



## Understanding Yield Curves and Indices

Yield curves, indices and benchmarks — collectively known as market indicators — are among the tools available to help investors and others assess sector-specific or broad market information about overall trends, the general level of interest rates and the value of any single security. The MSRB's [Electronic Municipal Market Access \(EMMA®\)](#) website provides public access to yield curves and indices, which can be useful for understanding the general level and direction of municipal bond interest rates and comparing the relative yields of specific municipal securities.

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## Yield Curves

In general terms, a yield curve represents a set of interest rates for a series of bond maturity dates that, when plotted on a graph, produces a curve. The vertical axis of yield curve represents the yields, while the horizontal axis depicts time to maturity. The relationship of interest rates over time, as reflected by the yield curve, will vary according to market conditions, resulting in a variety of yield curve shapes. Yield curves may be constructed uniquely for credits of various rating levels, sources of payments or specific states, among other characteristics. Yield curves are based either on yields of bonds actually trading in the market or on estimates of yields based on other available information. A graphical example of a typical yield curve is shown below.

## Indices

An index is a statistical composite of specific securities that can be used to measure changes in a market or segment of a market. Indices are often constructed by grouping similar securities together and may include securities based on standardized criteria, such as issue size, credit rating, sector, geography or maturity date. An index typically measures market movement reflecting changes in prices or yields. A graphical example of an index is shown below.

## Benchmarks

A benchmark is the basis of measurement for an interest rate, an index or peer group of bond prices

or other values that is used as a reference point. Examples would include the 30-year U.S. Treasury bond being used as a benchmark to establish the yield on a taxable bond in the municipal securities market.

## General Uses of Yield Curves and Indices

Market indicators, including the yield curves and indices available on EMMA, have several applications for market stakeholders. For instance, these tools can be used for evaluating bond prices and yields, and are often used by underwriters as a factor in determining the yield at which a new issue of municipal securities will be offered to investors and where bonds trade in the secondary market.

Many municipal issuers and their municipal advisors use market indicators as part of the bond pricing process to provide a benchmark when establishing offering yields on new bond issues.

Individual investors can use market indicators to measure the general direction and performance of the market as well as to compare the prices and yields of individual securities against available yield curves and indices.

Yield curves and indices can also be used to:

- Measure and analyze overall market movements. Using daily yield values or historical information, market indicators can help market participants determine past trends and anomalies in the market.
- Assess fluctuations and price movements in municipal securities.

Figure 1: Sample Yield Curve

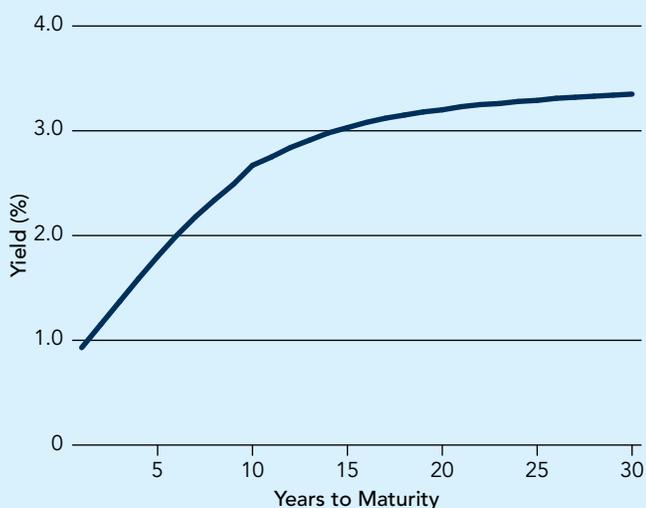
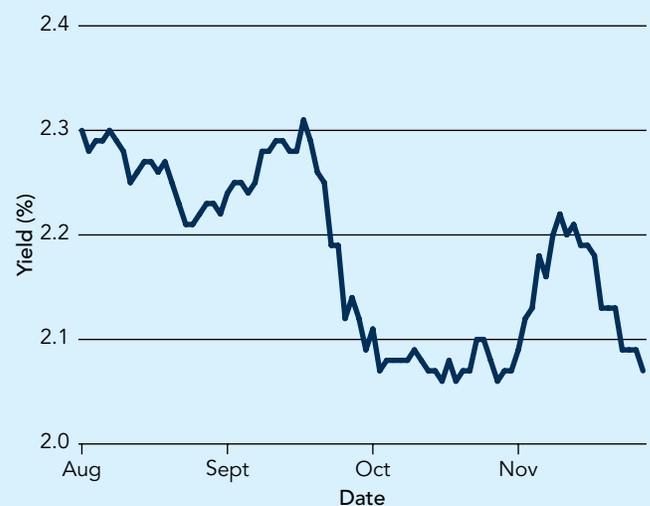


