A Bloomberg Professional Services Offering

ICVS <GO>
Swap Curve Builder
Help Page

Enter ICVS <GO>, then press <Help>

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Bloomberg

Contents

Definitions

For terms in blue throughout this document, see Definitions on p.60.

Frequently Asked Questions

What Is Swap Curve Builder (ICVS)?

ICVS <GO> allows you to analyze and customize interest rate curves, so you can determine the cost of funding for your swaps and derivatives transactions, value the performance of your trades, and calculate the present values of a known set of payments (cash flows). You can choose the appropriate instruments for the short end (cash or deposit rates), middle (interest rate futures contracts or forward rate agreements), and long end of the curve (interest rate swaps), then strip the curve to see zero (spot) rates, discount factors, and forward rates. The curves you build in ICVS can be used to evaluate derivative deals in other functions, such as the *Swap Manager* (SWPM) and *Option Valuation* (OVML) functions.

Note: Unless you specify a curve ID when you access the function (e.g., by entering ICVS 490 <GO>), the initial screen that appears is a menu that allows you to select the curve you want to analyze. You can select from interest rate curves for over forty currencies. For more information on country/currency codes, see the CURR Help Page.

Control Area

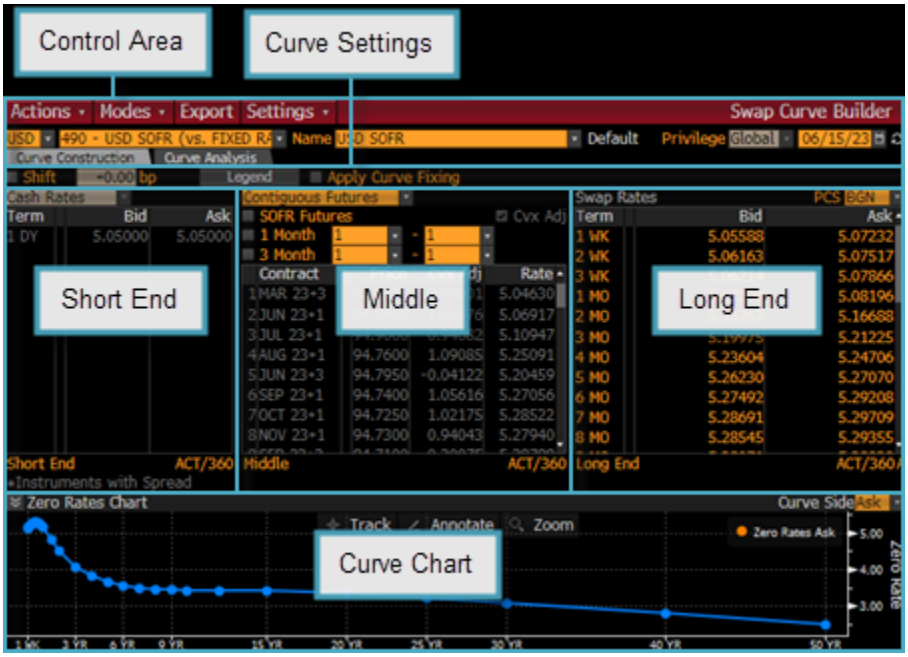
ICVS is organized into a control area and two tabs that allow you to examine and customize a curve or perform different types of curve analysis, such as horizon or forward analysis. You can use the control area at the top of the screen to manage your curve data.

- **Toolbar:** Allows you to customize and save curves, as well as configure your default settings.
  - For more information on customizing curves, see Quick Editing Curves and Customizing Instruments.
  - For more information on updating your default settings, see Settings.
- **Curve Selection:** Allows you to select the standard or custom curve you want to analyze and edit. You can also display the curve as of a different date, so you can backtest the curve. By default, the current swap curve appears.
  - For more information on selecting a curve, see Choosing a Curve.
  - For more information on setting the date of the curve, see Redating Curves.
- **Tabs:** Allow you to display either the composition of a curve or analytical views of the curve. For more information, see Curve Construction and Curve Analysis.

Curve Construction

The *Curve Construction* tab displays the rates in the short, middle, and long end of a swap curve, so you can gain insight into the curves you are using to value instruments in other Bloomberg Terminal® functions, such as *Swap Manager* (SWPM) and

Credit Default Swap Valuation (CDSW). You can customize and save curves, so you can make your own predictions about future interest rates.



Note: The image above displays the *Curve Construction* tab for the USD swaps curve. For information on the tab for forward basis curves and cross currency basis curves, see Single Currency Basis Curves and Cross Currency Basis Curves.

- **Control Area:** Allows you to customize your curve, manage your curve data, and update your default settings. For more information, see Control Area.
- **Curve Settings:** Allow you to shift the entire curve by a specified number of basis points. For more information on shifting the curve, see Shifting the Curve.
- **Short End:** Displays the short-term portion of the curve, which is composed of cash or deposit rates. The securities present in the market (e.g., for USD and EUR) are available for up to one year. For the default Bloomberg curve, these rates are used for up to three months. The bid and ask rates of each term appear. You can position your mouse over any term to see the ticker of the instrument used for the term. For more information on customizing the short end of the curve, see Updating the Short End.
- **Middle:** Begins where the short end of the curve ends, allowing you to customize the curve beyond the longest term cash or deposit rates. For a USD curve, you can use interest rate futures, but for other curves, such as EUR curve 45, you can choose between interest rate futures contracts and forward rate agreement (FRAs) contracts. Both contiguous and serial contracts are supported. For futures contracts, each contract's price, convexity adjustment (Cvx Adj), and rate appear. You can position your mouse over a contract name to see the contract's ticker. For more information on customizing the middle of the curve, see Updating the Middle.
- **Long End:** Displays interest rate swap (IRS) rates, covering the time interval from when you decide to end the use of futures or FRAs and extending up to 50 years in the future (e.g., for USD or EUR). IRS are instruments that exchange a stream of fixed-rate payments on some notional versus a stream of floating payments on the same notional. Fixed-leg payments are calculated using a fixed rate defined at the inception of the swap. Floating-leg payments are calculated in almost the same way, except the rate for each payment is a IBOR rate quoted at the beginning of the corresponding time interval, so the rate changes (or floats) with the changes in the quoted IBOR rate. You can position your mouse over any term to see the ticker of

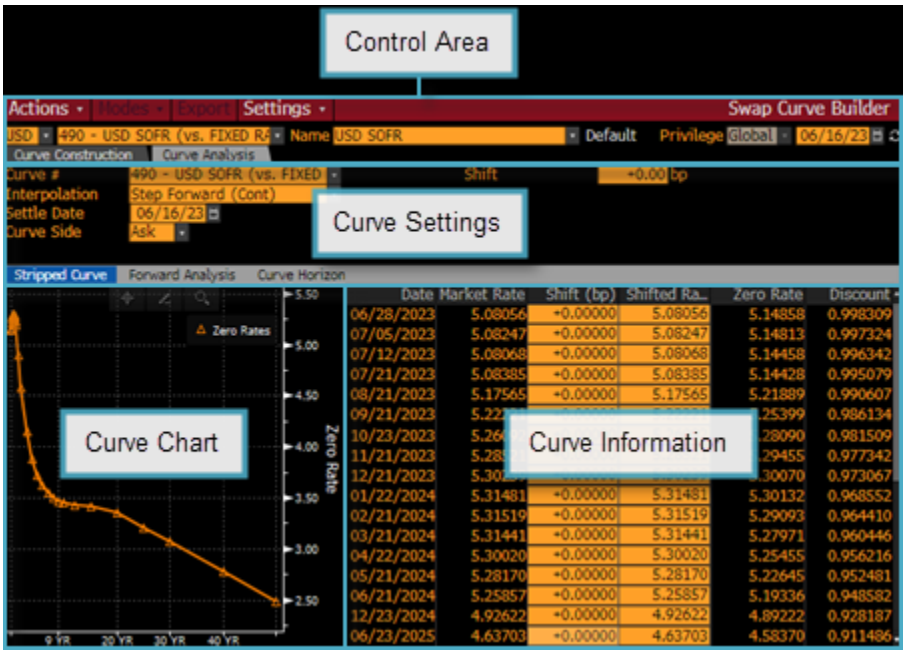
the instrument used for the term. For more information on customizing the long end of the curve, see Updating the Long End.

- **Curve Chart:** Plots the full curve based on your selections, so you can visualize the curve's shape. You can select the market side you want to display for the curve. For more information on updating the curve chart, see Updating the Chart.

Note: General best market practices for interest rate swap curve construction is to build the curve with the most liquid and active market instruments. For more information on curve construction, see the document Building the Bloomberg Interest Rate Curve: Definitions and Methodology.

Curve Analysis

The *Curve Analysis* tab allows you to analyze your customized curves. For example, you can determine the zero rates and discount factors calculated during the curve stripping (i.e., "bootstrapping") process or identify the forward rates projected from the zero rates.



- **Control Area:** Allows you to customize your curve, manage your curve data, and update your default settings. For more information, see Control Area.
- **Curve Settings:** Allow you to customize the curve parameters used to strip the curve and project forward rates. For example, you can enable OIS dual curve stripping and select the interpolation method you want to use. For more information, see Curve Analysis Tools.
- **Curve Chart:** Allows you to visualize the rates that appear in the selected subtab of the curve information section, so you can quickly gain insight into the shape of the curve.
- **Curve Information:** Allows you to examine different types of curve analysis. The *Stripped Curve* sub-tab displays the market and spot rates, as well as the discount factors, after stripping the curve. The *Forward Analysis* sub-tab displays the forward rates for the selected curve. The *Curve Horizon* sub-tab projects the curve up to up to fifty years in the future, by tenor, so

you can predict the future shape of the curve. For more information on each sub-tab, see Stripped Curve, Forward Analysis, and Curve Horizon.

Using ICVS

The following topics explain how to use ICVS to customize and analyze swap curves.

For a description of the function, see What Is ICVS?.

Choosing a Curve

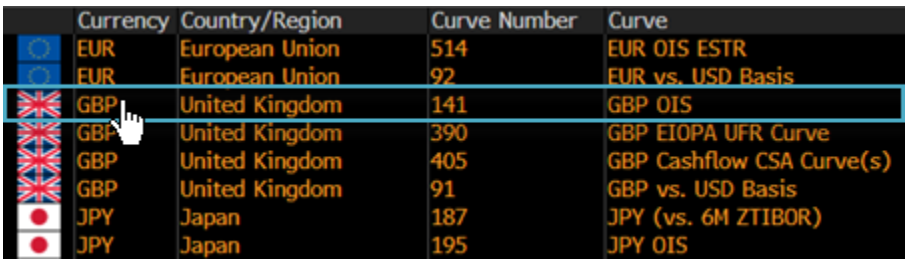
You can display the major interest rate curves for over forty different currencies. You can display the standard curve or a modified version of the curve that has been configured and saved by Bloomberg, you, or other members at your firm.

Note: While default Bloomberg curves are provided, you can customize the curve by choosing a different set of instruments and save the result as a new curve. You can also set it as a default curve for a given currency. For more information, see Curve Customization and Setting a Default Curve.

Steps:

1. Select the curve:

- To select a curve on the initial curve selection screen that appears when you run ICVS <GO>, click a curve. For example, click **GBP** to display curve number 141 for the British pound (GBP OIS).



ICVS appears with data for the selected curve.

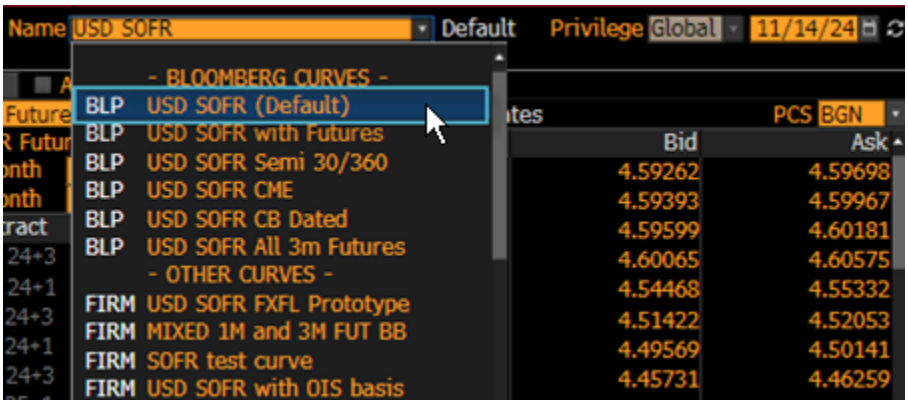
- To select a curve on the main screen of ICVS, in the control area, select a currency (e.g., *USD*), then select a standard curve (e.g., *490 - USD SOFR (vs. FIXED RATE)*).

ICVS updates based on the selected curve.

Note: ICVS defaults to the Bloomberg Curve, which reflects a robust and reliable configuration for the selected currency/curve.

2. From the *Name* drop-down menu, select the specific curve you want to display.

You can select from curves configured by Bloomberg (BLP), customized curves created by you (USER), and customized curves created by other users at your firm (FIRM).



The screen updates with the corresponding curve data.

Curve Customization

The *Curve Construction* tab allows you to display swap curves and modify them to suit your analysis. You can customize and save multiple custom curves (up to 100 curves for each curve type).

The following topics explain how to update the short, middle, and long end of the curve:

Updating the Short End	Updating the Middle	Updating the Long End
Customizing Curve Dependencies	Quick Editing Curves	Customizing Instruments
Updating Bulk Spreads	Shifting the Curve	Applying Curve Structure Changes to a Specific Point in Time
Viewing Curve Timelines		

For information on analyzing and customizing specific types of curves, see:

Cupom Cambial Curves	CSA Curves	Single Currency Basis Curves
Cross Currency Basis Curves		

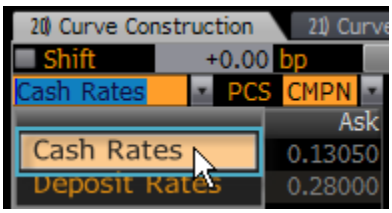
Updating the Short End

You can quickly update the rates on the short end of the swap curve. The securities present in the market (e.g., USD, EUR) are available for up to a year. For the default Bloomberg Curve, these rates are used for up to three months.

Note: Terms/rates that appear in amber are included in the curve. Inactive terms/rates that appear in gray are not included in the curve.

Steps:

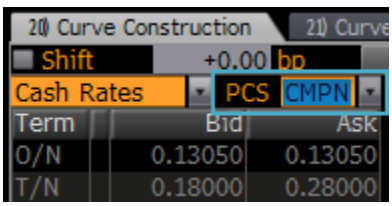
1. At the top of the section, from the drop-down menu, select the instruments you want to include in the portion of the curve with the shortest maturities (e.g., *Cash Rates*), then press <GO>:



- **Cash Rates:** The interest rate at which banks can borrow funds from other banks in the market. For example, for the three month tenor of curve 23 - USD Swaps (30/360, S/A), the rate is 3M IBOR (US0003M <Index>).
- **Deposit Rates:** The interest rate at which banks charge or pay for short term lending. For example, for the three month tenor of curve 23, the rate is USDRC <Crncy>.

The short end curve data updates based on your selection.

2. From the *PCS* drop-down menu, select the pricing source supplying the rates, then press <GO>.



The short end curve data updates based on your selection.

3. Further customize the curve:

- To select the terms that are included in the curve, from the toolbar, select **Modes > Quick Edit**. For more information, see Quick Editing Curves.
- To customize the specific terms, tickers, rates, or spreads included in the curve, select **Modes > Customize**. For more information, see Customizing Instruments.

