A background graphic featuring a teal gradient with a subtle grid pattern. In the upper left, there are silhouettes of several people standing in a row. A large, semi-transparent globe of the Earth is positioned in the lower left foreground, showing continents in dark green against a lighter blue ocean.

How to Construct Curves in FinPricing?

FinPricing

The term structure of interest rates, also known as yield curve, is defined as the relationship between the yield-to-maturity on a zero coupon bond and the bond's maturity. Zero yield curves play an essential role in the valuation of all financial products.

The current methodology in capital markets for marking to market securities and derivatives is to estimate and discount future cash flows using rates derived from the appropriate term structure. The yield term structure is increasingly used as the foundation for deriving relative term structures and as a benchmark for pricing and hedging.

Summary

- How to Construct Yield Curve in FinPricing?
- How to Construct FX Forward Curve in FinPricing?

How to Construct Yield Curve?

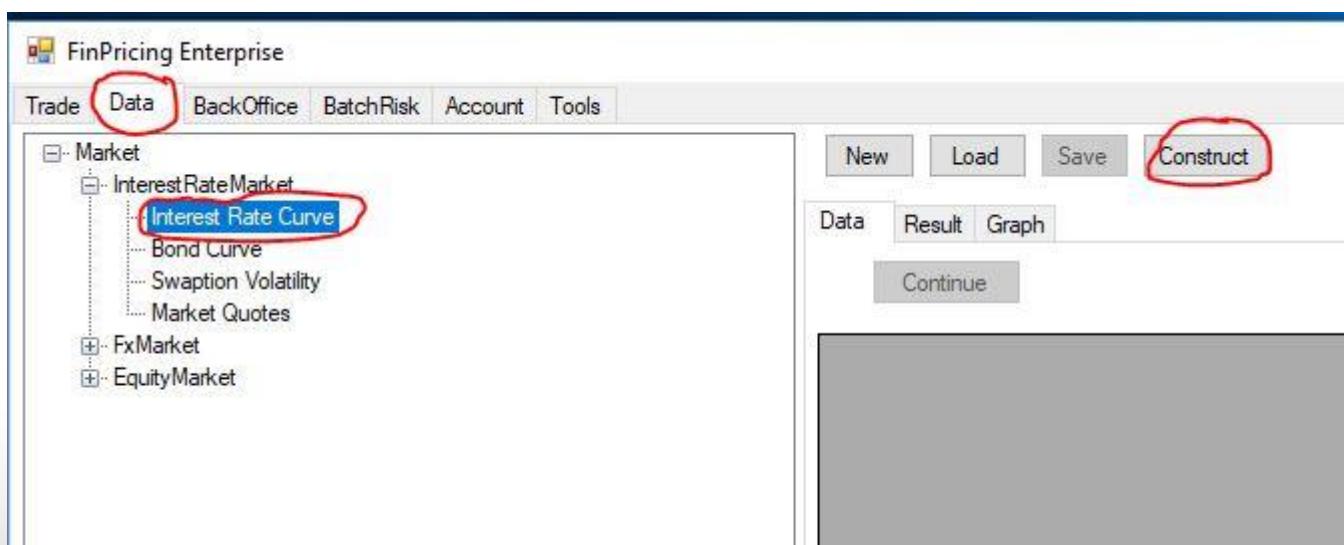
- Yield curves can be derived from government bonds or LIBOR/swap instruments. The LIBOR/swap term structure offers several advantages over government curves, and is a robust tool for pricing and hedging financial products. Correlations among governments and other fixed-income products have declined, making the swap term structure a more efficient hedging and pricing vehicle.
- With the supply of government issues declining, LIBOR/swap markets are more liquid and efficient than government debt markets. The term structure of zero rates is constructed from a set of market quotes of some liquid market instruments such as short term cash instruments, middle term futures or forward rate agreement (FRA), long term swaps and spreads. LIBOR curves have become the funding curves in the market. Among them, the 3 month LIBOR curve is the base yield curve.

