

Cross-currency basis

Implications and opportunities

Strategy Spotlight

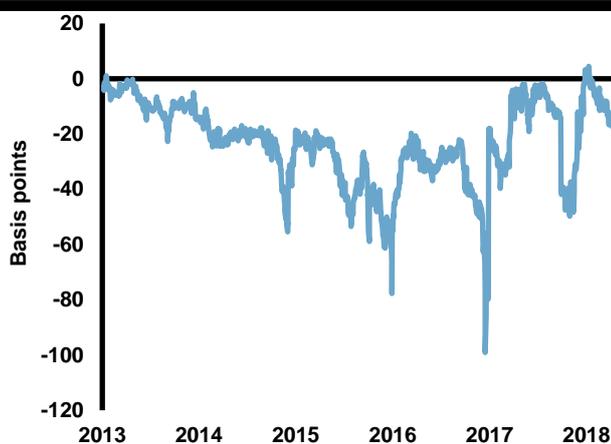


Disparate interest rate policies of global central banks have impacted the cost of currency hedging for investors. However, one market phenomenon also affecting cost that is not garnering as much attention is the cross-currency basis, which has been volatile in recent times. In this “Strategy Spotlight,” we look at the factors underpinning the cross-currency basis and the steps investors can take to maneuver potentially costly turbulence.

What is the cross-currency basis and why does it matter?

It is the excess premium (or discount) factored into the quoted price of a basis swap (or an FX forward) in the real world. The basis is the residual that theoretically shouldn't persist beyond the very short term if the Covered Interest Rate Parity (CIP) condition holds. The CIP condition states that the forward rate of a currency pair should be simply calculable from the current spot rate and the respective interest rates of each currency. Any residual indicates the existence of a (seemingly) risk-free opportunity that should be swiftly arbitraged away. Consequently, a persistent basis means certain investors are paying a premium. For example, the negative 3-month EUR/USD basis shown in Exhibit 1 implies that EUR-based investors pay more than the interbank interest rate differential to hedge their USD exposure.

Exhibit 1: 3-month EURUSD cross-currency basis



$$F = S \frac{1 + i_f t_n}{1 + i_b t_n}$$

$$1 + i_b t_n = \frac{S}{F} (1 + i_f t_n)$$

CIP with basis (**B**):

$$1 + i_b t_n = \frac{S}{F} (1 + i_f t_n + B)$$

Where:

i_b is the interest rate in the base currency

i_f is the interest rate in the foreign currency

S is the current spot FX rate

F is the forward FX rate

t_n is the date of delivery

B is the basis and can be either positive or negative

Source: Bloomberg. Data as of: 31 December 2013 to 31 May 2019.

Does the basis persist? Why? What does it mean for currency hedging?

In short, yes, the basis does persist. The CIP condition did hold reasonably well prior to the Global Financial Crisis (GFC) of 2008 (Akram, Rime and Sarno, 2008¹). Since then, however, with the advent of extraordinarily accommodative monetary policies across the globe and tighter regulatory limitations (e.g., *Basel III, Basel Committee on Banking Supervision*), the cross-currency basis has persisted for years and it has been exhibiting greater magnitudes (Rime, Schrimpf and Surstad, 2017²). As a result, certain currencies have been trading at a premium in the forward market, most notably the U.S. dollar. In other words, the market is punishing the borrower of USD due to the relatively lower demand for borrowing the counter-currency in the forward market. This phenomenon is pronounced at quarter-end, particularly more so at year-end (see Exhibit 1) due to the tidying up of balance sheets undertaken by banks. For example, a European investor hedging USD exposure, while already being afflicted with negative interest rates, must pay a premium, given that the forward contract represents the borrowing of USD for future delivery. The corollary then suggests that hedging is cheaper for a USD investor.

