector-country-size rank \leq 10, and
- United States-size rank \leq 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.

What is the Global Multi-Asset Risk Model? 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:

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

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. How are the yield curve factors reflected in the Global Multi-Asset Risk Model?

What are the yield curve risk factors?

In terms of interpreting the positive and negative values for the Yield Curve factor exposures, consider the following table:

For this risk factor	A positive factor exposure means	While a negative factor exposure means
Shift	The portfolio's price decreases when the shift premium goes up. When the premium for shift is negative, the portfolio's price increases.	The portfolio's price increases when the shift premium goes up. When the premium for shift is negative, the portfolio's price decreases.
Twist	The portfolio's price decreases when the twist premium goes up. When the premium for twist is negative, the portfolio's price increases.	The portfolio's price increases when the twist premium goes up. When the premium for twist is negative, the portfolio's price decreases.
Curvature	The portfolio's price decreases when the curvature premium goes up. When the premium for curvature is negative, the portfolio's price increases.	The portfolio's price increases when the curvature premium goes up. When the premium for curvature is negative, the portfolio's price decreases.

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:

Exercise 1: See how different factors have impacted returns

- 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**.

<u></u> ■ Menu	Investme	nt Analysis *Equ	iity Fund ${\scriptstyleee}$					Q \$	earch for S	Securities and Research	ļ [0 2	
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Multiple Risk	Premiums: Style										l.		
36.325	50									Component Settings		um 24	
										Time Period 07/01/2013 - 06/30/2018	>		Soloct this option
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27.244	10					\sim				Display Settings		5	
							\backslash	$\sim =$	\swarrow	Data View Chart	>	4	
					(0.100/	пр ніsк 7	

6. Click the Start Date option, then scroll up to select 1 Year.

Menu	□ Investment Analysis *Equity Fund ∨					۹ :	Search for	Securities and I	Research	Û (6) &		
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7. Click **Done**. The component updates.

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



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.

Exercise 2: Change the number of decimal points for the display

Do the following:

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

🗮 Menu	Home	Q 🛯 🖉 🖉	
	M RNINGSTAR Direct 🗠	Account File Management Global Settings	Note the highlighted selections.
	Q Search for Securities and Research	Content Catalog Sign Out	
Lists & S	Screens 🖄 Create V	Cieate	

- 2. Select Data Format. The Data Format options are displayed
- 3. From the **Decimal Places** drop-down field, select **5**.

Settings: Global				Cancel	
General Data Format > Calculation	Decimal Places 5 ∨	Decimal Separator Period[.] Comma[.]	Thousands Separator Period[.] Comma[, Space None Quote[']	Negative Indicator • -1234.56 (1234.56)	Note the highlighted selections.
	Date Format mm/dd/yyyy	Time Zone ∨ Pacific/Ea	ster V	Numbering System Arabic Indian 	
	Show Calculated Dates				

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.

Exercise 3: Use the Multiple Risk Premiums component to display multiple sets of Yield Curve risk factors



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.

Note the highlighted selections.

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									L			-	Twint		

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.



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**.



- 14. Name the worksheet Yield Curve Risk Premiums, then click Save.
- 15. To save the workbook, click the workbook menu and select Save As.



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:

Exercise 4: Screen for large-cap equity funds

- 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.

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							Create		
		M			List				
		III III III III III III III III III II	()KNINGO	IAK	Dilect		Screen		
	()))))))))()) Caarab far Caa	unitian and Day				Custom Benchmark		
			curres and nes	searci	l	2000	Custom Scenario		Select this option
							Policy		from the Create menu
	Lists & Screens				Model Portfolios		Model Portfolio		
							Workbook		
	Name	Туре	Last Modified		Name	La	Note		
	Active Share	List	08/30/2018		Model1	• o	Grid Batch		
	Emerging Markets	Screen	08/29/2018		Model2	0	1/22/2010	200000	

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

Select an existing workbook						
Q Locate Workbook Custom Benchmarks Read Only	Type Portfolios	Owner Morningstar	Modified 01/27/2017	Created 01/26/2017	^	
Equity Fund Read Only	Investments	Morningstar	01/27/2017	01/26/2017		Click this option
Fixed Income Fund Read Only	Investments	Morningstar	01/27/2017	01/26/2017		
Grid View Read Only	Investments	Morningstar	01/27/2017	01/26/2017		
Grid View Read Only	Portfolios	Morningstar	01/27/2017	01/26/2017		
Markets - Equity Research Read Only	Investments	Morningstar	01/27/2017	01/26/2017		
Markets - Overview Read Only	Investments	Morningstar	01/27/2017	01/26/2017	~	
					-	

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.

