

# Emerging Market Currencies in a “ZIRP” World

The context of near-zero short-term interest rates from the United States, Europe, the United Kingdom, and Japan provides a huge complication for emerging market countries in terms of the potential interplay of exchange rate movements with growth prospects and inflation pressures. There is nothing like zero interest rate policies (ZIRP) from the major currencies to provide incentives for market participants to seek higher yields elsewhere, including emerging market currencies. The essential policy challenge for emerging market central banks is how to encourage economic growth in these difficult times without fueling inflation on the one hand or creating an environment that would lead to too much currency appreciation that could weaken growth prospects on the other hand.

This report first briefly discusses the context of ZIRP, namely why near-zero rates in the mature industrial world are encouraging global markets participants to react to the on/off process of political decision making. Second, we present our perspectives on the transfer of volatility to emerging market currencies, which we call the “Volatility Box Conundrum.” Our *Volatility Box* approach allows us to frame the issues facing emerging market central banks as they decide on various policy courses which will impact their exchange rates. Next, we apply our analysis to examine some key emerging market countries to see where they fit into the *Volatility Box Conundrum*. We discuss India and China as they

move toward greater currency normalization; Brazil and Mexico as they struggle to encourage economic growth; and Russia as it manages its oil revenue risk.

Our conclusion is that markets are entering an especially challenging period for emerging market currencies. Exchange rates among the ZIRP nations will be driven by the on/off political process instead of economic fundamentals. Exchange rate movements for emerging market currencies will respond to the ZIRP world differently, depending on how market participants shift their evaluation of the foreign exchange carry trade in light of the volatility box conundrum and the interest rate or foreign reserve management choices of the various central banks.

## I. ZIRP is here for an extended period

The US Federal Reserve responded to the financial panic of 2008 by moving to near-zero short-term interest rates and initiating the first round of quantitative easing. The Fed has been in ZIRP mode ever since, even though the economy started growing again in the third quarter of 2009 and has been moving forward steadily, if not impressively, at around a 2% annual real GDP growth rate. Moreover, the unemployment rate, which peaked at 10% has also declined to below 8%, yet the Federal Reserve has viewed the economy as so fragile as to require two additional rounds of quantitative easing as

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well as a maturity extension program (i.e., Operation Twist) to further encourage lower long-term Treasury bond yields. There is every indication that ZIRP will remain in place through 2014 and possibly longer (although we doubt it), even if the fiscal cliff is resolved and US economic growth continues at the 2% pace or even better.

The European Central Bank (ECB) made it clear back in September 2012, that they would do whatever it takes to preserve the single currency. From our perspective, “whatever it takes” implies an extended period of extremely low short-term interest rates for the Euro. The need for austerity programs all across Europe is not going away. In general, most European banks remain in need of more capital and are not ready for Basel III, despite rhetoric to the contrary. The combination of fiscal austerity and a weakened banking system strongly suggests continued stagnation in northern Europe and recession in the more deeply indebted countries. Our projection is that the ECB will remain in ZIRP mode for years to come.

The Bank of Japan (BoJ) was the inventor of ZIRP, back in 1995. When Japan’s stock and property market bubble of the 1980s finally burst – or was punctured by rising rates from the BoJ – there was a period of denial. Japanese policy makers anticipated getting back to normal sooner rather than later. As the economy struggled and the Japanese yen continued to strengthen in the early 1990s, the BoJ responded with the introduction of a zero-rate policy, and the BoJ has been in ZIRP mode ever since. Currently, election politics in Japan strongly indicate that ZIRP in the future may even be accompanied by additional quantitative easing in the form of purchases either of domestic government debt or of US Treasuries as part of foreign exchange intervention to encourage a weaker yen (versus the US dollar).

The United Kingdom recently took the unusual step of appointing a Canadian to run the Bank of England (BoE). While this was a novel move and will undoubtedly shakeup the power establishment inside the BoE, there is nothing in the transition from former Governor Mervin King to incoming Governor Mark Carney that

suggests ZIRP will be abandoned. If anything, the new BoE Governor will focus even more intently on issues of financial market regulation (Canada’s banking system came through the panic of 2008 in relatively good form, especially compared to the UK and the US). ZIRP is likely to be continued and may be accompanied by more quantitative easing to mitigate the pain for difficult UK banking system reforms.

