Capital Flow Paradox, Speculation And External Adjustment In Emerging Market Economies

Massimiliano La Marca
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Abstract

The paper provides some evidence on the current pattern of current account imbalances, real exchange rate and growth in emerging market economies and offers an interpretation to the fact that fast-growing economies tend to run small current account deficits or surpluses while preserving a non overvalued real exchange rate. The evidence that some speculative capital flows induced by domestic monetary policies may bring the exchange rate on a path inconsistent with an improvement of the external position provides a basis for a reconsideration of monetary and exchange rate policies at the national and international level.

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1. Introduction

External imbalances can have adverse repercussions on both surplus and deficit economies due to the potentially disruptive effect of a sudden adjustment. They can be amplified by short term speculation that prevents the real exchange rate to perform its adjusting role. Moreover, there is rising evidence that developing economies grow more when they manage to run surpluses or relatively small deficits in the current account. The main risk for a developing economy is therefore the overvaluation arising from mounting speculative flows and the failure of their real exchange rate to reduce the external imbalance mostly when they are running current account deficits.

The paper describes and interprets the paradoxes of the current pattern of world trade and financial imbalances where faster growing economies tend to run small deficits or surpluses in the current account, and overvalued currencies may appreciate while undervalued currencies may depreciate. While there is a rising acknowledgement on role of a non-overvalued exchange rate in spurring growth, there is also mounting evidence that the real exchange rate may move in the direction necessary to restore the external balance and reduce large deficits. This is because the international adjustment mechanism can be undermined by many forms of speculative flows which can be triggered by a combination of global conditions and domestic monetary policies and can lead to financial fragility and to real costs for the affected economies. The mounting popularity of “carry trade” positions, broadly defined as highly-leveraged cross-country operations exploiting interest-differentials and low currency volatility, is playing a role in the current diverging pattern of global imbalances and real exchange rates trends and volatility. The paper shows how alternative exchange-rate regimes and their differing monetary policies generate varying degrees of speculative opportunities for the international capital markets.

The paper is organized as follows. Section 2 provide some evidence on the past and recent pattern of international capital flows and review the debate on the linkages between capital flows, growth and income level. The capital flow paradox is discussed and interpreted. Section 3 describes some salient episodes of large cross-currency interest rate returns, currency gyrations and volatility as the outcome of carry trade position build-up and unwinding respectively. The combination of external financial environment and domestic policies is associated to the large opportunities of speculation on a large number of emerging market currencies. Section 4 concludes and points out how national and international policies need to address the major sources of imbalance by providing an institutional framework that would reduce the potential for speculative flows and promote coordinated efforts for exchange-rate adjustment and stable real exchange rates.

2. Capital flow puzzles and the importance of the real exchange rate

2.1 The capital flow “puzzle”

The relation between external finance and growth and the role of capital flows in the process of development have been the object of a renewed debate in the aftermath of financial crises and in the late 1990s and early 2000s. Since then, economists have been starting gathering more critical evidence on the empirical relation between financial globalization and macroeconomic performances. The theoretically strong positive linkage between financial openness and growth does not seem to be supported by empirical evidence whose results are at best mixed and not robust to changes in the observations and the methodological
specification. The evidence that fast growing developing countries have relied less on capital inflows casts doubts on the role of financial market in providing a supporting role to economic development and adds onto the perception that standard analytical framework might be ill suited to provide policy direction for obtaining faster economic growth in a stable macroeconomic environment.

Recent studies such as Prasad et al. (2007) and Gourinchas and Jeanne (2007) find a clear empirical pattern in the net balance of various forms capital flows between rich and poor economies and high and low growing non-industrial countries. Poorer- high growing economies tend to have a positive balance of new net foreign assets and less or negative net capital inflows compared to richer low growing ones. This appears to contradict traditional open-economy growth theory that, in its various alternative specifications, associates larger returns to capital (and therefore more investment and growth) to less capital-rich economies and to economies that are experiencing faster productivity growth. Faster growth and larger investment should be therefore associated to larger inflows of capital.

