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Local Markets – LatAm View

Rates

Our difference on differentials

Real exchange rate appreciation throughout Latin America more likely reflects improvements in risk perception and rising demand for exports, rather than interest rate differentials. If these trends are to reverse course, one should expect a symmetric reaction in terms of real exchange rates. Nominal exchange rates, however, also should depend upon relative monetary policy stances.

Latin America
Economics

- Real exchange rates have appreciated significantly across Latin America over the past few years – in some cases due to nominal appreciation, in other cases due to higher inflation.
- Whereas common sense tends to ascribe this process to interest rate differentials, we present evidence here that reveals that (1) the differential has been declining, which is not consistent with the appreciation; and (2) countries that display very dissimilar interest rate differentials present, nonetheless, very similar appreciation processes. None of this bodes well for the interest rate differential hypothesis.
- We present evidence that real processes – namely the sharp decline in sovereign spreads and higher demand for these countries' exports – are consistent with the pattern observed, and the more likely hypotheses to explain patterns such as currency appreciation and rapid export growth.
- If these hypotheses are true, a reversion in both trends – ie, a less favourable environment in terms of world liquidity and/or a slowdown in world trade growth – could reverse the real appreciation. In any case, the reaction of nominal exchange rates would depend crucially upon the relative stances of monetary policy: countries with lower inflation would be likely to suffer more modest nominal depreciation than similar countries with higher inflation rates.

Introduction

Exchange rates play two roles in economics. The most conspicuous one is to maintain a country's external balance. Their less visible role is to keep economists humble (a tough call, I acknowledge), constantly reminding them about the hardships involved in making forecasts (chiefly those about the future). Regardless of this second function, however modest an economist may be, he (or she) will not escape the task of attempting to determine what will happen to exchange rates. For that purpose, it may be a good idea to examine the factors that presumably have some impact upon exchange rates.

That said, there is a fundamental difference between real and nominal exchange rates. Real exchange rates – which might be understood either as the nominal exchange rate adjusted for the inflation differential, or as the relative price of tradable to non-tradable goods – always play a fundamental role in determining (among other things) the performance of a country's external accounts. As a

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result, one should fundamentally expect real exchange rates to be determined by real factors: the rate of time preference, total factor productivity, terms of trade, taxes, country risk, fiscal policy and what not.

Nominal exchange rates, on the other hand, should reflect what is happening with real rates, but also (and chiefly) monetary considerations – that is, typically interest rate differentials.

That said, if real exchange rate determination presents quite a challenge, predicting the movements of nominal exchange rates has proved to be a nearly impossible task. Back in the 1980s, Richard Meese and Kenneth Rogoff[1] created quite an embarrassment for the profession when they found evidence that no econometric model forecast could outperform the simplest possible model – that is, predicting that the exchange rate tomorrow would be equal to its value today.

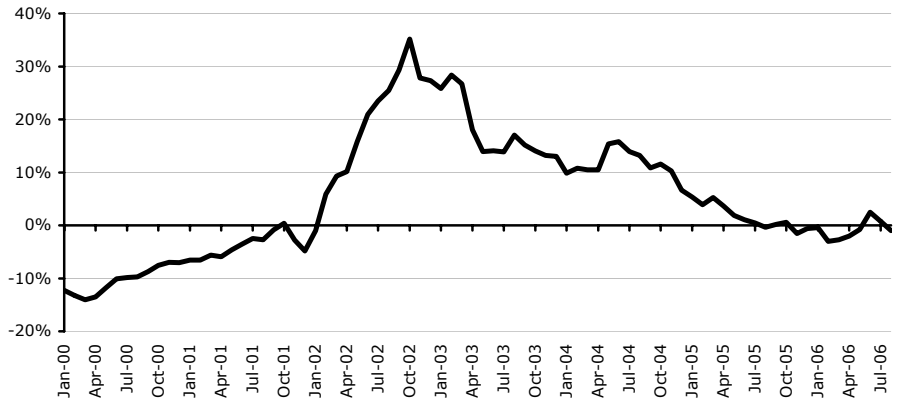
Given such difficulties, we should focus here upon what has been occurring on the real exchange rate side. Our claim is pretty simple. If we can understand the driving forces of real exchange rates, we should get part of the story about nominal exchange rates right. The remainder would be a challenge, but possibly only half as difficult to predict were it not for this effort.

That said, allow me to attempt to summarise the main message: nominal and real exchange rates have appreciated quite significantly throughout EM countries in general and Latin America in particular, although, of course, the timing and particular path of each currency remain quite distinct from one another. It is natural, therefore, to search for causes of the process. Some seem to ascribe this appreciation to the relative stances of monetary policy, particularly in the Brazilian case. Yet, a closer examination of the evidence we amassed relative to five large Latin American countries (Argentina, Brazil, Colombia, Chile and Mexico) does not seem to support that hypothesis.

