Butterflies Are Free, And Well Worth It: The Minors

Last month's examination of butterflies and their relationship to major currencies concluded the relative demand for price insurance between currency options' out-of-the-money strikes relative to the at-the-money strikes did not provide consistent information useful for trading straddles and strangles (see "Butterflies Are Free, And Well Worth It: The Majors"). Now let's repeat the exercise for a set of minor currencies including the Brazilian real, Indian rupee, South African rand, Turkish lira, Thai baht, Mexican peso and Taiwan dollar.

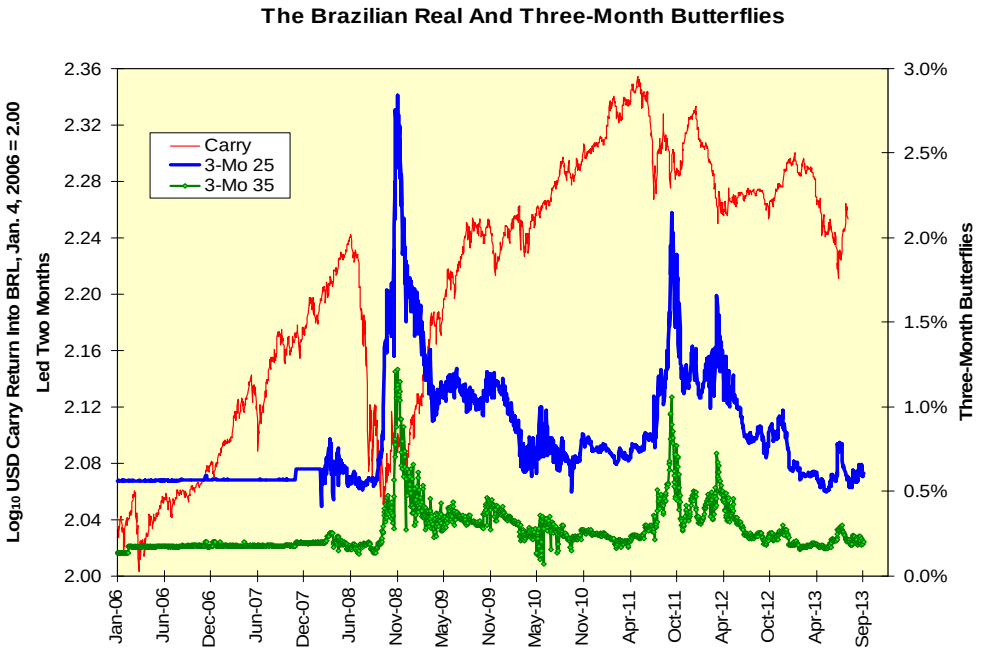
As a refresher, butterflies are defined as buying both the call and the put of a similar delta and selling two at-the-money options. We generally expect out-of-the-money volatility to be higher as a matter of course to reflect the greater risks involved in writing those options. In practice, however, the "smile" of volatility often is skewed so that volatility in either the call or put wing is greater than the at-the-money volatility while the other wing's volatility is less than the at-the-money volatility.

As in the case of the major currencies, two questions will be asked. First, how do butterflies relate to the carry return from borrowing the USD and lending into the target currency? Here we will map the butterfly values for both three-month 25- and 35-delta against the common logarithm of the total carry return from the U.S. dollar into those currencies reindexed to January 2006. This depiction allows for the intuitively appealing rising line depicting a stronger currency.

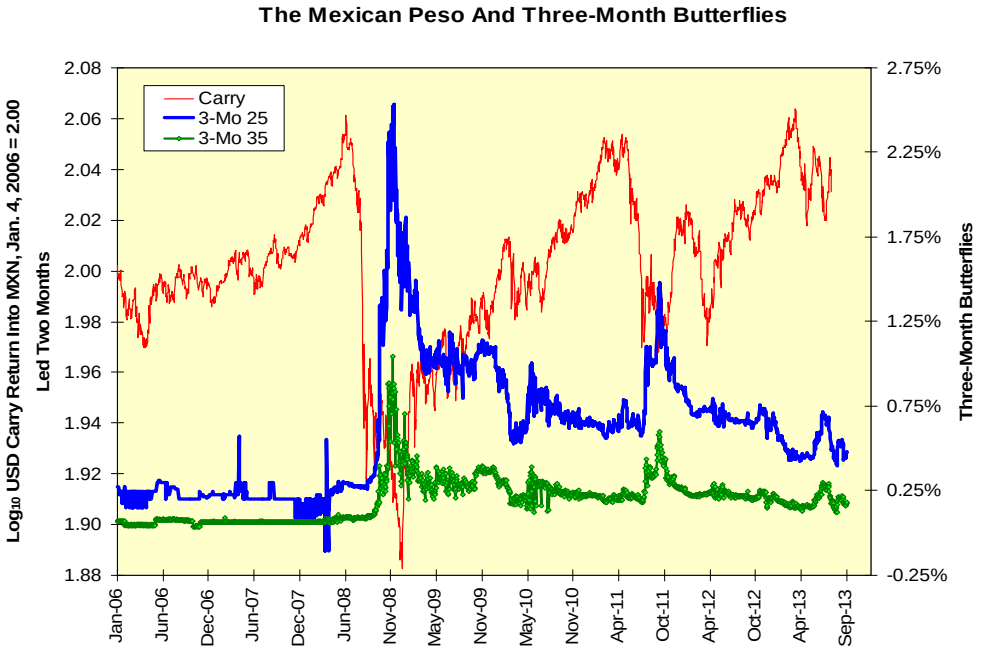
Second, do butterflies have any value in trading and market analysis? They should lead the return series if they do. Here we will focus on butterflies as a mean-reverting indicator for future absolute returns relative to recent absolute returns.