While there are a myriad of consequences and implications related to all of the major industrial country central banks being in ZIRP mode for an extended period of time, we want to focus on two that have profound implications for how currency markets trade. First, there is the market focus on the political decision process inside the major countries of the US, Europe, UK, and Japan. This political focus encourages “risk on/off” market behavior. Second, there is the challenge of evaluating the currency implications of emerging market monetary policies when the major currencies are in ZIRP mode.

## **A. Exchange rates among the majors follow politics, not fundamentals**

When the central banks of all the major countries are in ZIRP mode, then the lack of differentiation in interest rate policy shifts the attention of the currency markets to political decisions. In the US, the question is how to resolve the fiscal cliff. In Europe, the challenges surround how to bailout over-indebted countries and fix the weakened banking system at the same time. In Japan, the political issue is whether to actively weaken the yen in an attempt to create some modest inflation pressure and relieve the perceived negative drag on the economy from persistent deflationary expectations. In the UK, where fiscal austerity was practiced more aggressively at an earlier stage, the political decisions involve the timing of when more pro-growth policies might be enacted or brought forward.

If only one major country was in ZIRP mode and all the others were following normal monetary policy paths based on inflation and economic growth data, then FX analysis would be considerably more straightforward. The single ZIRP country could be treated as a special case,

such as Japan from 1995 until the other majors adopted ZIRP in 2008. In such a case, there would be discernible signals from relative monetary policy among the countries to assist in FX analysis; fundamentals would matter, and trends often persist. When all four major countries have adopted ZIRP and appear likely to maintain ZIRP for years to come, then there is no FX signal at all in relative short-term interest rate differentials. In effect, currency market participants have to look elsewhere to understand why one of the major currencies might outperform another. This takes the analysis into the political realm, and it emphasizes the on/off or binary nature of political decisions. Fundamentals are less important, and incipient trends have a way of reversing abruptly.

Think about the reality of the situation from the perspective of a currency market participant. Essentially, the US dollar, euro, Japanese yen, and British pound are all “sick” currencies. To favor one over the other, one has to decide if a currency just has the flu or if another is in the intensive care ward. The analytical process is inherently a political one based on one’s perceptions of whether long-term political compromises to address the economic challenges are likely to be made versus the more common course of kicking the can down the road and delaying meaningful action. The implication of ZIRP in all the major countries encourages markets to trade in a “risk on/off” fashion influenced heavily by the messy nature of political decision making.

## **B. Absolute rules of thumb to evaluate monetary policies no longer work**

One must always remember that the nature of any exchange rate is that it is a relative price of one currency in terms of another. Thus, FX analysis is all about relative comparisons. There are no absolutes in the FX world. ZIRP makes this observation all the more important.

ZIRP among the major countries removes relative monetary policy from the FX analysis in terms of the interplay of the US dollar, Euro, Japanese yen, and British pound, as discussed above. What is less well appreciated is that ZIRP among the major countries changes the way FX analysts should be looking at the monetary policy

decisions of the emerging market countries. The old rules of thumb may no longer apply, and here is why.

Before the financial crisis in the mature industrial countries in 2008 and before the ZIRP post-crisis period, there was a reasonable ability to use similar analytics for both the major industrial countries and emerging market countries to attack the question of which countries had more accommodative or more restrictive monetary policies than other countries. More or less, there was a level analytical playing field. While different fundamental analysts might prefer different metrics, in general, a country whose central bank maintained a positive premium of short-term rates over the prevailing inflation rate was deemed to be focused on controlling inflationary pressures. Other indicators would include the shape of the yield curve, with a more positive slope from short-term rates to long-term bond yields suggesting a more accommodative policy. And in the case of those countries known to manage their currencies, a more rapid pace of accumulation of international reserves was a useful indicator of relative monetary policy ease.

We are not suggesting these critical metrics be thrown out the window. We are just implying that in a ZIRP world we need to add some caveats and nuances that could mean all the difference in the interpretation.

The essential problem for FX analysts is that since all the major industrial countries have near-zero rates plus varying degrees of quantitative easing, they are all in emergency, accommodative mode using some non-standard techniques for the conduct of monetary policy. By contrast, in the emerging market world, central banks are still using only two traditional tools – short-term interest rates and/or purchases/sales of foreign reserve assets (usually US Treasury securities). As will be applied in the next section on the *Volatility Box Conundrum*, the old rule of thumb for monetary policy evaluation using the premium of the short-term rate over the prevailing inflation rate may yield incorrect conclusions in the ZIRP world.