The contradiction has been labelled the “capital flow paradox” to emphasize the difficulty of reconciling the empirical evidence with conventional wisdom. The puzzle takes different forms. Two decades ago, Lucas (1990) highlighted how poor economies were receiving too little flows of capital given their existing capital endowments and the relatively large capital productivity implied by the standard neoclassical model. There should be, therefore, large profitability of additional investments that could be exploited by both national and foreign investors. The “Lucas paradox” triggered a vast literature that attempted to account for the frictions in the domestic and international financial markets, the institutional inefficiencies explaining the small incentive in investing in poorer economies and other intangible factors explaining larger productivity of advanced economies such as human capital and institutional development. The large literature on the relation between total factor productivity (TFP) and output growth that identifies in the TFP growth the main source of development and cross-country per-capita income differences has provided a continuous attempt to explain the role of institutional elements and intangible productive factors other than labour and capital, while preserving the fundamental assumptions of traditional theory. If the return to investment is reflected by TFP, countries with faster productivity growth (whose TFP growth is larger and are catching up relative to developed economies) should attract more capital and invest more. However, despite the fact that the average non-OECD country had capital appears to flow to developing countries that invest and grow less. Gourinchas and Jeanne (2007) call “allocation puzzle” the impossibility to explain the supposedly perverse flow of capital from high growing and large investing developing economies that are closing up their gap in terms of TFP and flow of capital to low growing economies whose relative income is instead falling behind.

2.2 Comparing current account patterns

Figure 1 shows the time and cross-country simple average of the current account balance as a share of GDP for a number country groups. Economies can be grouped according to their

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1 Prasad et al. (2003) and Kose et al (2006), for instance, provide two broad and encompassing reviews of the existing empirical literature. The former assesses that “…an objective reading of the result of the vast research effort undertaken to date suggests that there is no strong, robust, and uniform support for the theoretical argument that financial globalization per se delivers a higher rate of economic growth…[and] the volatility of consumption growth has, on average, increased for emerging market economies in the 1990’s” (Prasad et al., 2003: 3) so that “…while there is no proof in the data that financial globalization has benefited growth, there is some evidence that some countries may have experienced greater consumption volatility as a result” (ibid.: 1). In the latter “…the majority of empirical studies are unable to find robust evidence in support of the growth benefits of capital account liberalization.
geographical location and their de facto financial openness which is substantially reflected by the inclusion in emerging market lists for stock and bonds indices, such as the JPMorgan EMBI+ or the MSCI indices (figure 1). Both groupings exclude oil exporting countries. The year-2007 point on the “Emerging Asia” line in figure 1, for instance, shows the average current account per GDP for Asian emerging market economies between 2003 and 2007. The figures show a marked tendency in the widening of global imbalances for Emerging Asia, and Emerging Europe and CIS in the last decade, with a significant improvement in the former and deterioration in the latter group. Latin American economies have improved their current accounts since 2002, with the emerging market groups reaching on average a small surplus in the latest years. A significant turnaround has characterized Emerging Asian economies after the 1997 crisis, while the other Asian economies have been recently experiencing a worsening of their balances. A clear feature of the data is that all the emerging market subgroups tends outperform the other economies within the same region, with the exception of Emerging Europe and CIS that have seen a drastic worsening of its balances in the last decade. Recalling that “emerging markets” are by definition those more open to financial flows and typically experiencing larger gross capital in- and outflows, the figure shows that more financially open economies do not tend to generate or absorb large amount of net foreign savings as their inflows must be significantly offset by outflows and reserve accumulation.

Moreover, as documented in Prasad et al. (2007), the average relative income of deficit economies had an increasing trend between 1970 and 2004, while the average income of surplus countries had a decreasing trend, denoting more and more economies that are poorer relative to the most industrialized nations economies are improving their current account while the external balance of relatively richer nations is worsening. With the inclusion of United States and China in the sample, the average relative income of surplus economies has been significantly lower of that of deficit economies in the last decade. Moreover, a number of previous studies found that faster growing economies display smaller deficits for the years 1970-2004, while between 2000 and 2004 high- and medium-growth economies experienced large and medium-sized surpluses as share of GDP, respectively, with China showing significant surpluses in both the periods.

2.3 Candidates for the solution of the puzzle

The inconclusive and non-robust evidence in favor of financial globalization and the more “puzzling” association of growth performances, lower relative income and capital export/current account surplus have generated two typical reactions. One has been to argue against the ability of macrodata to detect the expected relations and the other to question the standard interpretative framework. The emerging theoretical arguments to explain the paradox typically emphasize the imperfection of the domestic financial market and a role for the relative exchange rate.