Indeed, these currencies seem somewhat appreciated relative to their long-term 'equilibrium' levels (according to a metric we detail ahead) and seem to have become stronger over the past few years. To illustrate this statement and offer motivation for a more detailed examination in the next sections, we plot a simple average of the distance between the current level of the real exchange rate in each country and the 'equilibrium' level that we estimate from a simple econometric procedure.

[1] Meese, Richard A. and Kenneth Rogoff (1983). "Empirical exchange rate models of the seventies: Do they fit out of sample?" ***Journal of International Economics*** 14 (February): 3-24.

Chart 1 : Difference from equilibrium – simple average

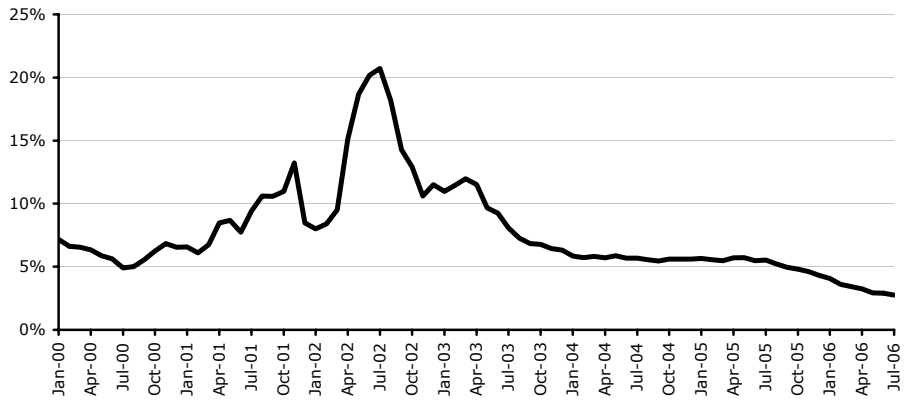


Source: ABN AMRO

The preceding chart should be taken with many grains of salt, because we are aggregating things well beyond what would be considered legitimate procedure. Its main purpose is to illustrate processes that should be detailed with this note, so no major harm should come from it. Bear in mind the limitations of a simple average and note that there may be some variance in the sample as well.

As for interest rate differentials, subject to the same caveats about simple averages, there is evidence that they have actually dropped during the period, an issue that should be explored in more detail later. Yet, the next chart is eloquent in revealing a trend that prevailed for all the countries we examined.

Chart 2 : Interest rate differential – simple average



Source: ABN AMRO

If interest rate differential seems to have played no role in the process, we should look somewhere else. In that respect, we should examine the impacts of export prices and sovereign spreads, developments that may offer some explanation about the determination of real exchange rates.

The behaviour of real exchange rates and a simple metric

As I indicated, it does not make much sense to compare the relative performances of nominal exchange rates, which have scant impact upon the external accounts. A more careful analysis of the issue calls for the comparison of ***real exchange rates***, that is, adjusted according to the evolution of the inflation differential between each country and a benchmark country (or countries). To avoid complications associated with the definition of currency baskets, our approach is the simplest one possible:

take the US as the benchmark country and follow the evolution of the inflation-adjusted bilateral exchange rate between each country in our sample and the US dollar.

The index for domestic inflation was defined in all cases to be the equivalent version of the CPI. This is not an idle choice. Typically, the CPI contains a large measure of non-tradable products – that is, products for which the transportation cost is so large relative to its value that international trade is either non-existent or negligible. As for the US inflation measure, we used the PPI, which in contrast contains a larger measure of tradable goods. Thus, our definition of the real exchange rate (RER) is as follows:

RER = Exchange Rate(PPI/CPI)*

The numerator of the preceding expression captures a measure of tradable prices in the benchmark country, converted into the domestic currency through the exchange rate, whereas the denominator captures the performance of non-tradable prices. One can see why the definitions of the real exchange rate as the inflation-adjusted nominal rate and as the ratio of tradable to non-tradable prices are equivalent.

Once we have a working definition, the calculation of the real exchange rate series is a simple task. In all cases we use the monthly average of the nominal exchange rate and brought it to July 2006 prices using the inflation differential between the domestic CPI and the US PPI.

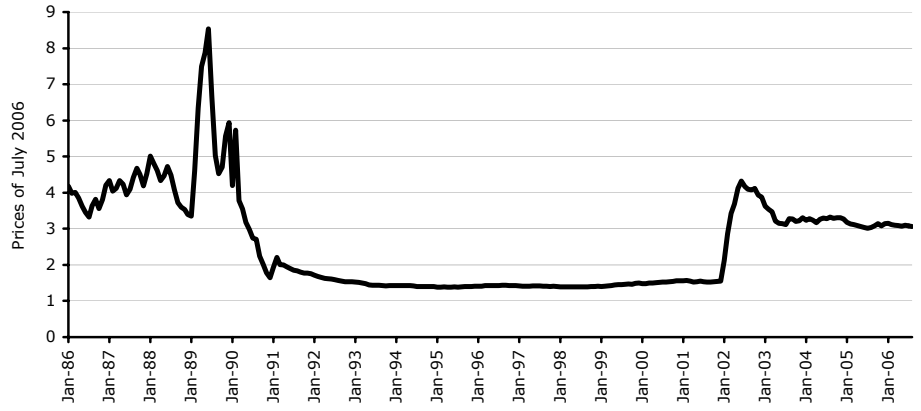
In the case of Brazil, Colombia and Mexico, available data allowed us to go as far back as 1980 to construct a monthly series. As for Argentina and Chile, we have been able to conduct the same exercise from January 1986 onward, and this already poses two problems. The first is that we are not comparing identical things, to the extent that we are missing six years of observations in the case of these two countries. The second issue, however, is even more relevant.