4. Save your curve changes:

- To save your changes to a curve you created, from the toolbar, select **Actions > Save**.
  The changes save.
- To save your changes as a new curve, from the toolbar, select **Actions > Save As**. For more information, see Saving Curves.

Updating the Middle

You can quickly configure the rates in the middle of the swap curve.

Steps:

1. At the top of the section, from the drop-down menu, select the type of contract you want to include as the rates in the middle portion of the curve, then press <GO>.

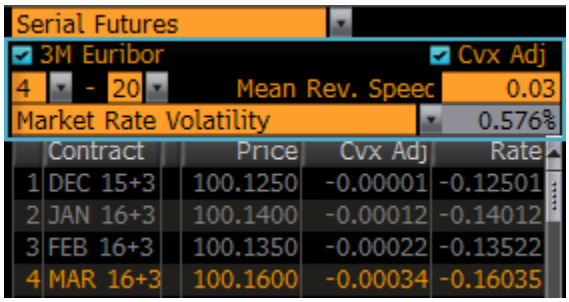
Depending on the selected currency, options may include *Serial Futures*, *Contiguous Futures*, *Serial FRAs*, and *Contiguous FRAs*. For example, curve 45 allows you to choose from all four options, while curve 490 allows you to choose between only *Serial Futures* or *Contiguous Futures*.

|Hint| Contiguous futures/FRAs allow no overlap in time periods (e.g., FRAs 3x6, 6x9), while serial futures/FRAs allow overlap of adjacent instruments (e.g., FRAs 3x6,4x7). Serial instruments generate smoother forward rates and introduce more inputs to the curve than contiguous instruments, leading to more accurate pricing of middle component instruments.

The fields in the middle section update based on your selection.

2. Configure the rates:

- To configure the rates for *Serial Futures* or *Contiguous Futures*, update the fields:

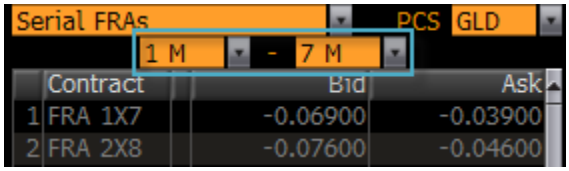


  - **Benchmark:** Select this option to include futures in the curve. The name of this option indicates the benchmark security used to calculate the forward rates, which varies depending on the currency/curve you select.
  - **Cvx Adj:** Select this option to specify a convexity adjustment, so that adjusted futures rates remain consistent with forward rates. By default, futures do not exhibit convexity. For information on how the convexity adjustment is calculated, see the document IR Futures Convexity.
  - **Term Range:** Select the range of instruments you want to include in the middle of the curve.
  - **Mean Rev. Speed:** Enter the factor of the Hull-White model used to calculate the convexity adjustment.

- **Volatility:** Select between the floating market-rate volatility or a fixed-rate volatility used to calculate the convexity adjustment. You can manage your volatility settings in the *Interest Rate Volatility Cube* (VCUB) function. For more information on volatility cubes, see the VCUB Help Page.

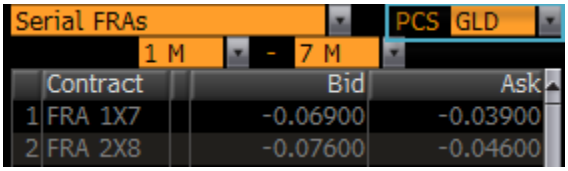
  Note: If you choose *Fixed Rate Volatility*, the field to the right activates. Enter a custom percentage.

- To configure the rates for *Serial FRAs* or *Contiguous FRAs*, from the term range drop-down menus, select the range of instruments you want to include in the middle of the curve.



The middle of the curve updates based on your selections.

3. If you selected *Serial FRAs* or *Contiguous FRAs*, from the *PCS* drop-down menu, select the pricing source you want to supply the rates, then press <GO>.



The middle of the curve updates based on your selection.

4. Save your curve changes:

- To save your changes to a curve you created, from the toolbar, select **Actions > Save**.
  The changes save.

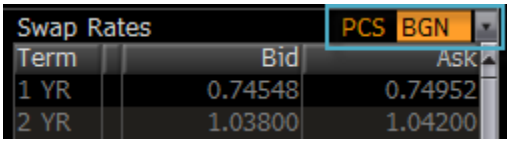
- To save your changes as a new curve, from the toolbar, select **Actions > Save As**. For more information, see Saving Curves.

Updating the Long End

You can quickly configure the swap rates used in the long end of the swap curve.

Steps:

1. From the *PCS* drop-down menu, select the pricing source you want to supply the swap rates, then press <GO>.



The long end curve data updates based on your selection.

2. Further customize the curve:

- To select the terms that are included in the curve, from the toolbar, select **Modes> Quick Edit**. For more information, see Quick Editing Curves.

- To customize the specific terms, tickers, rates, or spreads included in the curve, select **Modes > Customize**. For more information, see Customizing Instruments.

3. Save your curve changes:

- To save your changes to a curve you created, from the toolbar, select **Actions > Save**.
  The changes save.

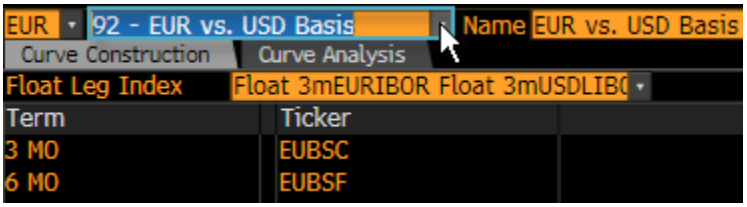
- To save your changes as a new curve, from the toolbar, select **Actions > Save As**. For more information, see Saving Curves.

Customizing Curve Dependencies

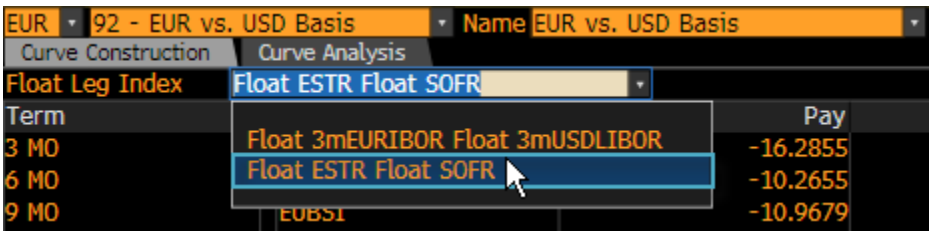
You can customize the underlying curve dependencies across supported single-currency basis, cross-currency basis, and cross-currency swap curves to build the curves with reference to specific floating leg indices.

Steps:

1. Load a supported curve (e.g., *ICVS 92*).



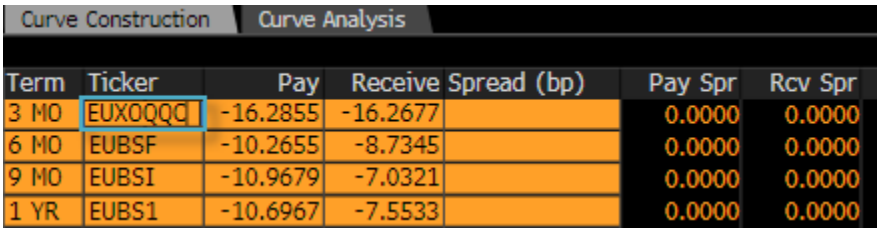
2. From the *Float Leg Index* menu, select the float leg index convention (e.g., *Float ESTR Float SOFR*).



3. From the toolbar, select **Modes > Customize**.

Curve construction fields activate.

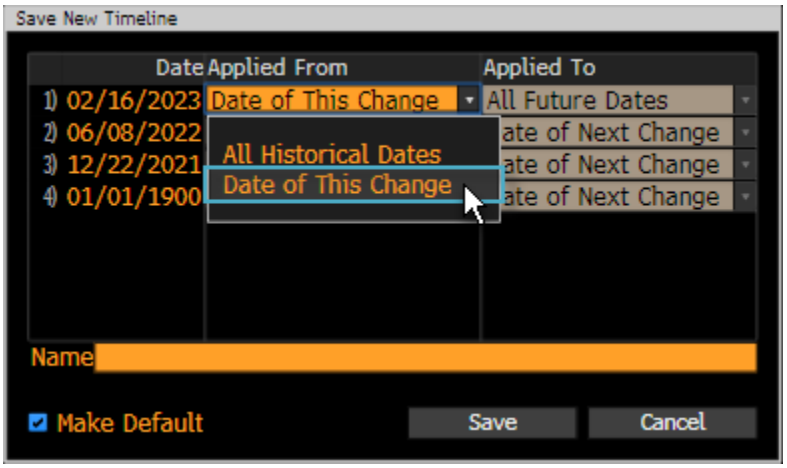
4. In the *Ticker* column, customize the curve tickers.



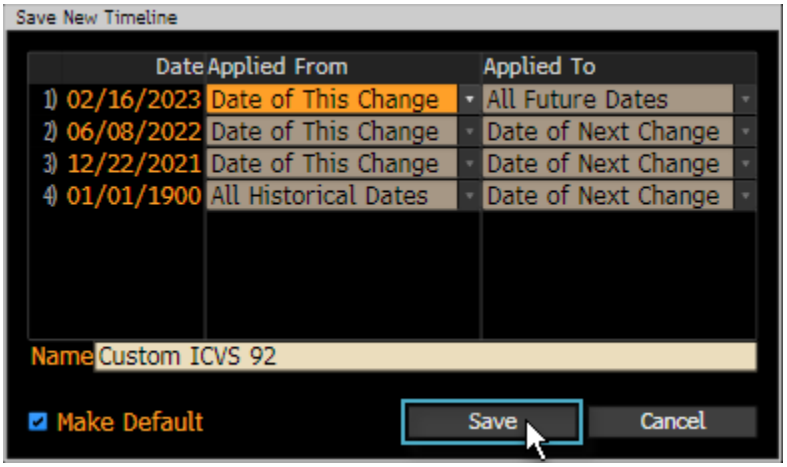
5. From the toolbar, select **Actions > Save As**.

   The *Save New Timeline* window appears.

6. From the *Applied From* drop-down menu, choose whether you want the curve customization to apply to all historical and future dates or from the date of the change (e.g., *Date of This Change*).



7. Enter a name for the customized curve, specify whether you want to use the custom version of the curve as your default curve version, then click **Save**.



Your custom curve saves.

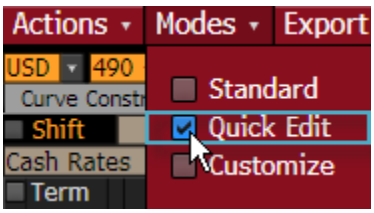
Quick Editing Curves

You can quickly select the instruments in the short and long ends of the swap curve. If you are using *Serial FRAs* or *Serial Futures* as the instruments in the middle of the curve, you can also use Quick Edit to select the included middle curve instruments.

Note: Terms/rates that appear in amber are included in the curve. Inactive terms/rates that appear in gray are not included in the curve.

Steps:

1. From the toolbar, select **Modes > Quick Edit** button.



   Checkboxes appear next to the rates in the short end and long end sections. If you are using *Serial FRAs* or *Serial Futures* as the instruments in the middle of the curve, you can also select rates in the middle section.

2. Select the rates you want to include in the curve and deselect the rates you want to exclude, then press <GO>.

   The checkboxes are removed. Excluded rates appear in gray. Included rates appear in amber.

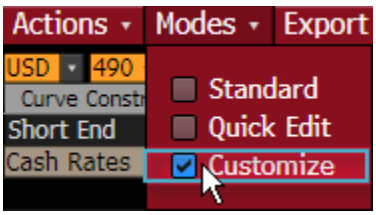
   Note: Amber rates that are selected are included in the curve. Gray rates that are selected are not included in the curve, because an instrument in another curve segment is being used instead for the same term.

Customizing Instruments

You can customize the instruments used in the short and long ends of the curve. You can also enter spreads to shift points on the short end, middle, and/or long end of the curve by a specified number of basis points, a CDS ticker, or a currency/index ticker.

Steps:

1. From the toolbar, select **Modes > Customize**.



   The curve customization view appears.

2. If you want to modify the basic construction of the curve, such as the type of rates and futures used in the curve, on the left side of the screen, in the *Short End*, *Middle*, and *Long End* sections, update the fields.

For a description of a field that appears, see Definitions.

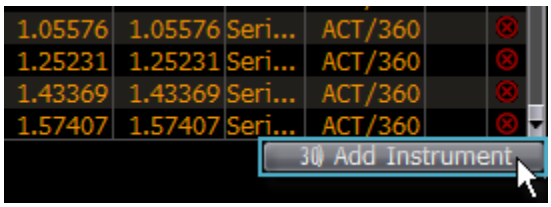
The table on the right side of the screen updates with the changes to the curve.

3. If you plan to enter spreads to shift rates in the curve, on the left side of the screen, select Display Spread Values.

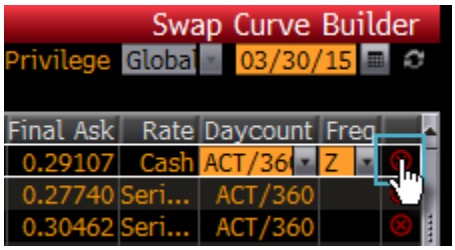
   Additional columns appear in the table on the right side of the screen (*Bid Spr* and *Ask Spr*) that display the actual adjustments made to the bid and ask rates in the curve depending on the spreads you enter. For example, if you are shifting a rate with a currency ticker (e.g., USSWAP5 <Crncy>), the bid and ask value of the currency ticker appear in these columns.

4. In the table on the right side of the screen, update the curve:

   - To modify a point in the curve, update the point's Term, Ticker, Bid Rate, Ask Rate, Daycount, and/or Freq fields, then press <GO>.
   - To add a new point to the curve, at the bottom of the table, click the **Add Instrument** button. In the row that appears, update the new point's *Term*, *Ticker*, *Bid Rate*, *Ask Rate*, *Daycount*, and *Freq* fields, then press <GO>.

   - To delete a point in the curve, click the corresponding red X.

- To shift a point on the curve, in the point's Spr (bp) field, enter the spread you want to add to the tenor, then press <GO>. You can enter:
  - A spread value in basis points (e.g., 100 or -20).
  - An index or currency ticker (e.g., USSWAP5 <Crncy>).
  - A CDS rate, including the Bloomberg CDS identification number and CDS data contributor (e.g., CIBM1U5 CBIN <Crncy> - CIBM1U5 is the ticker for IBM's Senior 5Y CDS and CBIN is the Bloomberg data contributor ID).

Note: If you want to shift the entire curve at once by basis points, index/currency ticker, or CDS rate, from the toolbar, select **Actions > Bulk Update of Spreads**. For more information, see Updating Bulk Spreads.

The curve updates based on your changes.

5. Save your curve changes:

- To save your changes to a curve you created, from the toolbar, select **Actions > Save**.
  The changes save.
- To save your changes as a new curve, from the toolbar, select **Actions > Save As**. For more information, see Saving Curves.

6. From the toolbar, select **Modes > Standard**.

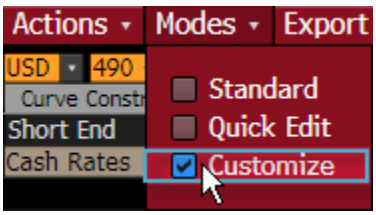
   The main *Curve Construction* tab appears with your customized instruments.

Updating Bulk Spreads

You can shift the entire curve at once by a specific number of basis points, an index or currency ticker, or a CDS rate.

Steps:

1. From the toolbar, select **Modes > Customize**.



   The curve customization view appears.

2. From the toolbar, select **Actions > Bulk Update of Spreads**.

   The *Bulk Update of Spreads* window appears.