Butterflies And The Minors

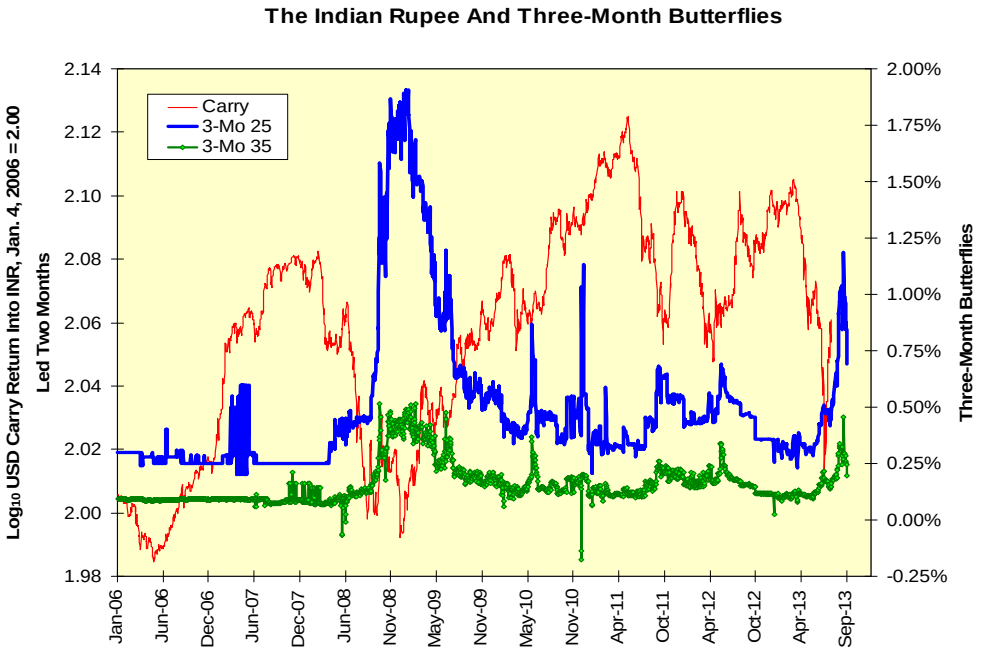
With the common and notable exceptions of the 2008 financial crisis and the 2011 U.S. debt ceiling and European sovereign credit situations, butterflies for the Brazilian real have remained within confined ranges. This is not surprising given the real's propensity to trade in long-lived trends.