Indeed, we have 248 monthly observations in the Argentine case. Of these, more than half refer to the period during which the exchange rate was fixed to the USD. Theoretically speaking, this should be of little importance: over a ***very*** long period, even if the nominal exchange rate is pegged, the adjustment of domestic prices can, in principle, adjust the real exchange rate as well. It would be a difficult task if prices are sticky (as I believe they are), and the economy is bound to suffer immensely, as the Argentine economy did suffer when deflation was setting in to adjust the real exchange rate in response to the negative shocks of the late 1990s and early 2000s.

That said, it is far from clear if even 10 years is long enough for this process. Moreover, as mentioned, the negative shocks, particularly the terms of trade shock and the risk aversion shock, materialised in late 1998. Thus, in fact, the real exchange rate adjustment through prices in Argentina had only some three years to materialise, and it seems pretty clear that this definitely was not long enough. This is to say that the series on Argentina RER suffers from even more serious problems than the others.

Keeping in mind this important caveat, the next set of charts displays the real exchange rate series for each of these countries.

Chart 3 : RER – Argentina

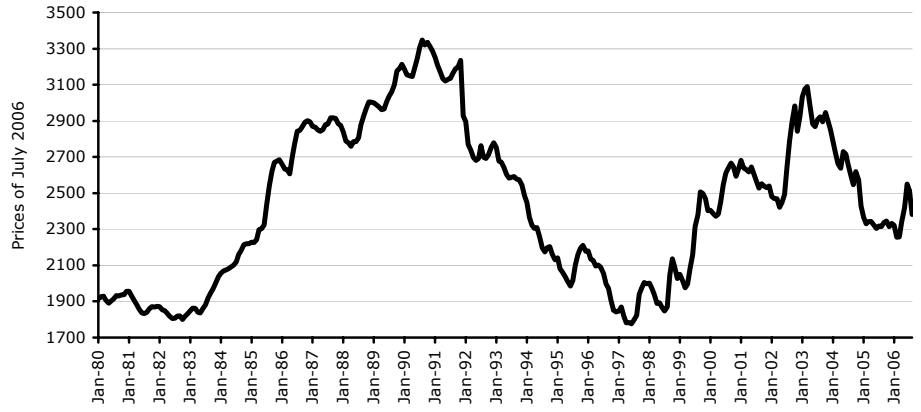


Source: ABN AMRO

Chart 4 : RER – Brazil

Source: ABN AMRO

Chart 5 : RER – Colombia

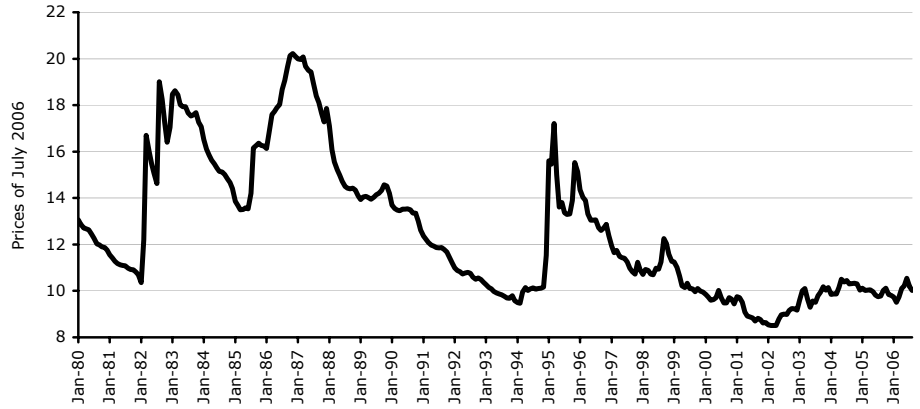


Source: ABN AMRO

Chart 6 : RER – Chile

Source: ABN AMRO

Chart 7 : RER – Mexico



Source: ABN AMRO

However, constructing the series is only part of the story. By themselves, without any reference to a specific value, inspection of the series could imply some considerations about 'ups' and 'downs', but hardly offers any deeper insight about whether the currency is too weak or too strong. One possible alternative is to set up a particular period as one in which the real exchange rate was 'right' (whatever this means), and then compare current levels to one that prevailed in that idyllic time, before the Fall of Man.

The drawbacks to this approach are numerous and obvious. First, the choice of any given period is arbitrary, since there is no set of criteria to help identify it, except vague references to the economy growing at potential (which brings in the very complicated issue of potential GDP growth), maintaining a sustainable current account balance, which also brings its own set of unanswered questions.