Figure 2: Sample Index



- Quantify differences between market indicators, credit quality and maturity. Users could, for example, compare a AAA-rated yield curve against a AA-rated curve to determine relative value of types of securities with different ratings. Similarly, users could compare different maturities for the same yield curve, such as values of the 10-year maturity versus the 30-year maturity.
- Facilitate the ability of market participants to estimate relative price levels of municipal securities. Users could compare a bond to a specific yield curve or index based on information related to securities with the same types of characteristics.

[Additional information on market indicators is available in the MSRB's Education Center.](#)

### Yield Curves and Indices on EMMA

The EMMA website provides municipal market stakeholders with free access to yield curves and indices from third-party providers. Each yield curve and index available on EMMA is based on specific types of securities and calculation methods. Yield curves and indices are based on securities that vary in credit quality, structure and other underlying characteristics. Documentation from the provider of each yield curve and index describing overall characteristics and methodologies can be found on EMMA.

[Explore the third-party yield curves and indices available on EMMA.](#)

The dynamic functionality available on EMMA gives users the ability to view the actual curves or values in table format and filter by date range and credit quality. The default view for daily yield curves is a graph of interest rates for a series of maturities on a specific day. A table view with the underlying values for each yield curve is also available. Users can select different dates to see how the yield curve has changed over time. Additionally, users can compare multiple yield curves for a single maturity using historical yield data over a desired date range.

In addition to yield curves, certain indices are also available on EMMA. The historical daily yield values for each available index can be graphed and compared to each other. Users are able to choose the index or indices and time range.

### EMMA Trade Information and Spreads to Yield Curves and Indices

While the comparison between yield curves and indices and individual municipal securities can help market participants make relative value comparisons, the results can be difficult to interpret. The calculation of yield spreads — or differences between the underlying market indicator and transaction yield — can help municipal securities dealers, academics and regulators assess the quality and movement of executions in the municipal securities market and enable investors and issuers to compare current bids and offers against historical trades.

For example, if a 9-year bond yielding 3% is offered today, and a yield curve is indicating a 2.5% yield for the 9-year maturity, that bond is said to be trading 50 (0.5%) over the curve. One year ago, when the bond was a 10-year bond, it traded at 3.4% and the yield was 3.0%, the bond traded at 40 (0.4%) over the curve. So, the bond in today's market is trading at a wider, or larger, spread (0.5% vs. 0.4%) than one year ago. See Figures 1 and 2.

Given that market indicators on EMMA are based on different methodologies and securities with unique characteristics and structures that may vary significantly, comparison of certain market indicators and actual municipal transactions can be difficult to analyze. There are, for example, yield curves built for different credit ratings (AAA, AA, A, investment