Screener				Cancel Done	After selecting
0/27,226 + 🖻 🖒	 Create your Universe 			O Logic Mode	option(s) for a field, be sure to click OK
1290 Convertible Securities A	Investment Type			СК	
1290 Convertible Securities I	Value				The Domicile criteria
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1290 DoubleLine Dynamic Allocation A					automatically and is
1290 DoubleLine Dynamic Allocation I	Ulosed-End Fund	 Exchange-Traded Fund 	Money Market Fund	Preferred Stock	set to United States
1290 DoubleLine Dynamic Allocation R	 Collective Investment Trust 	Index	Open-End Fund	Separate Account	
1290 GAMCO Small/Mid Cap Value A					This saves you the
1290 GAMCO Small/Mid Cap Value I	Domicile: United States			• ×	filter for only those
					funds sold in the U.S.

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**.

Screener		Cancel Done	
0 / 27,226 + 🖻 🖒	▼ Create your Universe	C Logic Mode	
1290 Convertible Securities A	Investment Type: Open-End Fund		
1290 Convertible Securities I	Domicile: United States	Some fields have a	
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1290 DoubleLine Dynamic Allocation A		selected when you	
1290 DoubleLine Dynamic Allocation I	Value	include them in a scre	en
1290 DoubleLine Dynamic Allocation R	Allow Missing Values		
1290 GAMCO Small/Mid Cap Value A			
1290 GAMCO Small/Mid Cap Value I	V Yes		
1290 GAMCO Small/Mid Cap Value R	O No		
1290 GAMCO Small/Mid Cap Value T	O Not Available		
1290 Global Talents A			

7. To find large-cap funds, in the **Search for data points** field, type **peer**.

8. Select Morningstar Category. Some additional fields now appear.

Screener			Cancel Done	
0/3,922 + 🖻 🖒	▼ Create your Universe		O Logic Mode	
1290 GAMCO Small/Mid Cap Value I	Investment Type: Open-End Fund			The smart search
1290 Global Talents I	Domicile: United States			capability
1290 Low Volatility Global Equity I	# Oldest Share Class	Value: Vec		occasionally allows
1290 SmartBeta Equity I		Value, 165		you to find a
1290 VT Energy K	I Global Broad Category Group: Equity			data point by
1290 VT Equity Income IB	I Add Criteria		×	searching for a
1290 VT GAMCO Small Company Valu				synonym of a data
1290 VT Low Volatility Global Equity K	Q peer X Y			point's name
1290 VT Micro Cap K	Morningstar Category			
1290 VT Natural Resources K	Monnigetal outogery			
1290 VT Real Estate K	Most Recent Category Peer			
1290 VT Small Cap Value K	Group Marine			

- 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.

Screener				Cancel	Done	
0/7,907 + 🖻 🖒	# Morningstar Category				ОК	
1290 Convertible Securities I 1290 DoubleLine Dynamic Allocation I 1290 GAMCO Small/Mid Cap Value I	Operator Include Exclude	Region United States ∨	Value Allow Missin Values	9		Use this field to
1290 Global Falents I 1290 High Yield Bond I 1290 Low Volatility Global Equity I	Global Broad Category	Value Q large		(≪< 1/	2 > »)	
1290 Multi-Alternative Strategies 1 1290 Retirement 2020 1 1290 Retirement 2025 1 1290 Retirement 2030 1 1290 Retirement 2035 1	Allocation Alternative	 Foreign Large Ble Foreign Large Gro Foreign Large Val 	nd 🥝 wth 🥝 ue 🧭	Large Blend Large Growth Large Value		Select the categories you want included in the screen

- 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.

Screener				Cancel Done	
0/1,221 十 面 心	 Create your Universe 			🔘 Logic Mode 📋	
1290 VT Equity Income IB	Investment Type: Open-End Fund				
1290 VT Socially Responsible IB	Domicile: United States			\bigcirc ×	
AAM/Bahl & Gaynor Income Growth I	# Oldest Share Class		Value: Yes	() ×	
AAMA Equity	" Marningstar Catagony Laura Pla	and Laura Canuda Laura Valua			
AB Concentrated Growth Advisor	. Worningstar Gategory. Large Die	eno, carge Growon, carge value			
AB Core Opportunities A	# Add Criteria			×	Note the search term.
AB Equity Income A	O size X	V Data Definition for Fund Size			and the item to select
AB FlexFee Core Opportunities Advisor					
AB FlexFee Large Cap Growth Advisor	Fund Size	The total value of all of the investments in a fund	S		
AB FlexFee US Thematic Advisor		portfolio.			