Our approach is a bit more agnostic, and relies upon a common econometric methodology. If we are to believe that there is such a thing as an 'equilibrium' real exchange rate, it must be the case that, over time, the actual real exchange rate should fluctuate around this level, diverging whenever shocks (terms of trade, capital account crises or booms) hit the economy, and then coming back at some speed. A simple description of this process would be to assume that the exchange rate tomorrow would be a weighted average of the exchange rate today and the 'equilibrium' exchange rate, plus an unpredictable shock.

$$e_{t+1} = \rho e_t + (1-\rho)\hat{e} + \mu_t$$

This equation can be estimated to yield values for 'ρ' and the 'equilibrium' exchange rate 'ê' (defined as the value around which the real exchange rate seems to gravitate) as well as the speed at which the real exchange rate returns to its equilibrium value in the absence of new shock.

Before presenting the estimates, we warn readers that there are delicate statistical issues involved, which could invalidate these results, so they should not be read as absolute truths about the 'correct' exchange rate that should prevail. Instead, these should be understood as values towards which apparently real exchange rates tend to regress over time. The next table summarises our results.

Table 1 : Estimation results

	Argentina	Brazil	Colombia	Chile	Mexico
Constant	0.080	0.036	22,550	6,807	0.199
Autoregressive parameter (ρ)	0.967	0.985	0.991	0.987	0.983
Half-life (months)	21	44	80	53	41
Implied 'equilibrium' RER (ê)	2,434	2,357	2613	525	11,971
Current RER	3,066	2,158	2383	538	10,017
Difference from 'equilibrium'	26%	-8%	-9%	2%	-16%

Source: ABN AMRO

Notice first that the autoregressive parameters are all quite high – that is, very close to one. A charitable interpretation is that it takes a long time for real exchange rates to return to their 'equilibrium' levels: the highest speed would be the one estimated for Argentina, in which half of the difference between current exchange rates and its 'equilibrium' level would vanish within about 21 months, absent any new shocks. The lowest speed would be in Colombia, where apparently it would take some 80 months for half of the difference to disappear. In Brazil, Chile and Mexico, we are talking about periods ranging from 41 to 53 months – still very long periods.

A less charitable interpretation is simply that the real exchange rate never reaches the 'equilibrium', or – better said – that there would be no such thing as an 'equilibrium'. If indeed ρ approaches 1, this would be precisely the case – that is, each shock would never die out and the path of exchange rates would simply be the accumulation of such shocks. To be absolutely frank, we cannot reject the hypothesis that ρ is 1, but the truth is that the sample size, however big, is not nearly enough to allow for the fine distinction between 1 and, say, 0.97, and this very small difference becomes a matter of life and would be very close to the 'equilibrium' levels, and Brazil, Colombia and Mexico would have relatively strong currencies, ranging from 8% (Brazil) to 16% (Mexico) stronger than the 'equilibrium' level. Again, the weakness of the Argentine peso simply may be an artifact of the data, due to the long period under a fixed-rate regime.

Regardless of the current level of the currency relative to the 'equilibrium' level, a mere inspection of the preceding charts reveals that almost all of these currencies appreciated over the past two to three years, the main exception being Mexico, whose real exchange rate oscillated around MXP 10 to the USD over the past 44 months or so. This pattern calls for an explanation, and we will examine some hypotheses in this note.

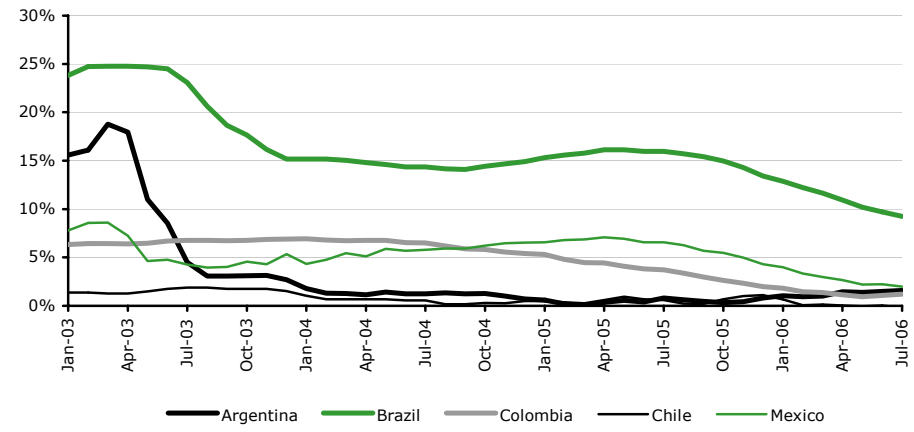
Interest rates

The usual story about the appreciation of the currency will at some point refer to the interest rate differential. Because there could be no arbitrage opportunities, a higher interest rate in a given country relative to another would make the domestic currency appreciate, so as to generate expectations of future depreciation, matching precisely the difference between domestic and foreign interest rates.