What matters in the ZIRP environment is the relative degree of accommodation in emerging market countries compared to the major ZIRP countries. This means, as

a hypothetical example, even if an emerging market country reduced its short-term rate to be equal to its prevailing rate of inflation, in a “risk-on” context, it might have an attractive currency due to the rate differential. By contrast, current market practitioners operating according to the pre-ZIRP interpretation would have put this emerging market country in the “easy money” camp and possibly sold it. With all the major countries in ZIRP mode, the new interpretation is that a small negative rate premium to current inflation may still represent a considerably and relatively tighter monetary policy than in the ZIRP countries. Put another way, **ZIRP in the major countries has the potential to encourage emerging market countries to lower their own rates.** So, even if an emerging market country lowers rates, thereby reducing the rate premium over inflation, or even takes short-term rates below the rate of inflation – it may still have the potential for currency appreciation versus the major ZIRP currencies, especially if market participants decide it is time for “risk-on” trades.

## II. Volatility Box Conundrum for emerging market countries

The *Volatility Box Conundrum* is a direct consequence of applying ZIRP assumptions to FX interest rate parity theory. The ideas are intuitive and straightforward, but not often fully appreciated.

Consider a box with four corners. The lower left corner is the spot FX rate between an emerging market country and the US dollar (representing the major currency ZIRP regime). The upper left corner is the prevailing short-term interest rate in the emerging market country, and the upper right corner is the prevailing short-term interest rate – effectively zero – in the US. The lower right corner is the FX futures premium relative to the FX spot rate (lower left). Using interest rate parity theory the FX futures premium equals the market short-term interest rate differential for the maturity of the futures contract.

Figure 1. Volatility Box

Emerging Market Country Short-term Interest Rate		US Federal Funds Rate
	Joint Interest Rate & Exchange Rate Market Volatility	
Spot FX/ USD Rate		Futures FX/ USD Rate

Now think through the policy choices of the emerging market country’s central bank. If the emerging market central bank decides to control its own short-term interest rate (upper left), then this fixes the interest rate differential and sets the FX futures premium (lower right), given ZIRP in the US (upper right). **Thus, by choosing to set its own short-term interest rate, the only place where global market forces that cause FX volatility can be reflected is in spot FX.** The logic works similarly when a country chooses to stabilize its exchange rate. That is, **if the emerging market central bank prefers to manage its exchange rate, then market forces causing FX volatility will be reflected in the short-term interest rate or in related asset activity on the central bank’s balance sheet.**

What is often implicit, but needs to be appreciated, is that for the most part the emerging market central bank has to deal with global market forces impacting its currency. **The most that the central bank can do is choose the channel taken by this external volatility; the volatility itself cannot be reduced or eliminated.** That is, the emerging market central bank can opt for policies that enhance exchange rate stability, but this comes at a price of (1) more short-term interest rate volatility or (2) more central bank asset volatility in the form of foreign reserve accumulation (or depletion in the currency weakness case). Or the emerging market central bank can take the alternative approach and fix its short-term interest rate, accepting the consequences in terms of heightened exchange rate volatility.

The *Volatility Box Conundrum* for emerging central banks, given ZIRP in the major currencies, is that they cannot reduce the amount of externally generated market volatility; all they can do is channel the volatility either into their currency or into their interest rates (or central bank asset purchases). In more normal times, this was not an easy policy choice even when the major country central banks were running their monetary policies to reflect a small premium in their rates over inflation. Now, when the major countries are all in ZIRP mode and running highly accommodative monetary policies, the complexities of central bank policy-making for emerging market countries are made incredibly more difficult.

### III. FX implications for selected emerging market countries

Emerging market countries have their own domestic priorities that are likely to drive their FX policy choices. To understand better the choice sets and how to interpret possible FX scenarios, we suggest dividing emerging market countries into two categories. The first category consists of those countries that have extensive exchange rate or capital controls, even though they may (or may not) be on a path toward currency normalization – for example, India, China, and Russia. The second category involves countries with less onerous capital controls, even if some exist, as well as reasonably well developed and liquid short-term money markets – for example, Brazil and Mexico. Despite dividing countries into these two generic categories, we have to emphasize that every country chooses its own path, and the exchange rate outcomes will all be different.

