Frequently Asked Questions about the Fixed Income Exposure Analysis Tool

Overview

The new Fixed Income Exposure Analysis (FIEA) tool allows users to see how a variety different fixed-income attributes intersect with one another. Thus, the tool offers users much more detailed information to understand how risk exposures may be amplified or balanced in a fund's portfolio. This information provides a more precise analysis into the underlying contributors of risk and return, allowing meaningful differentiation between managed investment alternatives.

This manual offers the following explanations about the FIEA tool:

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What is an attribute, and what fixed income attributes are available?

The term "attributes" describes the analytic characteristics and calculations users can combine in the tool. They become the rows and columns within the FIEA table. These attributes are recognizable to many fixed income investors due to their widespread adoption and offer a menu of choices covering major contributors of risk and return. The FIEA tool includes the following attributes:

This attribute...	**Can be displayed as a**...	**And has this number of breakdown classifications**...
Effective Duration	Column	10
Yield to Worst	Column	10
Credit Rating	Column	8
Sector	Row	7
Region	Row	14

☞ Note: Yield to Worst is the holding-weighted portion of a portfolio providing a rate of return equal to the discount rate of interest and principal cash flows which results in the lowest rate of return when early redemption of principal is possible. Yield is a measure of the expected rate of return. Calculation of yield to worst incorporates the impact of options such as call features, and calculates the lowest value for eligible principal dates. For a bond with a call feature valued at a price greater than the redemption price the exercise of a call feature would result in a "worse" yield. For a bond valued at a discount to redemption price holding until stated maturity would result in the "worst" yield. If the earliest return of principal is at the stated maturity the Yield to Maturity will be the same as the Yield to Worst. Expressed as a percentage.

What sectors are available?

The following sectors are available:

- Government
- Municipal
- Corporate
- Securitized
- Derivatives
- Cash & Equivalents, and
- Unknown.

☞ Note: Derivatives includes swaps, futures/forwards, and options/warrants.

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How does Morningstar classify different geographic regions?

Morningstar uses the following geographic regions:

- Africa
- Asia Developed
- Asia Emerging
- Australasia
- Canada
- Europe Emerging
- Europe ex-Euro
- Eurozone
- Japan
- Latin America
- Middle East
- Not Classified
- United Kingdom, and
- United States.

Users can read more about regions from this methodology paper.

What do the values in the table represent?

The Fixed Income Exposure Analysis table shows the breakdown of portfolio weights (% of assets) for each data combination. All information is based on portfolio holdings, rather than asset manager self-reported data. For example, what percentage of a fund's A-rated bonds have an effective duration of 1-2 years?

Is a methodology paper available describing how the intersection calculations are made?

The FIEA tool incorporates the following types of methodology:

- The way attribute intersections are measured, or "Exposures"
- The way holding weights within a portfolio are calculated, which is called "Basis"
- The way holding weights are treated within a combination based on the prioritization of an attribute by the user, and
- The way underlying holdings of a portfolio are determined.

For more information, be sure to read the Fixed Income Exposure Analysis methodology paper.

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How are a fund's holding weights determined?

Morningstar collects information from asset managers on the holdings within a fund or portfolio, including the market value of each holding and of the total portfolio. From this information, a holding weight value for each security is determined, as a percentage of the total portfolio.

Given that the analytics in the FIEA tool are specific to fixed income, however, a different weighting methodology is applied so the analytics take into account only the fixed income holdings within the portfolio. This methodology is a form of rescaling based on asset type and analytic applicability and is fundamentally different from the standard value rescaling implemented in Morningstar products.

"Asset Class Rescaling" takes only the holdings belonging to the asset class being analyzed, in this case fixed income, and uses that as the basis for determining the denominator to calculate holding weights. This concept is further refined by using an applicability test based on specific attributes, because not all holdings meeting the general asset class test as fixed income securities exhibit all fixed income attributes. For example, credit default swaps have no effective duration associated with them. Within the FIEA tool, this extra layer of rescaling is accounted for using a concept called "Basis."

Which fund holdings serve as the basis for the data shown in the FIEA tool?

"Basis" describes which portfolio holdings are included when determining holding weights and calculating exposures. Essentially, in order to show data broken out into parts, a way of measuring the whole is needed. Put another way, the denominator used to calculate holding weights as percentages needs to be determined. Due to some attributes not applying to some holding types, certain holdings may be excluded when summing up assets to include in the denominator.

