

Major Currencies And Inflation Expectations

The fundamental equation for calculating a currency forward against the U.S. dollar is very straightforward:

$$Forward = Spot * \left[\frac{1 + r_{for} * \left(\frac{90}{360}\right)}{1 + r_{U.S.} * \left(\frac{90}{360}\right)} \right]$$

As there can be only one real interest rate globally for any maturity, the difference in the two nominal interest rates has to be the difference in expected inflation. This is the famous Fisher's Law, which holds nominal interest rates are the sum of some mythical and immeasurable real rate plus expected inflation. Fisher wrote during the 1920s – yes, he was the same Irving Fisher of Yale who declared two weeks before the 1929 market crash, “Stock prices have reached what looks like a permanent high plateau...I expect to see the stock market a good deal higher than it is today within a few months.” - and so never had to contend with real-time evidence from inflation-linked bonds such as TIPS or with currency volatility. Let's just say the author has been unable to reassemble Fisher's Law in practice using actual data (see “TIPS And Pseudo-Real Rates,” *Active Trader*, April 2013) and leave it at that. As we will see below, the world does not operate in the simple and straightforward manner of single-equation models.

Inflation Swaps

Paul Volcker's December 2009 scathing dismissal, “The only thing useful banks have invented in 20 years is the ATM,” aside, some of the markets created for no other apparent purpose than to give two over-educated quants something to do have provided certain financial writers with positive externalities useful for analysis and commentary. A cynic might respond the need to do things is immense.

One of these markets, inflation swaps, grew out of TIPS and other inflation-linked bonds. As the name might suggest, two parties agree to swap payments based on whether the future, floating realized rate of inflation exceeds a fixed inflation index; once that swap and an ordinary interest rate swap are in place, other parties can create swaps on the implied breakeven rate of inflation. It all sounds harmless, but remember, these are the spiritual cousins of people who almost put us collectively back into the Stone Age in 2008.

The downside, an oversight sure to disturb no one outside of this space, is the shortest-dated inflation swaps tend to be one year in tenor on the sound theory any country whose inflation rate inside of one year is so unstable as to invite a trade most likely has untradeable debt instruments.

Let's make one very large assumption and then get down to work, and that is the difference between two inflation swap curves is monotonic. This would mean, for example, if U.K. one-year inflation swaps are greater than one-year U.S. inflation swaps then shorter-dated British inflation swaps would be greater than their U.S. counterparts as well. If we make this assumption, then we can see whether a higher expected rate of inflation exists for the U.K. and whether this leads or lags currency movements.

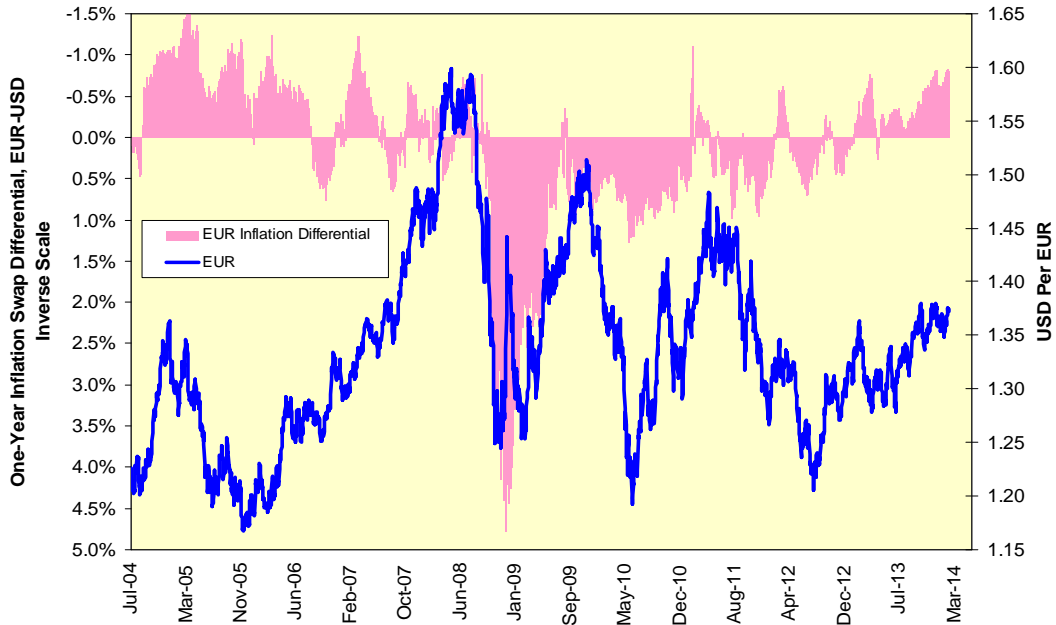
A set of four major currencies, the euro, the British pound, the Australian dollar and the Japanese yen will be examined here. In each case the one-year inflation swap differential to the USD will be mapped against the currency itself along with a correlelogram extending backward and forward nine months to see whether the changes in expected inflation lead the currency movement or vice-versa. The correlations when the currency leads the inflation swap differential are depicted in magenta; the correlations when the inflation swap leads the currency are depicted in cyan.