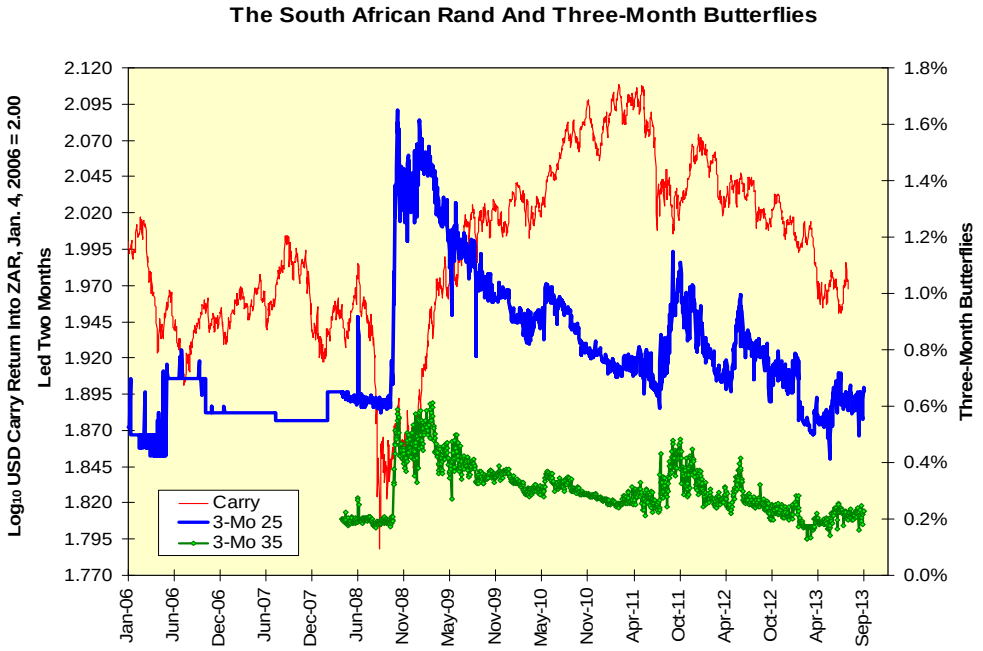
Butterflies on the Mexican peso have followed a very similar pattern to those seen for the BRL. This is somewhat surprising given the MXN's tendency to switch trends. The abrupt reversals seen in over the past three years might have encouraged higher volatility on the out-of-the-money strikes but clearly failed to do so.



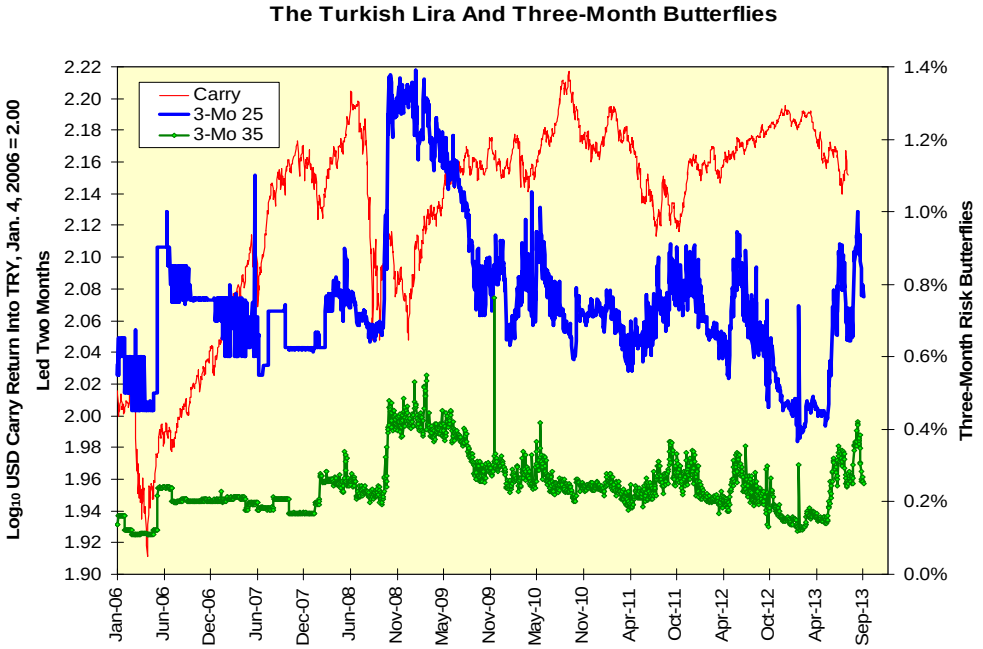
The Indian rupee has had a much more mixed picture. The INR posted large and sudden reversals in 2011-2012, and the Reserve Bank was active in first raising and then lowering interest rates in an attempt to quell inflation. Butterfly remained at post-2008 financial crisis levels during this period and then rose during 2013 as the INR broke in response to speculation the Federal Reserve would begin tapering its quantitative easing purchases. The jump in butterfly levels appears to be a singular episode for now and not the start of a new era in INR trading.