Before analyzing specific countries, let take a look at some comparative data that highlight the choice of exchange rate stability. We want to compare the annualized standard deviation of monthly exchange rate percent changes with the accumulation of foreign reserves. Foreign reserves are often divided into securities and gold, and because different countries value their gold holdings differently, we present our data in terms of the US dollar value of international reserves minus gold and then we show the millions of ounces of gold held separately.

#### A. Foreign Reserves and Mitigating Currency Volatility

Countries that choose the path of dampening exchange rate stability will tend to accumulate foreign reserves when there is upward pressure on their currency. That is, they purchase foreign assets, often US Treasury securities, paying for the purchase with their own currency, thereby increasing its supply to the FX markets. This puts downward pressure on the country's short-term interest rates in theory. But in practice not all emerging market countries have liquid money markets, so this pressure may be masked. Note that sterilized FX intervention means that foreign reserve purchases by the central bank are offset by domestic government debt sales, and the net result usually means no long-term impact on the currency. Only unsterilized FX intervention works long-term to mitigate currency instability.

Table 1.

Gold and Foreign Reserves (October 2012)			
	International Reserve Holdings Minus Gold in US Dollars (Billions, IMF Basis)	Gold in Million Ounces, IMF Basis	Standard Deviation Annualized of FX/USD Monthly Percent Change Since Jan-2010
<b>Major ZIRP Countries</b>			
United States	\$50	261	NA
Euro-Zone	\$217	347	12.44%
United Kingdom	\$58	10	8.84%
Japan	\$800	25	8.98%
<b>Selected Emerging Market Countries</b>			
India	\$175	18	10.88%
China	\$2,143	34	1.90%
Russia	\$308	30	14.29%
Brazil	\$243	2	16.70%
Mexico	\$104	4	13.84%

Source: Bloomberg Professional and CME Economics Calculations.

China is the country that has most aggressively chosen to mitigate currency market volatility. Even with a sliding peg to allow for some currency appreciation, the annualized standard deviation of the monthly percentage change in the RMB/USD exchange rate has been less than 2% since 2010. Volatility of over 10% is more the norm. To achieve this low degree of volatility, China has amassed several trillion US dollars of international reserves.

Although the international reserve holdings of Brazil, India, Mexico, and Russia may appear small in comparison to China, any accumulation by a given central bank of foreign reserves of more than US\$100 million is a clear sign of at least of some effort to mitigate currency volatility and specifically to lean against the wind of currency appreciation.

Japan's large (US\$ 800 billion) holding of foreign reserves is indicative of the extent that the Bank of Japan has used this version of quantitative easing (namely, purchasing US Treasury securities) to keep the yen from rising more than it otherwise would have, even after decades of ZIRP.

## B. Interest Rate Choices

The other central bank choice highlighted in our analysis is the level at which to set short-term rates relative to domestic inflation. With the exception of Japan, all the major ZIRP countries have negative inflation adjusted short-term interest rates. Japan shows a small positive because it has a slight touch of deflation.

Table 2.

Current Short-Term Rates and Inflation (Q4/2012)			
	Short-Term Policy Rate	Inflation Rate	Current Real (Inflation-Adjusted) Rate
<b>Major ZIRP Countries</b>			
United States	0.16%	2.18%	-2.02%
Euro-Zone	0.06%	2.24%	-2.18%
United Kingdom	0.50%	3.19%	-2.70%
Japan	0.13%	-0.30%	0.43%
<b>Selected Emerging Market Countries</b>			
India	8.09%	9.60%	-1.51%
China	3.00%	2.00%	1.00%
Russia	8.25%	6.50%	1.75%
Brazil	7.14%	5.53%	1.61%
Mexico	4.85%	4.18%	0.67%

Source: Bloomberg Professional and CME Economics Calculations.