How to Construct Yield Curve? (Cont'd)

- Prior to the 2007 financial crisis, financial institutions performed valuation and risk management of any interest rate derivative on a given currency using a single-curve approach. This approach consisted of building a unique curve and using it for both discounting and forecasting cash flows. However, after the financial crisis, basis swap spreads were no longer negligible and the market was characterized by a sort of segmentation. Consequently, market practitioners started to use a new valuation approach referred to as multicurve approach, which is characterized by a unique discounting curve and multiple forecasting curves

How to Construct Yield Curve? (Cont'd)

- Click the Data tab at the top-left corner of the application. Then, expand Market -> InterestRateMarket -> Interest Rate Curve and click the Construct button.





How to Construct Yield Curve? (Cont'd)

- A selection template is displayed in the main window. Select Discounting Approach (e.g., OIS), Curve Type (e.g., Base) and Basis Type (e.g., NA for base curve), fill Currency (e.g., USD), Curve Data (e.g., 2/8/2018) and then click the Continue button at the right of the row.

The screenshot shows the FinPricing Enterprise application window. The menu bar includes Trade, Data, BackOffice, BatchRisk, Account, and Tools. The main window has a tree view on the left under the Market node, listing InterestRateMarket, FxMarket, and EquityMarket. On the right, there are tabs for Data, Result, and Graph, with the Data tab selected. Below the tabs is a 'Continue' button. A table with 11 columns is displayed, with the first column labeled 'Column0' and the last column labeled 'Continue Button'. The first cell of the first row contains the placeholder text 'Please make selecti...'. The second cell contains 'OIS', the third 'USD', the fourth 'Base', the fifth 'M/d/yyyy', and the sixth 'NA'. All these cells are circled in red. The 'Continue' button at the end of the row is also circled in red.

Column0	Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Continue Button
Please make selecti...	OIS	USD	Base	M/d/yyyy	NA	Continue				
*										



How to Construct Yield Curve? (Cont'd)

- Based on your selection, the system knows what kind of curves needed. So it loads the data in the main window if they are available, otherwise it generates new curve templates in the main window for you to fill. If you fill new curves, you need to click the Save button to save them

The screenshot shows the FinPricing Enterprise application window. The menu bar includes Trade, Data, BackOffice, BatchRisk, Account, and Tools. The left sidebar shows a tree view with Market selected, which further branches into Interest Rate Market (Interest Rate Curve, Bond Curve, Swaption Volatility, Market Quotes) and FxMarket, EquityMarket.

The main area has tabs for Data, Result, and Graph. The Data tab is active, showing a table with two rows of headers. The first row is colored blue and contains "USD_3M" and "Base Curve". The second row is yellow and contains "Currency", "ValuationDate", "CurveName", "QuoteName", "InstrumentT...", "Term", "Value", "Currency", "ValuationDate", and "CurveName". Below these headers is a table of data rows. The first data row shows "USD", "02/08/2018", "USD_3M", "USD_STUB: ...", "Cash", "3/21/2018", "0.0171232", "USD", "02/08/2018", and "USD_OIS". The "Continue" button is highlighted with a red oval.

Column0	Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9
Currency	ValuationDate	CurveName	QuoteName	InstrumentT...	Term	Value	Currency	ValuationDate	CurveName
USD	02/08/2018	USD_3M	USD_STUB: ...	Cash	3/21/2018	0.0171232	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	03/16/2020	97.2826	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	03/18/2019	97.5445	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	03/19/2018	98.05	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	06/15/2020	97.257	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	06/17/2019	97.4659	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	06/18/2018	97.8551	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	09/14/2020	97.2374	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	09/16/2019	97.4076	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	09/17/2018	97.7353	USD	02/08/2018	USD_OIS
USD	02/08/2018	USD_3M	USD_STUB: ...	FUTURE	12/14/2020	97.1065	USD	02/08/2018	USD_OIS



How to Construct Yield Curve? (Cont'd)

- After filling/validating data, click the Continue button above the main window. FinPricing starts to construct the interest rate curve. The results are shown in the Result tab.