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

Screener			Cancel Done	
0/1,206 十 面 心	I Morningstar Category	: Large Blend, Large Growth, Large Value	•X	
	# Fund Size Comprehen	isive (mo-end)	<	
1290 VT Equity Income IB	Operator	Value		
1290 VT Socially Responsible IB				
AAM/Bahl & Gaynor Income Growth I	 Greater than or 	O Allow Missing Values		
AAMA Equity	Equal to			
AB Concentrated Growth Advisor	O Greater than	Value		Note that no
AB Core Opportunities A	O Equal to	500000000 ×		commas are needed
AB Equity Income A	O Not Equal to	🔿 Not Available		
AB FlexFee Core Opportunities Advisor	🔿 Less than or Equa			
AB FlexFee Large Cap Growth Advisor	to			
AB FlexFee US Thematic Advisor	○ Less than			
AB Growth B	O Between			

- 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).

Screener				Cancel Done	
0/585 + 🖻 🖒	Domicile: United S	tates		٥×	
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AAM/Bahl & Gaynor Income Growth I	I Morningstar Cate	:gory: Large Blend, Large Growth,	Large Value		Note the search
AB Equity Income A	E Fund Size Compre	ehensive (mo-end): Greater that	n or E Value: 500000000	()×	term to select
AB Growth B	The sector Detector	F			
AB Large Cap Growth A	Inception Date of	Fund's Uldest Share Class			
AB Relative Value A	Operator	Value			
AIG Focused Alpha Large-Cap A	Before	O Allow Missing			
AIG Focused Dividend Strategy A	O After	Values	_		Enter the date in
AIG Focused Multi-Cap Growth A	Retween	02/28/2015			MM/DD/YYYY format
Akre Focus Instl	O between	-			
Alger Capital Appreciation B					

- 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.

Invest	ment Analysis	*Equity Fun	d \vee			
Grid View \vee	Performance	Attribution	Active Share	Characteristics	Holdings	
* Untitled List 🗸	·					
Lists & Screens		+ :		∑ Column	Set ∨	
Create New		>				Use this com
Open				Ticker	Morningstar Category	to save the s
Save				_		
Save As				-	Large Value	
		e Growt	hl	AFNIX	Large Blend	

- 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.

Exercise 5: Examine different factors' impact on returns



- 3. Click the Component Settings icon. The Component Settings menu opens.
- 4. From the Component Settings menu, select **Time Period**.

E Menu	Investme	nt Analysis *Equ	uity Fund $ imes$					Q Se	arch for S	Securities and Research	Û 🛛	0 2	
Grid View	Performance	Analyst Research	Eq. Attribution	Active Share	Characteristics	Holdings	a Allocation	Style	MPT	Risk Factor Risk Premium V	+	Edit	
Multiple Risl	Premiums: Style										5	2 - ²	
36.325	50									Component Settings		um DA	
										Time Period 07/01/2013 - 06/30/2018	>		Salact this antion
										Display Group Style	>	5 I Health	Select this option
27.244	13									Frequency Monthly	>	,	
27.244	10					~			/	Display Settings		5	
							\backslash	$\sim p$	\sim	Data View Chart	>	4	
											0.100/	пр пізк 7	

5. Click the Start Date option, then scroll up to select 1 Year.

Menu	Investme	nt Analysis *Equ	uity Fund ${\scriptstyle\lor}$					9	Search for	Securities and	Research) Û [402	
Grid View	Performance	Analyst Research	Eq. Attribution	Active Share	Characteristics	Holdings	Allocation	Style	MPT	Risk Factor	Risk Premium	/	+ Edit	
Multiple Risk	Premiums: Style												0 2 7	
36.325	50									Select	Time Period	Done	um	
										Start Date			24	
										5 Years Ag	10	V	15	Use this field to char the time period being
										End Date Quarter Er	ıd	V	l Health O	roflocted in the chart
27.244	13										~ /			Tenecteu în the chân

- 6. Click **Done**. The component updates.
- 7. Click the **Component Settings** icon to close the menu.



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.

Exercise 6: Evaluate current risk factor exposures for a fund and historic risk premiums

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.