3. In the *Spread* field, enter the spread you want to add to the curve.

Spread options are:

- A spread value in basis points (e.g., 100 or -20).
- An index or currency ticker (e.g., USSWAP5 <Crncy>).
- A CDS rate, including the Bloomberg CDS identification number and CDS data contributor (e.g., CIBM1U5 CBIN <Crncy> - CIBM1U5 is the ticker for IBM's Senior 5Y CDS and CBIN is the Bloomberg data contributor ID).

4. From the *Update Segment* drop-down menu, select the portion of the curve you want to shift.
5. Click the **Update** button.

   The window closes and the curve shifts based on your specification.

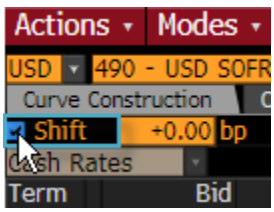
Shifting the Curve

On the *Curve Construction* tab, you can shift the entire curve by a specified number of basis points (bp).

Note: If you want to shift the entire curve by an index/currency ticker or a CDS rate, see Updating Bulk Spreads.

Steps:

1. In the control area, select **Shift**.



   The *bp* field activates.

2. In the adjacent *bp* field, enter the number of basis points you want to shift the curve, then press <GO>.

   The curve data updates based on your entry.

Applying Curve Structure Changes to a Specific Point in Time

You can customize the curve structure of Bloomberg-recommended Source 8 curves for specific date ranges.

When you save your customization, you can apply it from the date of the change (e.g., to preserve historical valuations) or to all historical and future dates.

Steps:

1. Load a Bloomberg-recommended Source 8 curve (e.g., *ICVS 490*).

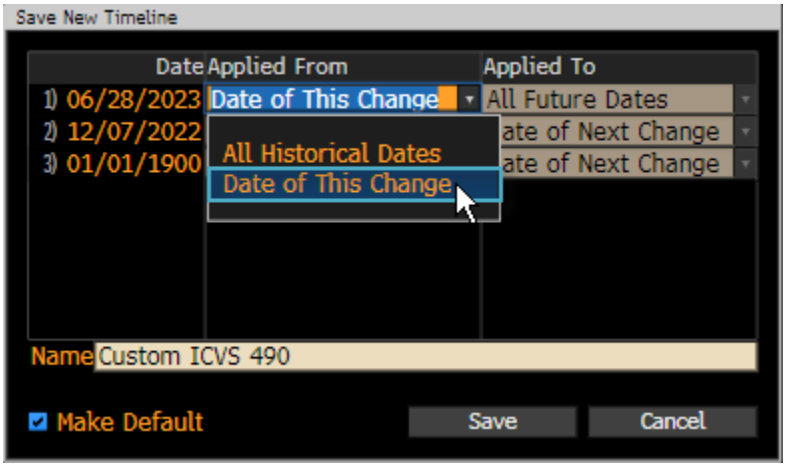
2. Select the start date of the time period for which you want to customize the curve structure.

3. Customize the curve structure (e.g., choose *Serial Futures* with a 3-month interval, and a lower and upper bound of 1 and 4).

4. In the toolbar, select **Actions > Save As**.

The *Save As* window appears.

5. From the *Applied From* drop-down menu, choose whether you want the curve customization to apply to all historical and future dates or from the date of the change (e.g., *Date of This Change*).



6. Enter a name for the customized curve, specify whether you want to use the custom version of the curve as your default curve version, then click **Save**.

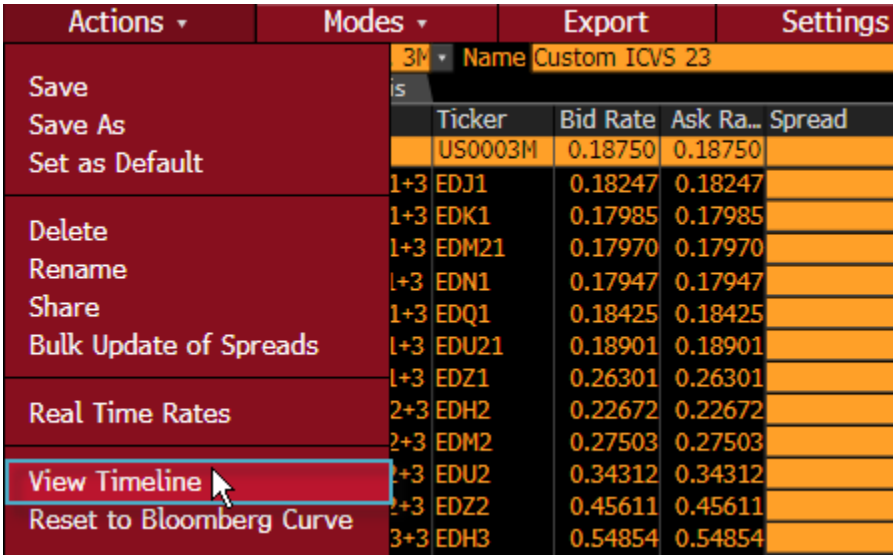
   Your custom curve appears.

   Note: If you want to make additional curve structure changes, select a new curve date, then, in the toolbar, select **Modes > Customize**.

Viewing Curve Timelines

You can review the dates at which curve structure changes have been made.

Select **Actions > View Timeline**.



The *Timeline Viewer* window appears.

Managing Curves

After customizing interest rate curves, you can save them for future use. Saved curves can be set as your default curve for the corresponding currency, shared with other Bloomberg Terminal® users at your firm, or deleted.

The following topics explain how to save, share, rename, and delete custom curves, as well as set them as defaults:

Saving Curves	Setting a Default Curve	Permissioning Your Firm
Renaming Curves	Deleting Curves	

Saving Curves

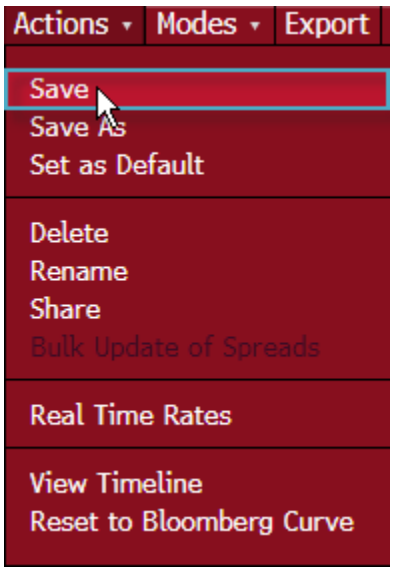
You can save a customized curve and use it to price deals in other Bloomberg Terminal® functions, such as the *Swap Manager* (SWPM) and *Credit Default Swap Valuation* (CDSW) functions.

Steps:

1. Customize a curve by following the steps in Curve Customization.

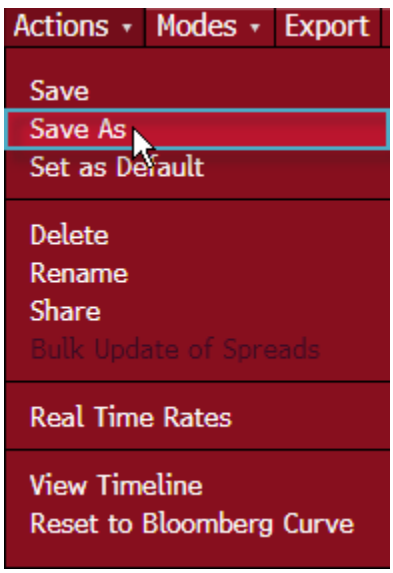
2. Save your curve:

- To save changes to a curve, from the toolbar, select **Actions > Save**.



The curve saves.

- To save a curve with a new name, from the toolbar, select **Actions > Save As**.



The *Save As* window appears.

3. If you are saving a new curve, update the *Save As* window:

- **Save As:** Enter a name for the new curve.
- **Make Default?:** If selected, the new curve is set as the default curve for the curve number.

4. Click the **Save** button.

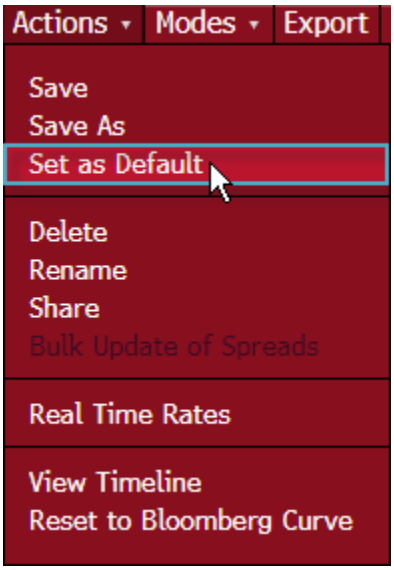
The curve saves.

Setting a Default Curve

You can set a named curve as the default curve for a curve number (e.g., save the *USD SOFR (vs. FIXED RATE)* as the default curve for curve number 490).

Steps:

1. Load the curve by following the steps in Choosing a Curve.
2. From the toolbar, select **Actions > Set As Default**.



The curve is set as the default curve for the selected curve number.

Permissioning Your Firm

You can permission other members of your firm to access your saved custom curves.

Steps:

1. Load a saved custom curve by following the steps in Choosing a Curve.
2. From the *Privilege* field drop-down menu, select **Firm**, then press <GO>.

Note: When *User* is selected, only you can see your custom curve.

The permissioning is applied and the curve appears in the *Name* menu for other members of your firm.

Renaming Curves

You can rename your saved custom curves you have saved.

Note: You cannot rename a standard or pre-configured Bloomberg curve.

Steps:

1. Load the curve you want to rename by following the steps in Choosing a Curve.
2. From the toolbar, select **Actions > Rename**.

   The *Save As* window appears.
3. Enter a new name, then click the **Rename** button.

   The curve is renamed.

Deleting Curves

You can delete a saved custom curve.

Note: You cannot delete a standard or pre-configured Bloomberg curve.

Steps:

1. Load the curve you want to delete by following the steps in Choosing a Curve.
2. From the toolbar, select **Actions > Delete**.

   The *Delete Curve* window appears.
3. Click the **Yes** button.

   The curve deletes.

Curve Analysis Tools

On the *Curve Analysis* tab, you can select the parameters for stripping the curve and projecting forward rates.

At the top of the tab, choose your curve analysis settings, then press <GO>:

- **Curve #:** Select the curve you want to analyze.
- **Interpolation:** Select the interpolation method you want to use for stripping the curve. For more information on each method, see Interpolation.
- **Settle Date:** Enter the date for Zero Rate and Discount Factor effective date calculations. The default value will be equal to the Curve Date.
- **Curve Side:** Select the market side of the curve (bid, mid, or ask).

- **Shift:** Enter the number of basis points you want to shift the entire curve, then press <GO>.

The tab updates based on your selections.

Stripped Curve

The *Stripped Curve* sub-tab of the *Curve Analysis* tab displays the market rates (par), zero rates (spot rates), and discount factors after stripping (or "bootstrapping") the curve.

Note: The spot rates calculated from cash rates are simple spot rates. All other instruments, such as FRAs, futures, and swaps, use compounded spot rates.

For information on the curve stripping process and the calculations used to determine the zero rates and discount factors, see the document Building the Bloomberg Interest Rate Curve: Definitions and Methodology.

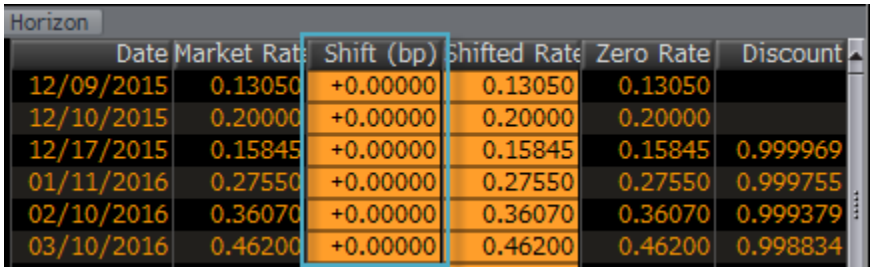
- **Curve Chart:** Visualize the stripped curve. For more information on customizing the chart, such as adding annotations, click here.
- **Market Rates:** Review each term and the corresponding market rate from the *Curve Construction* tab.
- **Shifted Rates:** Shift a market rate by a specified number of basis points. You can enter the number of basis points you want to shift the rate in the *Shift (bps)* column or enter a new rate in the *Shifted Rate* column. For more information, see Shifting Stripped Curve.
- **Zero Rate:** Examine the spot starting zero coupon rate for each point of the curve, calculated from the curve stripping process.
- **Discount Factors:** Observe the discount factors calculated from the curve stripping process, which you can use to simplify present value calculations (i.e., determining the current value to you of the same amount of money at a certain point in the future).

Shifting Stripped Curve

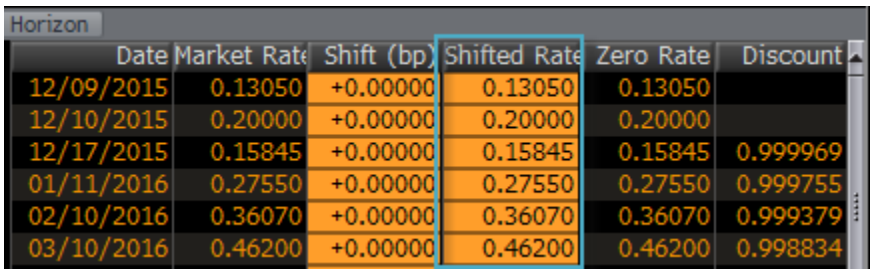
On the *Stripped Curve* sub-tab of the *Curve Analysis* tab, you can shift market rates to display the corresponding zero rates and discount factors after stripping (or "bootstrapping") the curve.

To recalculate a zero rate and discount factor, shift the corresponding market rate, then press <GO>:

- To shift a rate by a specified number of basis points (bps), update the corresponding Shift (bp) field.



- To enter a new rate, update the corresponding Shifted Rate field.



The zero rate and discount factor update based on your entry.

Forward Analysis

The *Forward Analysis* sub-tab of the *Curve Analysis* tab calculates projected forward rates between two dates in the future, using standard gap analysis.

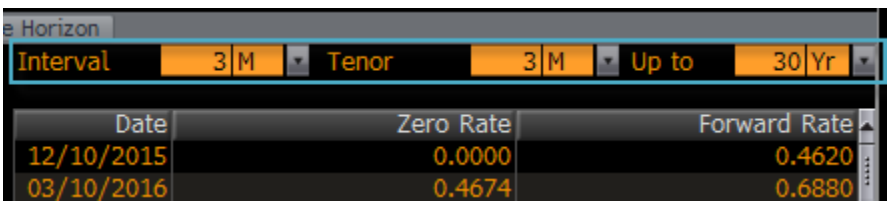
- **Forward Settings:** Select the interval for the dates in the *Date* column (e.g., three months), the time period for which you want to project the forward rate from each date (e.g., three month forward rates), and the length of time for which you want to project the forward rates (e.g., for 50 years). For more information, see Analyzing Forwards.
- **Curve Chart:** Visualize the forward and spot (zero) rates. For more information on customizing the chart, such as adding annotations, click here.
- **Date:** Track each date in the future based on the selected *Interval*.
- **Zero Rates:** Review the compounded spot rate for each date. The spot rates are calculated from the discount factor, using the same day count and pay frequency as the swap rates on the curve.
- **Forward Rates:** Examine the forward rates for each date, for the selected *Tenor*, calculated from the spot rate.

Analyzing Forwards

On the *Forward Analysis* sub-tab of the *Curve Analysis* tab, you can display and analyze forward rates. You can customize the time interval for each prediction, as well as the forward tenor and length of time you want to analyze.