This is a simple and elegant explanation. Yet, it was developed to explain the performance of nominal, rather than real exchange rates. It may be a good idea to determine if it works for real exchange rates as well. For this purpose we constructed a series of interest rate differentials for each of the countries we have examined. Since we are dealing with the exchange rates against the USD, we used the fed funds rate as the proxy for external interest rate. Alternatively, we used the 1-year UST rate, but the general results remained the same, hence we report only the differentials relative to the fed funds.

To choose the interest rate series for each country, we attempted to use representative interest rates, for which it would be possible to find sufficiently long and consistent data. For Brazil, we use the Selic rate (the results using the 1-year swap yielded similar results), whereas for other countries we used pre-fixed short-term rates, ranging from 28 days in Mexico to 90 days in Colombia. The results appear in the next chart.

Chart 8 : Interest rate differential



Source: ABN AMRO

Notice that during the period in which the real exchange rate appreciated in different countries, the interest rate differential dropped quite substantially. It is true that the differential remains at the highest level in Brazil (slightly more than 9% as of July 2006), but notice that Brazil displays the most rapid decline in differentials: about 6.7% relative to where it was 12 months before.

It turns out that the simple average line we depicted in the introduction did capture what has been going on with differentials: they have been consistently dropping over the past few years, not by chance precisely during the period in which real exchange rates have been appreciating.

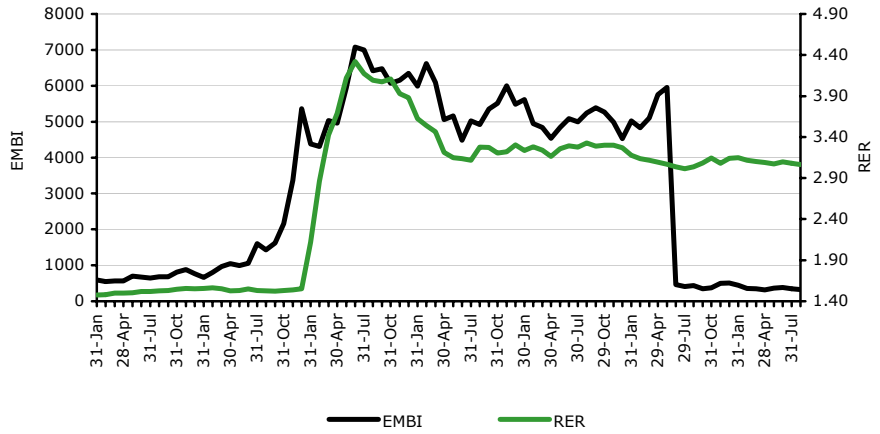
That is, interest rate differentials do not look like they are driving the currency appreciation throughout the region. Not only have they been declining, but in countries where the differential is very small (say, Colombia), we find real exchange rates have appreciated significantly and have reached levels that are stronger than the 'equilibrium' levels estimated in the previous section. In other words, there seems to be more to life than interest rate differentials. We examine what this could be in the next sections.

Sovereign spreads

Part of the story is possibly linked to the performance of sovereign spreads, although this definitely seems to play a more important role in some cases than in others. Indeed, there seems to be a stronger correlation between sovereign spreads and real exchange rates in countries that experienced serious confidence crises,

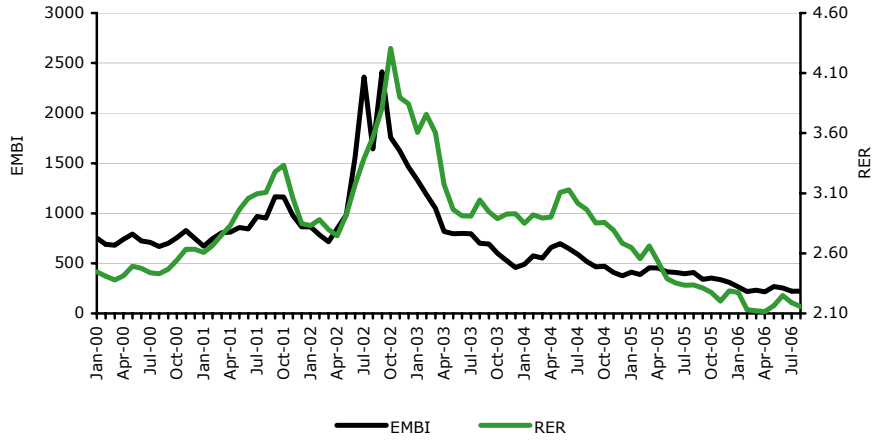
such as Brazil and Argentina, although the correlation seems to exist for more moderate cases as well. The charts summarise the evidence.