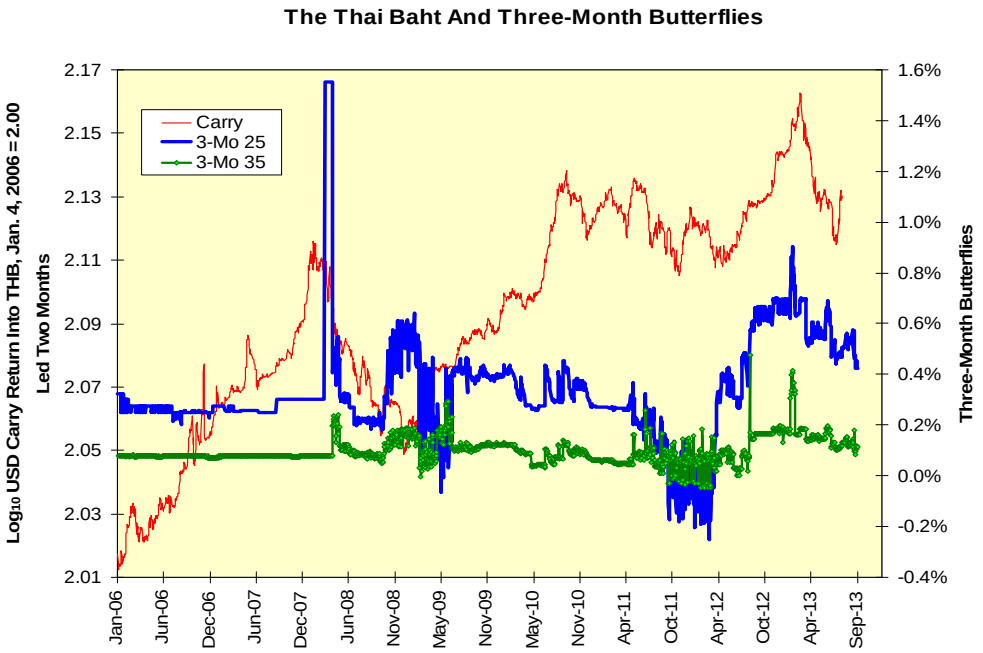
Butterflies for the South African rand have followed a different path since the end of the 2008 financial crisis. Regardless of the ZAR's trend, which has been lower since June 2011, the path of the 25-delta butterfly has declined with two strong spikes higher. The first occurred in the 2011 U.S. debt ceiling and European sovereign debt crisis and the second arrived in June 2012 in the general absence of volatility either in the rand or in global currency markets in general.



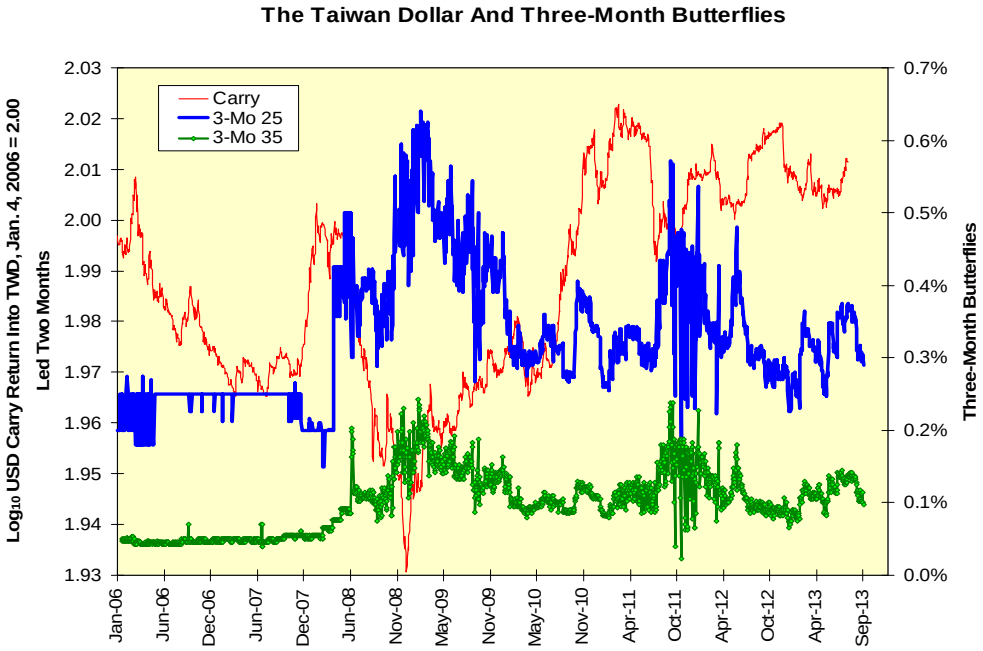
Butterflies for the Turkish lira turned erratic in 2013 as the TRY weakened against the USD on interest rate speculation and, more importantly, against the EUR on relative asset returns. Much of the TRY's carry return in recent years has derived from its wide interest rate spreads vis-à-vis the USD and EUR. Once those high rates start to affect economic growth and relative asset returns, they become reflected in a noisy 25-delta butterfly.



The Thai baht's butterflies follow a unique pattern. The 25-delta butterfly spiked higher in March 2008 as the THB's carry return was starting to decline. Once that episode passed, the THB moved through the 2008 financial crisis with relatively little volatility and started to trend higher. The pattern shifted to lower 25-delta butterflies in 2013 even as the carry into the baht weakened; few currency options markets are able to see past short-term trends this way.