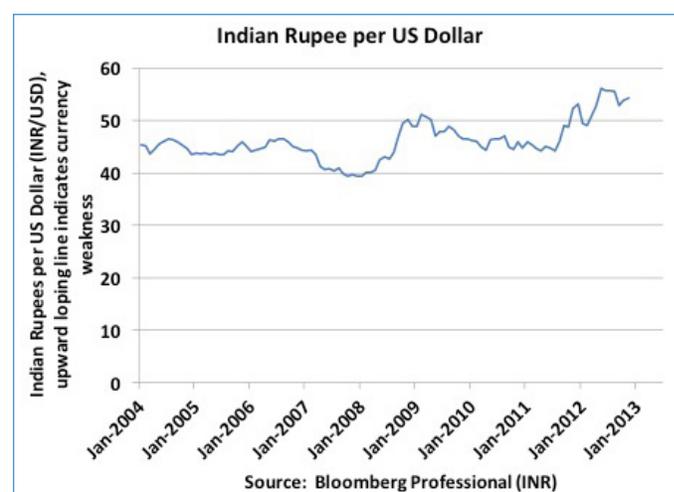
Current real or inflation adjusted short-term interest rates are positive for China, Russia, Brazil, and Mexico. All of these countries have narrowed their rate differentials to inflation in the past few years. India has an elevated inflation rate (above 9%), and has chosen not to keep rates above 10% to maintain a positive premium over inflation.

### C. Emerging market countries with extensive capital controls, less developed property rights, or banking system limitations

**India.** Let's start our country-by-country analysis with India. It is a relatively insular country. Its capital control policies emphasize a desire to maintain local control of foreign investment where possible. Also, domestic entities face a myriad of rules and restrictions when trying to move money outside the country. While India appears to have amazing long-term potential, many observers see its heavy-handed bureaucracy, capital restrictions, and currency controls as being a drag on economic growth while making the control of domestic inflation extremely hard. From a *Volatility*

Box perspective, India has typically chosen to control its short-term interest rate so as to manage inflation expectations, while allowing the Indian rupee to absorb the volatility. This has been on display recently, as the Indian rupee has declined in value relative to the US dollar due to concerns over India's policy toward foreign investment as well as rising inflation pressures.

Figure 2.



If and when India makes the political choice to reduce currency and capital controls, some observers would see

a chance for greater FX volatility in the rupee. We would not, however, agree with this assessment. Our perspective of international markets is that countries that choose to let money flow freely often find that money comes into the country – since it is free to leave. And for those countries that restrict money from leaving the country, well, individuals and corporations often successfully find ways to get their money out of the country.

For India, we would argue that more currency freedom easily might lead to increased inflows of foreign capital, given the huge long-run economic potential of the country. In this case, India's central bank might find it acceptable to reduce short-term interest rates, given that the potential capital inflows might create a rising currency which would assist with inflation control. In any case, however, we would expect India to continue to use its short-term money market interest rate as the primary tool for monetary policy, allowing the exchange rate to adjust accordingly and absorb market volatility.

Currently, our view is that India's inflation rate will soon decline, due to demand weakness domestically and globally. Also, the weakness of the currency in 2011-2012 was in part caused by home-grown issues related to the treatment of foreign investment. India is moving to address these issues, and there are some signs of increased capital inflows and a modest rebound in the currency.

**China.** China has chosen a different currency path. China has even more extensive capital and currency controls than India. Over the last several decades, China has used its state-run enterprise system to channel huge infrastructure spending into the domestic economy to propel its economic growth, while restricting the inflow of foreign capital. At the same time, to encourage exports and manufacturing growth, China opted for the path of currency stability via tight controls on the renminbi (RMB).

Without a well-developed banking system and liquid money market, the choice of currency stability was affected not by interest rate policy, but by the purchase of foreign assets, such as US Treasury securities as

noted previously. That is, the volatility from world markets as they interacted with the Chinese economy was reflected in the tremendous growth of China's foreign reserve holdings.

If and when China decides to ease its currency controls and to normalize exchange rate transactions, China will have to reconsider how it manages its monetary policy. Currency normalization, however, will not occur in a vacuum. The nature of tradable currencies is that their future values, compared to the spot exchange rate, incorporate a premium (or discount) for interest rate differentials. This means that active trading in currencies, including futures and forward transactions, comes hand in hand with more liquid short-term money markets.

**If China accelerates its progress toward currency normalization, as we think the new leadership will do, then increasing the pace of money market development and encouraging a more mature banking system are an integral part of the process.**

To the extent that China can create a financial system that can support a liquid money market, it will also create for itself more options in how to manage its monetary policy. China will still have to make choices from within the *Volatility Box*, but it may choose to back away from currency stability, stopping or reducing its purchases of US Treasuries as part of that process, and move toward short-term interest rate management as the primary tool of monetary policy. This is, perhaps, a long time into the future, but a more open currency arrangement increases domestic policy options, although at some cost in terms of increased currency volatility. Given China's current stage of economic maturity, and its desire to move away from an infrastructure-driven economic growth model and move toward a domestic-demand model, the combination of currency normalization and a faster pace of development for the financial system, including the encouragement of more liquid money markets, all makes perfectly good policy sense.