A strong prior expectation here should be the inflation swap differential leading the currency with a negative correlation value by 126-189 days, or the six-nine month timeframe often seen in relative short-term interest rate differentials. If the opposite, the currency leading the inflation swap differential, occurs we have evidence changes in currency levels affect expected relative inflation differentials.

Individual Currency Analyses

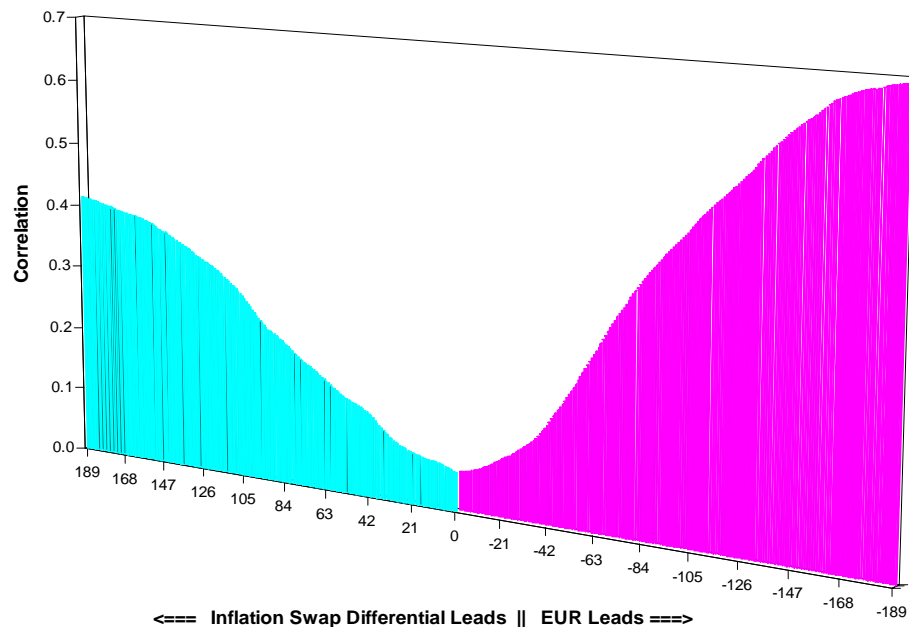
The EUR-USD inflation swap differential appears to have a general relationship of a wider differential being associated with a weaker EUR and vice-versa.