Finally, the Taiwan dollar's butterflies have traded in a low and narrow range with the common exceptions of the 2008 financial crisis and the 2011 U.S. debt ceiling and European sovereign debt situations. Butterflies expanded in mid-2013 in anticipation of a TWD weakness that failed to materialize.



Prospective Returns

Now let's see whether absolute three month-ahead return shifts appear to be a function of these butterflies and of the forward rate ratio between six and nine months ($FRR_{6,9}$) for the major currencies (see "Minor Currencies Less Affected By Great LIBOR Kerfuffle," July 2013). The $FRR_{6,9}$ is the rate at which we can lock in borrowing for three months starting six months from now, divided by the nine-month rate itself. The steeper the yield curve, the more this ratio exceeds 1.00; an inverted yield curve has an $FRR_{6,9}$ less than 1.00.

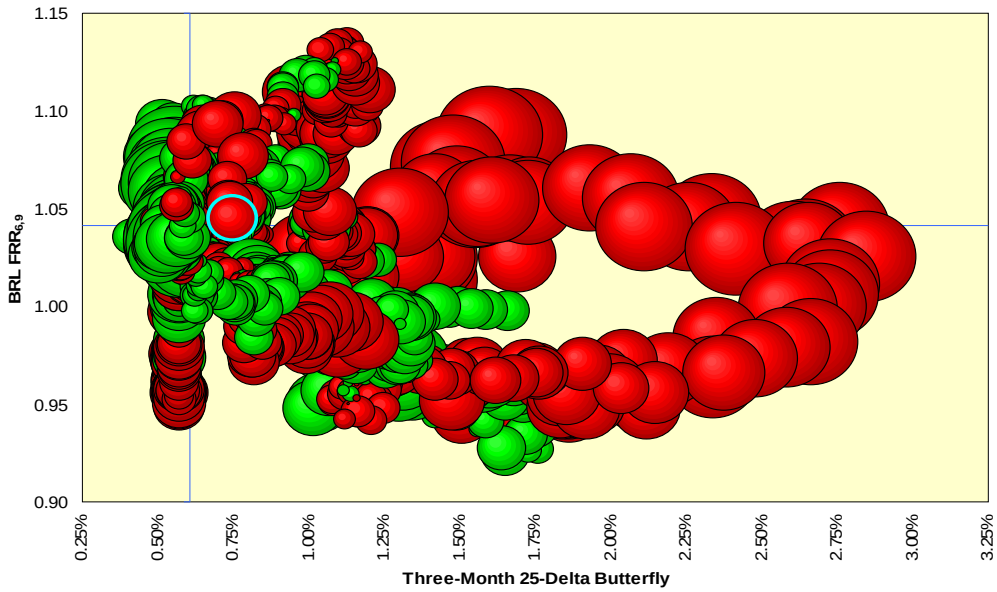
Prospective return shifts will be defined as the absolute average daily return for the next three months less the average absolute daily return for the previous three months. The goal here is to see whether 25-delta butterflies, which measure the difference between out-of-the-money and at-the-money volatility, lead changes in absolute return

levels. If so, traders can use them to emplace trading strategies such as straddles or strangles, both of which are bets on large or small absolute movement in either direction, respectively.

Positive absolute return shifts are depicted with green bubbles, negative with red bubbles; the diameter of the bubble corresponds to the absolute magnitude of the return. The last datum used is highlighted and the current environment is marked with a bombsight.