E Menu	Investme	nt Analysis *Eq	uity Fund ${\scriptstyle\lor}$						C Search for	Securities and	Research		Ĵ	10	
Grid View	Performance	Analyst Research	Eq. Attributio	n Active Share	Characteristics	Holdings	Allocation	Style	MPT	Risk Factor	 Risk Prem 	nium			Edit
Large Cap Su	ubset 🗸		$\mathbb{P}_{\!$	Risk Exposure Snap	ishot: Style 02/06/20	18								0	2 2
✓0	582	≞ ⊘ + :	<u>q et i</u>	Risk Factors		Portfolio Exposure	Benchmark Exposure	+/-	CGM Foci	ıs I Morningsta –0,	r US Large Cap TF 50 0.00 0.	I USD 50		2.	00
0	Name			Valuation	0	-0.53407	0.08071	-0.61479							
	,			Economic Moat	0	0.29839	1.33366	-1.03527							
78	Carillon Eagle Grow	th & Income A	_	Einancial Health	Ū.	0.74851	0.84455	0.10398							
791	CGM Focus			Momentum	0	1.19486	0.42161	0.77325							
001	ClearRridge Aggress	ive Growth A		Volatility	0	0.45028	-0.93124	1.38151							
82	ClearBridge All Cap	Value A		Size	0	-1.43117	-1.52361	0.09244							
83	ClearBridge Appreci	ation A		Value Growth	0	-1.45214	0.12995	-1.58209							
84	ClearBridge Dividen	d Strategy A		Valuation Uncertain	ty (i)	-0.22243	-0.99543	0.77300							
85	ClearBridge Large C	ap Growth A		Liquidity	., 0	0.3/000	0.46901	_0.11003		· ·					
86 0	ClearBridge Large C	ap Value I		Liquidity	0	0.34303	0.40301	-0.11333							
87 1	ClearBridge Value C			Ownership Populari	ty 🛈	-0.05453	-0.38951	0.33498							
88	Clipper			Ownership Risk	0	0.08257	-0.70118	0.78375		1					
89	Coho Relative Value	Equity Advisor									1				

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.

E Me	nu Investme	ent Analysis *Eq	uity Fund ${\scriptstyle \lor}$						Search for Securitie	s and Res	earch		l E Ø		
Grid View	Performance	Analyst Research	Eq. Attribution	Active Share	Characteristics	Holdings	Allocation	Style	MPT Risk Fa	actor \vee	Risk Pren	nium ·	+ I	Edit	
Large Cap	Subset \vee		$\mathbb{P}_{\!$	Risk Exposure Snaps	hot: Style 02/06/201	8							0 ß	∇_{Δ}	Lles this ison to
	582	1 🗇 + 🛛		Risk Factors		Portfolio Exposure	Benchmark Exposure	+/-	CGM Focus Morn -2.00	ingstar US -0.50	Large Cap TF 0.00 0.	1 USD 50	E 2.00	xpand	expand a component
	Name			Valuation	0	-0.53407	0.08071	-0.61479							Use this icon to
	•		_	Economic Moat	(i)	0.29839	1.33366	-1.03527							evpand a component
	8 Carillon Eagle Grov	/th & Income A		Financial Health	0	0.74851	0.64455	0.10396							expand a component
	9 CGM Focus			Momentum	0	1.19486	0.42161	0.77325							
	 ClearBridge Aggreg 	red Equity Insti		Volatility	0	0.45028	-0.93124	1.38151	1						
	2 ClearBridge All Cap	i Value A		Size	0	-1.43117	-1.52381	0.09244							
	3 ClearBridge Apprec	iation A		Value Growth	0	-1.45214	0.12995	-1.58209							
	4 ClearBridge Divider	nd Strategy A		Valuation Uncertaint	. 0	-0.22243	-0.99543	0 77300							
	5 ClearBridge Large (Cap Growth A		Liquidity		0.34000	0.46901	-0.11003							
	6 ClearBridge Large I	Cap Value I		Enquirency	0	0.54505	0.40301	0.113335		- Li -		1			
	7 ClearBridge Value I	C		Ownership Popularity	0	-0.05453	-0.38951	0.33498		. 11					1
	8 Clipper			Ownership Risk	0	0.08257	-0.70118	0.78375							1
	9 Coho Relative Valu	e Equity Advisor													1

5. Click the Component Settings icon to change the Data View to a Table.

Investr	ment An	alysis	*Equity	/ Fund ${\scriptstyle \lor}$		Q	Search					Û	Ŀ	3 2	ν		
Allocation S	tyle I	MPT	Risk Fac	ctor \vee	Risk Premium	Factor Attribution	Scenario	o Analysis		Notes	Alerts		+	Edit	t		
Risk Exposure Sna	pshot: Style	e 01/31/	/2018										C	Z .	4		
Risk Factors			Fund Exposure	Benchmari Exposure	¢ +/-	CGM Focus Morning -2.00	ıstar US Ları –(ge Cap TR U:).50 (SD 1.00	Compone Display G	ent Settings				-		
Economic Mo	at	()	0.42	1.37	-0.95					Style					_		
Financial Hea	lth	<u>(</u>)	0.77	0.67	0.10					Data Type Absolute	9			>	>		
Momentum		(i)	1.11	0.39	0.73					Benchma	rk				_		
Liquidity		i	0.28	0.36	6 -0.08					Morning	star US Lar	ge Cap 1	'R USD				
Value Growth		()	-1.01	0.11	-1.12				U	Comparis	ons			>	>	Click here to swite	
Valuation		0	-0.56	-0.08	3 -0.48		- I			0 Selecte	d				-	between a chart a	ŕ
Ownership Po	pularity	(i)	-0.12	-0.46	0.34					Display S	ettings						
Ownership Ri	sk	(i)	0.07	-0.72	0.79		1			Data Viev	v						
Volatility		()	0.24	-0.93	3 1.17		1			Chart	•			>	>		

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.