The Euro And Inflation Swap Differential To The USD



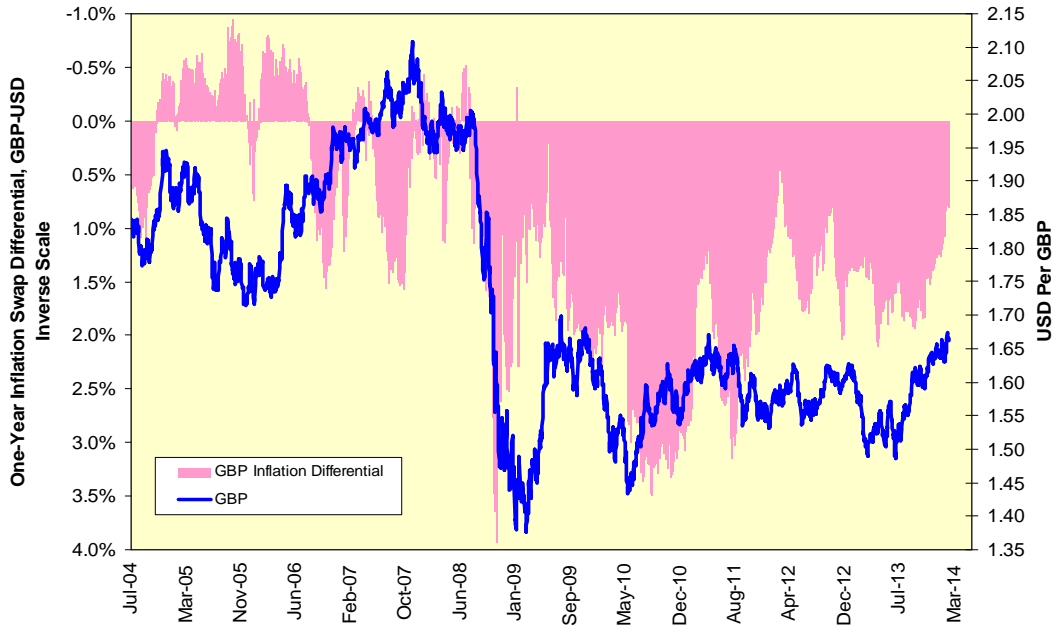
The relationship is anything but contemporaneous, however. The currency clearly dominates the lead/lag relationship and in the unexpected direction: A stronger euro leads to a wider [EUR-USD] inflation differential six-nine months later. While we might expect the stronger currency to make imports cheaper and reduce inflationary pressures, the apparent response is one where the stronger currency leads to expectations the European Central Bank will try to inflate the currency's gains away in the global game of competitive devaluation.

Euro Leads Inflation Swap Differential More Than Vice-Versa



Now let's cross the Channel and look at the British pound. The GBP fell against the USD during the financial crisis and never recovered the \$1.90-\$2.00 range in which it had been trading. British inflation swaps have traded over the U.S. counterparts since August 2006; the two markets do not have any apparent correlation to one another.

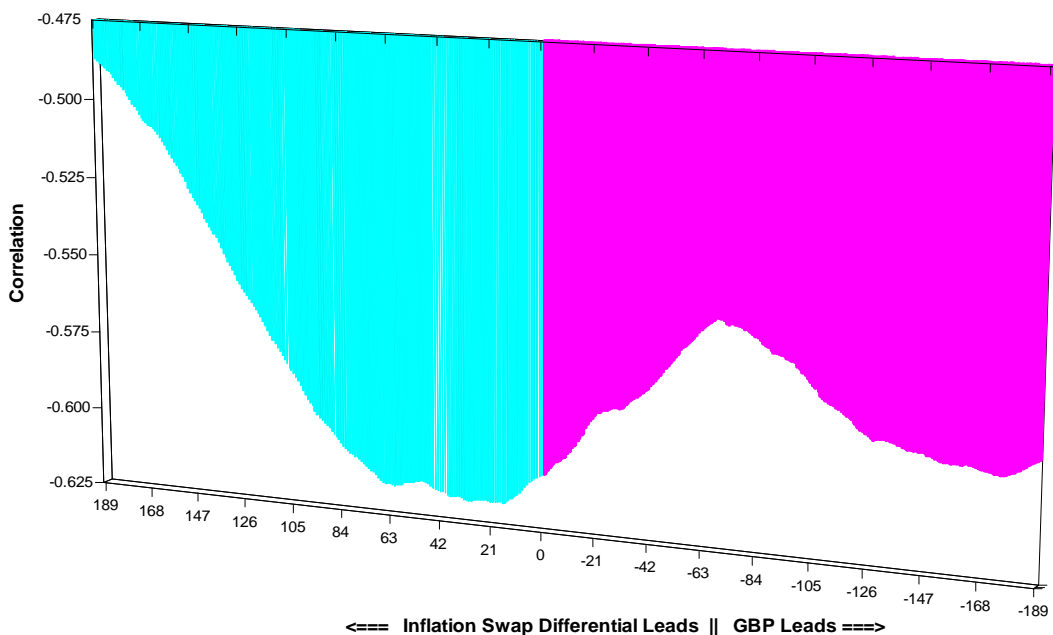
The British Pound And Inflation Swap Differential To The USD



