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Best Practices for Maximizing Returns in Multi-Currency Rates Trading

Introduction

In the current market environment, it is particularly important to have the ability to identify and capture opportunities wherever they might be available. For this reason, modeling market currency rates is becoming a business imperative for many financial institutions.

As a multi-currency rates trader, being able to quickly adjust your curves and models to reflect new market dynamics is critical to maintaining a competitive trading advantage. Without this ability, you have an increased risk of mispricing trades and inaccurate hedging. Your capacity for seizing new trading opportunities is also limited.

In this mini eBook, we will discuss key best practices that will help you maximize gains and achieve accurate hedging in a rapidly changing rates environment.

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Get Your Curves Right

Getting you curves right is the most fundamental requirement for any rates and FX trader. Having compete faith in your curves gives you the ability to execute trades without hesitation. By having a curve building framework that is on par with the brokers, you will no longer have to fish around to find the "best" price. Leave it to other traders to have the market move on them while they hesitate on their position.

The key to having a curve building framework that is on par with the brokers is flexibility. One must be able to quickly adapt to any changes in best practice.

The Need for Sophisticated Curve-Building Frameworks

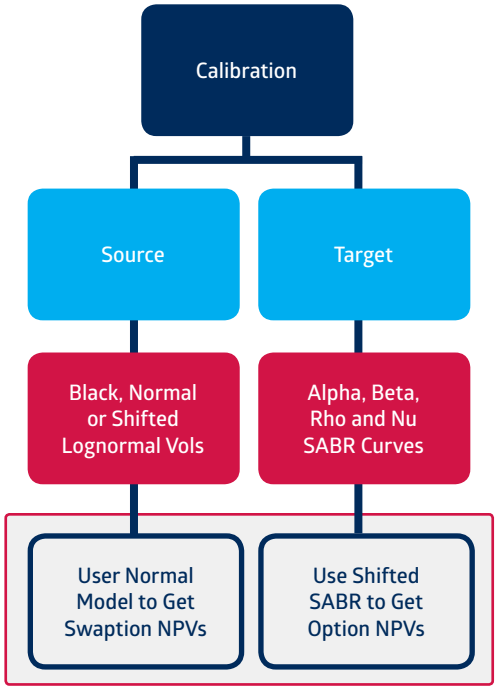
The main issue with legacy curve building frameworks is that they were created on an ad-hoc basis for solving the problems of the moment, and therefore they have not stood the test of time.

On the other hand, sophisticated curve-building frameworks, like those available in enterprise risk and valuation solutions, have been designed to allow you to quickly and easily change your curve-building approach.

Such frameworks use generic concepts to simplify your curve building problem into pieces of a puzzle. Each part of the puzzle can then be solved separately. Additionally, the pieces can be swapped out with minimal effort, and without impacting other parts of the solution. They can also be reused in combination with other different pieces to solve additional problems, or created new, which simply involves adding a new method to solve a subset of the overall problem in a restricted domain.

Improve Trading Agility

To avoid errors, it is imperative that you not hard code any market data assumptions in your curve-building framework. While you can build out the standard functionality that meets current requirements for best practice, it is also advantageous to have a low level facility in your framework whereby you can define any trade to be used in calibration. This low level facility should allow for quick updates to best practice, without core code changes.



The faster you can adjust your framework, the faster you can restore confidence in your curves, and in turn improve the overall agility of your trading.

Staying Arbitrage-Free in a Cross-Currency Triangle

Multi-Currency Curve Building

Having a granular, self-consistent view of interest rate and FX risk is the Holy Grail for a large enterprise. A single model for managing risk enables you to improve the effectiveness of enterprise-wide risk analysis. At the desk level, you can reduce the cost of hedging by netting out exposures that manifest when viewing risk at a multi-currency portfolio level.