Steps:

1. Update the fields at the top of the sub-tab:



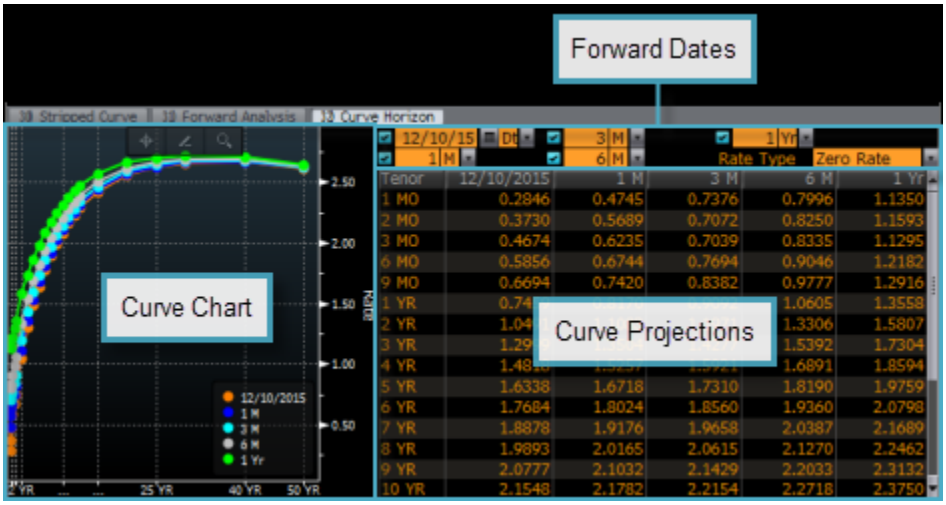
- **Interval:** Select the length of time between each date in the *Date* column, in months or years.
- **Tenor:** Select the amount of time you want to look into the future for each forward rate, in months or years.
- **Up To:** Select the point in time to which forward rates are appear, in months or years.

2. Press <GO>.

   The screen updates based on your selections.

Curve Horizon

The *Curve Horizon* sub-tab of the *Curve Analysis* tab projects the entire curve up to fifty years in the future, by tenor.



- **Forward Dates:** Select the future dates or periods for which you want to project the curve. You can also select whether you want to display spot rates (zero rates) or swap rates (par coupon standard swap rates) for the projections. For more information, see Redating Curves.
- **Curve Chart:** Visualize the curve projections. For more information on customizing the chart, such as adding annotations, click here.
- **Curve Projections:** Analyze the curve projections. Each row represents a tenor in the curve. Each tenor is projected forward based on the dates and/or periods that appear as column headers.

Customizing the Horizon

On the *Curve Horizon* sub-tab of the *Curve Analysis* tab, you can display and analyze the curve horizon, so you can see the shape of the curve on certain dates in the future. You can display the curves for up to five dates or time periods.

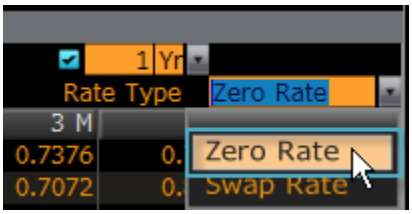
Steps:

1. At the top of the sub-tab, select the future dates and/or time periods you want to include in the curve horizon table.

The table updates based on your selections.

2. If you want to customize a date or time period, from the drop-down menu, select *Month* or *Year* to specify a future period or *Date* to specify a specific date, then enter the period or date in the adjacent field.

3. Select whether you want to use Spot Rate or Zero Rate for the horizon calculations (e.g., *Zero Rate*).



4. Press <GO>.

The curve horizon table and chart update based on your selections.

Redating Curves

You can display your selected curve on a specific date to see the spot rates and discount factors using an earlier date's curve. By default, the curve data for the current day appears.

Steps:

1. In the control area, in the date field, enter a new date, then press <GO>.

The curve data updates based on your entry.

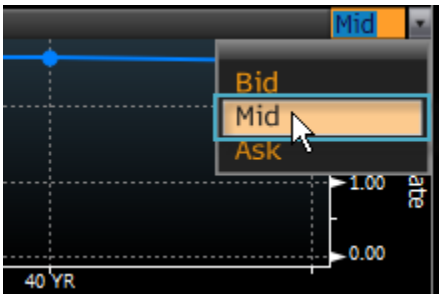
2. If you want to backtest the curve, on the *Curve Analysis* tab, select the *Curve Horizon* sub-tab.

Curve predictions based on the date you enter appear. For more information on using the *Curve Horizon* subtab, see Curve Horizon.

Updating the Chart

On the *Curve Construction* tab, you can select the market side you want to analyze on the *Zero Rates Chart*.

To select a market side for the charted curve, from the drop-down menu at the top of the chart, select *Bid*, *Ask*, or *Mid* (e.g., *Mid*).

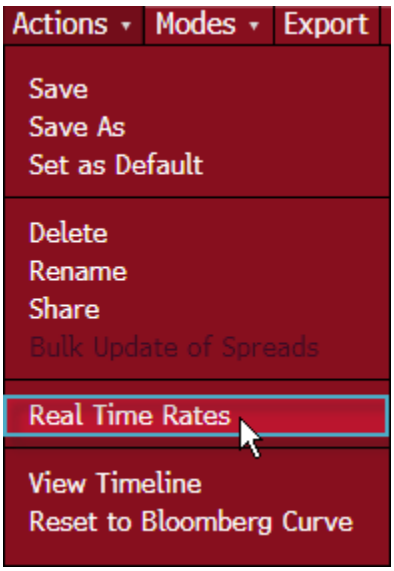


The chart updates based on your selection.

Real-time Data

You can monitor real-time market data for a specific country/currency.

To display real-time data, from the toolbar, select **Actions > Real Time Rates**.



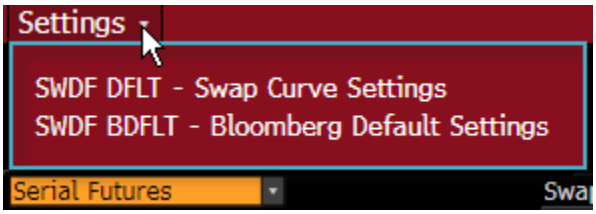
The *Real Time Rates* screen appears with the data. Rates appear in white when they update.

Note: You can press <Menu> to exit the *Real Time Rates* screen.

Settings

From ICVS, you can access the Swap Curve Settings (SWDF) function to configure your default settings for curves, interpolation, and OIS discounting, as well as DV01 and key rate risk (KRR).

To access SWDF settings, from the toolbar, select **Settings**, then choose an option:



- **SWDF DFLT - Swap Curve Settings (UUID):** Configure your personalized default settings for curves, interpolation, and OIS discounting, as well as default DV01 and key rate risk (KRR) settings.
  - For more information on general swap defaults, see SWDF Help Page > Editing Curve Settings.
  - For more information on DV01 and KRR settings, click SWDF Help Page > DV01/KRR Settings.
- **SWDF BDFLT - Bloomberg Default Settings:** Enable Bloomberg's default swap settings, which provide the most accurate valuation of derivative instruments involving interest rate curves. For more information, click SWDF Help Page > Recommended Settings.

Shortcuts

You can use shortcuts to directly access specific interest rate curves in ICVS.

Enter	To specify
ICVS (Country/Currency Code) <GO>	The default curve for a country/currency code. For example, enter ICVS USD <GO> to specify the S490 USD swap curve. For more information on country/currency codes, see the CURR Help Page.
ICVS (Curve Number) <GO>	The default curve for the curve number. For example, enter ICVS 490 <GO> to specify the S490 USD swap curve.

Calculations

The following calculations and methodologies are used in ICVS:

Curve Building

ICVS supports the following methods for building a curve:

- **Bootstrap Method:** With the bootstrap method, each of the curve's points has one independent degree of freedom variation, which does not affect previous time intervals. In this case, the curve is built by adjusting one piece at a time while moving from shorter maturities to longer ones.
- **Global Method:** With the global method, all of the curve, or at least some degrees of freedom variation, affect the curve shape everywhere, and therefore you must solve a general system of N non-linear equations with N variables.

For more information, see Building the Bloomberg Interest Rate Curve: Definitions and Methodology.

Interpolation

ICVS supports four functional forms (interpolation methods) you can use to build the interest rate curve.

- **Piecewise Linear (Simple):** Simple compounded zero rate. The simple rate rs defined by the formula is *piecewise linear*. For dates outside the range defined by the rates with the shortest and longest maturities on the curve, the curve is extrapolated with constant forward on the short end and constant (non-annualized) zero on the long end.
- **Smooth Forward/Piecewise Quadratic (Cont):** Continuously compounded forward rate. The forward rate rcf defined by the formula is *piecewise quadratic*. The neighboring points of the forward curve are connected in such a way that the first derivative of the forward rate is continuous, which is reflected in the term "smooth." The building of the curve requires the global pricing method. For more information, see Curve Building.
- **Step-function Forward (Cont):** Continuously compounded forward rate. The forward rate rcf defined by the formula is *piecewise constant*. Constant forward extrapolation is used on both the short end and the long end of the curve.
- **Piecewise Linear (Cont):** Continuously compounded zero rate. The zero rate rcz defined by the formula is *piecewise linear continuous*. The curve is extrapolated with constant forward on the short end and constant (non-annualized) zero on the long end.

Note: Incorporating serial FRAs in curve building does not require any special treatment from the stripping algorithm, in the sense that the stripper succeeds in producing a curve that matches all input instruments. However, converting FRAs to corresponding discount factors relies implicitly on stub rates (i.e., zero rates at the FRAs' start dates), which are often interpolated from the curve. While the stubs do not affect the FRAs themselves, the stubs may create artifacts on the forwards on the dates that the FRAs mature.

For more information on interest rate curve methodology, see the document Building the Bloomberg Interest Rate Curve: Definitions and Methodology.

OIS Discounting

You can apply OIS discounting to the curve.

An Overnight Indexed Swap (OIS) is a fixed/floating interest rate swap with the floating leg computed using the published FF Effective Rate (FEDL01). The combination of several trends has led the market to adopt the overnight index swap (OIS) curve as the "new risk-free swap curve" used as an alternative to a IBOR-based curve.

OIS discounting involves discounting the expected cashflows of a derivative using a nearly risk-free curve, such as an overnight indexed swap (OIS) curve. OIS-discounted swap rates are calculated with a different formula than single-curve counterparts, using the dual-curve (DC) stripping method. When calibrated to the same set of swap rates, the OIS/DC-stripped swap curve produces slightly different forward rates, and consequently forward swap rates, compared to those from the traditional single-curve approach.

OIS rates are not widely available in the marketplace beyond the ten-year maturity. To support OIS/DC stripping, the OIS curve is extended beyond the ten-year maturity by harnessing USD Fed Funds (FF) basis swap quotes, which are available to the 30-year maturity. Because both OIS and FF basis are stripped to project forwards of the FF Effective Rate (FEDL01), you can make sensible predictions for future interest rates using both types of quotes in an arbitrage-free environment.

Brazil Futures Roll

The expiration dates of the different market instruments used in the construction of the Cupom Cambial clean curve differ slightly, which requires some special handling at the end of the month for the calculation of the synthetic spot.

- General Formula: The First Dollar Future is the most liquid instrument.
  Synthetic spot = (First UC Dollar Future - CASADO)/1000

- Two Days Prior to Expiration Date (first business day of the contract month): The Second Dollar future starts trading more actively, making it the more liquid contract, while the Casado is still quoted against the First Dollar future. As a result, the synthetic spot formula is altered to take this into account.
  Synthetic Spot = (Second Dollar Future - (CASADO + SPREAD))/1000

  Spread = spread between Second Dollar Future and First Dollar Future (S:UCUC 1-2 Curncy)

  This formula is implemented when the ADD ROLLOVER FLAG is checked.

- One Day Prior to Expiration Date (first business day of the contract month): On the last day of the month, the Casado is quoted against the Second Dollar Future.
  Synthetic spot = (Second Dollar Future – Casado)/1000

For more information on Cupom Cambial curves, see Cupom Cambial Curves.

Source 8 Curve

When you modify your swap curve defaults in the *Swap Curve Settings* (SWDF) function for a specific country/currency (e.g., US), you can choose the source of the rates in a curve (e.g., curve 490). By selecting "Source 8" (or "SRC 8") as a curve's rate source, you enable the corresponding default curve from ICVS for that curve.

Functions that use Source 8 for the swap curve include (but are not limited to):

- *Swap Manager* (SWPM)
- *Option Valuation* (OVML)
- *Bond Hedge Analysis* (HGBD)
- *Bond Valuation from Credit Defaults Spreads* (VCDS)
- *Credit Default Swap* (CDSW)
- *Forward CDS Matrix* (FWCS)
- *Option Valuation Risk Analysis* (OVRA)
- *Generic Option Valuation* (OVGE)

For mortgages, the Source 8 model cannot process a futures-based curve for the *OAS Analysis* (OASN) function. OASN defaults to Source 1 (standard curve in SWDF - cash based curve). The *Yield Analysis* (YT) function and the *Super Yield Table* (SYT) function obtain the swap curve from other sources (I52 curve IYC source).

Forward rates in YT and SYT, as well as the *Quick Yield Analysis* (QY) and *Cash Flow Table* (CFT) functions, are provided by the same set of APIs as OASN and are affected by the SWDF settings, except when Source 6 or Source 8 are chosen from SWDF. In this case, these functions revert to Source 1. For more information, see each function's Help Page.

Curve Horizon

Rate Type	Curve Type	Convention
Swap Rate	Vanilla + Cross Currency Swap	Market Swap Rate
Swap Rate	Basis (single and cross currency)	Swap Rate Equivalent
Zero Rate	All	ACT/365, Continuous Compounding. Nominal dates, no end–of–month adjustment.

Forward Analysis

Rate Type	Curve Type	Convention
Zero Rate	All	ACT/365, Continuous Compounding. Nominal dates, no end–of–month adjustment.
Forward Rate	All	ACT/365, Continuous Compounding. Nominal dates, no end–of–month adjustment.

Collateral Assumptions

The following table provides the collateral assumption for each interest rate curve. These assumptions are applicable if you have selected Bloomberg's recommended settings in the *Bloomberg Default Settings* (SWDF BDFLT) function.

For more: SWDF Help Page > Applying Bloomberg Default Settings.