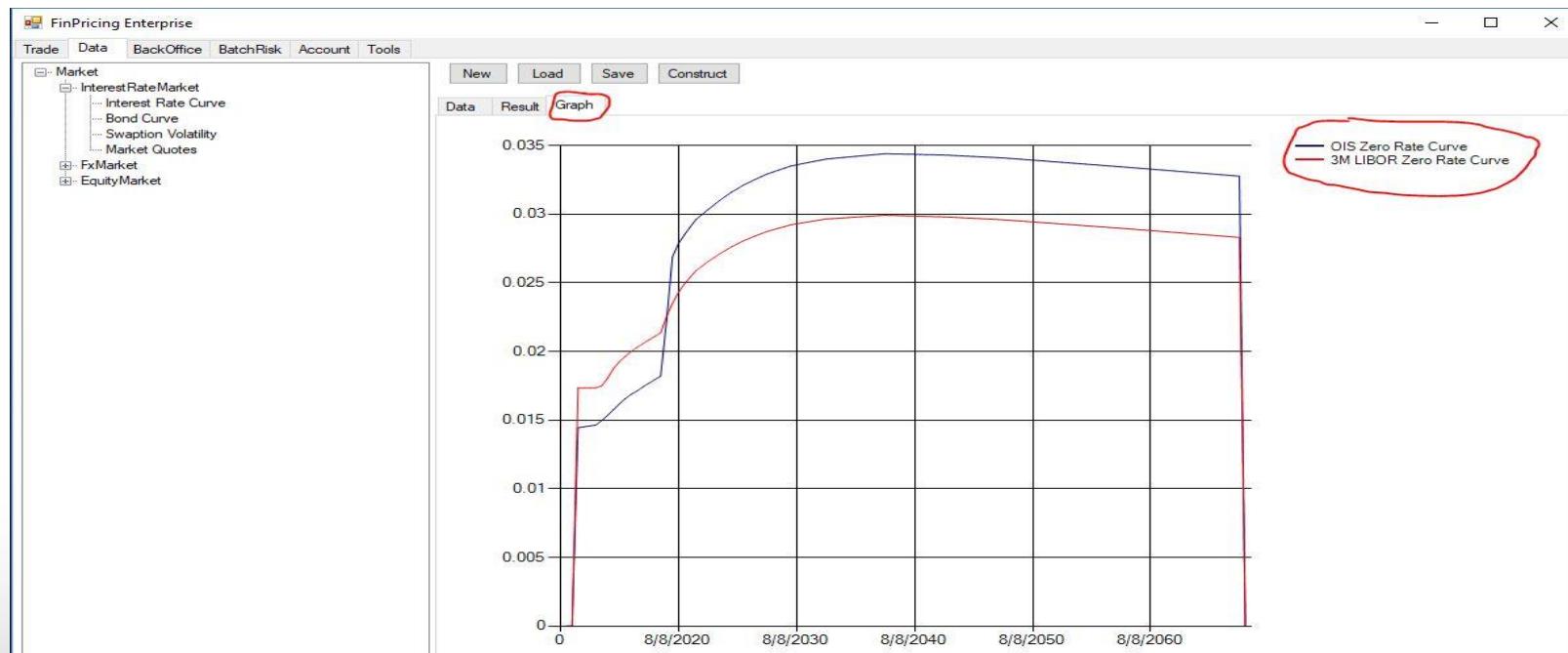
The screenshot shows the FinPricing Enterprise application window. The menu bar includes Trade, Data, BackOffice, BatchRisk, Account, and Tools. The left sidebar has a tree view with Market (selected), InterestRateMarket (selected), Interest Rate Curve, Bond Curve, Swaption Volatility, and Market Quotes. Below these are FxMarket and EquityMarket. The main area has tabs New, Load, Save, and Construct. The active tab is Result. A red circle highlights the Result tab. Below it is a Graph tab. A red box highlights the 'OIS Curve' row in a table. Another red box highlights the 'OIS Zero Rate Curve' and '3M LIBOR Zero Rate Curve' columns. The table data is as follows:

	Column1	Column2	Column3
▶	OIS Curve		
Date	OIS Zero Rate Curve	3M LIBOR Zero Rate Curve	
2/15/2018	0.0144446958649282	0.0173441159671608	
2/22/2018	0.014509035938584	0.0173441159671611	
3/1/2018	0.0145738182120647	0.0173441159671613	
3/8/2018	0.0146387110354979	0.0173441159671601	
4/8/2018	0.0149525775810282	0.0174924148582577	
5/8/2018	0.0153440659472915	0.0180432128620182	
6/8/2018	0.0157572797339464	0.0187486033483515	
7/8/2018	0.0161757489824201	0.0192557542693167	
8/8/2018	0.0165624313162406	0.0196316105318471	
9/8/2018	0.0168709438162761	0.0199930934728389	
10/8/2018	0.0171212056082124	0.0202920969366876	
11/8/2018	0.0174237974774616	0.0205708814810946	



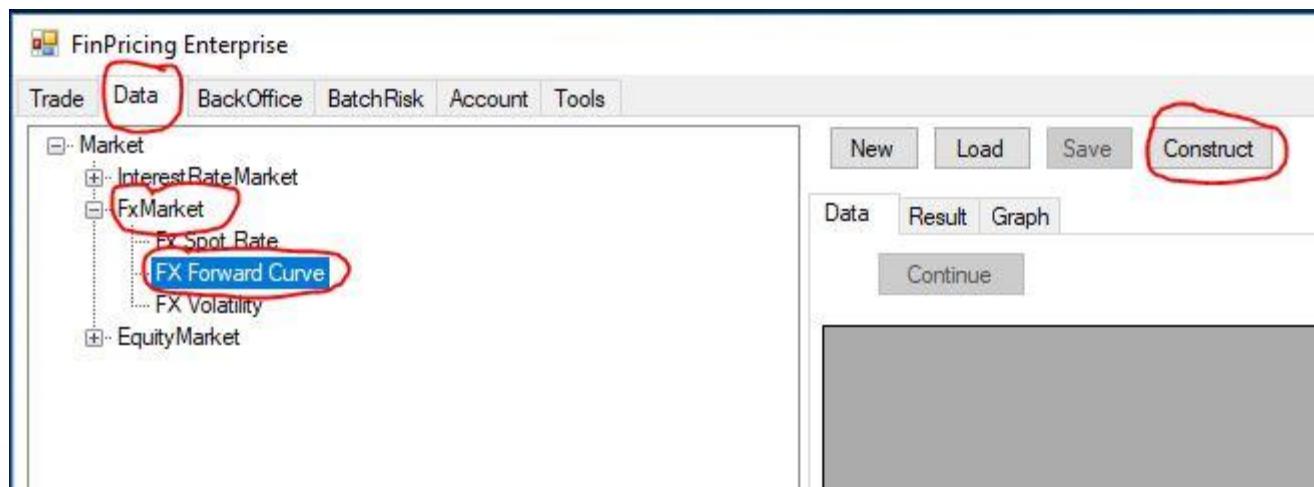
How to Construct Yield Curve? (Cont'd)

- Based on the results above, a more visually intuitive yield curve graph is provided in the Graph tab.



How to Construct FX Forward Curve?

- Click the Data tab at the top-left corner of the application. Then, expend Market -> FxMarket -> FX Forward Curve and click the Construct button.





How to Construct FX Forward Curve? (Cont'd)

- Click the Data tab at the top-left corner of the application. Then, expend Market -> FxMarket -> FX Forward Curve and click the Construct button.

The screenshot shows the FinPricing Enterprise application window. The menu bar includes Trade, Data, BackOffice, BatchRisk, Account, and Tools. The Data tab is selected. On the left, a tree view shows Market > InterestRateMarket, Market > FxMarket (with Fx Spot Rate, FX Forward Curve, and FX Volatility listed), and Market > EquityMarket. The main area has tabs for New, Load, Save, and Construct, with Construct being the active tab. Below these are Data, Result, and Graph tabs, and a Continue button. A table is displayed with columns: Column0, Column1, Column2, Column3, Column4, Column5, and Continue Button. The first row contains headers: CurrencyCurve, InputCurrency, Currency, InputCurrency, Date, InputDate, and Continue. The second row contains data: Base Currency (highlighted with a red circle), USD, Underlying Currency (highlighted with a red circle), CAD, Curve Date (highlighted with a red circle), M/d/yyyy, and Continue. The Continue button is highlighted with a blue rectangle. The bottom of the table has a footer row with Continue buttons.

