A Bloomberg Professional Services Offering

Content & Data Solutions

Pricing

BVAL GSAC

Government, supranational, agency, corporates issuer & sector curves

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BVAL GSAC issuer & sector curves

Bloomberg's BVAL Evaluated Pricing Service provides transparent and highly defensible prices for fixed income securities across the liquidity spectrum. The key to BVAL's methodology is its real-time access to market observations from a wealth of contributed sources. The accumulated mass of market data serves as the main driver of an innovative and quantitative approach that first corroborates market levels on actively traded bonds and then derives a comparable relative value price on those securities that are less liquid. This methodology aligns with Bloomberg's trusted capabilities as the financial industry's leading analytics platform and source of fixed income information. In addition to sophisticated algorithms that generate evaluated prices, the BVAL methodology assigns a BVAL Score based on the amount and consistency of market data used in our models.

A natural extension of the BVAL pricing product is Bloomberg's BVAL Curves offering, which serves as the pricing foundation for BVAL's Observed Comparables model.

BVAL GSAC issuer curves methodology

Bloomberg offers a deep library of approximately 1,000 BVAL Issuer Curves across the Government, Agency, Investment-Grade Corporate and bond asset classes. These issuer and curves are constructed using bid yields at the senior unsecured level by specific issuer and currency denomination using direct market observations on bonds through a 30-year term structure. In issuer curve construction, direct market observations are adjusted for bond-specific technical factors, such as issue size, age and coupon, to best represent the yield or coupon of a new issue bond brought to market at par.

BVAL GSAC Issuer Curves comprise the following:

- 100+ Government & Agency Issuer Curves
- 800+ Investment-Grade Corporate Issuer Curves

BVAL GSAC issuer curve fitting

BVAL uses a sophisticated curvefitting technique to construct par issuer curves at the senior unsecured level. This methodology produces par issuer yield curves with comparable shape, even for those issuers with little to no direct market observations. BVAL achieves this by creating a library of highly liquid issuer curves, or reference curves, defined by sector and credit rating. When an issuer yield curve shape is difficult to determine, BVAL identifies the most appropriate reference curve(s) and applies that shape to the target bond. Refer to the Appendix for a more detailed discussion of curve construction.

The following example, shown in Figure 2, illustrates BVAL's reference curve selection and yield curve creationthrough a term structure.

Figure 1 – Description of Texas Instruments 1.65 of 8/3/2019.

Issuer – Texas Instruments Inc. ("TXN")

Sector – Technology

Rating – A+

Rank – Senior Unsecured

Currency – USD

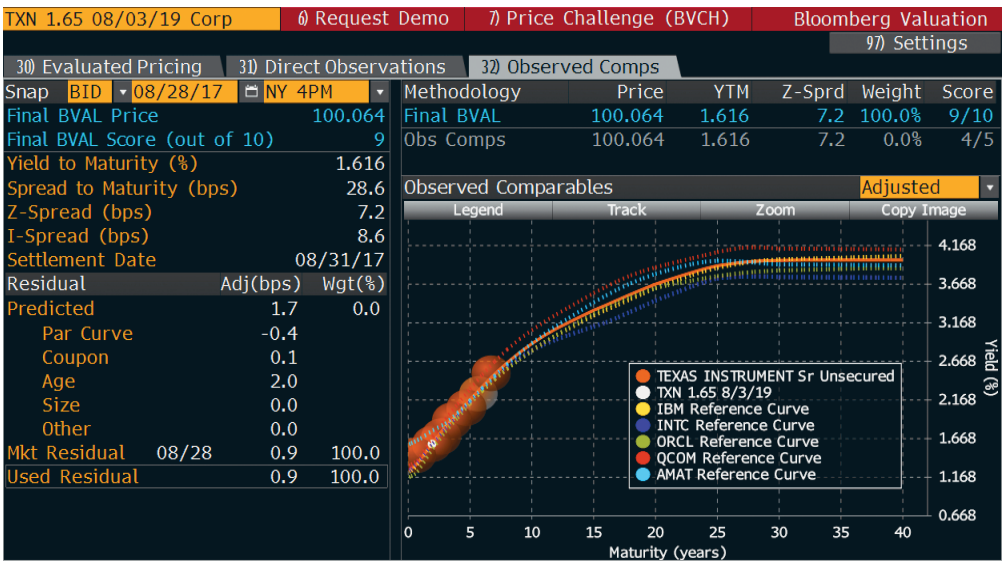

Figure 2 – BVAL Issuer Curve for Senior Unsecured Texas Instruments.

Target bond
TXN 1.65 08/03/19 Corp <GO>

BVAL's curve-fitting algorithm identifies highly liquid comparable issuer curves and selects the most appropriate curves from its library to derive term structure shape through the 30-year point. For this example, liquid technology sector names with similar credit quality — Oracle (A+), IBM (A+), Intel (A+), Qualcomm (A) and Applied Materials (A-) — to derive the shape of TXN's yield curve from 10–30 years.