Curve ID	Ccy	Collateral Ccy/Int Rate
230 – AED (vs. 3M EIBOR)	AED	USD/SOFRRATE Index
231 – AED vs. USD Basis	AED	USD/SOFRRATE Index
334 – AED (vs. 1M EIBOR)	AED	USD/SOFRRATE Index
335 – AED (vs. 6M EIBOR)	AED	USD/SOFRRATE Index
336 – AED (vs. 12M EIBOR)	AED	USD/SOFRRATE Index
574 – AED CCS (vs. USD)	AED	USD/SOFRRATE Index
571 – Offsh. ARS CCS (vs. USD)	ARS	USD/SOFRRATE Index
159 – AUD OIS	AUD	AUD/RBACOR Index
302 – AUD (vs. 6M Bank Bills)	AUD	AUD/RBACOR Index
303 – AUD (vs. 3M Bank Bills)	AUD	AUD/RBACOR Index
306 – AUD (vs. 1M Bank Bills)	AUD	AUD/RBACOR Index
563 – AUD EIOPA UFR Curve	AUD	Single curve stripped
95 – AUD vs. USD Basis	AUD	USD/SOFRRATE Index
494 – AZN CCS (vs. USD)	AZN	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
517 – BDT Onsh. CCS (vs. USD)	BDT	USD/SOFRRATE Index
556 – BGN Onsh. CCS (vs. USD)	BGN	USD/SOFRRATE Index
316 – BHD (vs. 3M BHIBOR)	BHD	Single curve stripped
572 – Offsh. BHD CCS (vs. USD)	BHD	USD/SOFRRATE Index
304 – Cupom Cambial Clean	BRL	Single curve stripped
305 – Cupom Cambial Dirty	BRL	Single curve stripped
387 – Offsh. BRL CCS (vs. USD)	BRL	USD/SOFRRATE Index
388 – Offsh. Pre x DI	BRL	Single curve stripped
89 – BM&F Pre x DI	BRL	Single curve stripped
135 – CAD vs. USD Basis	CAD	USD/SOFRRATE Index
147 – CAD OIS	CAD	CAD/CAONREPO Index
330 – CAD (vs. 1M CDOR)	CAD	CAD/CAONREPO Index
4 – CAD (vs. 3M CDOR)	CAD	CAD/CAONREPO Index
21 – CHF (vs. 6M LIBOR)	CHF	CHF/SRFXON3 Index
234 – CHF OIS	CHF	CHF/SRFXON3 Index
254 – CHF (vs. 3M LIBOR)	CHF	CHF/SRFXON3 Index
340 – CHF (vs. 1M LIBOR)	CHF	CHF/SRFXON3 Index

Curve ID	Ccy	Collateral Ccy/Int Rate
93 – CHF vs. USD Basis	CHF	USD/SOFRRATE Index
520 – CLF (vs. CLP Camara) w/ FX Forwards	CLF	USD/SOFRRATE Index
193 – CLP (vs. Camara)	CLP	USD/SOFRRATE Index
194 – CLP vs. USD Basis	CLP	USD/SOFRRATE Index
521 – CLP CCS (vs. USD)	CLP	USD/SOFRRATE Index
368 – CNH (vs. 3M HIBOR)	CNH	Single curve stripped
369 – CNH vs. USD Basis	CNH	USD/SOFRRATE Index
535 – CNH CCS (vs. USD) w/ FX Fwds	CNH	USD/SOFRRATE Index
149 – CNY vs. USD Basis	CNY	USD/SOFRRATE Index
181 – Onsh. CNY (Qtrly vs. 7D REPO)	CNY	Single curve stripped
200 – Onsh. CNY (vs. 3M SHIBOR)	CNY	Single curve stripped
204 – Offsh. CNY (vs. 7D REPO)	CNY	Single curve stripped
228 – Onsh. CNY OIS	CNY	Single curve stripped
399 – Offsh. CNY vs. USD Basis	CNY	USD/SOFRRATE Index
523 – Onsh. CNY (1Y LPR Q/Q)	CNY	CNY/CNRR007 Index
524 – Onsh. CNY (1Y LPR A/A)	CNY	CNY/CNRR007 Index
525 – Onsh. CNY (5Y LPR Q/Q)	CNY	CNY/CNRR007 Index

Curve ID	Ccy	Collateral Ccy/Int Rate
526 – Onsh. CNY (5Y LPR A/A)	CNY	CNY/CNRR007 Index
536 – Onsh. CNY CCS (vs. USD) w/ FX Fwds	CNY	USD/SOFRRATE Index
566 – CNY EIOPA UFR Curve	CNY	Single curve stripped
61 – Offsh. CNY CCS(vs. USD)	CNY	USD/SOFRRATE Index
191 – COP CCS (vs. USD)	COP	USD/SOFRRATE Index
192 – COP vs. USD Basis	COP	USD/SOFRRATE Index
329 – COP OIS	COP	USD/SOFRRATE Index
515 – COU (vs. COP)	COU	USD/SOFRRATE Index
542 – CRC Offsh. CCS (vs. USD 6M) w/ FX Fwds	CRC	USD/SOFRRATE Index
296 – CZK vs. EUR Basis	CZK	EUR/ESTRON Index
319 – CZK (vs. 3M PRIBOR)	CZK	CZK/CZEOINDX Index
320 – CZK (vs. 6M PRIBOR)	CZK	CZK/CZEOINDX Index
551 – CZK OIS	CZK	CZK/CZEOINDX Index
186 – DKK OIS	DKK	DKK/DETNT/N Index
337 – DKK (vs. 1M CIBOR)	DKK	DKK/DETNT/N Index
338 – DKK (vs. 3M CIBOR)	DKK	DKK/DETNT/N Index
339 – DKK (vs. 6M CIBOR)	DKK	DKK/DETNT/N Index

Curve ID	Ccy	Collateral Ccy/Int Rate
554 – DKK OIS DESTR	DKK	DKK/DETNT/N Index
94 – DKK vs. USD Basis	DKK	USD/SOFRRATE Index
240 – Dominican Republic Peso	DOP	Single curve stripped
241 – DOP vs. USD Basis Swaps	DOP	USD/SOFRRATE Index
539 – EGP Offsh. CCS (vs. USD) w/ FX Fwds	EGP	USD/SOFRRATE Index
133 – EUR OIS	EUR	EUR/ESTRON Index
201 – EUR (vs. 3M EURIBOR)	EUR	EUR/ESTRON Index
232 – EUR (vs. 1M EURIBOR)	EUR	EUR/ESTRON Index
314 – EUR (vs. 12M EURIBOR)	EUR	EUR/ESTRON Index
391 – EUR EIOPA UFR Curve	EUR	Single curve stripped
45 – EUR (vs. 6M EURIBOR)	EUR	EUR/ESTRON Index
514 – EUR OIS ESTR	EUR	EUR/ESTRON Index
92 – EUR vs. USD Basis	EUR	USD/SOFRRATE Index
141 – GBP OIS	GBP	GBP/SONIO/N Index
22 – GBP (vs. 6M LIBOR)	GBP	GBP/SONIO/N Index
222 – GBP (vs. 3M LIBOR)	GBP	GBP/SONIO/N Index
223 – GBP (vs. 1M LIBOR)	GBP	GBP/SONIO/N Index

Curve ID	Ccy	Collateral Ccy/Int Rate
315 – GBP (vs. 12M LIBOR)	GBP	GBP/SONIO/N Index
390 – GBP EIOPA UFR Curve	GBP	Single curve stripped
91 – GBP vs. USD Basis	GBP	USD/SOFRRATE Index
493 – GEL Onsh. CCS (vs. USD)	GEL	USD/SOFRRATE Index
586 – GEL OIS	GEL	GEL/TBIBONIR Index
510 – GHS Offsh. CCS (vs. USD)	GHS	USD/SOFRRATE Index
10 – HKD (vs. 3M HIBOR)	HKD	HKD/HOISHKD Index
145 – HKD OIS	HKD	HKD/HOISHKD Index
310 – HKD (vs. 1M HIBOR)	HKD	HKD/HOISHKD Index
311 – HKD (vs. 6M HIBOR)	HKD	HKD/HOISHKD Index
564 – HKD EIOPA UFR Curve	HKD	Single curve stripped
96 – HKD vs. USD Basis	HKD	USD/SOFRRATE Index
298 – HUF vs. EUR Basis	HUF	EUR/ESTRON Index
324 – HUF (vs. 3M BUBOR)	HUF	HUF/BUBOR06M Index
325 – HUF (vs. 6M BUBOR)	HUF	HUF/BUBOR06M Index
158 – IDR OIS	IDR	IDR/JIIN3M Index
212 – Offsh. IDR CCS (vs. USD)	IDR	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
227 – IDR vs. USD Basis	IDR	USD/SOFRRATE Index
233 – Onsh. IDR CCS (vs. USD)	IDR	USD/SOFRRATE Index
380 – IDR (vs. 3M JIBOR)	IDR	IDR/JIIN3M Index
381 – IDR (vs. 1M JIBOR)	IDR	IDR/JIIN3M Index
504 – Onsh IDR vs USD Basis	IDR	USD/SOFRRATE Index
162 – ILS (vs. 3M TELBOR)	ILS	Single curve stripped
163 – ILS vs. USD Basis	ILS	USD/SOFRRATE Index
585 – ILS OIS SHIR	ILS	ILS/SHIRON Index
127 – INR (vs. 6M MIFOR)	INR	Single curve stripped
157 – INR vs. USD Basis	INR	USD/SOFRRATE Index
266 – Offsh. INR OIS	INR	Single curve stripped
46 – Onsh. INR OIS	INR	Single curve stripped
503 – Onsh INR vs USD Basis	INR	USD/SOFRRATE Index
550 – INR (vs. 6M MOD MIFOR)	INR	Single curve stripped
68 – Onsh. INR CCS (vs. USD)	INR	USD/SOFRRATE Index
69 – Offsh. INR CCS (vs. USD)	INR	USD/SOFRRATE Index
188 – ISK (vs. 1M REIBOR)	ISK	Single curve stripped

Curve ID	Ccy	Collateral Ccy/Int Rate
189 – ISK vs. USD Basis	ISK	USD/SOFRRATE Index
516 – JOD Onsh. CCS (vs. USD)	JOD	USD/SOFRRATE Index
13 – JPY (vs. 6M LIBOR)	JPY	JPY/MUTKCALM Index
187 – JPY (vs. 6M ZTIBOR)	JPY	JPY/MUTKCALM Index
195 – JPY OIS	JPY	JPY/MUTKCALM Index
307 – JPY (vs. 1M LIBOR)	JPY	JPY/MUTKCALM Index
308 – JPY (vs. 3M LIBOR)	JPY	JPY/MUTKCALM Index
371 – JPY (vs. 3M ZTIBOR)	JPY	JPY/MUTKCALM Index
372 – JPY (vs. 6M DTIBOR)	JPY	JPY/MUTKCALM Index
373 – JPY (vs. 3M DTIBOR)	JPY	JPY/MUTKCALM Index
395 – JPY (vs. 1M ZTIBOR)	JPY	JPY/MUTKCALM Index
396 – JPY (vs. 1M DTIBOR)	JPY	JPY/MUTKCALM Index
580 – JPY EIOPA UFR Curve	JPY	Single curve stripped
97 – JPY vs. USD Basis	JPY	USD/SOFRRATE Index
512 – KES Offsh. CCS (vs. USD)	KES	USD/SOFRRATE Index
154 – KRW vs. USD Basis	KRW	USD/SOFRRATE Index
205 – Offsh. KRW (vs. 91D CD)	USD	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
471 – Offsh. KRW vs. USD Basis	KRW	USD/SOFRRATE Index
567 – KRW EIOPA UFR Curve	KRW	Single curve stripped
57 – Onsh. KRW (vs. 91D CD)	KRW	Single curve stripped
58 – Onsh. KRW CCS (vs. USD)	KRW	USD/SOFRRATE Index
59 – Offsh. KRW CCS (vs. USD)	KRW	USD/SOFRRATE Index
588 – KRW KOFR	KRW	KRW/KWCDC Curncy
255 – KWD (vs. 3M KIBOB)	KWD	Single curve stripped
256 – KWD vs. USD Basis	KWD	USD/SOFRRATE Index
549 – KWD CCS (vs. USD)	KWD	USD/SOFRRATE Index
508 – KZT Offsh. CCS (vs. USD)	KZT	USD/SOFRRATE Index
518 – LKR Onsh. CCS (vs. USD)	LKR	USD/SOFRRATE Index
474 – Moroccan Deposit	MAD	Single curve stripped
537 – MAD CCS (vs. USD) w/ FX Fwds	MAD	USD/SOFRRATE Index
579 – MAD OIS	MAD	Single curve stripped
397 – Myanmar Kyat	MMK	Single curve stripped
398 – MMK vs. USD Basis	MMK	USD/SOFRRATE Index
495 – MNT CCS (vs. USD)	MNT	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
242 – Mauritian Rupee	MUR	Single curve stripped
243 – MUR vs. USD Basis Swaps	MUR	USD/SOFRRATE Index
248 – Malawi Kwacha	MWK	Single curve stripped
249 – MWK vs. USD Basis Swaps	MWK	USD/SOFRRATE Index
151 – MXN vs. USD Basis	MXN	USD/SOFRRATE Index
364 – USD Coll Curve (Implied)	MXN	Single curve stripped
83 – MXN (vs. 28D TIIE)	MXN	USD/SOFRRATE Index
576 – MXN CCS (vs. USD)	MXN	USD/SOFRRATE Index
583 – MXN TIIE–F RFR	MXN	USD/SOFRRATE Index
150 – MYR vs. USD Basis	MYR	USD/SOFRRATE Index
208 – Offsh. MYR CCS (vs. USD)	MYR	USD/SOFRRATE Index
209 – Offsh. MYR (vs. 3M KLIBOR)	MYR	Single curve stripped
267 – Onsh. MYR OIS	MYR	MYR/KLIB3M Index
39 – Onsh. MYR (vs. 3M KLIBOR)	MYR	MYR/KLIB3M Index
568 – MYR EIOPA UFR Curve	MYR	Single curve stripped
499 – MZN CCS (vs. USD)	MZN	USD/SOFRRATE Index
511 – NGN Offsh. CCS (vs. USD 3M)	NGN	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
134 – NOK vs. USD Basis	NOK	USD/SOFRRATE Index
312 – NOK (vs. 3M NIBOR)	NOK	NOK/NOWA Index
313 – NOK (vs. 6M NIBOR)	NOK	NOK/NOWA Index
350 – NOK (vs. 1M NIBOR)	NOK	NOK/NOWA Index
394 – NOK EIOPA UFR Curve	NOK	Single curve stripped
487 – NOK OIS	NOK	NOK/NOWA Index
136 – NZD vs. USD Basis	NZD	USD/SOFRRATE Index
15 – NZD (vs. 3M NFIX3FRA)	NZD	NZD/NZOCRS Index
198 – NZD OIS	NZD	NZD/NZOCRS Index
484 – NZD (vs. 1M NFIX1FRA)	NZD	NZD/NZOCRS Index
485 – NZD (vs. 6M NFIX6FRA)	NZD	NZD/NZOCRS Index
538 – OMR Onsh. CCS (vs. USD) w/ FX Fwds	OMR	USD/SOFRRATE Index
374 – PEN (vs. USD 6M)	PEN	USD/SOFRRATE Index
65 – Onsh. PHP CCS (vs. USD)	PHP	USD/SOFRRATE Index
66 – Offsh. PHP CCS (vs. USD)	PHP	USD/SOFRRATE Index
81 – Onsh. PHP (vs. 3M PHIREF)	PHP	Single curve stripped
160 – PKR (vs. 6M KIBOR)	PKR	Single curve stripped