Column0	Column1	Column2	Column3	Column4	Column5	Continue Button
CurrencyCurve	InputCurrency	Currency	InputCurrency	Date	InputDate	Continue
Base Currency	USD	Underlying Currency	CAD	Curve Date	M/d/yyyy	Continue
**						Continue
						Continue



How to Construct FX Forward Curve? (Cont'd)

- Based on your fillings, the system knows what kind of curves needed. So it loads the curve data in the main window if they are available, otherwise it generates new curve templates in the main window for you to fill. If you fill new curves, you need to click the Save button to save them.

FinPricing Enterprise

Trade Data BackOffice BatchRisk Account Tools

New Load Save Construct

Data Result Graph Continue

Market

- InterestRateMarket
- FxMarket
 - Fx Spot Rate
 - FX Forward Curve
 - FX Volatility
- EquityMarket

Column0	Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8	Column9	Column10	Column11	Column12	Column13
USD_3M	Base Curve						FxCurve						
Currency	ValuationDate	CurveName	QuoteName	Instrument...	Term	Value	Currency	ValuationDate	CurveName	Instrument	Tenor	Type	Value
USD	02/08/2018	USD_3M	USD_STUB: CASH	Cash	3/21/2018	0.0171232	CAD	02/08/2018	USD/CAD	CAD.Dp.18...	18M ...	Dp ...	-76
USD	02/08/2018	USD_3M	USD_STUB: FU...	FUTURE	03/16/2020	97.2826	CAD	02/08/2018	USD/CAD	CAD.Dp.1M ...	1M ...	Dp ...	-3.75
USD	02/08/2018	USD_3M	USD_STUB: FU...	FUTURE	03/18/2019	97.5445	CAD	02/08/2018	USD/CAD	CAD.Dp.1Y ...	1Y ...	Dp ...	-0.99
USD	02/08/2018	USD_3M	USD_STUB: FU...	FUTURE	03/19/2018	98.05	CAD	02/08/2018	USD/CAD	CAD.Dp.1Y ...	1Y ...	Dp ...	-53.9
USD	02/08/2018	USD_3M	USD_STUB: FU...	FUTURE	06/15/2020	97.257	CAD	02/08/2018	USD/CAD	CAD.Dp.2M ...	2M ...	Dp ...	-9.65
USD	02/08/2018	USD_3M	USD_STUB: FU...	FUTURE	06/17/2019	97.4659	CAD	02/08/2018	USD/CAD	CAD.Dp.2Y ...	2Y ...	Dp ...	-96.5
USD	02/08/2018	USD_3M	USD_STUB: FU...	FUTURE	06/18/2018	97.8551	CAD	02/08/2018	USD/CAD	CAD.Dp.3M ...	3M ...	Dp ...	-14.25
USD	02/08/2018	USD_3M	USD_STUB: FU...	FUTURE	09/14/2020	97.2374	CAD	02/08/2018	USD/CAD	CAD.Dp.3Y ...	3Y ...	Dp ...	-128.5



How to Construct FX Forward Curve? (Cont'd)

- After filling/validating data, click the Continue button above the main window. FinPricing starts to construct the FX forward curve. The results are shown in the Result tab.