For example, because credit default swaps have no duration, if a user is evaluating duration as a primary attribute, only those holdings for which duration is applicable would be included when determining holding weight percentages – assets in credit default swaps would not be included in the denominator.

The following distinct Basis categories are employed in the FIEA tool:

- All fixed income holdings (for example, those aligned with the Sector attributes)
- Cash flow calculation attributes (for example, duration or yield)
- Credit ratings, and
- Geographic attributes.

The Morningstar Detailed Investment Type classification is assigned to all holdings to determine inclusion for the purpose of Basis.

What is the source of data for the tool?

All of the information available within the FIEA tool is based on holdings-based analytics. No analytic data collected through the Morningstar Fixed Income Survey or other analytic data self-reported by asset managers is incorporated into the tool, besides the fund/portfolio holdings data previously referenced.

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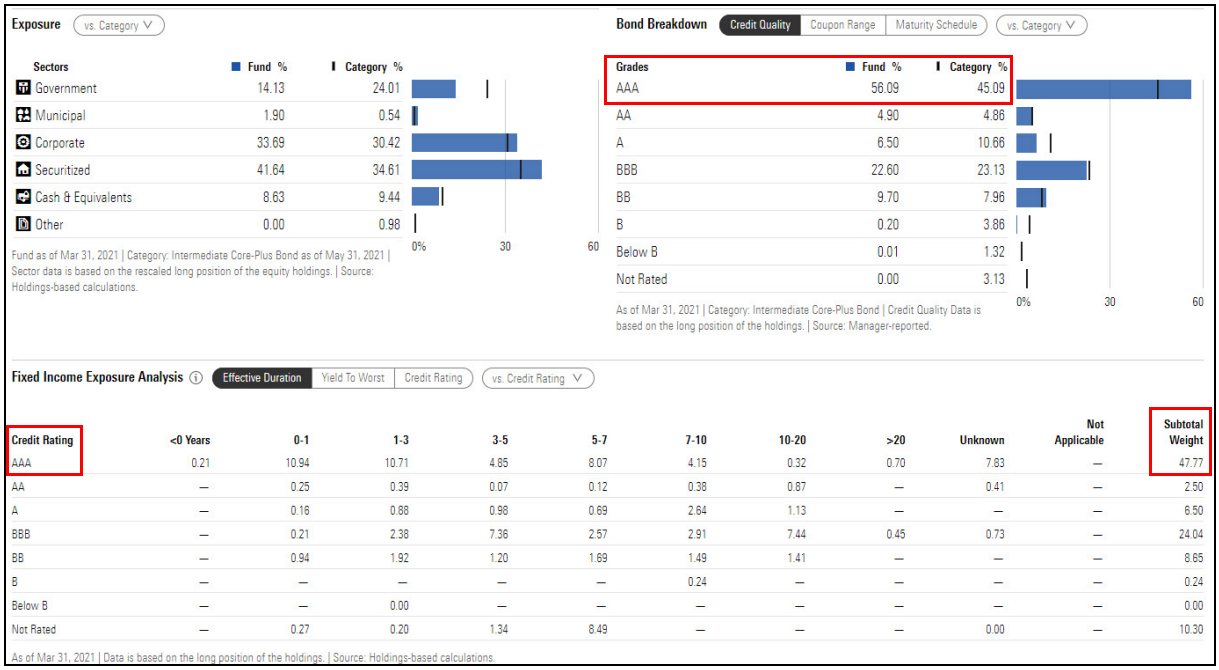
Why does the data in the FIEA tool seem to differ from other fixed-income components on the report?

As mentioned in the previous section, the data from the FIEA tool is based on holdings-based calculated data. Other fixed-income portfolio components on the report, such as the Morningstar Fixed Income Style Box or Bond Breakdown, are based on surveyed data provided by fund managers. For this reason, values from the FIEA tool may not align with values from other fixed-income components on the report.

The difference between the summary values for the weighting to AAA-rated holdings in these two components (45.09% vs 47.77%) is a seeming discrepancy, but actually reflects the difference between manager-reported data (in the Bond Breakdown component) and holdings-based calculated data (in the Fixed Income Exposure Analysis component).



Exposure (vs. Category)

Sectors	Fund %	Category %
Government	14.13	24.01
Municipal	1.90	0.54
Corporate	33.69	30.42
Securitized	41.64	34.61
Cash & Equivalents	8.63	9.44
Other	0.00	0.98

0% 30 60

Fund as of Mar 31, 2021 | Category: Intermediate Core-Plus Bond as of May 31, 2021 | Sector data is based on the rescaled long position of the equity holdings. | Source: Holdings-based calculations.