The correlogram is mixed, which is perhaps a kinder description than, “strange.” The mode of the lead/lag relationship occurs with the [GBP-USD] inflation swap differential leading the currency by one-four months. This is the expected direction, but it implies a very quick transmission between relative inflation expectations and currency changes.

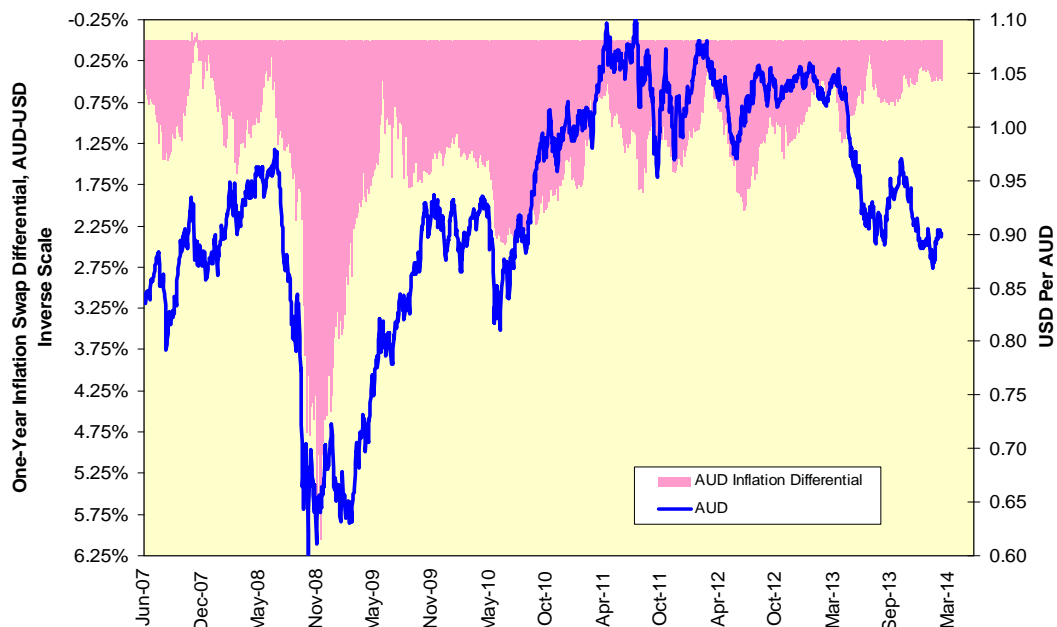
However, a second but smaller mode occurs with the currency leading the expected inflation differential by seven-nine months. This is equivalent to saying a weaker GBP is expected to induce the Bank of England and the Exchequer to adopt further weakening policies. As the time sample involves several rounds of British quantitative easing, this interpretation certainly describes history well.