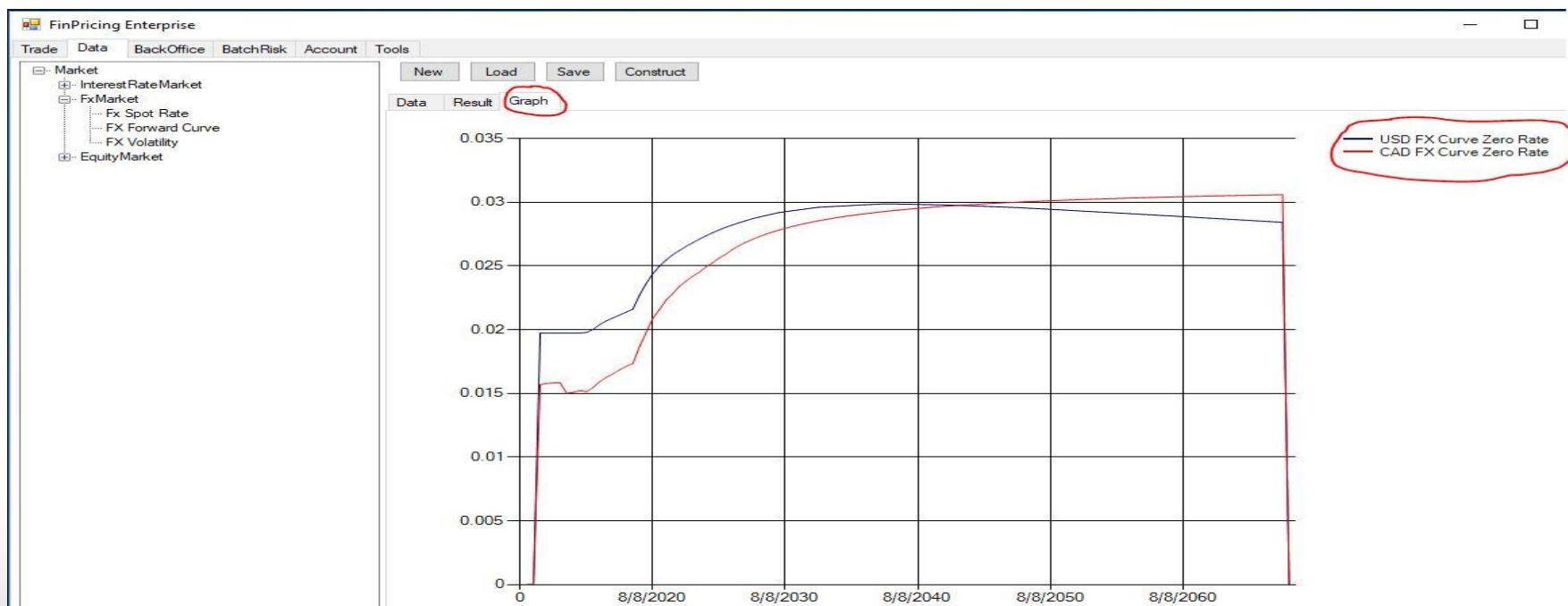
The screenshot shows the FinPricing Enterprise application window. The menu bar includes File, Trade, Data, BackOffice, BatchRisk, Account, and Tools. Below the menu is a toolbar with New, Load, Save, and Construct buttons. A navigation pane on the left lists Market (Interest Rate Market, FxMarket - Fx Spot Rate, FX Forward Curve, FX Volatility), EquityMarket, and a summary of 1000 rows. The main area has tabs for Data, Result (which is selected and highlighted with a red circle), and Graph. A table displays the FX Forward Curve data, with columns for Date, USD FX Curve Zero Rate, and CAD FX Curve Zero Rate. The table shows rates for dates from 2/15/2018 to 9/8/2018, with the last row partially visible.

	Column1	Column2	Column3
>	FX Forward Curve		
Date	USD FX Curve Zero Rate	CAD FX Curve Zero Rate	
2/15/2018	0.0197217340580845	0.0156894124493822	
2/22/2018	0.0197217340580848	0.015781339343474	
3/1/2018	0.0197217340580866	0.0158246016209078	
3/8/2018	0.0197217340580875	0.0158450193301923	
4/8/2018	0.0197217340580888	0.0150100387311001	
5/8/2018	0.019721734058087	0.0150862583651021	
6/8/2018	0.0197217340580874	0.0152241366701769	
7/8/2018	0.0197742942244542	0.0151363158440825	
8/8/2018	0.0200233832888533	0.015459628159313	
9/8/2018	0.0203976224149791	0.0159241945389144	
10/8/2018	0.020600000000000002	0.016000000000000002	



How to Construct FX Forward Curve? (Cont'd)

- Based on the results above, a more visually intuitive currency forward curve graph is provided in the Graph tab..





Thank You

You can find more details at
<https://finpricing.com/lib/EqRainbow.html>