Chart 9 : Argentina



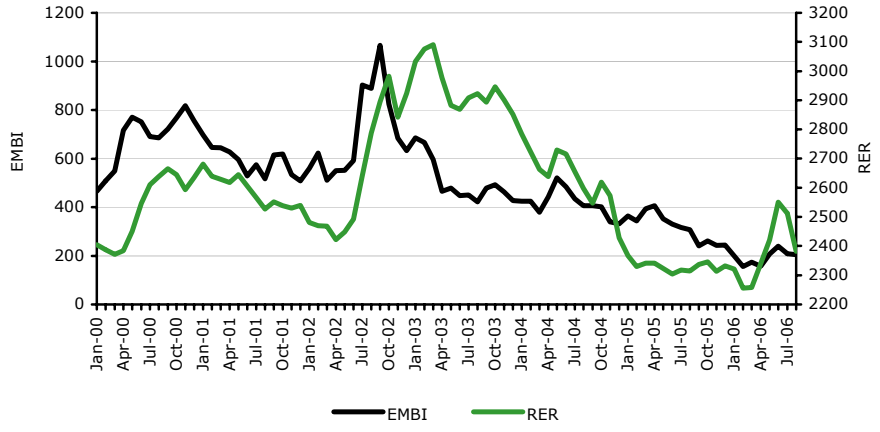
Source: ABN AMRO (RER) and J.P. Morgan (EMBIs)

Chart 10 : Brazil



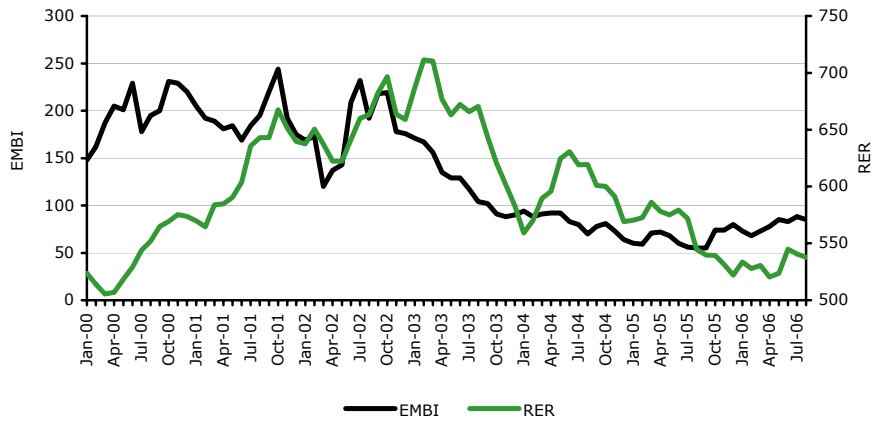
Source: ABN AMRO (RER) and J.P. Morgan (EMBIs)

Chart 11 : Colombia



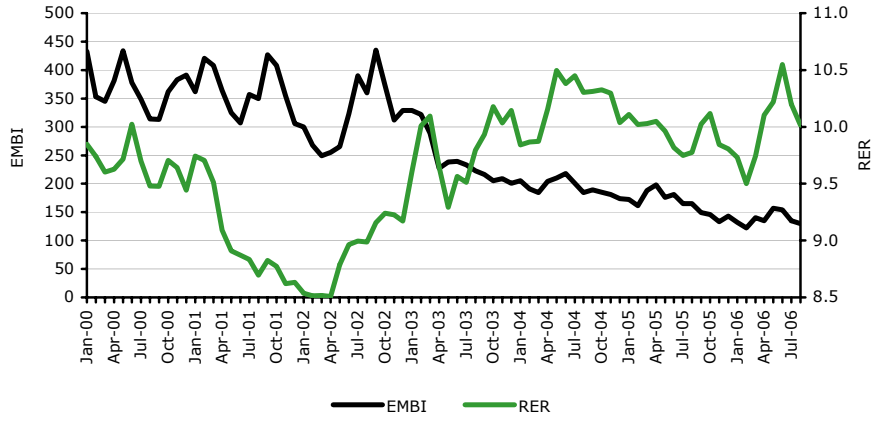
Source: ABN AMRO (RER) and J.P. Morgan (EMBIs)

Chart 12 : Chile



Source: ABN AMRO (RER) and J.P. Morgan (EMBIs)

Chart 13 : Mexico



Source: ABN AMRO (RER) and J.P. Morgan (EMBIs)

Once more, the Argentine case requires a more careful interpretation, as the debt exchange implied a redefinition of sovereign spreads from June 2005, harming the results. That said, except in the case of Mexico, there seems to be some adherence between sovereign spreads and real exchange rates, and there are good reasons to believe this to be the case.