	Investment	Analysis	*Equity Fund				Search			Û	4 0 2	
Allocati	ion Style	MPT	Risk Factor \lor	Risk Pren	nium Fac	tor Attribution	Scenario Analysis	Notes	Alerts		+ Edit	
Risk Ex	posure Snapshot:	Style 01/31/2	2018								0 2 2	Note the sort order for this column
▼ Ris	k Factors			Fund Exposure	Benchmark Exposure	+/-					_	
1 Va	lue Growth			-1.01	0.11	-1.12					^	
2 EC	lustion			-0.56	-0.08	-0.95						
4 Lic	nuation			0.28	0.36	-0.40						
5 Siz	(e)			-1.45	-1.53	0.09						
6 Fir	nancial Health			0.77	0.67	0.10						
7 Ov	vnership Popular	ity		-0.12	-0.46	0.34						
8 M	omentum			1.11	0.39	0.73						
9 Ov	vnership Risk			0.07	-0.72	0.79						
10 Va	luation Uncertain	nty		-0.20	-1.07	0.88						
11 Vo	latility			0.24	-0.93	1.17					•	

- 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).



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:

Setting	Value
Time Period	Last 2 Years
Risk Factor Exposures	Select the factor with either the greatest overexposure or underexposure from step 6 on page 29.
Frequency	Quarterly
Risk Premium	Cumulative Returns



- 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:

Exercise 7: Discover which holdings contribute to a fund's risk exposures

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.



 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.

	Investm	ent Analysis	*Equity Fund	V		Q	Search				Û	Ø (2	2
Style	MPT	Risk Factor	Risk Premium	Factor Attribu	ution S	Scenario Analys	is Not	tes Alert	s Untitled	1 ∨		+	Do	one
rge C	ap Subset									Co	mponent	Library		
~	0	585	⊗ + <u>⊧</u> Q	2 B 1						(Q Search	Componer	11	^
										Ris	k Model			
	Name			Ticker							Historia	al Risk Ex.	🛈	
	•			-				- 4		-	Holding	gs Risk Fac	tor 🛈	
	1 1290 VT	Equity Income IB		-			_				Multin	e Risk Fxn	0	1
	2 AAM/Ba	hl & Gaynor Incom	e Growth I	AFNIX				Holdings Risk	Factor: CG	0	×		0	
]	3 AB Equit	y Income A		AUIAX							ltip	e Risk Pre.	🛈	
	4 AB Grow	th B		AGBBX							Rick Ex	posure Sna	a 🛈	
	5 AB Large	Cap Growth A		APGAX				Holding			Somar	io Metrics	i	
]	6 AB Relat	ive Value A		CABDX								. Total	0	
	7 AIG Focu	sed Alpha Large-C	Cap A	SFLAX				1 Bank of A	America Corporati	on	∧ enar	io irend	0	
]	8 AIG Focu	sed Dividend Strat	tegy A	FDSAX				2 Citigroup	Inc		~			
	9 AIG Focu	sed Multi-Cap Gro	owth A	FOCAX				6		>	hart	od Account	. (i)	
	10 Akre Foc	us Instl		AKRIX				`			Jaci	eu Accourri		~
				<							Notes		()	

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.

	Investment Analysis	*Equity Fund ${\scriptstyle\lor}$									
Style	MPT Risk Factor	Risk Premium Fa	ctor Attrib	ution Scena	irio Analysis	Notes	Alerts	Ur	ntitled 1	∨ … + Done	
Large (Cap Subset		\times	Holdings Risk Fa	actor: CGM Focus	s 12/31/2017		Ś	$> \times$	Component Library	
	/ 0 585 🛗	S + ⊴ Z								Q Search Component	
			_	Holding				_		Risk Model	
	Name	Ti	cker	1 Bank of Ame	erica Corporation				^	II Historical Risk Ex	
_	•			2 Citigroup Inc	:					I Holdings Risk Factor 🛈	
	1 1290 VT Equity Income IB	-	~	3 Vale SA ADR	1					Multiple Bisk Exp (1)	
	2 AAM/Bahl & Gaynor Incom	e Growth I Al	FN								
	3 AB Equity Income A	AI	Uli		2004			-		II Multiple Risk Pre ()	
	4 AB Growth B	A	GE		Rick Exposure	Snanehot-	õ	X		I Risk Exposure Sna 🕕	
	5 AB Large Cap Growth A	A	PG		пок схрозите	onaponociti		~		Scenario Metrice	Click-and-drag this
	6 AB Relative Value A	C/	AB					~			component to here
	7 AIG Focused Alpha Large-C	ap A Sf	U		Risk Factors					I Scenario Trend	
	8 AIG Focused Dividend Strat	tegy A FC	DS .							Tools	
	9 AIG Focused Multi-Cap Gro	wth A FC	DC.		Economic	Moat					
	10 Akre Focus Instl	AI <	KR >		Financial	Health	() ~	~		II Notes	

- 5. Click **Done**. The Component Library closes.
- 6. In the Untitled 1 worksheet name, click **down arrow**, then select **Rename**. A dialog box opens.