Curve ID	Ccy	Collateral Ccy/Int Rate
557 – PKR Offsh. CCS (vs. USD)	PKR	USD/SOFRRATE Index
570 – Onsh. PKR CCS (vs. USD)	PKR	USD/SOFRRATE Index
321 – PLN vs. EUR Basis	PLN	EUR/ESTRON Index
322 – PLN (vs. 3M WIBOR)	PLN	PLN/PZCFPLNI Index
323 – PLN (vs. 6M WIBOR)	PLN	PLN/PZCFPLNI Index
327 – PLN OIS	PLN	Single curve stripped
378 – PLN (vs. 1M WIBOR)	PLN	PLN/PZCFPLNI Index
587 – PLN OIS WIRON	PLN	PLN/PZCFPLNI Index
589 – PYG CCS (vs. USD)	PYG	USD/SOFRRATE Index
366 – QAR (vs. 3M QIBOR)	QAR	Single curve stripped
367 – Onsh. QAR vs. USD Basis	QAR	USD/SOFRRATE Index
562 – QAR Onsh. CCS (vs. USD)	QAR	USD/SOFRRATE Index
225 – RON (vs. 3M ROBOR)	RON	Single curve stripped
226 – RON vs. USD Basis	RON	USD/SOFRRATE Index
301 – RON vs. EUR Basis	RON	EUR/ESTRON Index
363 – RON (vs. EUR 3M)	RON	EUR/ESTRON Index
590 – RSD CCS (vs. USD)	RSD	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
179 – RUB (vs. 3M MosPrime)	RUB	USD/SOFRRATE Index
180 – RUB vs. USD Basis	RUB	USD/SOFRRATE Index
356 – RUB OIS	RUB	USD/SOFRRATE Index
513 – RUB (vs. 7D KEY RATE)	RUB	USD/SOFRRATE Index
534 – RUB CCS (vs. USD) w/ FX Fwds	RUB	USD/SOFRRATE Index
166 – SAR (vs. 3M SAIBOR)	SAR	USD/SOFRRATE Index
167 – SAR vs. USD Basis	SAR	USD/SOFRRATE Index
331 – SAR (vs. 1M SAIBOR)	SAR	USD/SOFRRATE Index
332 – SAR (vs. 6M SAIBOR)	SAR	USD/SOFRRATE Index
575 – SAR CCS (vs. USD)	SAR	USD/SOFRRATE Index
137 – SEK vs. USD Basis	SEK	USD/SOFRRATE Index
185 – SEK OIS	SEK	SEK/STIB1D Index
20 – SEK (vs. 3M STIBOR)	SEK	SEK/STIB1D Index
347 – SEK (vs. 1M STIBOR)	SEK	SEK/STIB1D Index
348 – SEK (vs. 6M STIBOR)	SEK	SEK/STIB1D Index
555 – SEK OIS SWESTR	SEK	SEK/STIB1D Index
341 – SGD (vs. 1M SOR)	SGD	Single curve stripped

Curve ID	Ccy	Collateral Ccy/Int Rate
342 – SGD (vs. 3M SOR)	SGD	Single curve stripped
44 – Onsh. SGD (vs. 6M SOR)	SGD	Single curve stripped
527 – SGD OIS SORA	SGD	SGD/SIBCSORA Index
565 – SGD EIOPA UFR Curve	SGD	Single curve stripped
71 – Onsh. SGD CCS (vs. USD)	SGD	USD/SOFRRATE Index
98 – SGD vs. USD Basis	SGD	USD/SOFRRATE Index
578 – Offsh. SGD vs. USD Basis	SGD	USD/SOFRRATE Index
146 – Onsh. THB OIS THOR	THB	THB/TTHORON Index
156 – Onsh. THB vs. USD Basis	THB	USD/SOFRRATE Index
172 – Onsh. THB (vs. 6M THBFIX)	THB	Single curve stripped
210 – Offsh. THB (vs. USD 6M)	THB	USD/SOFRRATE Index
211 – Offsh. THB (vs. 6M THBFIX)	THB	Single curve stripped
53 – Onsh. THB CCS (vs. USD)	THB	USD/SOFRRATE Index
552 – Offsh. THB OIS THOR	THB	Single curve stripped
569 – THB EIOPA UFR Curve	THB	Single curve stripped
496 – TJS CCS (vs. USD)	TJS	USD/SOFRRATE Index
164 – TRY (vs. 3M TRLIBOR)	TRY	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
165 – TRY vs. USD Basis	TRY	USD/SOFRRATE Index
522 – TRY OIS	TRY	USD/SOFRRATE Index
533 – TRY CCS (vs. USD) w/ FX Fwds	TRY	USD/SOFRRATE Index
155 – TWD vs. USD Basis	TWD	USD/SOFRRATE Index
203 – Offsh. TWD (vs. 3M TAIBOR)	USD	USD/SOFRRATE Index
386 – Onsh. TWD (vs. 3M TAIBOR)	TWD	Single curve stripped
41 – Onsh. TWD (vs. 3M TAIBIR)	TWD	Single curve stripped
472 – Offsh. TWD vs. USD Basis	TWD	USD/SOFRRATE Index
55 – Onsh. TWD CCS (vs. USD)	TWD	USD/SOFRRATE Index
56 – Offsh. TWD CCS (vs. USD)	TWD	USD/SOFRRATE Index
581 – TWD EIOPA UFR Curve	TWD	Single curve stripped
507 – TZS Onsh. CCS (vs. USD)	TZS	USD/SOFRRATE Index
553 – Offsh. UAH CCS (vs. USD) with FX Fwd	UAH	USD/SOFRRATE Index
577 – UDI CCS (vs MXN)	UDI	USD/SOFRRATE Index
509 – UGX Onsh. CCS (vs. USD)	UGX	USD/SOFRRATE Index
23 – USD (30/360, S/A vs. 3M LIBOR)	USD	USD/SOFRRATE Index
349 – USD (vs. 12M LIBOR)	USD	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
357 – USD MUNI %	USD	USD/SOFRRATE Index
389 – USD EIOPA UFR Curve	USD	Single curve stripped
42 – USD OIS	USD	USD/SOFRRATE Index
490 – USD SOFR (vs. FIXED RATE)	USD	USD/SOFRRATE Index
50 – USD (vs. 1M LIBOR)	USD	USD/SOFRRATE Index
51 – USD (vs. 6M LIBOR)	USD	USD/SOFRRATE Index
52 – USD (vs. T–BILL)	USD	USD/SOFRRATE Index
558 – USD 1M CME Term SOFR	USD	USD/SOFRRATE Index
559 – USD 3M CME Term SOFR	USD	USD/SOFRRATE Index
560 – USD 6M CME Term SOFR	USD	USD/SOFRRATE Index
561 – USD 12M CME Term SOFR	USD	USD/SOFRRATE Index
85 – USD (vs. FED FUNDS)	USD	USD/SOFRRATE Index
86 – USD (vs. PRIME)	USD	USD/SOFRRATE Index
87 – USD (vs. Comm Paper)	USD	USD/SOFRRATE Index
544 – UYI Offsh. CCS (vs. USD 3M)	UYI	USD/SOFRRATE Index
543 – UYU Offsh. CCS (vs. USD) w/ FX Fwds	UYU	USD/SOFRRATE Index
497 – UZS CCS (vs. USD)	UZS	USD/SOFRRATE Index

Curve ID	Ccy	Collateral Ccy/Int Rate
214 – VND ND CCS	VND	USD/SOFRRATE Index
252 – Franc BEAC	XAF	Single curve stripped
253 – XAF vs. USD Basis Swaps	XAF	USD/SOFRRATE Index
573 – XBT Bitcoin Curve	XBT	USD/SOFRRATE Index
582 – XET Ether Curve	XET	USD/SOFRRATE Index
500 – XOF CCS (vs. USD)	XOF	USD/SOFRRATE Index
18 – ZAR (vs. 3M JIBAR)	ZAR	Single curve stripped
477 – South Africa Deposit	ZAR	Single curve stripped
519 – ZAR JIBAR Linked Deposit Curve	ZAR	Single curve stripped
584 – ZAR OIS ZARONIA	ZAR	ZAR/ZARONIA Index
99 – ZAR vs. USD Basis	ZAR	USD/SOFRRATE Index
498 – ZMW Offsh. CCS (vs. USD)	ZMW	USD/SOFRRATE Index

Articles

The following article provides additional information about ICVS and related functionality.

Type	Title	Description
	Bloomberg Markets Strategies: Creating Custom Curves	A description of how to build curves that take into account the cost of funding when pricing interest–rate swaps.

White Papers

The following white papers provide additional information about ICVS and related functionality.

Type	Title	Description
	Building the Bloomberg Interest Rate Curve: Definitions and Methodology	Describes the process of building interest rate curves, including the instruments used to build the curve and methods for interpolation (curve–stripping).
	CSA Curves in Bloomberg	Describes the implementation of CSA curves on the Bloomberg Terminal®.
	Convexity Adjustment Calculation Interest Rate Futures	Discusses the definition and calculation of interest rate futures convexity used for ICVS curves.

Excel Integration

You can transfer data from ICVS to Microsoft® Excel in two ways. You can create Bloomberg API formulas to dynamically download interest rate curve data or export data directly from ICVS to Excel.

API Formulas

Curves Toolkit

The Bloomberg API formulas within the Curves Toolkit allow you to work with interest rate curves directly in Microsoft® Excel. You can download curves from ICVS (including both Bloomberg curves and the custom curves that you define), strip the curves using Bloomberg data or your own custom data, generate discount factors and zero coupon rates, interpolate within the stripped curves, and generate forward rates and matrices. The formula types within the toolkit include:

- **BCurve:** Downloads a Bloomberg or custom curve from ICVS. You can download current rates that update in real-time or historical rates, as well as control the pricing sources used for each component of the curve. For more information, click here.
- **BCurveStrip:** Strips a Bloomberg or custom curve and creates a curve object you can reference in other Curve Toolkit formulas to display rates, interpolate points, or generate forwards for the stripped curve. You can use market data from Bloomberg for the stripping or specify your own market rates. For more information, click here.
- **BView:** Displays the values contained in a stripped curve. For example, you can display all of the information contained within the curve object or specify specific information you want to see, such as discount factors or zero coupon bid rates. For more information, click here.

- **BCurveInt:** Allows you to interpolate points on the stripped curve for specific dates or terms. For more information, click here.
- **BCurveFwd:** Allows you to generate forward rates for the stripped curve. The formula accepts both date and term formats, allowing you to easily calculate a forward for a broken date starting swap or a recurring set of forward forwards (reset rates). For more information, click here.

For more information about the Curves Toolkit and live examples of the formulas, open the Curves Toolkit Tutorial spreadsheet.

Using Custom Curves

If you created your own saved curves in ICVS, you can create spreadsheets that, using Bloomberg API formulas (BDP or BDS), allow you to value multiple swap deals that you saved in the *Swap Manager* (SWPM) function with these curves. You can override the curves used in your saved deal with another Bloomberg or customized curve, including curves you have created yourself (USER) or curves shared within your firm (FIRM).

For more information on SWPM, see the SWPM Help Page.

To override a curve, you must use one of the following override fields in your API formula:

- REC_CURVE_NAME
- PAY_CURVE_NAME
- REC_FORECAST_CURVE_NAME
- PAY_FORECAST_CURVE_NAME

The syntax for specifying the curve is as follows:

- To override with a USER saved curve: USER:your_user_curve_name
- To override with a FIRM saved curve: FIRM:firm_curve_name
- To override with a Bloomberg default curve: BLP:bloomberg_default_curve_name

Note: The curve name and prefix are case-sensitive.

For example:

- =BDP("SL4K2XYC Corp", "SW_MARKET_VAL", "REC_CURVE_NAME=USER:MyCurve")
- =BDP("SL4K2XYC Corp", "SW_MARKET_VAL", "PAY_FORECAST_CURVE_NAME=BLP:USD Treasury Spread Curve")

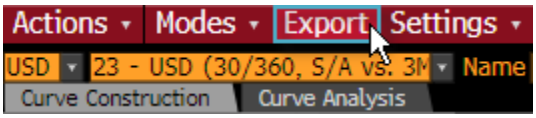
For more information on valuing saved swaps from SWPM in Microsoft® Excel, click here.

Exporting from ICVS

Exporting Data

You can export the curve data that appears on the *Curve Construction* tab to a Microsoft® Excel spreadsheet.

To export the data, from the toolbar, select **Export**.



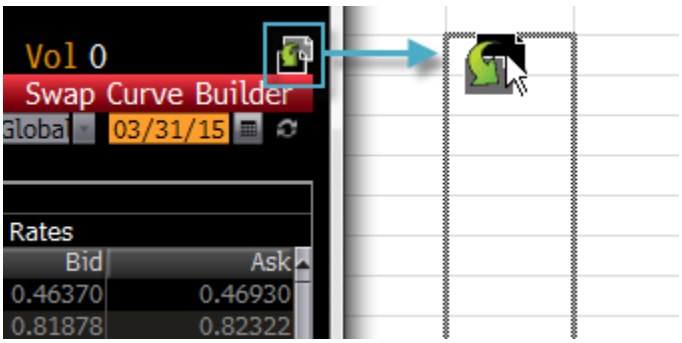
Note: Export functionality is only available on the *Curve Construction* tab.

The data appears in a new Excel spreadsheet.

Exporting Tickers

You can export the tickers that compose a curve to a Microsoft® Excel spreadsheet or Word document.

To export the tickers for the curve you are analyzing, drag the export icon into a spreadsheet or document.



The tickers from the curve appear in the spreadsheet or document.

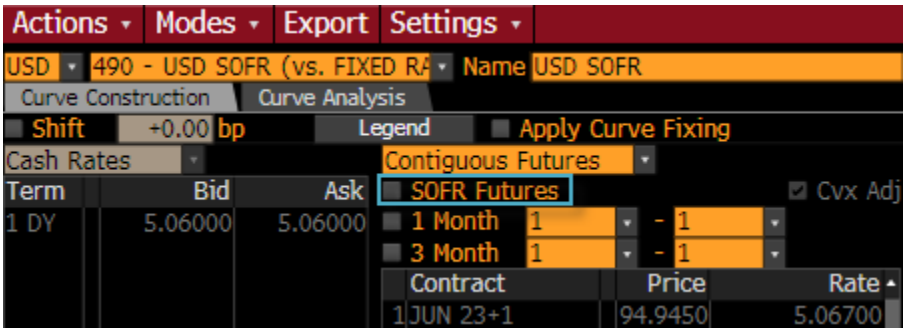
Importing from Excel

Dragging from Excel

You can customize your curve by exporting rates from ICVS, customizing the rates, then dragging the new rates from the Microsoft® Excel spreadsheet into the customize curve view.

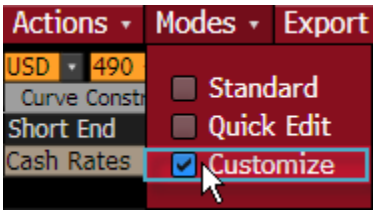
Steps:

1. In ICVS, select the curve you want to customize by following the steps in Choosing a Curve.
2. If there is a middle portion of the curve that displays futures, deselect the middle portion checkbox (e.g., *490 - USD SOFR (vs. FIXED RATE)*).



The middle rates become gray and are removed from the curve.

3. From the toolbar, select **Modes > Customize**.

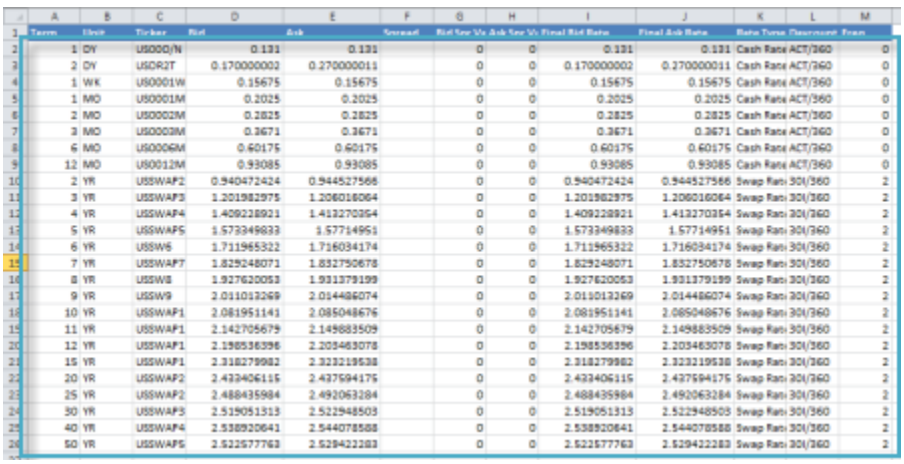


The customize curve view appears.