**Russia.** Russia joins China and India in the "capital controls" category of currency analysis, because property rights are not always as clear as some would hope, there are many controls and regulations that

hinder foreign investment, and money markets are not well developed. Russia is different yet again from China and India, however, in terms of how it makes its currency management choices.

Russia's government depends critically on revenues from oil and gas, and the economy is more or less managed with this in mind. Without a diversified manufacturing base, developments in the energy markets, along with the ebb and flow of the political environment are important currency drivers. In times when global market participants are attracted to Russia's energy resources, Russia can opt for currency stability and resist currency appreciation by purchasing foreign assets such as US Treasury securities. When domestic political tensions cause global market participants to withdraw, or when energy markets turn downward, Russia can choose to spend its foreign reserves to prop up the currency or simply allow the currency volatility. On net, as seen earlier, Russia has been an accumulator of foreign reserves, indicating some desire to mitigate currency volatility.

Essentially, there is an asymmetry to Russia's choice set within the *Volatility Box*. This occurs in part because Russia's own political environment generates considerable volatility in addition to the volatility from global sources and partly from the one-dimensional nature of the economy. Thus, if and when market forces lead to currency depreciation, Russia may be reluctant to spend its foreign reserves, choosing currency depreciation and its accompanying volatility instead. When energy markets are strong and provide an upward lift to the currency, Russia can choose to balance the accumulation of foreign reserves with a desire for more currency stability – that is, leaning against the winds of appreciation.

## B. Emerging market countries with more open banking systems and liquid short-term interest rate markets

**Brazil.** While Brazil has occasionally adopted transaction taxes and other means of limiting currency movements, Brazil has a much more open and market-driven financial system than the countries we have put in the “capital controls” category. This makes the analysis more

straightforward, while the policy decisions facing the central bank are every bit as difficult.

In the 1970s and 1980s, Brazil was known for its hyper-inflation. In the late 1990s and early 2000s, a concerted effort was made by the central bank to deliver on a promise of controlling inflation, by maintaining short-term interest rates at a steady premium above the inflation rate. The result was both improved inflation control and an appreciating currency. The perception among some policy makers that the Brazilian real was appreciating too rapidly and potentially harming the domestic economy led to the imposition of certain taxes and rules to control capital flows.

The financial panic of 2008, however, changed the game. In a ZIRP world, with Brazil's large short-term interest rate differential versus the US and other major countries, the Brazilian real tends to feel pressure for appreciation only when there is a global “risk-on” environment, and the currency trend abruptly turns to depreciation when market participants shift to “risk-off”. **The “risk on/off” switch is totally out of the control of the Brazilian authorities, as it is mostly driven by the political decision process of the major ZIRP countries. If any country is subject to the *Volatility Box Conundrum*, it is Brazil.**

In the post-2008 ZIRP world, Brazil has chosen a mixed approach. When global markets shift to “risk-off”, Brazil has allowed currency depreciation while more or less allowing the increased volatility to hit the currency and not domestic short-term interest rates. In those periods when global markets have shifted to “risk-on”, the currency has moved higher, but the authorities typically have (1) opted for more foreign reserve purchases to slow the rise of the currency and (2) have moved to lower interest rates, effectively also narrowing the premium over the prevailing inflation rate.

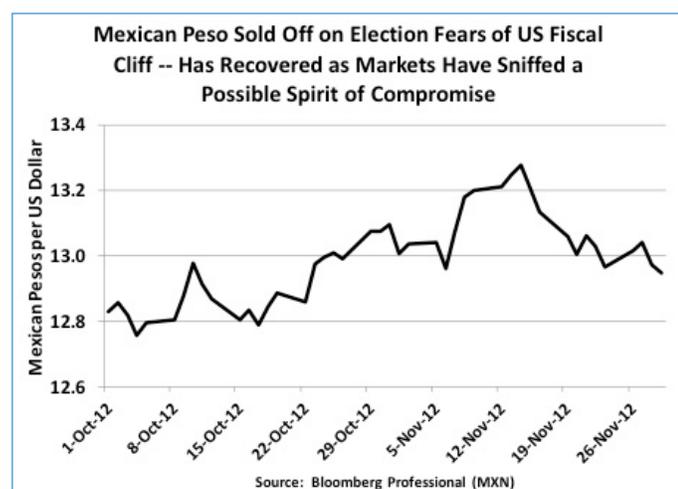
Should the US get by its fiscal cliff, and the ECB contain the financial damage to the Euro, then a more prolonged “risk-on” environment will test Brazil's policy mix. In particular, our *Volatility Box* analysis suggest, given a “risk-on” environment in a ZIRP world, that Brazil may have to