If consumers and firms are financially constrained and are forced to self finance their consumption and investment projects, larger income growth can only be associated with larger national savings. The impossibility to “borrow against future income”, due to an insufficient development domestic financial system that prevents intertemporal resource allocation role of the current account, would explain the fact that larger investment demand is associated with an even larger domestic savings that would imply a positive transfer of savings abroad (net capital outflows) and current account surplus (Prasad et al., 2007).

Monetary considerations and the role of the nominal exchange rate on macroperformances enter in the present discussion by admitting that capital inflows typically induce an
The appreciation of the real exchange rate and an overvaluation that can harm the tradable sector by reducing the competitiveness of exports in key sectors such as manufacturing, where the large dynamic productivity gains are essential for sustainable growth and development (Prasad et al., 2007).

The evidence that the availability of foreign savings as a complement of domestic savings for investment is neither a necessary nor a beneficial condition for growth lead to the conclusion that individual firms as well as entire economies might not be “saving-constrained” but rather “investment-constrained” (Rodrik and Subramanian, 2008). The perceived return and the incentive to capital accumulation can be repressed by the low social return and or low appropriability of the returns itself. The social return of the project and the private returns on investment can be limited by market failures arising from externalities and weak domestic institutions (UNCTAD, 2006) and can reduce the incentive to invest for any given financing cost. Moreover, if profitability of investment project is large relative to current cash flow, firms would to recur to external finance which can be more expensive than internal one because of agency costs, while if the profitability of investment projects is low relative to the their cash flow, firms can self finance their own investment project and do not need to recur or depend on external financial conditions. If the binding constraint to investment is the return and self-finance is relatively important the investment demand can be insensitive to the cost of finance and saving supply can be irrelevant. According to this interpretative framework, investments in “investment-constrained” economy would not respond positively to the lower cost of finance implied by openness but would negatively respond to the loss of profitability induced by an appreciation. Preserving the hypothesis of responsiveness of domestic consumption and savings to real interest rate changes (a lower return to saving increase current consumption) capital inflows would substitute investment with consumption and generate a positive correlation between current account deficit, appreciation, larger consumption, lower investment and slower growth.

So far, the pieces of empirical evidence and their alternative interpretation led to a consistent assessment that capital flows have not been necessary for faster growing economies and might be dangerous for their effect on the external competitiveness and investment via real appreciation. Dropping the role of the current account deficit as the source of real investable funds and reinterpreting it as the measure of the trade balance and the income payments on assets and liabilities allows to merge the institutional factors that limit private return on investment and induce self-finance with the role of a “competitive”, that is “not overvalued”, real exchange rate in export performance, investment and growth.

2.4 The real exchange rate and the export-led solution of the puzzle

There is indeed a rising acknowledgement on the role of a competitive exchange rate in leading export-led growth and the damages of overvaluation (Esterly, 2005; Johnson et al., 2007). Some analyses support the view that a temporarily undervalued exchange rate can be beneficial to growth in the long run provided that some conditions are met (Frenkel and Taylor, 2006; Frenkel and Rapetti, 2007; Eichengreen, 2007; and Rodrik, 2007).

Whether defined as the ratio of the price indices of two or more economies or as the ratio of nontraded-good price over a traded-good price index, the real exchange rate performs the fundamental role of directing the incentive in production and consumption between domestically produced goods and those produced abroad and between non-traded vis-à-vis exportables and importable goods. This relative price can affect resource allocation across sectors and stimulate aggregate demand and employment, it can allow for substitution effects between goods produced domestically and abroad, it can foster faster productivity growth by stimulating allocation of resources and accumulation of productive capacity on tradable goods,
which are typically characterized by larger economies of scale and dynamic productivity increases.

The \textit{nominal} exchange rate, on the other hand, can be a critical determinant of the \textit{real} exchange rate given the relative sluggishness of prices and provided that monetary and exchange rate policies are not only devoted to control inflation and exchange rate volatility but are also consistently designed to target a competitive real exchange rate. The nominal exchange rate can affect expectation of inflation and asset returns; it can be critical factor in anchoring inflation expectation and expected speculative returns (UNCTAD, 2007). Indeed, both the level and the stability of the real exchange rate can be preconditions for generating real positive effects in employment generation, resource allocation, productivity increases as well as its role in monetary policy and capital markets.