4. From the toolbar, select **Export**.

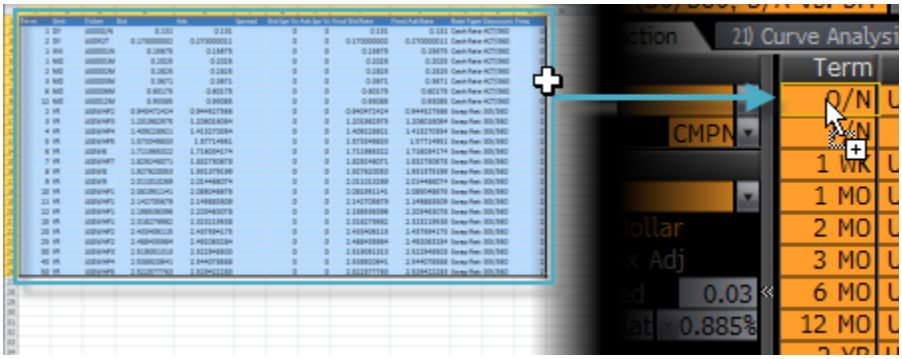
The curve rates appear in a new spreadsheet on your desktop.

5. In the spreadsheet, update the rates.



Note: When dragging rates from Excel into ICVS, if a row contains both a ticker and a custom rate, the ticker takes precedence and the market rate of the ticker appears in ICVS for the tenor. To use a custom rate instead, delete the ticker from the *Ticker* column in your spreadsheet.

6. Select ALL of the rows and columns (including the headers), then drag them into a cell on ICVS.



The customize curve view updates based on the rates you uploaded.

7. From the toolbar, select **Modes > Standard**.

The main ICVS view appears.

8. Save your curve changes:

- To save your changes to a curve you created, from the toolbar, select **Actions > Save**.
The changes save.

- To save your changes as a new curve, from the toolbar, select **Actions > Save As**. For more information, see Saving Curves.

Curve Customization

The following topics explain how to customize the UFR, Cupom Cambial, JSCC, CSA, Forward Basis, Cross Currency Basis, and Basis with FX Forwards curves.

Cupom Cambial Curves

The Cupom Cambial represents the local onshore USD interest rate within Brazil and is one of the most important derivatives instruments in the Brazilian financial market. Because it is determined based on the Brazilian financial markets, it may be different than existing USD rates found outside of Brazil. The Cupom Cambial rate for a given maturity is the spread between the local BRL interest rate, as measured from onshore CDI rate, and the local USD/BRL exchange rate variation.

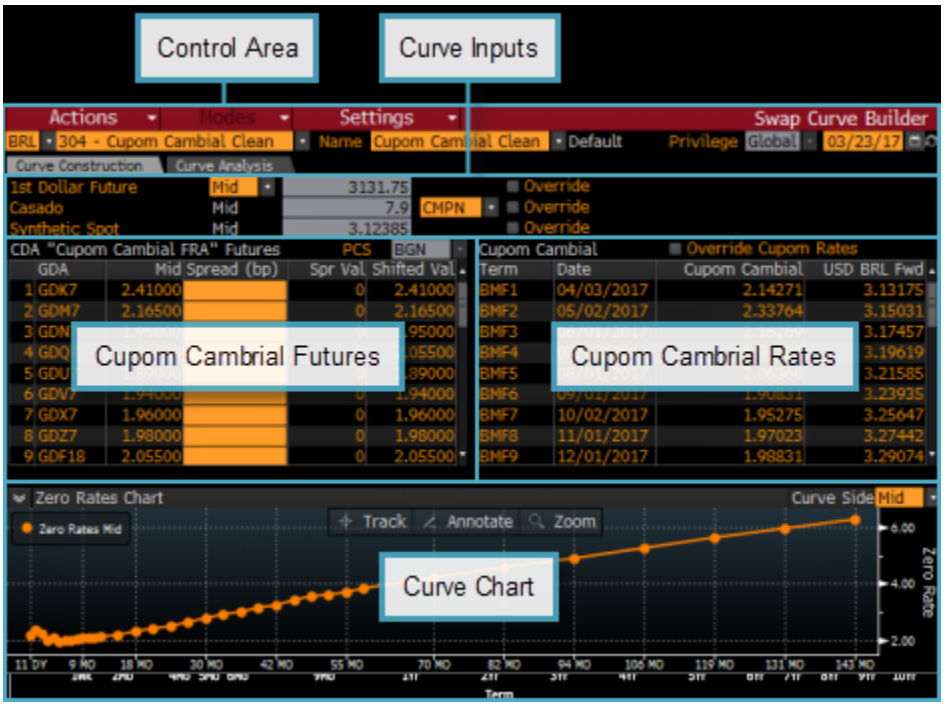
You can display and analyze the curves for Cupom Cambial contracts and other Brazilian non-deliverable cross-currency swaps. The Cupom Cambial curve is built with BM&F BOVESPA tenors. Each tenor expires on the first business day of each month.

The Cupom Cambial curve represents the term structure of Cupom Cambial contracts. Future cash flows in local USD are discounted by the difference between the local BRL interest rate and changes in the USD/BRL exchange rate. The screen displays the implicit value of the (local) USD/BRL FX forward outright for each Cupom Cambial term. The GDA <Crncy> contracts (Cupom Cambial FRA futures) are the market inputs used to calculate the Cupom Cambial zero rates (local USD interest rates). GDA <Crncy> is traded like a futures contract on the BM&F BOVESPA exchange.

There are two types of Cupom Cambial curves (both are zero coupon): Clean and Dirty.

- **Cupom Cambial Clean (Curve 304):** Uses the Synthetic Spot for today's value of the USD/BRL exchange rate in the calculation of the Cupom Cambial interest rate. Unlike other countries, in Brazil, the most liquid FX instrument is the USD/BRL Future, which is the second most traded future in the BVMF exchange. For that reason, the Synthetic Spot uses the most liquid USD/BRL Future contract (usually the closest contract to expire), and computes the spot FX rate using the Casado (USD/BRL Future Contract – USDBRL Spot). For information on how the instruments used in the curve roll, see Brazil Futures Roll.
- **Cupom Cambial Dirty (Curve 305):** Uses PTAX for the USD/BRL Spot exchange rate in the calculation of the Cupom Cambial interest rate. When viewing a Cupom Cambial Dirty curve during the Brazilian trading hours, the curve can have very high or low values, depending on the direction that the USD/BRL Spot has moved that day since the prior day's close.

When you select a Cupom Cambial curve from the initial ICVS menu, the screen is divided into a control area and four sections. You can customize the market instruments used to construct the curve in the curve inputs section. The FRA futures rates based on your inputs appear in the Cupom Cambrial futures section, while the calculated curve rates appear in the Cupom Cambial rates section. The curve chart at the bottom of the screen visualizes the Cupom Cambial rates.



Note: The image above displays curve 304 (the Cupom Cambial Clean curve).

- **Control Area:** Select the curve type and name you want to analyze. You can also display an additional tab of data, the *Curve Analysis* tab, which lets you investigate the zero and forward rates of the curve.
  On the *Curve Analysis* tab, the *Stripped Curve* sub-tab displays the curve's zero rates (spot rates) and discount factors after stripping (or "bootstrapping") the curve. The *Forward Analysis* sub-tab calculates projected forward rates for the curve between two dates in the future, using standard gap analysis. The *Curve Horizon* sub-tab projects the entire curve up to fifty years in the future, by tenor. For more information on these tabs, see Stripped Curve, Forward Analysis, and Curve Horizon.

- **Curve Inputs:** Allows you to customize the market instruments used to calculate the first Cupom Cambial rate and the FX spot rate. You can override the default values in the 1st Dollar Future, Casado, and/or Synt. Spot fields by selecting the

corresponding *Override* option, then updating the adjacent field. For curve 305 (Cupom Cambial Dirty), you can override the PTAX rate.

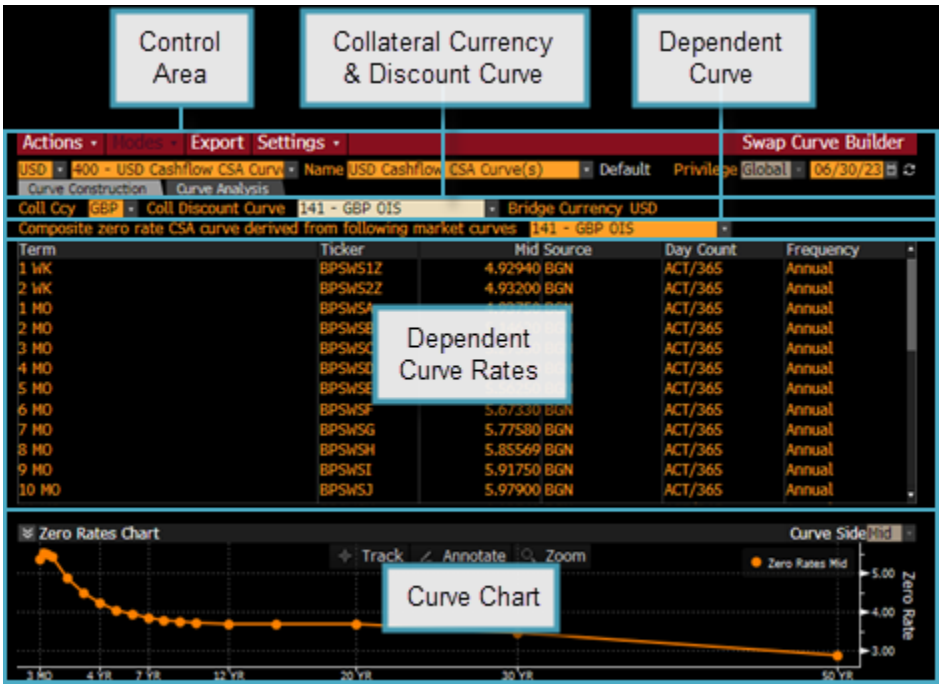
- **Cupom Cambial Futures:** Displays the Cupom Cambial FRA futures used to build the curve. You can select the pricing contributor providing the rates and shift points in the curve by adding a spread (in basis points) to each tenor.
- **Cupom Cambial Rates:** Displays the curve outputs, i.e., the Cupom Cambial rates and FX forwards. You can override these calculated rates by selecting the *Override Cupom Rates* option and entering your own custom values.
- **Curve Chart:** Provides a illustration of the rates from the *Cupom Cambial* rates section.

CSA Curves

The Bloomberg Terminal® offers credit support annex (CSA) cashflow curves, which allow you to discount future cashflows based on the rate of return earned on the collateral currency specified in the CSA (transformed into the relevant cashflow currency). When you select a CSA curve from the initial ICVS menu, the screen that appears varies from the standard version of ICVS.

Many OTC derivative transactions are traded under a Credit Support Annex (CSA), which explicitly stipulates the terms for posting collateral. Bloomberg's CSA curves are used to price collateralized interest rate (IR) swaps. These CSA curves are calibrated to cross-currency basis swap quotes via standard bootstrapping under the assumption that the implied FX forwards should be invariant to the currency in which the collateral is posted. For more information on CSA curves, see the document CSA Curves: Pricing Collateralized Interest Rate Swaps Under a CSA.

The CSA curve screen is divided into a control area and four sections. You can select the collateral currency, collateral discount curve, and dependent curve used to derive the composite rate CSA curve, then analyze the curve rates in both the dependent curve rates table and curve chart.



- **Control Area:** Select the curve type and name you want to analyze. You can also display an additional tab of data, the *Curve Analysis* tab, which lets you investigate the zero and forward rates of the curve.
  On the *Curve Analysis* tab, the *Stripped Curve* sub-tab displays the curve's zero rates (spot rates) and discount factors after stripping (or "bootstrapping") the curve. The *Forward Analysis* sub-tab calculates projected forward rates for the curve between two dates in the future, using standard gap analysis. The *Curve Horizon* sub-tab projects the entire curve up to fifty years in the future, by tenor. For more information on these tabs, see Stripped Curve, Forward Analysis, and Curve Horizon.
- **Collateral Currency & Discount Curve:** Select the Coll Ccy and Coll Discount Curve of the collateral under the CSA for the curve.
- **Dependent Curve:** Select the dependent curve to display its rates.
- **Dependent Curve Rates:** Get transparency into the market data used to construct the CSA curve, including the tickers used to construct the curve.
- **Curve Chart:** Display the resulting zero rates from the CSA curve.

Single Currency Basis Curves

You can display and analyze the curves for single currency basis curves (e.g., curve 484), which allow you to analyze the relationship of a single basis or compare two different basis in the forward space. Basis curves are comprised of single currency basis swaps, which are a floating-floating interest rate swap. For example, the single currency basis swap between one month IBOR and three month IBOR.

The *Curve Construction* tab appears as follows for single currency basis curves:

- **Control Area:** Customize your curve, manage your curve data, and update your default settings. For more information, see Control Area.

- **Curve Settings:** Display the dependant curve on which the basis curve is based and select the pricing source for the basis rates.
- **Curve Information:** Identify the curve construction information for the selected basis curve, so you can see the maturity or tenor of the rate. The *Pay*, *Receive*, and *Mid* columns are shown in basis points. The basis curve is made up of basis instruments and the spread is what is quoted. You can select the terms/rates you want to include in the curve and deselect the rates you want to exclude. Terms/rates that appear in amber are included in the curve. Inactive terms/rates that appear in gray are not included in the curve.
- **IBOR and Basis Adjusted Swap:** Examine the derived IBOR swap rates based off of the dependant curve and the swap rates after the basis spread is applied.
- **Curve Chart:** Visualize the full curve based on your selections, so you can gain insight into the curve's shape and predict future interest rates. You can select the market side you want to display for the curve. For information on updating the curve chart, see Updating the Chart.

For a description of the *Curve Analysis* tab, see Curve Analysis.

Cross Currency Basis Curves

You can display and analyze the curves for cross currency basis curves (e.g., curve 92), which allow you to analyze the relationship of a single basis or compare two different basis in the forward space. Basis curves are comprised of cross currency basis swaps, which are a floating-floating interest rate swap. For example, the cross currency basis swap is between three month EURIBOR and one month IBOR.

The *Curve Construction* tab appears as follows for cross currency basis curves:

- **Control Area:** Customize your curve, manage your curve data, and update your default settings. For more information, see Control Area.

- **Curve Settings:** Display the dependant curve on which the basis curve is based and select the pricing source for the basis rates.
- **Curve Information:** Examine the curve construction information for the selected curve, so you can see the maturity or tenor of the rate. You can select the terms/rates you want to include in the curve and deselect the rates you want to exclude. Terms/rates that appear in amber are included in the curve. Inactive terms/rates that appear in gray are not included in the curve.
- **Curve Chart:** Visualize the full curve based on your selections, so you can gain insight into the curve's shape and predict future interest rates.. You can select the market side you want to display for the curve. For information on updating the curve chart, see Updating the Chart.

For a description of the *Curve Analysis* tab, see Curve Analysis.