To have this consistency, all trades need to be priced based on the same self-consistent and arbitrage-free curves. This is not an easy task, and when we consider the collateralization of trades and market data, this appears to make a complex problem even more complicated. However, correctly introducing collateral agreements into a curve building framework actually helps solve many of the practical problems of trying to stay arbitrage-free.

Overcoming Challenges of CSAs

Historical credit support annex (CSA) agreements allow for the collateral poster to choose which currency they would like to post collateral in. The interest rate option here posed significant challenges to many curve building frameworks. However, things became somewhat simplified when the ISDA published the 2013 Standard CSA.

The new Standard CSA only allows collateral to be posted in one currency. While this has reduced some of the complexity, there are still significant challenges to correctly handling the nuances of single currency collateral agreements, for cross-currency trades.

To solve these problems, many firms are turning to robust curve building frameworks that offer consistency, in the sense of self-consistent modeling and arbitrage-free pricing. These frameworks can afford you a holistic view of risk, allowing you to gather consistent firm-wide analysis and may open the door for potential cost saving as exposures net out at the portfolio level. They should also provide you the insight you to choose the most liquid hedging instruments, helping you reduce your hedging costs in the long run.

Smile Like You Mean It: Tackling Negative Rates

After accurate and consistent curve construction, the next fundamental requirement for a vanilla rates trader is to understand and manage risk. This step is critical to correctly capturing the volatility smile. Historically this has been done using the SABR model. So then this begs the question—why is SABR a model that is so well-suited for this

1. Good Fit to Market Data

The SABR model enables you to fit the market sufficiently, capturing the skew/smile of implied volatility versus strike.

2. Speed

SABR helps you quickly perform calculations so you can capture market opportunities.

3. Volatility Smile Dynamics

SABR offers proper support for managing smile dynamics with the ability to control the backbone of the model.

4. Useful Model Parameters

Utilizing SABR, firms can construct orthogonal model parameters allowing them to readily control elements such as the overall level, skew and curvature of the smile. This can help you better manage smile risk.

5. Financially Motivated

It's common knowledge that the best financial models are those based on relevant financial considerations. As a stochastic volatility model, SABR has been built around such considerations.

The Problem of Negative Rates

Unfortunately, as an implied volatility formula, SABR simply will not work for zero and negative interest rates. Let's now review some of the issues that can arise.

$$\sigma(F,F) = \frac{\alpha}{F^{1-\beta}}\left\{1+\left[\frac{(1-\beta)^2}{24}\frac{\alpha^2}{F^{2-2\beta}}+\frac{1}{4}\frac{\alpha\beta\rho\nu}{F^{1-\beta}}+\frac{(2-3\rho^2)}{24}\nu^2\right]T\right\}.$$

In the formula at right, you will see that as the forward F and strike K go to zero, terms such as (F/K) and FK^(1-B) will start creating problems.

And the problems do not end here. As rates become negative, the probability density function will also dip below zero, which also implies arbitrage into hedging strategies.

So, you may be thinking, how do we fix the problem of SABR and negative rates? By introducing a simple shift to the forward, most of our problems are eliminated.

The result here is a model that is almost indistinguishable from the original SABR model, and one that has all of the same positive attributes listed above.

Conclusion

In order to maximize returns and carve out a competitive trading advantage, multi-currency rates traders must embrace flexible, future-proof curve-building framework that allows you to agilely adapt to any shift in market practice.

After you've achieved accurate and consistent curve construction, the next fundamental requirement is to understand and properly manage your risk. This step is critical to correctly capturing the volatility smile, which has been done historically using the SABR model. Utilizing a strong model such as SABR for capturing the smile, is at the core of obtaining accurate hedging strategies, which in turn helps you to better manage your P&L volatility for a vanilla options desk.

Finally, in a complex environment where negative interest rates have become the new normal, many are questioning what model to use. The best way forward is to use Shifted SABR, a model that is almost indistinguishable from the original SABR model, and one that has the same advantages.

For more information on this topic, view our full-length version of this eBook.

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