BVAL sector curves methodology

In addition to BVAL Issuer Curves, BVAL offers a comprehensive library of more than 500 Corporate sector curves. BVAL Sector Curves are constructed using mid-yields from senior unsecured bonds from the same industry, credit rating category and currency denomination. BVAL's sector classification is based on Bloomberg's Industry Classification System ("BICS").

BVAL Sector Curves comprise the following:

- 350+ Investment-Grade Corporate Sector Curves
- 130+ High-Yield Corporate Sector Curves

To most effectively use the varied market data in curve construction, bonds must meet the following criteria:

- For Sovereign, Agencies and Investment-Grade Corporates, a BVAL Score of 6 or greater is required. (see The BVAL Score section below)
- For Sovereign, Agencies and Investment-Grade Corporates, fixed-rate institutional issues without call/put/convertible options and/or sinking/amortizing/inflation-linked structures
- For High-Yield Corporates, fixed-rate institutional issues without convertible option and/or amortizing structures

BVAL GSAC zero curve methodolgy

BVAL zero coupon tenors are produced by stripping BVAL Issuer and Sector curves using standard bootstrapping methodology developed by Bloomberg's Interest Rate Derivatives Group. Since the zero coupon rates are stripped from the BVAL issuer or sector curves, these zero-coupon yields will be sensitive to any changes in the underlying yields of the BVAL coupon curves. Zero coupon yields are updated daily based on inputs from the latest BVAL coupon curve.

For example, BI0001Z 1Y BVLI Curncy is the 1-year zero coupon rate derived from issuer curve BVIS0001. Similarly, BS0022Z 1Y BVLS Curncy is the 1-year zero coupon rate derived from sector curve BVSC0022.

To promote the consistent creation of credit-notched corporate sector curves through the term structure, the BVAL Sector Curve methodology abides by the following criteria:

Reference curves

BVAL utilizes an extensive library of reference curves to help construct term structure shape through the 30-year point for sparsely populated curves.

Curve constraints

BVAL has implemented curve constraints to prevent ratings-notch inversion within a given sector

Outlier detection

BVAL has implemented outlier detection to exclude bonds that breach certain thresholds

Credit-quality calibration

BVAL utilizes all direct observations through the credit-quality spectrum at each sector level to aid curve construction for sparsely populated curves. This data is carefully calibrated to best reflect the credit risk in yield-to-maturity through the term structure.

Refer to the Appendix for a more detailed discussion of curve construction.

BVAL curves on the Bloomberg Terminal®

BVAL Issuer and Sector Curves are available for selection using the curve finder function CRVF <GO>, see Figure 3. Curves can also be viewed by using the GC <GO> (graph curve) function to view bonds used in curve construction and historical performance of the curve, see Figure 4.

The BVAL score

An index that combines the number of weighted observations with the standard deviation of those observations to determine a proprietary metric on the data used to produce the BVAL Price.

Weighted observations

The number of weighted market observations used in deriving the BVAL Score. This number is based on the concept of direct market observation type (trade, executable or indicative) coupled with other relevant factors such as size and age of the observation. For example, market observations are first sorted and weighted by type, with a trade given more weight than an executable or indicative level. The market observation is then weighted by factors such as age and size. More recent observations receive a larger weight than older observations. Round-lot size trades receive a larger weight than odd-lot size trades.

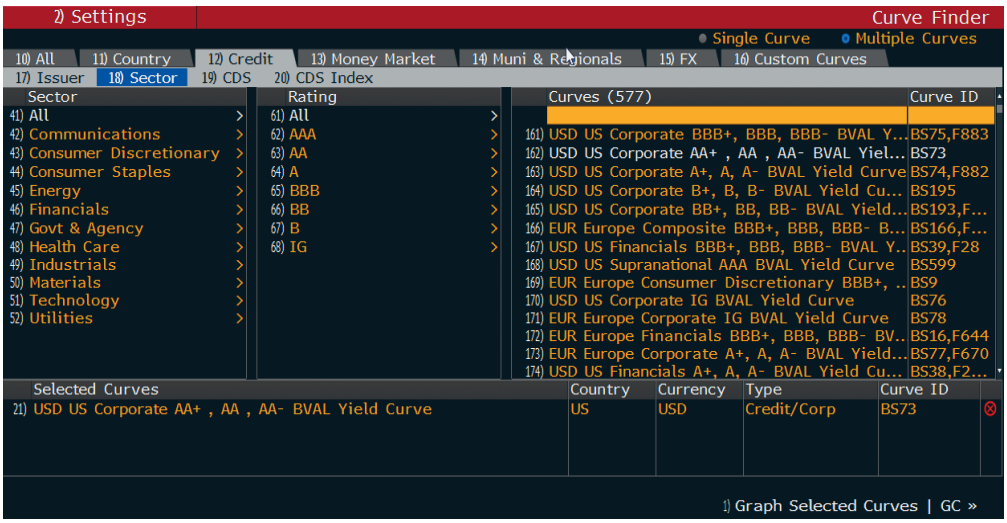

Figure 3 – Curve Search in CRVF <GO>.