Shifting the interpretation of current account imbalances as the outcome of export performances and import demand for consumption and investment as well as foreign assets and liabilities service payment, as opposed to a pure view of international savings transfer, can provide more practical insights on the reasons why current account surpluses and net foreign asset accumulation can favor longer term growth. The mentioned arguments highlighting the role of domestic financial system, the risks of Dutch disease and the role of private profitability of investments under various forms of market failures are indeed not mutually exclusive but rather complementary. The analysis on the role of a competitive real exchange rate and its beneficial impact on the reallocation of resources and creation of productive capacity on tradables and more specifically on manufactures (UNCTAD, 2002; 2003) are characterized by significant economies of scale and scope that can be exploited through export demand and are subject by returns on learning, technological improvement and product variety expansion. Many authors have also underlined how such productions are more subject to market failures and institutional deficiencies than traditional sectors and non-tradables. Non-overvalued and competitive real exchange rate can provide the price I incentive that can partially and temporarily compensate for the vulnerability of manufacture production to market and institutional weaknesses. They can be driving force in investment demand and output growth. The development of domestic financial systems and their connections with world financial market (as noted in Prasad et al. 2007) as well as social and distributive factors can explain how larger income and output growth has been associated with a more-than-proportional increase in national savings, so that growing economies have fundamentally relied less on foreign savings, that is, their imports and foreign interests payments have been low relative to export if compared with slow growing economies.\footnote{The issues of domestic financial system development absorptive capacity of foreign capital flows and investment financing are dealt with more extensively in other chapters.}

Not only larger current accounts tend to be associated with faster growth across economies but high growth episodes are in general associate with lower real exchange rate (Hausmann et al. 2005) without conditioning for an improvement of the current account.

Figure 2 shows some trend patterns of real effective exchange rate, current account balance over GDP, and growth rate for some selected emerging economies. The black, the red and the blue line represent, respectively, the growth, the real effective exchange rate and current account averages over the eight preceding years.\footnote{Rodrik (2007) estimates index of undervaluation by taking into consideration Balassa-Samuelson effects and fixed effects for time period that can be used both to compare it with five-year moving average of GDP and to}
In China the sharp decline in the real effective exchange rate up to the exchange rate regime change in 1994 has been accompanied by an increasing growth trend and followed by external balance improvements. The similarity with the Indian case is striking, although the current account improvement led only to a short living surplus between 2001 and 2004. The Korean example enriches the diversity of the Asian model by displaying more variability in the average growth rate and current account pattern, but preserving a striking association between real depreciation and current account improvement and between the latter and the growth rate. The large swings of the averages in Argentina and Brazil denote the incidence of their recurrent balance of payment crisis and procyclical effect of capital inflows (represented in the fourth section) on growth. While the current account and real effective exchange rate move symmetrically up to the last decade, growth accompanies the real appreciation presumably following the capital inflows via consumption booms, deteriorating the current account. One interesting diverging point for the two Latin American economies emerged in the current decade, with Argentina preserving a surplus and sustained growth with a relatively undervalued currency and Brazil experiencing a trend improvement in the external balances and growth with an appreciating currency. Rising prices of commodity exports can indeed reverse the link between real exchange rate and the current account. The growth current account and effective real exchange rate co-movement in the Russian Federation is a remarkable example of that.

(Figure 2 about here)

The role of the real exchange rate as a key international relative price is widely acknowledged. The discussion raises the complementary question as of whether the real exchange rate can be treated under certain monetary policy frameworks as a policy variable. The role of the real exchange rate in the short run in allowing for improvement in the current account and growth in the short run as well as in the longer run will be address in section 6 of this paper.

3. Speculative capital flows: determinants and effects

If the real exchange rate is one of the main factors explaining the capital flow paradox - as it represents the relative price that allows for productivity growth and small deficit or surpluses in the current account – and if the direction and volatility real exchange rate is overwhelmingly affected by the persistent trend and volatility of the nominal exchange rate, then the attention needs to shifted on the main determinants of latter in the emerging market economies.