Inflation Swap Differential Leads British Pound More Than Vice-Versa



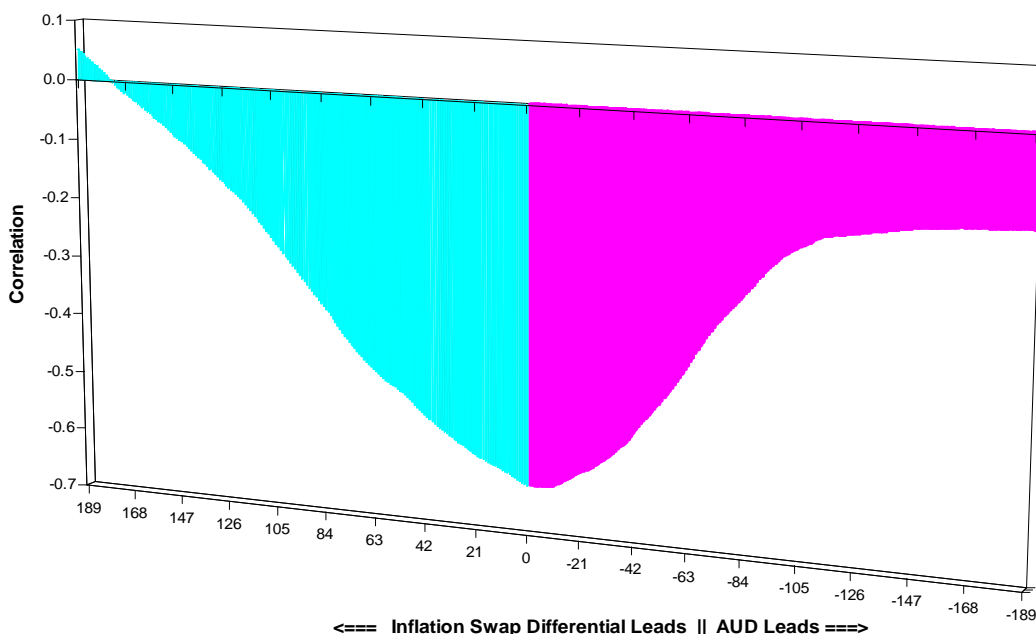
With the exception of a handful of days in November 2007, Australian inflation swaps have traded well over their U.S. counterparts. The AUD appears to lead the differential with great regularity as well.

The Australian Dollar And Inflation Swap Differential To The USD



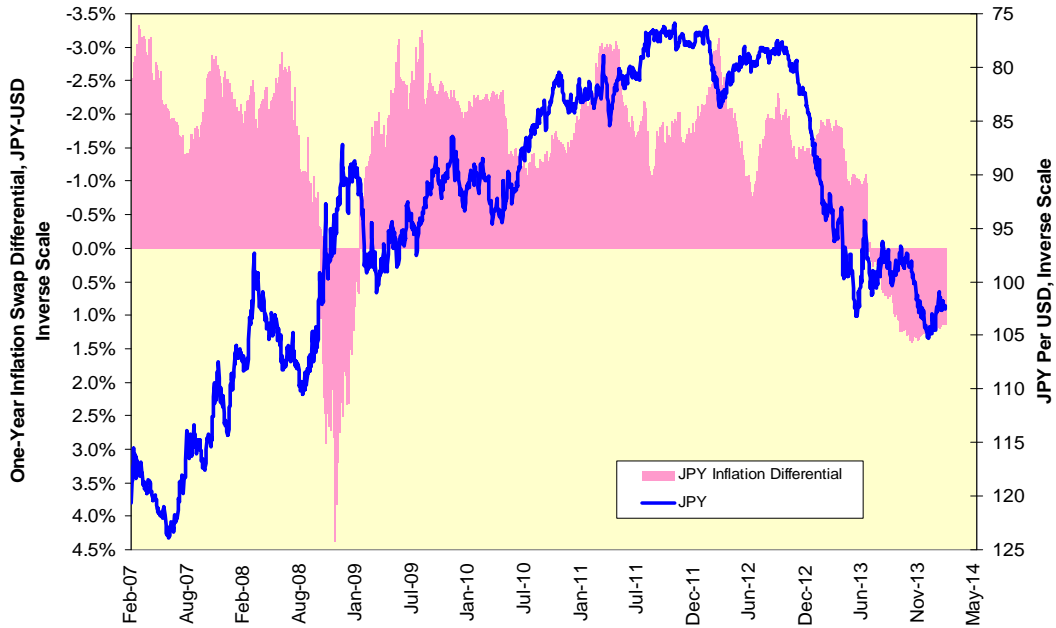
Accordingly, the correlogram is very symmetric with a slight bias toward the [AUD-USD] inflation swap differential leading the currency, but the lead-time is virtually contemporaneous. By the time we get to the expected six-nine month lead-time, the correlation approaches zero and turns positive in the eight-month timeframe. Relative inflation expectations and the AUD have a descriptive as opposed to a prescriptive relationship. This, unfortunately, is of little use for either trading or planning.