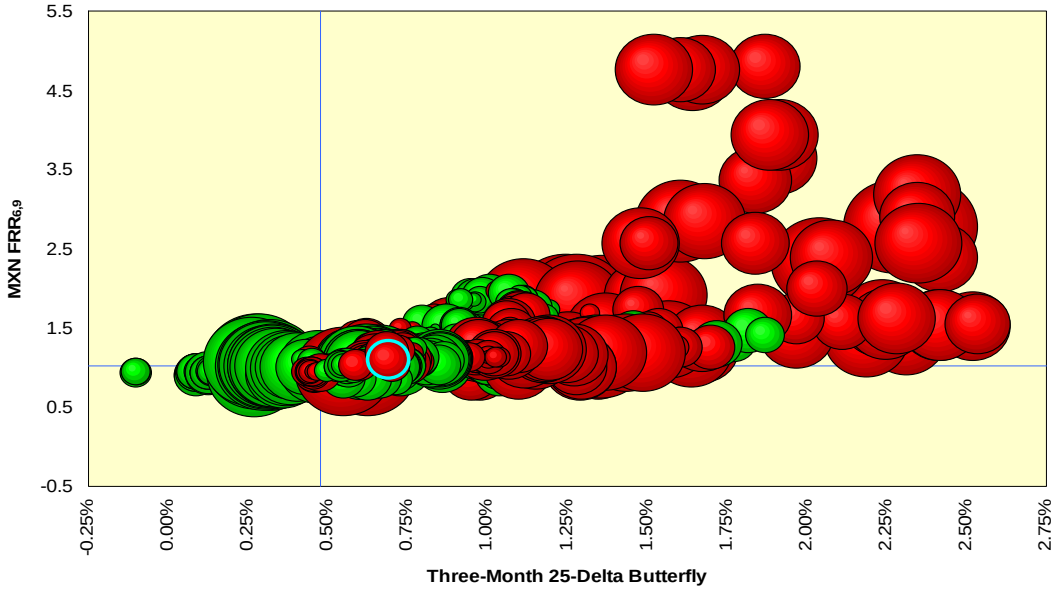
In the case of the Brazilian real, the results are very interesting for 25-delta butterfly levels over 1.75% and for 25-delta butterfly levels below 1.00% in a positively sloped yield curve environment. In both cases the butterflies suggest mean-reversion is operating; selling strangles is indicated for the high butterfly levels and buying straddles is indicated for the low butterfly levels.

Three Month-Ahead Return Shifts For The Brazilian Real

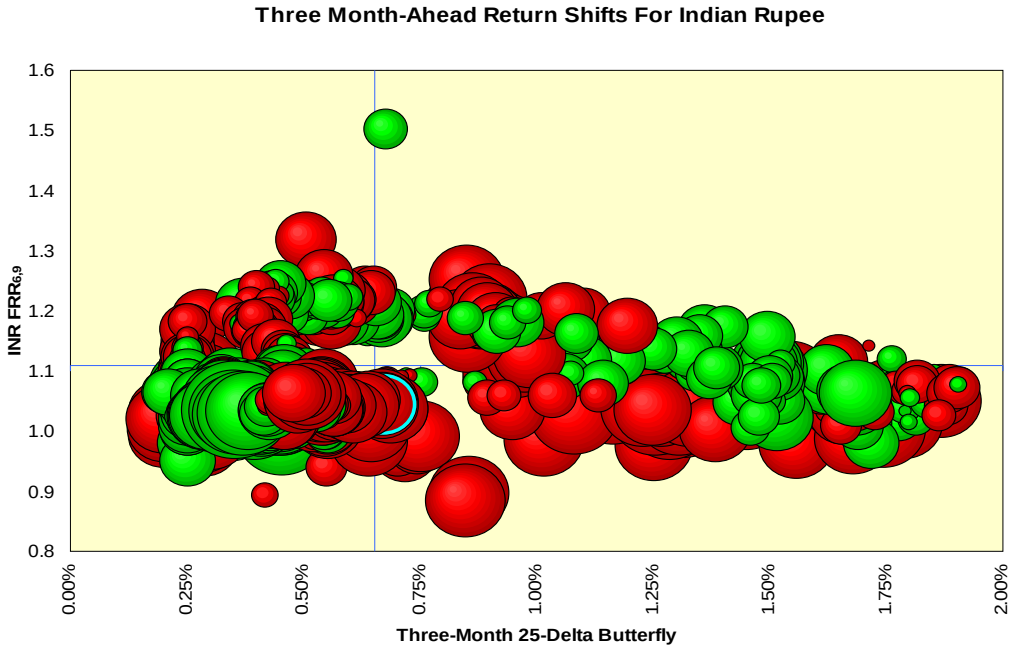


The Mexican peso appears even more amenable to these mean-reverting trading strategies. Here 25-delta butterflies in excess of 1.25% generally are followed by negative return shifts; the opposite is true for 25-delta butterfly levels less than 0.50%.