Bond Breakdown (Credit Quality | Coupon Range | Maturity Schedule) (vs. Category)

Grades	Fund %	Category %
AAA	56.09	45.09
AA	4.90	4.86
A	6.50	10.66
BBB	22.60	23.13
BB	9.70	7.96
B	0.20	3.86
Below B	0.01	1.32
Not Rated	0.00	3.13

0% 30 60

As of Mar 31, 2021 | Category: Intermediate Core-Plus Bond | Credit Quality Data is based on the long position of the holdings. | Source: Manager-reported.

Fixed Income Exposure Analysis (Effective Duration | Yield To Worst | Credit Rating) (vs. Credit Rating)

Credit Rating	<0 Years	0-1	1-3	3-5	5-7	7-10	10-20	>20	Unknown	Not Applicable	Subtotal Weight
AAA	0.21	10.94	10.71	4.85	8.07	4.15	0.32	0.70	7.83	—	47.77
AA	—	0.25	0.39	0.07	0.12	0.38	0.87	—	0.41	—	2.50
A	—	0.16	0.88	0.98	0.69	2.64	1.13	—	—	—	6.50
BBB	—	0.21	2.38	7.36	2.57	2.91	7.44	0.45	0.73	—	24.04
BB	—	0.94	1.92	1.20	1.69	1.49	1.41	—	—	—	8.65
B	—	—	—	—	—	0.24	—	—	—	—	0.24
Below B	—	—	0.00	—	—	—	—	—	—	—	0.00
Not Rated	—	0.27	0.20	1.34	8.49	—	—	—	0.00	—	10.30

As of Mar 31, 2021 | Data is based on the long position of the holdings. | Source: Holdings-based calculations.

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What types of investments can be analyzed in the tool?

Only certain managed investments are included; individual bonds and indexes cannot be analyzed. Only a single fund/portfolio can be analyzed at a time. Funds from the following areas are covered:

- any fund belonging to the Morningstar Global Broad Category Group Fixed Income
- any fund belonging to the Morningstar Global Broad Category Group Allocation, and
- funds in the following Morningstar Categories from the Morningstar Global Broad Category Group Alternative:

- Alt - Currency
- Alt - Event Driven
- Alt - Global Macro
- Alt - Long/Short Credit
- Alt - Long/Short Equity - Europe
- Alt - Long/Short Equity - Global
- Alt - Long/Short Equity - Other
- Alt - Long/Short Equity - UK
- Alt - Long/Short Equity - US
- Alt - Market Neutral - Equity
- Alt - Multistrategy
- Alt - Other
- Alt - Relative Value Arbitrage
- Alt - Systematic Futures
- Alt - Volatility
- Alternative Credit Focused
- Alternative Equity Focused
- Alternative Market Neutral
- Alternative Multi - Strategy
- Alternative Other
- Alternative Strategies
- Alternative Strategies - Diversified
- Alternative Strategies - Managed Futures
- Arbitrage Fund
- Bear Market
- Long-Short Credit
- Long-Short Equity
- Managed Futures
- Market Neutral
- Miscellaneous - Income and Real Property
- Multialternative
- Multicurrency
- Options-based
- Passive Inverse/Leveraged
- Retail Venture Capital
- Single Currency
- Trading - Leveraged/Inverse Commodities
- Trading - Leveraged/Inverse Equity
- Trading - Leveraged/Inverse Fixed Income
- Trading - Leveraged/Inverse Other
- Trading--Inverse Commodities
- Trading--Inverse Debt
- Trading--Inverse Equity
- Trading--Leveraged Commodities
- Trading--Leveraged Debt
- Trading--Leveraged Equity
- Trading--Miscellaneous
- Volatility

If an investment owns another fund, can the tool "look through" that holding to understand its holdings?

In some cases when Morningstar collects holdings from asset managers, a fund's portfolio may hold another fund. These are referred to as a "fund holdings." Rather than ignore these cases for analysis, the FIEA tool can "look through" to the underlying holdings within those fund holdings. By doing so, the underlying holding attributes can be aggregated along with the other, individual security holdings.

This capability is quite robust and can be applied to a depth of 10 levels of funds held by other funds in a parent-to-child relationship. This greatly expands the ability to calculate attribute exposures, thereby enhancing coverage and accuracy of the analytics produced.

What are the default settings for the tool?

When first viewing the Fixed Income Exposure Analysis section, the following settings are in place:

- Columns = Effective Duration, and
- Rows = Credit Rating.

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