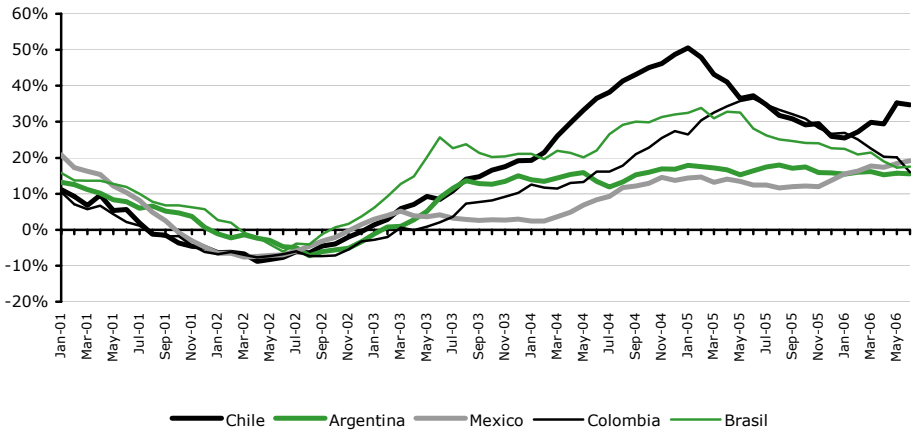
Sovereign spreads measure, among other things, investors' willingness to hold a given country's assets, or, better said, the required premium to hold a certain asset. It is just natural to expect, therefore, exchange rates to be highly correlated to sovereign spreads: after all, not only is the exchange rate an asset price, but also the appetite for a given country's assets should be reflected in the country's exchange rate, which measures the rate at which foreign investors can acquire domestic assets.

As one can infer from an examination of the preceding charts, all these countries have experienced over the past few years a decline in sovereign spreads, which should, to some extent, reflect the appreciation of the real exchange rate. Of course, this is likely to be a partial correlation at most – ie, one of the various effects that might have some impact upon real exchange rates. To fully understand what has been under way, some other elements must be examined.

Export prices and the trade balance

Another part of the story about real exchange rates seems to be related to the very performance of these countries' external accounts, particularly exports. The next chart depicts the annual growth rate of their exports, that is, a comparison between exports over a 12-month rolling window to the preceding 12-month period. As one can see, there has been a substantial acceleration of exports from mid-2002 onward, which is common to all these countries, although it was not necessarily of the same magnitude for all.

Chart 14 : Exports – annual growth rate

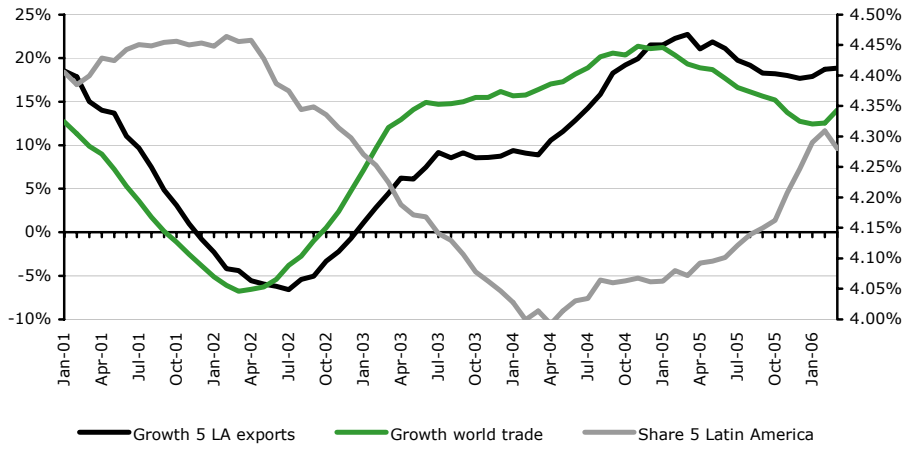


Source: ABN AMRO (from Indec, BCB, BRC, BCC and Inegi data)

Thus, Chile has displayed the best performance of the pack, followed most of the time by Brazil, and sometimes by Colombia, while Argentina and Mexico, although strong, have been the laggards in that respect.

Although we tend to think of the real exchange rate affecting the performance of the trade balance, the correct way to look at the problem is one of simultaneous determination of the external balance and the real exchange rate, pretty much as the prices and quantities are determined in any market worthy of this classification. That is, there must be some other forces, exogenous to the market, that have been moving around demand and supply to produce an outcome in which exports continue to rise while the real exchange rate appreciates.

Chart 15 : Annual growth rates and share



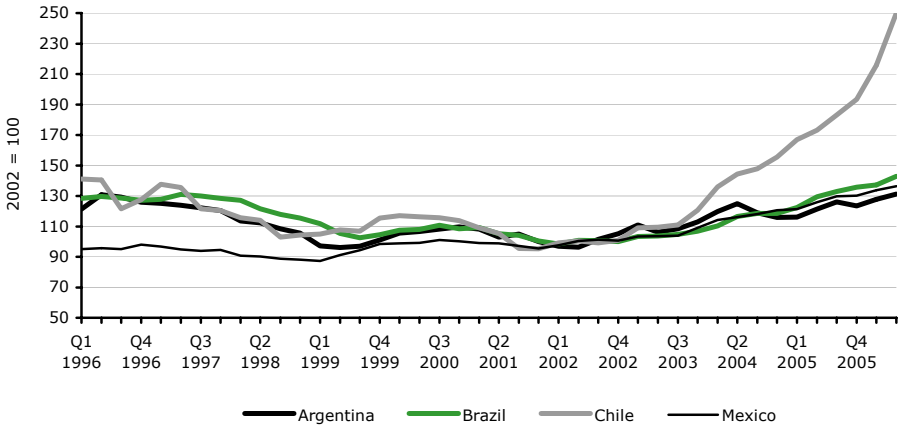
Source: ABN AMRO (from IMF, Indec, BCB, BRC, BCC and Inegi data)

There is an obvious suspect. World trade has been growing at a rate of 15-20% annually since mid-2003, after a decisive acceleration around mid-2002, a process

that has driven up export growth in Latin America as well. Since late 2004 the annual growth rate of these five countries combined outpaced world trade growth, translating into a rising share on world exports.