In other words, not only speculative capital flows can generate and supported current account imbalances of small economies, but can also prevent the exchange rate from performing its external adjustment role for larger economies and contribute to the persistence and widening of global imbalances. As the build up of international speculative positions may be induced and supported by inconsistent domestic monetary and exchange rate policies and not sufficiently discouraged by floating exchange rate regimes, then the dilemma of open economy macroeconomics can not be easily solved by invoking an exchange rate regime “corner solution”. Moreover, if speculation is an important source of real exchange rate misalignments and of persistent diverging patterns of global real balances, domestic and international regulations and policies have to provide the macroeconomic and financial conditions for generating converging patterns of trade balances and a coherent adjustment of the imbalances.

run cross-country regression showing the . Since we show the graphical co-movement of single economies we do not correct for country specific factors.
Speculative flows are difficult to define, identify and monitor. For simplicity sake we can define as “speculative” those short term risky position involving two currencies. “Currency carry trade”, for instance, is a class of financial operations that requires the borrowing and selling a low-yielding currency to buy and lend in a high-yielding currency. The ensuing cross-currency speculative positions are typically highly leveraged and may generate a large and continuous stream of profits as long as the interest rate differentials between funding/low-yielding currency and target/high-yielding currency are not offset by a sudden exchange rate reversal. Expected exchange rate movement and volatility, together with cross-currency interest rate differentials, play a key role in inducing a build-up of such speculative positions and their sudden unwinding. On the other hand, interest rate differentials and exchange rate movement cannot be considered exogenous to this form of speculation. The relative size of the funds involved in such a class of operations may trigger a cumulative effect on the exchange rates, inducing an appreciation of the target currencies and a depreciation of the funding currencies. A persistent trend toward appreciation has been experienced by the Icelandic krona, the Australian and New Zealand dollars, the Brazilian real, the Turkish lira, the South African rand and the Korean won, as well as the currency of some transition economies such as Hungary, Romania, Bulgaria and the Baltic states. Funding currencies, such as the Japanese yen and the Swiss franc, demonstrated an opposite trend.

According to McGuire and Upper (2007) and Galati et al. (2007), hedge funds and commodity trading advisors (CTAs) have been the main players and beneficiaries of trades using the yen and the Swiss franc as funding currencies for buying some short-term assets (bank deposits and short-term government papers) in the target currencies. Measuring the volume of the carry trade is problematic because of the lack of data and the variety of forms that these flows can take. However, a comparison of carry-to-risk ratios (the three-month interest rate differential divided by the implied volatility of the currency option) provides further evidence that there is a clear tendency for the currencies of some developing countries, like the Brazilian real and the Turkish lira, to become increasingly more attractive than traditional carry trade targets such as the Australian and New Zealand dollars and the pound sterling.

The mounting evidence on the effects of carry trades shows the absence of strong stabilizing forces on the capital market that would tend quickly to remove any arbitrage gain and lead to cross-currency uncovered interest parity (hereafter UIP).

The UIP states that capital flows find equilibrium when the expected devaluation of a currency compensates for the interest rate differential obtained by investing in that currency and represents a fundamental tenet of our theoretical conventional wisdom and a building block of standard macroeconomic models. The UIP holds when the incentive to buy a currency and invest abroad, driven by an interest rate spread, is completely offset by the potential loss of the currency value, that is, if the positive interest rate spread is compensated by an expected devaluation of the exchanged currency. This implies that assets denominated in a different currency should have the same return so that no extra profit can be made by exchanging them. On the other hand, it also implies that it should not be profitable to short-sell or borrow in a currency and lend uncovered in another. The uncovered interest parity condition is therefore an equilibrium condition that rules out excess demand in the

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4 For example, an established speculator such as a hedge fund might borrow 12,000 yen in Japan, buy 100 dollars in the United States, invest this amount in United States bonds and obtain an interest revenue equal to the difference between the borrowing rate in Japan, say 0.25 per cent, and the higher lending rate in the United States, say 5 per cent. Exchange rate changes between the time of borrowing and paying back the funding currency can add to the gains, or induce smaller gains or even losses. But with stable exchange rates, the interest rate gain amounts to 4.75 per cent. However, both gains and losses are largely magnified by high leverage ratios, since traders typically use huge amounts of borrowed funds and very little equity. For instance, owning a capital of $10 and borrowing 10 times the equivalent of that value in yen, the leverage factor of 10 leads to a net interest return on equity of 47.5 per cent.
international market. Coupled with the assumption that expectations are formed in a fully rational way (market participants use *efficiently all the information* available), it becomes a manifestation of the market efficiency hypothesis that states that any security prices (exchange rate included) reflect all available information, and that no unexploited extra profit is possible.\(^5\)