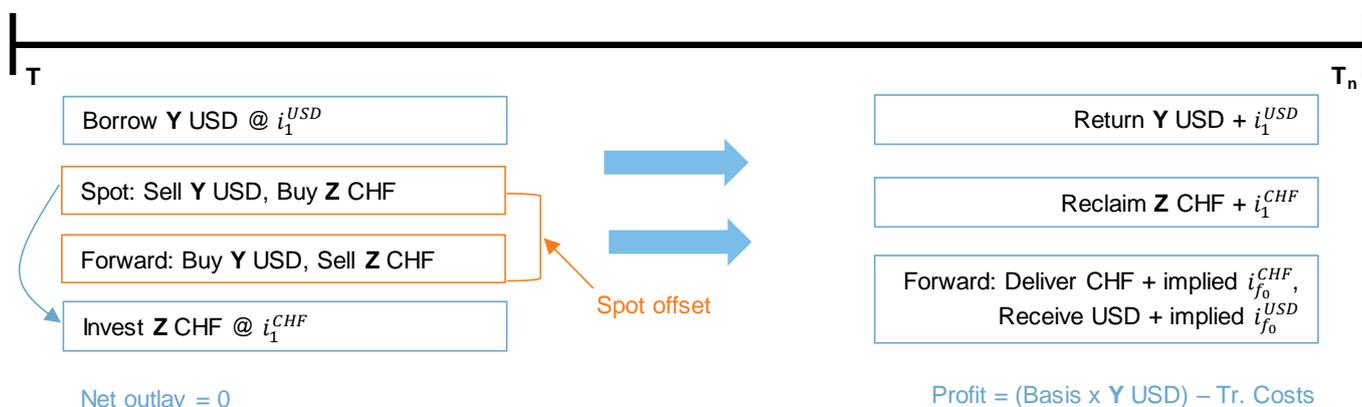
Given favourable borrowing rates, what does an arbitrage strategy look like?

1. The first step is to identify where the basis exists and to what degree. At this stage the arbitrageur must consider the currencies and the basis between various pairs; the term (e.g., 1-month, 3-month, etc.); and basis gap patterns (e.g., quarter-end, year-end, etc.).
2. Once the variables have been selected, the arbitrageur must obtain quotes from counterparties in order to assess the practical efficacy of the strategy. Quotes are required for a) a cash loan, and for b) an FX spot and offsetting currency forward. The forward points spread paid is crucial at this stage.
3. Implementation: borrow the premium currency (premium here refers to that which is trading at a premium in the forward market). Convert it to the discount currency and invest the proceeds. At the same time as the conversion, the arbitrageur takes out an FX forward to neutralise the spot exposure while gaining exposure to the interest rate differential (and basis) implied in the forward points.
4. At the end of the period, deliver the discount currency with implied interest and receive the premium currency with implied interest from the FX forward contract. At this time, the arbitrageur will also reclaim the invested cash with interest while returning the borrowed cash with interest. The residual? Basis.

At its deepest point (see Exhibit 1), 100 points of basis gap suggests a theoretically extractable value of \$1 million on a notional of \$100 million. In practice, achievable borrowing and transaction costs will affect the expected value.

An illustrated example is shown in Exhibit 2, where a negative basis exists between CHF and USD.

Exhibit 2: Illustration of basis arbitrage operations



Provided for illustrative purposes only. Note: The basis is embedded in the forward points.

¹ Akram, Q., Rime, D. and Sarno, L. (2008). Arbitrage in the Foreign Exchange Market: Turning on the Microscope. *Journal of International Economics*, [online] 76(2), pp.237-253. Available at: <https://doi.org/10.1016/j.jinteco.2008.07.004>

² Rime, Dagfinn and Schrimpf, Andreas and Syrstad, Olav, Segmented Money Markets and Covered Interest Parity Arbitrage (July 11, 2017). BIS Working Paper No. 651. Available at SSRN: <https://ssrn.com/abstract=3000351>

What are the risks and costs?