Near-Symmetric Relationship Between Inflation Swap Differential And Australian Dollar



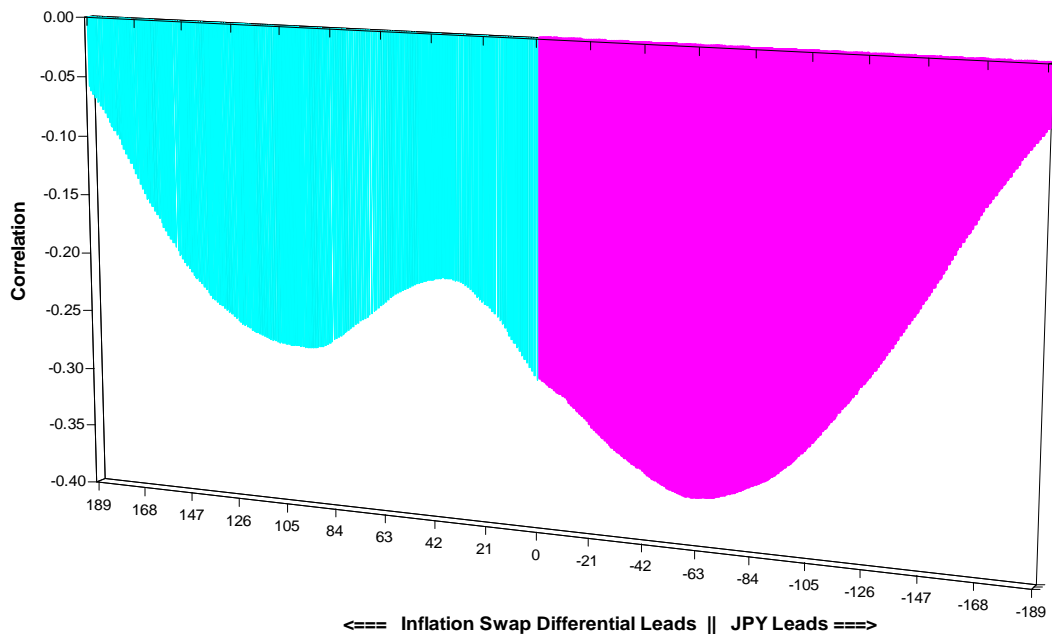
Finally, we come to the Japanese yen. As Japan has had near-zero percent nominal short-term interest rates virtually continuously since February 1999, first went to quantitative easing in March 2001, has whipsawed global markets through the yen carry trade several times and has engaged in several attempts to create inflation, we should expect a most unusual set of relationships. You will not be disappointed. First, Japanese inflation swaps have traded below their U.S. counterparts with the exception of the financial crisis; no surprise here. Nor is it a surprise the JPY itself has traded independently of this differential.

The Japanese Yen And Inflation Swap Differential To The USD



Now let's map the lead/lag relationship; it is what statisticians describe as bimodal. The larger mode involves the JPY leading the inflation swap differential at the three-four month timeframe and with the same negative coefficient seen for the GBP. The market expects the Bank of Japan and Ministry of Finance to weaken the yen further after each downturn. The second mode involves the inflation swap differential leading the JPY at the six-seven month timeframe; here the narrower expected inflation gap is associated with future JPY strength.

Japanese Yen Leads Inflation Swap Differential More Than Vice-Versa



A Series Of Anecdotes

While this is only four currencies and a relatively short timeframe, the conclusion has to be nothing other than the interest rate parity model and Fisher's Law are nice constructs but provide little in the way of describing actual experience. Each of these four currencies defies the theories in separate ways. As we will see next month, this conclusion about anecdotal currency/inflation expectation relationships extends to additional currencies as well.

That is the bad news. The good news is if markets worked according to theory, they would be so efficient as to put traders out of business.