Standard deviation

The measure of corroboration, or agreement, of market observations used in deriving the BVAL Price.

Figure 4 – Graph Curves and Display the List of Bonds used in Curve Construction with GC <GO>.

Appendix – BVAL issuer & sector curves construction

Issuer curve construction

The first step in constructing issuer curves is to normalize bond yields to a common denominator. We normalize bond yields to account for their idiosyncratic features that impact bonds' liquidity profile like issue age, coupon, amount outstanding, sinking fund, etc. Moreover, bond yields are adjusted to correspond to a par coupon.

The second step is to construct reference curves. These curves are mainly used in coming up with the shape for issuer curves that have a very small number of traded bonds. The reference curves are constructed at a ticker level and the fitting is done to bond spreads with respect to the relevant swap curve (pointwise "yield" difference). The fit is done in two stages. We first construct a mix of adaptive non-parametric regression fits of zeroth and first orders and subsequently smooth the resulting curve by using rational Bezier curves.

Finally, the issuer curves are constructed in three stages. We first estimate the shape of the issuer curve by using a weighted average of the reference curves. Reference curves that belong to the same sector as the target issuer and have similar rating are given higher weight. Then, we compute bond spreads to the shaper curve and fit a spread curve by using a regularized linear regression with regressors given by Eigen curves (curves that best describe variations between yield curves; computed from reference curves). The regularization parameter is determined via a two stage procedure that adaptively selects it by balancing fit and robustness of such a fit. We finally smooth the remaining residuals by using a zeroth order non-parametric fit.

Sector Curve Construction

The first step sector curve construction involves normalizing bond yields to account for certain idiosyncratic bond features. The features currently accounted for in the sector curve construction process are relevant in the high yield space such as revenue, outlook, etc.

The second step is the construction of shaper curves (akin to reference curves in the Issuer Curve Construction process). These curves satisfy liquidity requirements that are appropriate for the given asset class. For a given curve, generally speaking, the swap curve in the relevant currency is used as input to the shaper curve construction process, e.g. the fitting is done to bond spreads with respect to the relevant swap curve (pointwise "yield" difference). Similar to issuer reference curve construction, we first construct a mix of adaptive non-parametric regression fits of zeroth order and subsequently smooth the resulting curve by using rational Bezier curves.

Finally, the published sector curves are constructed in the following stages. First, for a given sector curve, the shaper curves most relevant to the target curve being constructed are identified and averaged (weighted by relevance) to produce the initial shape estimate for the target curve. This selection is a function of similarity between the target and shaper curves on attributes such as currency, rating, and sector. Second, the initial shape estimate for the target curve is adjusted to fit the observed bond yields on the target curve, using a linear regression. In particular, the regression seeks to identify the optimal scale and shift of the initial shape estimate to fit the observed yields of bonds on the target curve. Third, spreads are computed between each observed bond yield and the optimized shaper curve, and these spreads are fit using adaptive non-parametric regression fits of zeroth order and smoothed using rational Bezier curves. Lastly, sector curve yields are adjusted if necessary to ensure that rating inversions do not occur, e.g. yields on the AA- curve must be tighter than corresponding tenor yields of the A+ curve, within the same sector. The adjustments are computed by minimizing the weighted sum of squares between the initial and final yield estimates (for all rating curves within the sector) necessary to satisfy the no-inversion requirements.

About the Bloomberg Terminal.

Since 1981, business and financial professionals have depended on the Bloomberg Terminal for the real-time data, news and analytics they need to make the decisions that matter. The Terminal provides information on every asset class — from fixed income to equities, foreign exchange to commodities, derivatives to mortgages — all seamlessly integrated with on-demand multimedia content, extensive electronic-trading capabilities and a superior communications network.

Bloomberg for enterprise

To succeed today, financial institutions must respond to challenges that are not addressed by traditional approaches. They require world-class solutions that integrate people, processes, information and technology for the front office, middle office and operations. Bloomberg partners with these institutions to protect and capitalize on data, manage risk, deliver transparency and control costs. Through enterprise-level expertise and three decades of deep industry experience, Bloomberg creates real value through the use of innovative technology that turns data into a strategic asset.

Learn more

Learn more about how we can help your firm increase the rigor and transparency of pricing. Visit bloomberg.com/enterprise or reach us at bval@bloomberg.net.

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