The carry trade phenomenon, as well as many other profitable speculative activities, not only clearly violates the parity condition but also gives additional support to its related “forward-premium puzzle” (Burnside et al., 2007). The evidence that currencies at a forward premium tend to depreciate, while currencies at a forward discount tend to appreciate, implies that positive interest rate differentials are systematically associated with appreciation. This systematic deviation from the parity condition, not only represents a clear violation of the market perfection hypothesis, but also generate two distinct and destabilizing cumulative effects on the currency involved: In the winding of carry trades, speculative positions pile up, feeding into a pattern of real appreciation for deficit economies and real depreciation for surplus economies. This can provide a substantial contribution to the widening of global imbalances. In the unwinding of the positions, fears of currency reversals generate sales and depreciation of the target currencies, while players' loss-minimizing strategies generate cross-country contagion and volatility.

Carry trade may therefore constitute a significant amplifying factor for global imbalance and financial turmoil and be a direct source of financial fragility and instability. This paper aims at framing the carry trade phenomenon within the broader issue of divergent pattern of global imbalances and of policy options available to countries that are undergoing major transformations in their financial system and monetary policies such as in the case of China. The following sections describe how speculative capital flows, concomitant false pricing and the resulting misalignments are induced by short-term interest rate differentials and floating currencies in perfectly open markets. In light of the evidence, both policy targets for exchange rates and a new assignment of monetary and non-monetary instruments at the national level need to be reconsidered.

As described in UNCTAD (2007), over the past two years, yen- and Swiss franc-funded carry trade operations appear to be responsible for the large volatility and gyrations of some of the high-yielding currencies, such as the New Zealand and Australian dollars, the Hungarian forint, the Brazilian real, the Korean won and the Icelandic krona. The target currency, for instance, experienced what has become the typical currency speculation pattern: prolonged periods of steady appreciation and capital inflows, disrupted by shorter periods of sharp devaluations as carry traders unwound their positions. Figure 1 shows past carry trade potential returns driven by the nominal exchange rate dynamics and the interest rate differentials between the Japanese yen and the Icelandic krona (left panel) along with those between the Japanese yen and the US dollar (right panel). The thick red line represents a 3-month interest rate differential between a krona- and a yen-denominated asset; the thin blue line is the exchange rate change of the krona vis-à-vis the yen for the same period, while their sum (the shaded area) is the return on a 3-month (uncovered) lending in the Icelandic market by borrowing in Japan in local currencies. Since this return carries the risk of exchange rate changes, it is hereafter called “uncovered interest return” (UIR).

(Figure 3 bout here)

\(^5\) The literature on the validity of parity has been extensive and has strongly rejected the joint assumptions of UIP and of exchange rate expectations that are based on “perfect rationality”. Attempts to solve the rational-expectation UIP puzzle, either by adding a time varying risk premium or by assuming a transitional learning period, or by adding “noisy traders”, have delivered theoretically and empirically controversial results.
Figure 3 shows that the potentials for positive returns in cross-currency interest rate differentials persisted even in the face of moderate yen appreciations vis-à-vis the target currency. The returns, however, can be reversed by a steep and prolonged exchange rate movement as in the first half of 2006 which can trigger and be the outcome of an unwinding of the speculative positions.

Indeed, the dollar itself has been the target of "yen carry traders" and, to a lesser extent, of traders borrowing in Swiss francs, at least since the rise of the fed funds rate between 2004 and 2006 and may become again a funding currency with the persistent downward trend of both the exchange and interest rates triggered by the sub-prime mortgage crisis of summer 2007. Other countries, such as Brazil and Turkey, have experienced a steady appreciation trend of their currencies despite fairly high inflation rates. The real appreciation of the Brazilian and Turkish currencies and their large interest rate differentials vis-à-vis the other major currencies and particularly the yen have allowed for large gains in carry trade which persist despite the mid-2006 and summer 2007 turbulences (figure 4).