choose between a strengthening currency (that is, moving below 2.00 BRL per USD) or making further cuts in short-term interest rates that would virtually eliminate the premium over inflation. In this hypothetical scenario, we might see all of the above – that is, currency appreciation, rate cuts, and foreign reserve accumulation.

**Mexico.** Mexico shares a long border with the US and its economy is much more intertwined with its neighbor to the north than any of the other economies we have considered here. The higher degree of US-dependence does not change the analytical framework, but it does magnify the impact on the path and volatility of the currency. Even more than Brazil, Mexico is in the crosshairs of the *Volatility Box*, or in terms of the FX markets, a very attractive FX carry trade during “risk-on” market environments. The ZIRP world, moreover, has allowed Mexico to have lower short-term interest rates with a narrower premium to inflation than would otherwise have been consistent with reducing inflation.

What this means for Mexico, and what one can see in the movements of the currency relative to the US dollar, is that the Mexican peso is currently trading US political developments. That is, knowing whether one is in “risk-on” (US fiscal cliff resolved) or “risk-off” (US heading for the cliff with no fiscal compromise in sight) is driving currency volatility.

Figure 3.



## IV. Synthesis

We can summarize the challenges that the *Volatility Box Conundrum* poses for emerging market economies as follows:

When global markets are in “risk-off” mode, ZIRP does not matter, and emerging market currencies tend to depreciate. For the most part, emerging market countries tend to accept the volatility and currency weakness during the “risk-off” environments, given that they cannot control it anyway.

When global markets are in “risk-on” mode, ZIRP makes things a lot more complicated, not to mention interesting, for currency market participants, because it accentuates the policy choices framed by the *Volatility Box*. Emerging market currencies generally belong to the class of financial exposures considered as high risk. In “risk-on” environments, market participants are by definition drawn to riskier exposures to enhance their expected returns.

In a “risk-on” ZIRP world, countries with well-developed money markets and relatively open currency markets may choose to lower short-term interest rates, and narrow or eliminate the premium over the inflation rate rather than ramp up their accumulation of foreign reserves to what may be perceived as excessive amounts. Brazil and Mexico fit into this category.

While India has tight currency controls, and even though it has a more severe inflation challenge than Brazil or Mexico, India may also consider lowering interest rates as a counter to a strong currency, if (a big if) such a trend develops in a “risk-on” environment during 2013.

Until China can achieve normalization of its currency movements, it is likely to prefer currency stability, since it does not have sufficiently well-developed money markets to use lower interest rates as a counterweight to currency appreciation. This means in a “risk-on” environment, China may resume its accumulation of US Treasury securities and other foreign reserves. If deeper and more liquid money markets can be developed, then currency normalization can be accelerated and China can move more toward interest rate management and away from reserve accumulation.

Russia feels a double-impact from “risk-on” environments. “Risk-on” also may come with higher energy prices, so the currency volatility and upward pressure may be increased. Interest rate policy is only partly effective, and domestic politics and property rights developments play a large role. Thus, currency movements in Russia are more multi-faceted and more complex to analyze than the simplified *Volatility Box* approach used here, although the pressures are still the same direction.

Finally, we emphasize that the analysis of emerging market currencies in a ZIRP world starts with the assessment of whether global financial market

participants are in a “risk-on” or “risk-off” mode. More than anything else, this determination of “risk-on” or “risk-off” is more likely made due to political considerations in the major industrial countries as they deal with the challenges of their excessive debt.

The implication for emerging market countries is that their currencies may depreciate and experience increased volatility through no fault of their own and with little ability to do much about it. When markets shift to “risk-on”, however, our perspective is that emerging market countries then face the challenge of potential currency appreciation and are constrained by the *Volatility Box* in terms of their policy choices.

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