In other words, there has been a surge in demand for these countries' exports, implying not only higher volumes, but also – and perhaps more important – rising prices. Hence, as of 2Q06, export prices in Chile reached a level 150% higher than the average observed in 2002. Brazilian export prices were in turn 43% higher than in 2002, while in Mexico they were 36% higher, and 31% in Argentina. No wonder, therefore, the astounding performance of Chilean exports.

Chart 16 : Export prices



Source: ABN AMRO

That is, in addition to the improvement in the financing side of the balance of payments, these economies faced a sharp increase in demand for their exports. The increase in volumes and chiefly in commodity prices implied a dramatic improvement in export and trade balance performances in general, which in turn implied downward pressure on real exchange rates.

Of course, as the preceding chart hints at, the impact has not been uniform throughout the region. Chile, for whom copper exports are prevalent (54% of 12-month exports up to August), enjoyed a larger positive shock, once – as most minerals – the supply of copper in the short term is relatively inelastic. Argentina, on the other hand, benefited less, because the bulk of its commodities' exports is composed of soft commodities, such as grains and meat, whose prices have not increased as much as that of oil (only 17% of Argentine exports) and metals.

One would expect Mexican export prices to fare better, given that Mexico is a large oil exporter (US$39bn over 12 months up to July), but this represents only 16% of Mexican exports. In fact, Mexico is mostly an exporter of differentiated products, so the commodity boom has produced relatively smaller impacts upon its currency, which may explain the relative stability of its real exchange rate during the past three years or so.

As for Brazil, according to my calculations, nearly two-thirds of its exports could be classified as commodities (some of them manufactured goods, but commodities nonetheless), but the profile is quite diversified. Oil and derivatives, for example, account for nearly 6% of Brazilian exports, while metals are close to 15%, agriculture-related commodities (including pulp and paper) 22%, and meats some 6%.

Differences apart, one could not ignore that these countries enjoyed a substantial positive shock to their exports associated with the rapid increase in global trade growth. This process is consistent with an appreciation of their real exchange rates and could also explain patterns we have observed in this variable over the past three years.

Concluding remarks

There is no doubt that Latin currencies have appreciated, but it seems that it would be a mistake to assign this movement to the interest rate differentials. First, they have dropped quite visibly; yet this does not appear to have produced any significant effect upon the currencies. Second, while the interest rate differential has been quite high in Brazil, in other countries that went through a similar process differentials have been quite small, clearly not enough to explain the large swing of these past few years.

We suggest that the combination of reduced risk perception (hence higher appetite for these countries' assets) and a sharp increase in demand for their exports could explain much, if not all, of the real exchange rate appreciation.

Against such a backdrop, there is little that monetary authorities can do. Indeed, if the appreciation results in real factors such as lower sovereign spreads and higher demand for exports, the scope of the monetary authorities is limited to the determination of ***how*** real appreciation should occur – ie through an appreciation of the nominal exchange rate, or through an acceleration of inflation.

I am not suggesting that the path of real exchange rates would be identical in both cases. Price stickiness is likely to make the dynamics of the adjustment quite different; in particular, one would expect economies in which nominal exchange rates remained stable to feel the entire impact of higher prices upon the domestic economy, accelerating activity first, to feel inflationary pressures later. Yet, there is no reason to expect the final equilibrium to be much different in each case, regardless of the particular dynamic adjustment.

Hence, while interest rates may not have an important effect upon real exchange rates, they are likely to have an impact upon the nominal exchange rate. Central banks that set interest rates with the objective of maintaining control of inflation would typically observe an appreciation of the nominal exchange rate with low inflation, while those that set interest rates to keep the nominal exchange rate stable should typically see inflation picking up, despite currency stability.

But the story does not end here. If it is true that low (and declining) sovereign spreads and export prices account for the bulk of currency movements, these are the variables that should be monitored to determine the medium- and long-term performance of real exchange rates. As I stated, however, knowing the likely behaviour of real exchange rates is but part of the tale. Monetary policy stances should be then critical variable in determining the second portion of the movements.

Thus if we are, as some claim, entering a period of lower commodity prices and possibly less financial exuberance (hence credit spreads a bit less tight than they have been), it would be natural to expect some movement of the EM/commodity producer currencies towards real devaluation. The amount of nominal devaluation, however, would depend crucially upon the behaviour of inflation: countries in which inflation is low would typically see their nominal exchange rates suffering relatively less than countries in which inflation rates are high, and hence the nominal devaluation would have to walk a few extra miles.

DISCLOSURES APPENDIX

Regulatory disclosures

None

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