The strategy is not completely without risk. The entire forward contract notional default risk will be concentrated with a single bank per arbitrage operation. Collateralisation is an option, while counterparty credit quality due diligence is advisable. Transaction costs must also be taken into account in order to ensure the efficacy of the operations. Indeed, any costs must be scrutinised to a greater degree when conducting arbitrage operations.

Why aren't market participants conducting arbitrage operations to make a profit?

There are several restrictions preventing the basis from being arbitrated away, mostly related to the stringent regulatory environment, which encumbers the market from balancing supply and demand of FX derivatives. Since the GFC, banks (i.e., the traditional arbitrageurs) have been under significant pressure to improve conduct and hold more capital, such that the regulatory requirements of certain instruments on banks' books are consequential. FX derivatives like cross-currency basis swaps, which are used to arbitrage the basis, now require more risk capital to be held against them. The seemingly erratic behavior in the basis, over quarter- and year-end periods (see Exhibit 1), is in fact underpinned by banks' efforts to reign in their leverage ratios (comprising on- and off-balance sheet risks) in order to satisfy regulations. However, it is not only the post-GFC legal framework that has impacted banks and other market participants. To perform arbitrage activities, access to leverage from banks is necessary. Tighter counterparty credit risk management means that the quality threshold above which banks are willing to lend at the most favorable rates has been raised. Often, those engaging in arbitrage tend to be riskier entities that are consequently afflicted with higher borrowing costs. Ultimately, the extent to which investors can participate in basis arbitrage has weakened considerably from a more accommodative period that once prevailed.



In our absolute return currency strategy, Russell Investments always uses the forward-implied carry to identify the currencies for the long and short baskets for the carry factor.

Implications for currency management

For an investor hedging USD exposure (for example), hedging dictates that they must short USD against their home currency in the forward market. With a negative basis, the investor pays a premium in order to achieve the desired hedge since a short is a borrowing of USD for future delivery. As explained earlier, that premium appears to be particularly high around year-end. One way of reducing the risk from potential spikes in the negative basis is to either avoid year-end rolls or even roll forward contracts earlier than usual in anticipation of a year-end turn. Certainly, basis is not guaranteed to appear at year-end; nevertheless, for a risk-conscious investor it can make sense to avoid probabilistically adverse periods. This is a step that Russell Investments has taken for some of our currency hedging mandates.

Beyond basis spikes around significant dates, investors should consider cost reduction more broadly. For example, for a Swiss investor, who is currently facing a widening interest rate differential in favour of USD, the basis adds further hedging costs. The investor may taper the negative basis impact via basis arbitrage upon adequate preconditions. Alternatively, dynamic adjustment of the hedge ratio may be considered to lessen the impact of the negative interest rate differential and the basis. Academic research (e.g., Menkhoff et al 2012³) shows that the carry trade is a profitable strategy, hence a Swiss investor may benefit from slightly reducing their hedge ratio during times when the forward premium implies that the cost of hedging is high.

For investors who are using the carry factor as an absolute return strategy, it is important to use the forward-implied carry rather than just the differential of interbank interest rates. In our absolute return currency strategy, Russell Investments always uses the forward-implied carry to identify the currencies for the long and short baskets for the carry factor.

³ Menkhoff, L., Sarno, L., Schmeling, M, and Schrimpf, A. (2012): Carry Trades and Global Foreign Exchange Volatility, *Journal of Finance*, 67 (2)

Closing comments

Covered Interest Rate Parity is one of many economic theories that have become victims of our current post-GFC reality. It is important to not only acknowledge the persistence of basis, but to also assess its implications, particularly for a currency hedged portfolio. While the implied basis in forward contracts is unavoidable, it may also provide interesting opportunities. It would only be prudent to be aware of the basis and explore any options available to reduce risk or to even increase return. For example, basis arbitrage or risk-conscious trading can be considered for investors who pay a premium to hedge back to their home currency. Carry trades using the forward-implied interest rate differentials are another way of benefitting from dislocations in the basis.

 *Carry trades using the forward-implied interest rate differentials are another way of benefitting from dislocations in the basis.*

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