**Figure 3: Yield Curve — Today**

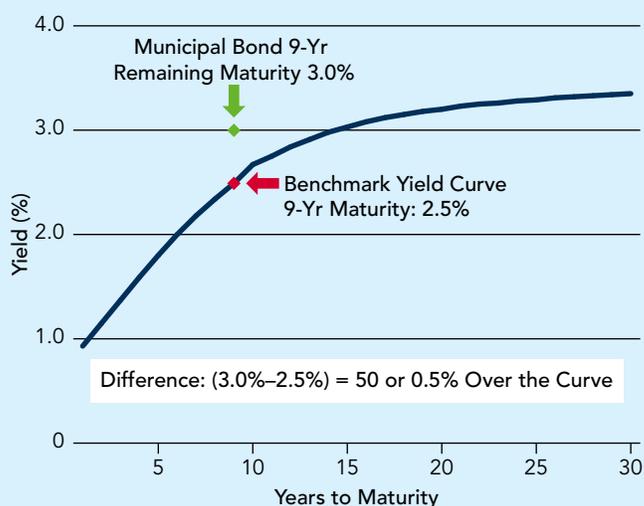


Figure 4: Yield Curve — One Year Ago

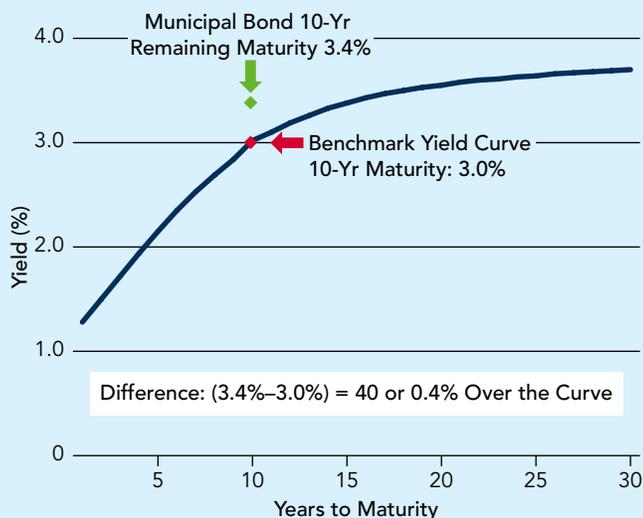
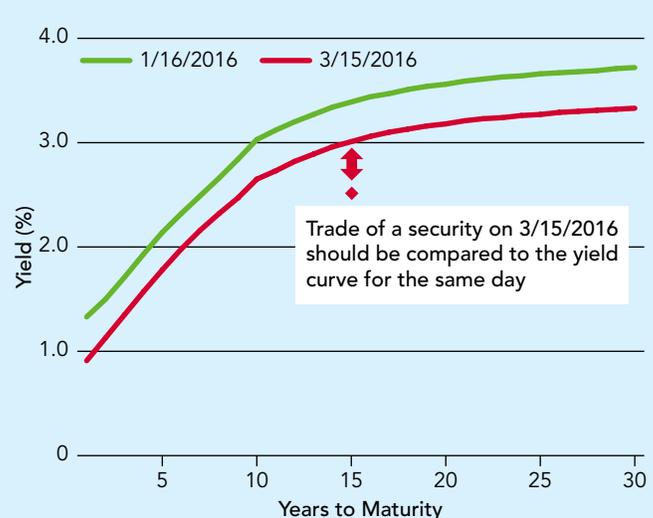


Figure 5: Multiple Yield Curves



grade, high yield, etc.). Other yield curves also take into account various structures of bonds, such as those with a 5% coupon that are callable in 10 years, or those priced at par that are callable in 10 years.

Additionally, the values of a yield curve may fluctuate daily. Comparisons between actual trades of a security and a specific yield curve should be made for the same day in which the trade occurred and yield curve was calculated. In the example below, a trade that occurred March 15, 2016 should be compared to the yield curve for that same day. Otherwise, market fluctuations could have an impact on the results of the analysis. See Figure 3.

It is important to note that comparing yield spreads over time is probably most informative when the bond's rating is generally consistent. For example, a bond that was issued with a rating of AAA that is now rated single A likely will trade at a significantly larger yield spread over the same market indicator today compared to when the bond was rated AAA because yields of a single A-rated bond will be higher than yields of a AAA-rated bond.

When comparing yields of municipal securities against available yield curves, EMMA users should pay close attention to the underlying characteristics and structure of both the bond and yield curve as differences can lead to results that may be misleading or not particularly useful. For example, it would be useful to compare bonds trading near par with 10-year call features against a par bond yield curve based on bonds priced at par that are callable in 10 years. In contrast, a par bond yield curve that is callable in 10 years may not be a good comparison for a bond with a 6% coupon due in six years and callable in three years and that is trading at a significant premium at a yield of 1.5%. The more similar the bond is to the yield curve or index in terms of the underlying characteristics, the more useful and meaningful the results of the comparison will be.

Yield curves and indices can be powerful tools available to market participants, but these examples illustrate the inherent challenges in using these tools, especially when comparing prices and yields of specific municipal securities.

### About the MSRB

The MSRB protects investors, state and local governments and other municipal entities, and the public interest by promoting a fair and efficient municipal securities market. The MSRB fulfills this mission by regulating the municipal securities firms, banks and municipal advisors that engage in municipal securities and advisory activities. To further protect market participants, the MSRB provides market transparency through its Electronic Municipal Market Access (EMMA®) website, the official repository for information on all municipal bonds. The MSRB also serves as an objective resource on the municipal market, conducts extensive education and outreach to market stakeholders, and provides market leadership on key issues. The MSRB is a self-regulatory organization governed by a 21-member board of directors that has a majority of public members, in addition to representatives of regulated entities. The MSRB is overseen by the Securities and Exchange Commission and Congress.