Definitions

Term	Definition
1st Dollar Future	Appears for Cupom Cambial curves. The first USD Dollar FX future traded on the Brazilian Mercantile and Futures Exchange (BM&F BOVESPA). Due to liquidity concerns, on the last two business day of the month, this field instead displays the *2nd Dollar Future*.
2nd Dollar Future	Appears on the last two business day of the month for Cupom Cambial curves. The second dollar future traded on the Brazilian Mercantile and Futures Exchange (BM&F BOVESPA). This field appears instead of *1st Dollar Future* due to liquidity concerns.
Add Roll Over	Appears for the Cupom Cambial curve. You can select this option to add the difference between the first and second dollar futures to the Casado.
Ask	The ask rate for the curve point/ticker.
Ask Rate	The ask rate for the curve point/ticker.
Ask Spr	The spread for the ask rate.
Bid	The bid rate for the curve point/ticker.
Bid Rate	The bid rate for the curve point/ticker.
Bid Spr	The spread for the bid rate.
bp	The number of basis points shifted when you apply a global spread.
Casado	The OTC–contributed points used to calculate the BRL synthetic spot rate (also known as the "dollar pronto" and CASADO <Crncy>). The value decreases as the first dollar future expiration approaches.
Cash Rates	The interest rate at which banks can borrow funds from other banks in the market.
Change	The bps change from the previous business day's close.
Coll Ccy	The currency of the collateral for the CSA curve. For more information on country/currency codes, see the CURR Help Page.
Coll Discount Curve	Allows you to choose the collateral discount curve for the selected Coll Ccy (collateral currency). Many OTC derivative transactions are traded under a Credit Support Annex (CSA), which explicitly stipulates the terms for posting collateral. For more information on CSA curves, see the document CSA Curves: Pricing Collateralized Interest Rate Swaps Under a CSA.
Contract	The specific futures or forward rate agreement (FRA) contract. You can position your mouse over a contract name to display the contract's ticker. Contracts/terms/rates that appear in amber are included in the curve. Inactive contracts/terms/rates that appear in gray are not included in the curve.
Contributor	Appears for deposit/cash rates, FRAs, Cupom Cambials, and swap rates only. Allows you to select the market data source for the rates (e.g., CMPN – Bloomberg Composite NY).
Convergence Term	Applies to UFR curves. The maturity of the curve where the rate falls within the Convergence Tolerance of the Ultimate Forward Rate.

Term	Definition
Convergence Tolerance	Applies to UFR curves. The maximum spread (in basis points) allowed between the curve and the Ultimate Forward Rate at the Convergence Term. The default value is one basis point, as specified by Solvency II regulations.
Country	The country associated with the curve.
Credit Adj Spread	Applies to UFR curves. A spread (in basis points) that reflects the impact of credit risk in the 6–month swap rates used to construct the curve. It is applied as a parallel downward shift of the market rates for maturities up to the Last Liquid Point. The default value is ten basis points, as specified by Solvency II regulations.
CSA	The abbreviation of "Credit Support Annex," which provides credit protection by setting forth the rules governing the mutual posting of collateral. CSAs are used in documenting collateral arrangements between two parties that trade privately negotiated (over–the–counter) derivative securities. The trade is documented under a standard contract called a master agreement, developed by the International Swaps and Derivatives Association (ISDA). The two parties must sign the ISDA master agreement and execute a credit support annex before they trade derivatives with each other.
Cupom Cambial	The local onshore US Dollar interest rate within Brazil. Because it is determined based on the Brazilian financial markets, it may be different than existing USD rates found outside of Brazil. The Cupom Cambial rate for a given maturity is the spread between the local BRL interest rate, as measured from onshore CDI rate, and the local USD/BRL exchange rate variation.
Cupom Cambial FRA Futures	The Cupom Cambial can be traded as a future contract (GDA <Crncy>), as well as an OTC swap contract. Prices are quoted as an interest rate expressed as an annual rate on a 360 day basis. Notional value for the futures contract are 100,000 BRL and settled in BRL. The futures contracts are used in the construction of the Cupom Cambial curves that are used to price the OTC swaps.
Currency	The currency used in the curve. For more information on country/currency codes, see the CURR Help Page.
Curve	The name of the curve corresponding to the curve number.
Curve #	The curve name and number of the curve you are analyzing.
Curve Number	The curve ID that corresponds to the country and asset type.
Curve Side	The market side of the associated rates. Options include: Bid, Mid, Ask.
Cvx Adj	As an option, allows you to apply a convexity adjustment to the futures contracts, so that adjusted futures rates remain consistent with forward rates. As a column header, indicates the convexity adjustment used for the contract. The value is used to calculate the equivalent yield (rate) of the contract, which is included as a tenor in the middle portion of the curve. The equivalent yield of the contract is calculated as 100 – price – convexity adjustment. For information on how the convexity adjustment is calculated, see the document IR Futures Convexity. This field and column appears only when you choose *Serial Futures* or *Contiguous Futures* from the *Middle* drop–down menu.
Date	On the *Stripped Curve* sub–tab, the maturity of the tenor. On the *Forward Analysis* sub–tab, the date from which the forward rate is calculated.
Day Type	The day count method.

Term	Definition
Daycount	The date count convention used to determine the frequency of the rate.
Deposit Rates	The interest rate at which banks charge or pay for short term lending.
Discount	The discount factor calculated from the curve stripping process, which you can use to simplify present value calculations (i.e., determining the value to you at the present of the same amount of money at a certain point in the future). For more information on the curve stripping process, see the document Building the Bloomberg Interest Rate Curve: Definitions and Methodology.
Display Spread Values	Allows you to display the amounts added to the bid and ask rates, based on the value you enter in the Spr (bp) field.
Final Ask	The ask rate with the Spr (bp) applied.
Final Bid	The bid rate with the Spr (bp) applied.
Forward Rate	The forward rates, which are calculated from the zero rates with standard gap analysis.
Freq	The frequency/compounding frequency convention for the rate.
GDA	Appears for the Cupom Cambial curve. Displays the futures trades in Brazilian Mercantile and Futures Exchange (BM&F).
Interpolation	Allows you to select the method used by the curve stripping process to calculate missing points on the curve. For more information on the options that appear, see Interpolation.
Interval	The frequency of observations, in months or years.
Last	The most recent price quoted for the rate.
Last Liquid Point	Applies to UFR curves. The longest duration on the 6–month swap curve (which is used to construct the UFR curve) for which there is reliable data. This is the point after which data is extrapolated using the Smith-Wilson method to extend the long end of the UFR curve and better match the duration of insurance liabilities. By default, the following last liquid points appear for each currency: EUR – 20 years, GBP – 50 years, and USD – 30 years.
Legend	Allows you to display the meanings of the text colors.
Market Rate	The par rate of each point in the curve.
Mean Rev. Speed	The factor of the Hull–White model used to calculate the convexity adjustment. This field appears only when you choose either *Contiguous Futures* or *Serial Futures* from the *Middle* drop–down menu and select Cvx Adj.
Middle	Allows you to select the type of instruments you want to use for the middle of the curve. Options may include: *Contiguous FRAs*, *Contiguous Futures*, *Serial FRAs*, and *Serial Futures*. When you choose a futures option, you must specify the convexity adjustment to convert the cash type futures rates to forward rates. Do not let two serial FRAs overlap each other.
Name	The name of the Bloomberg, custom, or shared curve you are analyzing. When the default curve is selected, "Default" appears in white to the right of the field.
OIS Dual Curve Stripping	Allows you to apply OIS discounting to the curve. For more: OIS Discounting .

Term	Definition
Override	The options that appear for the Cupom Cambial Clean curve. These options allow you to modify the market data available for the 1st Dollar Future or the Casado. When you select *Override* for the Synt. Spot, the *Casado* is disabled, which leaves only the *1st Dollar Future* for other parts of the calculation.
PCS	Appears for deposit/cash rates, FRAs, Cupom Cambials, and swap rates only. Allows you to select the market data source for the rates (e.g., CMPN – Bloomberg Composite NY).
Price	Appears when futures are used for the middle portion of the curve. The price of the futures contract.
Privilege	Allows you to specify the user (private) or firm (shared) privilege level of a custom curve. The *Privilege* field is inactive if the current curve is a Bloomberg curve.
PTAX	The official exchange rate released by the Brazilian Central Bank at the end of every business day (BZLABZLA <Index>).
Rate	Appears when futures are used to build the middle portion of the curve. The yield of the futures contract, which is used as the rate in the curve. When Cvx Adj is not selected, the yield is calculated as 100 – price. When *Cvx Adj* is selected, the yield is calculated as 100 – price – *Cvx Adj*. For information on how the convexity adjustment is calculated, see the document IR Futures Convexity.
SCR Shift	Applies to UFR curves. The Solvency Capital Requirement (SCR) is the amount of funds that insurance and reinsurance undertakings are required to hold in the European Union, as per Solvency II requirements. By selecting this option, you can add or subtract a value to/from each point in the zero rate curve (in basis points) that reflects the SCR. **Note:** For the basis point values of the shift(s) applied to the zero rate curve, you can click the adjacent *Details* button.
Settle Date	The date for Zero Rate and Discount Factor effective date calculations. The default value will be equal to the Curve Date.
Shift	Allows you to enter a shift in basis points (bps) to apply a spread to the whole curve. You can enter the appropriate shift amount in basis points in the *bp* field to the right of *Shift*.
Shift (bp)	Allows you to enter a shift in basis points (bps) to apply to the market rate of the specific point in the curve. The market rate + shift appears in the Shifted Rate column.
Shifted Ask	The shift/spread ask rate for the entire curve, expressed in basis points.
Shifted Bid	The shift/spread bid rate for the entire curve, expressed in basis points.
Shifted Rate	The new shifted rate after adding the Shift (bp) to the market rate.
Short End	Allows you to select the type of instruments you want to use for the short end of the swap curve. Options include Cash Rates and Deposit Rates.

Term	Definition
Smith-Wilson	The method of interpolation for UFR curves. Smith–Wilson is a macroeconomic interpolation method. A spot (i.e., zero coupon) rate curve is fitted to observed prices of financial instruments, with the macroeconomic ultimate long term forward rate as an input parameter. The use of this interpolation method for building UFR curves is specified by Solvency II regulations.
Spot FRAs	If selected, indicates that spot FRAs are in your swap curve.
Spot Rate	The compounded interest rate calculated from the discount factor using the same day count and pay frequency as the swap rates on the curve.
Spot Rates	The compounded interest rate calculated from the discount factor using the same day count and pay frequency as the swap rates on the curve.
Spr (bp)	Allows you to enter a spread to apply to the point in the curve. For more information, see Customizing Instruments.
Spread	Appears on the *Bulk Update of Spreads* window. Allows you to apply a global spread to a section of the curve or the entire curve.
Synt. Spot	Appears for Cupom Cambial curves. The BRL synthetic spot, which is calculated as (1st Dollar Future – Casado) / 1000. This is standard practice in the Brazilian local market.
Tenor	The amount of time you want to look into the future for each forward rate, in months or years.
Term	The maturity or tenor of the rate. Terms/rates that appear in amber are included in the curve. Inactive terms/rates that appear in gray are not included in the curve. **Note:** Cupom Cambial curves are specifically for the Brazilian local market and are calculated in Brazilian Mercantile and Futures Exchange (BM&F) "head-of-the month" terms. Each BM&F term in the column corresponds to the first business day of each coming month, according to the BM&F calendar.
Ticker	The ticker symbol, followed by the corresponding data source, if applicable, for the curve point.
Time	The time of the most recent update to the real–time data.
Ultimate Forward Rate	Applies to UFR curves. The rate to which the curve should converge. It is driven by the long term average of short term interest rates and long term expected inflation. The current Solvency II regulations set a UFR of 3.2% for CHF and JPY, 5.2% for BRL, INR, MXN, TRY, and ZAR, and for 4.2% for every other economy (which is split as 2.2% long term growth and 2% inflation).
Up To	The point in time to which forward rates appear.
Update Segment	Appears on the *Bulk Update of Spreads* window. Allows you to select the segment that applies a global spread to a section of the curve or the entire curve.
USD Dollar FX Future	The exchange rate of Brazilian BRL per US Dollar for cash delivery, according to the provisions of the National Monetary Council (UCA <Crncy>). Price quotation in Brazilian BRL is per one thousand Dollars to three decimal places. From the March/99 contract on, the contract size is $50,000.

Term	Definition
USDBRL Fwd	Appears for Cupom Cambial curves. The onshore forward USD/BRL FX rates. These forward rates are calculated in Brazilian Mercantile and Futures Exchange (BM&F BOVESPA) terms. When you select User Rates mode, you can enter your own Cupom Cambial rates and recalculate the USD/BRL onshore forwards based on the selected rates.
VA Country	Applies to UFR curves. Allows you to select the country for which you want to calculate the UFR curve. The country you select determines the default value that appears in the Volatility Adj Spread field. The default *Volatility Adj Spread* value reflects country–specific risk and is determined by Solvency II regulations.
VA Shift	Applies to UFR curves, when you select a country from the VA Country drop–down menu on the *Curve Construction* tab. Allows you to apply the Volatility Adj Spread on the *Curve Construction* tab to the zero rate curve.
Volatility Adj Spread	Applies to UFR curves. An adjustment (in basis points) to the relevant risk–free interest rate term structure that reflects country–specific risk. The default value that appears depends on your selection from the VA Country drop–down menu and is based on Solvency II regulations.
Zero Rate	The interest rate that would be earned on a bond or swap that has no coupon payments (zero coupon) and is presented based on a specific day count convention and compound frequency. For more information on the curve stripping process used to calculate the zero rates, see the document Building the Bloomberg Interest Rate Curve: Definitions and Methodology.

Frequently Asked Questions

Get answers to the most commonly asked questions.

What is the Bloomberg curve?

The Bloomberg curve reflects a robust and reliable configuration for each interest rate curve.

Can I change the interpolation method for a curve?

Yes, you can change the interpolation method for curves on the *Swap Curve Settings* (SWDF) function.

To change the interpolation method, from SWDF <GO>:

1. From the toolbar, click the Settings button.
2. In the *Interpolation Method* section, select the method you want to use. For more on the methods, see the SWDF Help Page: Interpolation Methods.
3. From the toolbar, click the Save button.

Note: The method you choose applies to curves across all currencies (except BRL).

On ICVS, why don't the spot rates match for all rates?

On the *Swap Curve Builder* (ICVS) function, the spot rates depend on which sub-tab of the *Curve Analysis* tab you are looking at:

- On the *Stripped Curve* sub-tab, the cash rates are simple spot rates.
- On the *Forward Analysis* sub-tab, compounded spot rates appear for all types of rates, including cash rates.

What function can I use to bootstrap a swap curve?

You can bootstrap a swap curve and see the resulting zero rates on the *Swap Curve Builder* (ICVS) function.

To bootstrap a curve, on ICVS <GO>:

1. Select the curve you want to bootstrap. For example, select curve 490 - USD SOFR (vs. FIXED RATE).
2. On the screen that appears, select the Curve Analysis tab, then select the Forward Analysis sub-tab. The values in the *Zero Rate* column are the bootstrapped curve rates.

How do I find the projected 1M IBOR resets for every month end date over the next five years?

You can find IBOR forwards on the *Swap Curve Builder* (ICVS) function.

To see the monthly resets, on ICVS <GO>:

1. Select a curve. In this example, to find the projected 1M IBOR resets, select curve 201 - EUR (vs. 3M EURIBOR).
2. Select the Curve Analysis tab.
3. Select the Forward Analysis sub-tab.
4. In the *Interval* fields, specify the frequency of resets. In this case, enter 1 M (for one month).
5. In the *Tenor* fields, specify the tenor of IBOR for which you want to you want to see the resets. In this case, enter 1 M (for one month).
6. Press <GO>.

The *Forward Rate* column shows you the resets.

How do I download the USD swap curve to a spreadsheet?

You can download a USD swap curve (e.g., USD SOFR (vs. FIXED RATE)) using a BCurve formula in a Microsoft® Excel spreadsheet.

The basic syntax for a BCurve formula is:

=BCurve("Curve ID", [optional parameters]) where "Curve ID" is the curve number (e.g., s490) or curve profile (e.g., USD.3m).

For example, to download the curve USD SOFR (vs. FIXED RATE) with rates that update in real time: =BCurve("s490")

To download a static snapshot of the curve that updates every time you refresh your spreadsheet: =BCurve("s490", "CurveDate=Today")

For more: DAPI Help Page > BCurve (Curve Data).

Take the next step.

For additional information,
press the <HELP> key twice
on the Bloomberg Terminal®.

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