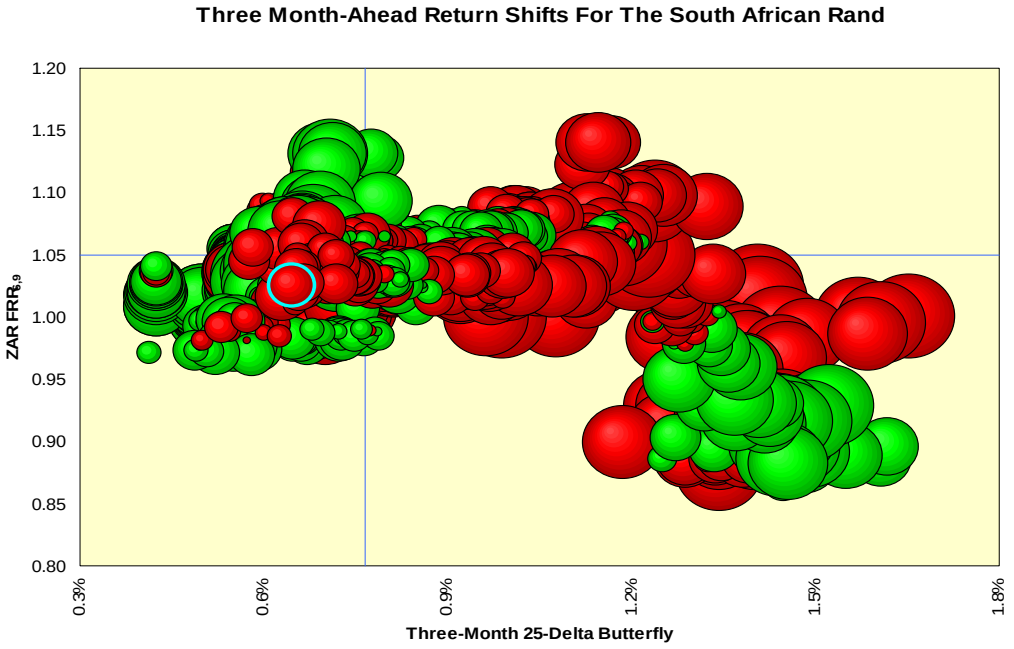
Three Month-Ahead Return Shifts For The Mexican Peso



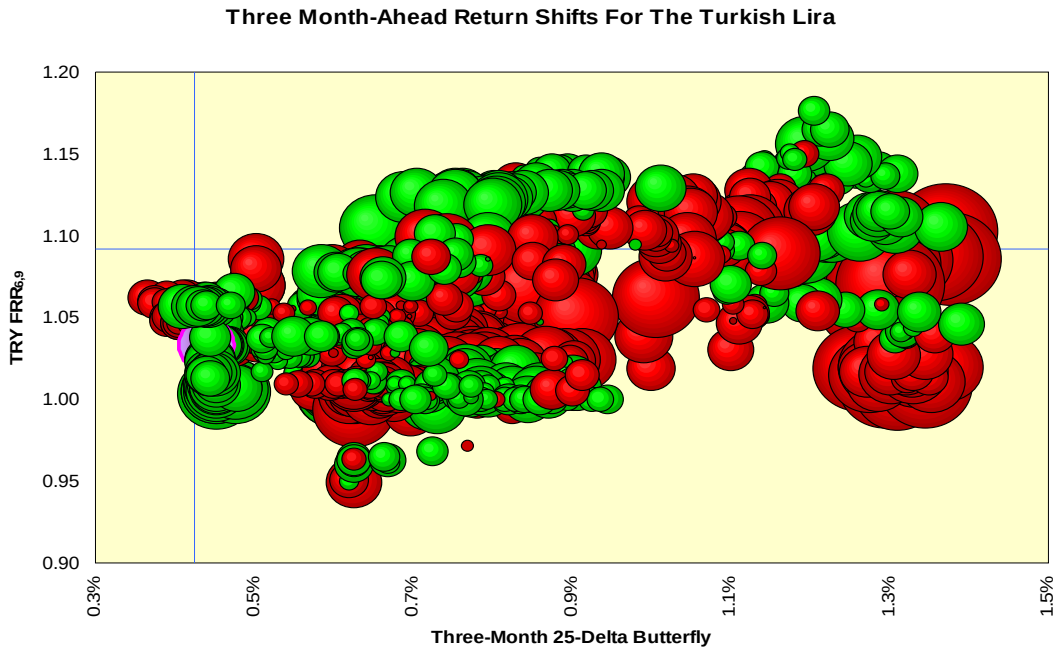
Now the results start to become more mixed. The Indian rupee lacks consistent patterns of return shifts as a function of butterfly levels even when adjusting for different levels of the yield curve.