	In	Investment Analysis *Equity Fund V									Q Search for Reports and Research					Û		2 8		
Allocat	ion	Style	MPT	Risk Factor	Risk Premium	Risk Attribu	ution S	Scenario An	alys	sis Notes	Alerts	Analyst Take	Resea	arch Untitled	II X			Edit		
* Untitle	ed Lis	t V						\mathbb{P}_{2}		Q 0P000020YH	Holdings	Risk Factor: Morga	n Stanley	Edit Worksheet				2 2		
\sim	⁷ 0	6		⊗ + ₽	Z B Y	Column	Set \vee							Rename					11	
										Holding			-	Delete					Use this	0
										1 Amazon.con	n Inc							/î	obanga tha	Č.
0		Name				Ticker	SecId			2 Alphabet In	: C			6.14409		_	-		change the	
										3 Facebook In	c A			6.00381	-0.644	29 1	.70421		name of	
0	1	American Fu	unds Gro			AGTHX	FOUSA00	D02 L		4 Salesforce.c	om Inc			5.06830	0.210	32 1	.70421		the workshe	eet
0	2	Fidelity® Cor	ntrafund [®]			FCNTX	FOUSA00	ICEO I		5 Starbucks C	orp			4.96542	1.018	56 1	.70421			

- 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.

Investment An	alysis *Equity	und \vee	
Allocation Style N	Workbook	Risk Premium Risk Attribution Scenario Analysis	
* Untitled List \vee		2	
	Create New		Select this option
6	Open	🔍 🖸 🖹 🍸 🛛 Column Set 🗸	
	Save		
	Save As		
Name	Manage Sharing	Ticker SecId	

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



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.

Investment Analysis Risk Model Wo	orkbook 🗸		Q Sear	ch			Ĵ 🛯 🤇	Bo
Risk Premium Risk Attribution Scenario Analysis	Notes Aler	ts Anal	yst Take	Research	Holdings Risk Fa	ctor \vee	+	Edit
CGMFX Holdings Risk Factor: CGM Focus 12/31/201	17						\$ 0	40 6
Holding	Portfolio Weight %	Valuation	Economic Moat	Valuatior Uncertainty	Financial Health	Ownership Risk	Ownership Popularity	(
3 Simon Property Group Inc	-13.26	-0.27	0.17	-1.63	-0.18	-0.85	-0.24	~
4 Snap Inc A	-12.89	1.54	-0.93	1.42	-0.38	0.79	-1.10	
5 Macerich Co	-11.59	-0.38	-1.76	-0.96	i –0.83	-0.47	0.00	
6 Amazon.com Inc	-11.27	-0.17	1.67	-0.81	0.38	-0.49	-0.52	
7 Netflix Inc	-11.01	-1.80	1.64	1.11	-0.26	-0.32	1.46	
8 US TREASURY N/B	-9.48	-	-	_		-	-	
9 US TREASURY N/B	-7.78	-	-	_	-	-	-	
10 US TREASURY N/B	-5.26	-	_	_		-	-	
11 Chipotle Mexican Grill Inc Class A	-3.83	1.60	1.34	-0.15	i 0.14	-0.76	-0.91	
12 00000 400	1.00							~

For short positions, each risk factor is subtracted from the fund's net exposure to that risk factor

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:

Exercise 8: View Morningstar research related to the funds

1. Select the **Analyst Research** worksheet.

Investment Analysis	Risk Model Workboo	$k \lor$				Û	y () &
Style MPT Risk Factor	Risk Premium Factor Attri	bution Scei	nario Analysis	Notes Alerts	Holdings	s Risk Factors 🗸 🛛 …	+ Edit
CGMFX Holdings Risk Factor: C	CGM Focus 12/31/2017					View Worksheet	
Holding	Portfol Weight	io % Valuation	Economic Moat	Valuation Uncertainty	Financial Health	(Grid View	^
1 Bank of America Corporation		▲ 10 -0.08	0.50	0.63	1.77	Performance	_
2 Citigroup Inc	20.3	0.18	0.43	0.51	1.88	Analyst Research	
3 Vale SA ADR	16.8	6 -1.80	-0.92	-0.21	-0.93	Eq. Attribution	
4 Morgan Stanley	16.0	9 -0.02	0.14	0.42	1.79	Active Share	
5 Turquoise Hill Resources Ltd	13.4	19 —	_	_	_	Characteristics	
6 Thor Industries Inc	11.6	64 0.04	0.53	-0.45	0.20	Holdings	
7 Royal Caribbean Cruises Ltd	11.5	i8 -0.22	1.42	-1.63	-0.07	Allocation	
8 United Rentals Inc	11.3	-0.60	1.67	-0.36	-0.76	Chula	
9 Skechers USA Inc	11.3	.7 -1.58	-0.21	-0.19	-0.02	Style	_
40 D I I D II 00 D I I 0	DD 111	0 1.01	1 70	0.05	0.10	MPT	

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

Investment Analysis Risk Mod	l Workbook v Q Search Q C Search
Analyst Research 🗸 Eq. Attribution Acti	s Share Characteristics Holdings Allocation Style MPT Risk Factor … + Edit
arge Cap Subset \lor $\mathbb{A}^{\!$	C CGMFX Morningstar Analyst Take: Not Available
✓ 0 585 🕅 🛇 +	This fund is not currently covered by a Morningstar analyst. If this investment was previously under analyst coverage, you can find the archived analyses in the Report Archive.
 77 Calvert US Large Cap Core Rspnb Idx I 78 Carillon Eagle Growth & Income A 	How do we decide what funds to cover? We're committed to covering those funds that are most relevant to investors and that
79 CGM Focus	Morningstar Research: CGM Focus
St ClearBridge Aggressive drowth A St ClearBridge All Cap Value A S2 ClearBridge Appreciation A	▼ Highlighted
83 ClearBridge Large Cap Growth A	Fund Sustainability Report
84 ClearBridge Large Cap Value I 85 ClearBridge Value C	Under the Hood: Is It Growth-Stock Rally, Momentum-Stock Rally, Or Both? Sep 19 2017
Sb Clipper	The Top- and Bottom-Performing U.S. Equity Funds From the First Jul 07 2015

Exercise 9: Screen

for analyst-rated fixed-income funds

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.

Investment Analysis | *Equity Fund ∨ Menu Grid View ∨ Performance Analyst Research Eq. Attribution Large Cap Subset 🗸 Lists & Screens Use this menu to select this option. Create New > Ticker Open Save AFNIX owth l AUIAX Save As AGBBX

3. Select the following criteria for the screen:

Data Point	Operator	Value(s)
Investment Type	n/a	 Exchange-Traded Fund Open-End Fund
Domicile	n/a	United States
Morningstar Category	Include	 Bank Loan Corporate Bond Emerging Markets Bond High Yield Bond High Yield Muni Inflation-Protected Bond Intermediate Government Intermediate-Term Bond Long Government Long-Term Bond Muni National Interm Muni National Long Muni National Short Muni Single State Interm Muni Single State Long Muni Single State Short Nontraditional Bond Short Government Short Government Ultrashort Bond World Bond
Morningstar Analyst Rating	Include	 ▶ Bronze ▶ Gold ▶ Silver
Oldest Share Class	n/a	Yes

- 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.

Exercise 10: Access the Multi-Asset Risk Model components on the Risk Factor worksheet



3. Select a fund.

4. In the **Risk Exposure Snapshot** component, click the **Expand** icon. The component resizes to fill the screen.

Menu Investment An.	. ~	Q Search	n for Securities	and Research	Ĺ) &	
Risk Factor ∨ Risk Premium	Factor Attribution	Scenari	io Analysis	Notes Al	erts	+	Edit	
Fixed Income V	ABTYX Risk	Exposure Sn	apshot: Yield Cu	ırve (USD) AB Hiç	jh Income	. 00	2	Click this
0 926	- Risk Factors		Portfolio Exposure	-1.00 -0.5	0		*	icon to expand the component.
· · · · · · · · · · · · · · · · · · ·	USD - Shift	()	0.17245					
1 AB Bond Inflation Strategy I	USD - Twist	()	0.10099					
2 AB Diversified Municipal	USD - Curvature	()	0.02121		- F			
4 AB High Income A	EUR - Shift	0	0.00000					
5 AB High Income Municipal 4 6 AB Income Advisor	EUR - Twist	0	0.00000		7		•	

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.

Exercise 11: Display data from two risk models

Do the following:

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

Menu In	V	Q Se	arch for S	ecurities and Research	Û	í (?)	Bo		
Risk Factor ∨ Ri	sk Premium	Factor Attrib	ution	Scenario Analysis Notes		+ E	dit		
Risk Expos	ure Snapshot: §	Style (USD) AB	Bond Infla	ation Strategy I 11/30/2018	0	O 🛛	A		
		Portfolio I	Benchmai	Component Settings	/				
Risk Factors Valuation	Ū	Exposure	Exposul	Risk Models Global Equity Model (USD)		> 10			
Economic Moat	0	0.00081	-	Data Type Absolute		>			
Financial Health	()	0.00482	2	Display Group				N 1 - 2 - 21	
Momentum	0	0.00060	2	Style				Note the highlighted	
Volatility	0	-0.00113	-	Benchmark Morningstar US TIPS TR USD		>		selections.	
Size	()	-0.00396	-	Comparisons					
Value Growth	()	-0.00221	-	0 Selected		>	${}$	Data View	
Valuation Uncertainty	()	0.00017	-	Display Settings			Char	t	~
Liquidity	0	0.00009	-	Data View			Table		
Ownership Popularity	0	0.00073	-	Chart		>			
Ownership Risk	()	-0.00143	1	- 11			-		

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

 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.

Risk Factor \vee	Risk Premium	Factor Attribution) 	+	Ec	lit	
Q ABTYX Risk Exposu	re Snapshot: (USD) AE	B High Income Municipa	l Advisor	00	3 🖉	A	Click this icon to collapse all premium
▼ Risk Factors	Portfolio Exposure						
▼ Style	_						All Chule Caster Design Currency on
1 Valuation	0.00000						Yield Curve premiums and their risk
2 Economic Moat	0.00000						factors are available in the table view
3 Financial Health	0.00000						You might need to scroll down to see
4 Momentum	0.00000						ule ouleis.
5 Volatility	0.00000						
6 Size	0.00000						
7 Value Growth	0.00000						
8 Valuation Uncertainty	0.00000						
9 Liquidity	0.00000						
10 Ownership Popularity	0.00000						
11 Ownership Risk	0.00000						
▼ Sector	1000 C						
12 Basic Materials	0.00000						
13 Telecommunications	0.00000						
14 Consumer Cyclical	0.0000						
15 Consumer Defensive	0.00000						
16 Healthcare	0.00000						
AT Induced at	0.00000						

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

🗮 Menu	Q Search for Securi	ties and Research	Û	Ø (ව සි	
Risk Factor \vee	Risk Premium	Factor Attribution		+	Edit	
Q ABTYX Risk Exp	osure Snapshot: (USD) AE	B High Income Municipal	Advisor	00		
Risk Factors	Portfolio Exposure					
► Style	 8					
► Sector	<u>28.6</u> 33					Click this icon to
Region						expand Yield Curve.
► Currency						
► Yield Curve	-1					

Only the Yield Curve risk factors are displayed.

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

<u> </u>	Q Search for Securit	ties and Research	Û	Ø (2 2	
Risk Factor \vee	Risk Premium	Factor Attribution		+	Edit	
Q ABTYX Risk E	xposure Snapshot: (USD) AE	High Income Municipa	al Advisor	00	₫ ♣	
Risk Factors	Portfolio Exposure					
► Style	-					
► Sector						
► Region	-					
► Currency						
▼ Yield Curve	-					
37 USD - Shift	0.17245					Your results
38 USD - Twist	0.10099					should look something
39 USD - Curvature	0.02121					like this.
40 EUR - Shift	0.00000					
41 EUR - Twist	0.00000					
42 EUR - Curvature	0.00000					
43 GBP - Shift	0.00000					
44 GBP - Twist	0.00000					
45 GBP - Curvature	0.00000					
46 CHF - Shift	0.00000					
47 CHF - Twist	0.00000					
48 CHF - Curvature	0.00000					

5. In the upper-right corner of the component, click the **Collapse** icon. The component returns to its original size.

Menu		Q Search for Securi	ties and Research	Û		@ &	
Risk Facto	r∨	Risk Premium	Factor Attribution		+	Edit	
Q ABTYX	Risk Exp	osure Snapshot: (USD) Al	3 High Income Municipa	I Advisor	0 {	} ₫ 4	Click this
► Risk Fac	tors	Portfolio Exposure					icon to collapse th component
► Style		_					
► Sector		11 () () () () () () () () () (
► Region		-					
► Currency	1	12-11					
▼ Yield Cu	rve	-				100	
37 USD - Sh	ift	0.17245					
38 USD - Tw	/ist	0.10099					

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.

Exercise 12: Examine historical risk exposure in fixed-income funds

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.



 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.

 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.



6. In the middle component, click the **Component Settings** icon and select **Risk Factor Exposures > Yield Curve > USD - Twist**.



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.



Exercise 13: Examine

the UK and Eurozone

regional models

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 o predict a fund's future performance if certain market conditions should arise again. How can I learn more about using the Morningstar Global Risk Models?