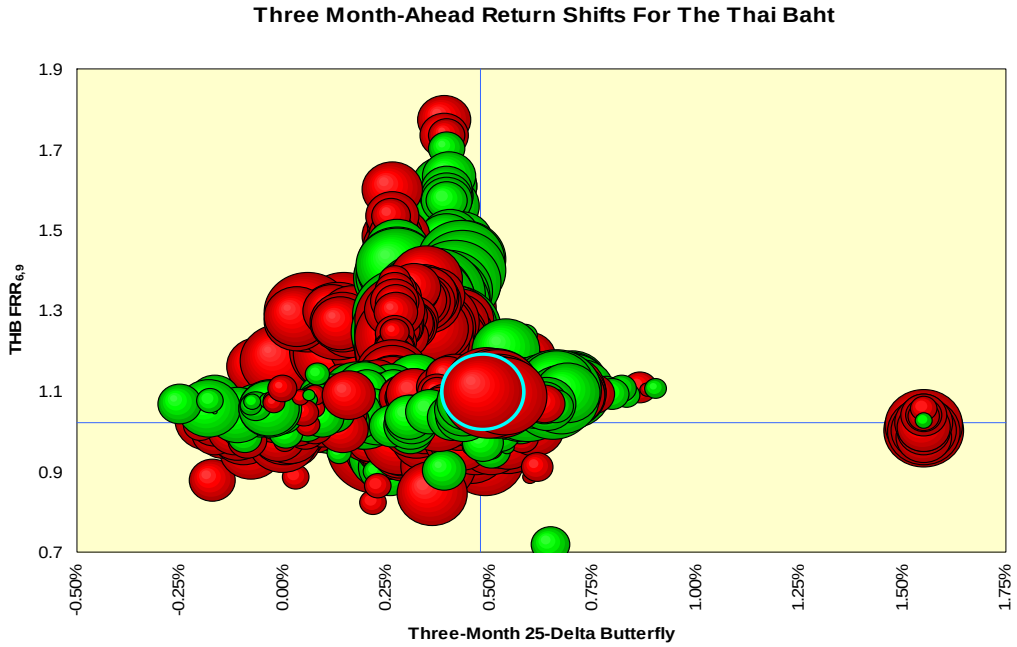
The situation is similar for the South African rand even though the positive and negative prospective return shifts are clustered strongly. The alternating clusters suggest the effects are too anecdotal or period-dependent to be of much use in developing a trading strategy.



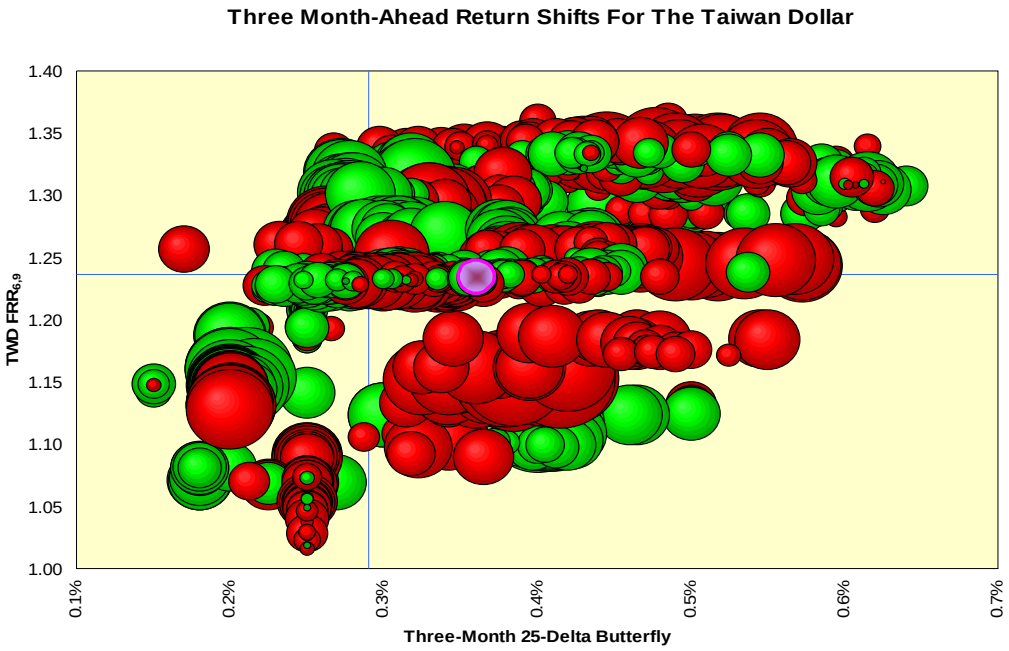
The Turkish lira's patterns are jumbled across both 25-delta butterfly levels and $FRR_{6,9}$ levels. No consistent pattern of mean-reversion is evident.



The Thai baht's pattern is of little use as well. Even though the exaggerated 25-delta butterfly levels of March 2008 were followed by a large cluster of negative return shifts, this appears to be a singular episode. Nothing in the remainder of the data set suggests mean-reverting behavior.



Finally, the map for the Taiwan dollar appears to be a random collection of unrelated observations. No mean-reverting trading strategy is evident.



At the end of this examination of minor currencies we are left with two currencies, the BRL and MXN, with promising patterns of prospective mean-reversion of five currencies with no such behavior. The net conclusion from the combination of this analysis and last month's involving the major currencies is currency butterflies are of little use in setting up mean-reverting position trades.