(Figure 4 about here)

The renminbi/yen exchange rate changes have followed closely the dollar/yen rate changes even after the exchange rate regime in July 2005 (figure 5). The renminbi/dollar exchange rate has trended downward in a increasing but relatively stable manner. This implies that the potential returns on borrowing in yen and lending in renminbi had a similar volatility to that of lending in dollars, but typically an increasingly lower return. On the other hand, borrowing in renminbi and lending in dollar has potentially yielded a small and stable return despite the steady appreciation of the Chinese currency. With the summer 2007 financial turbulence and the acceleration of the dollar depreciation vis-a-vis any other major currency and US Fed interest rate cuts, a strategy of borrowing in renminbi and lending dollar becomes increasingly costly. Indeed, the yen strong appreciation and increasing volatility vis-à-vis the dollar and renminbi have reduced the appeal of using the dollar as a target currency, while lending in renminbi and borrowing in dollar could generate a small return due to the large dollar depreciation. One crucial policy question could be whether the renminbi would be likely to fall into the group of a target or funding currency in case of a full external liberalization of Chinese financial system. So far, we can notice that even in the presence of a significant appreciation of the Chinese currency a strategy of borrowing in renminbi, to buy dollar and target other high-yielding emerging-market currency could provide a more stable source of profits than using the yen as a funding currency. Indeed, the loss due to the renminbi appreciation can be more than compensated by the low volatility of the of the Chinese/US currency pair.

(Figure 5 about here)

The problems arising with speculative flows are not limited to the sustained exchange rate pressures generated by the build up of the speculative positions (a depreciation and appreciation pressure for funding and target currencies, respectively), but extend to the currency stability and, for more financially fragile economies, can involve the overall financial stability. The currency volatility and abrupt reversal of pressure on the exchange rate induced by the unwinding of the speculative positions and contagion effects may have unpredictable and disruptive consequences on the tradable sector first and then on the financial system and the whole real economy.

Indeed, one remarkable feature of any carry trade cycle is the contagion effect that the web of different funding and lending currencies of otherwise unrelated economies imposes on the countries involved. Contagion spreads due to speculators’ profit-maximization (or loss-minimization) motives: unwinding of positions in one country affects all the web-related economies. Such unwinding may be triggered by “conventional focal points” such as the external balance or expected GDP growth, or by the fear of an interest-rate correction and an
exchange rate jump caused by the prospects of inflation of the funding currency. For instance, it has been debated whether the speculative run on the Icelandic krona was triggered by the perceived non-sustainability of the huge current-account deficit, by a downgrade from some rating agency, or even by a piece of “good news” related to the funding currency such as an improvement in the Japanese economy that had the potential of an interest rate increase and an appreciation of the yen. Undoubtedly, the carry trade unwinding from the krona in the early 2006 had a significant impact not only on the Icelandic financial and credit system but also on some third parties involved, namely emerging markets such as Brazil and Turkey, as traders needed to cash in some of their earnings from well-performing currencies to cover some of their losses from the krona trade.

The other specific feature is the currency volatility associated with sudden unwinding of the positions. While uncovered gains and losses can be significant, their volatility depends entirely on fluctuations in the nominal exchange rate. Periods of relative stability and large interest rate differentials provide a strong incentive to traders, as in 2005 and late-2006. During that period the dollar appreciated vis-à-vis the two funding currencies, despite high and rising current-account deficits and higher inflation rates in the United States than in Japan or Switzerland. On the other hand, the carry trade is such a psychological game that it does not require big changes in interest differentials for the direction of the flows to be reversed. The movements between the yen and the dollar are under scrutiny and have become focal points that can trigger a wider reversal. A sudden pickup of expected volatility, as in mid-2006 and in the summer of 2007, can trigger a large unwinding of investments and spill over into emerging market economies. Currency volatility discourages carry trade operations by raising the risk that gains from interest differentials between the funding and the target currency may be eroded by adverse exchange rate movement. Symmetrically, the unwinding of the speculative positions generates the volatility and the exchange rate shifts that lead to further reversal of the flows.

The summer 2007 turmoil originating in the US sub-prime credit market and spreading to other segments of the financial and credit markets worldwide affected carry trade operations and was amplified by sudden carry trade unwinding.

Figure 6 shows the most recent trend in the US $/yen exchange rate and the rate of change. A strong appreciation of the yen since the end of June 2007 is associated with an increase in volatility visible in the large jumps from significant appreciations to minor depreciations.

(Figure 6 about here)

The expectations of lower US rates to ease tight liquidity conditions along with slightly increasing rates in Japan reflecting inflationary pressures played a clear role in these developments. However, this trend change seems to be largely affected by increasing currency market volatility and the rising risk aversion of speculators.

The evidence for the Brazilian Real is supportive of the hypothesis that the fear of crisis can spill over into emerging markets, leading to larger risk aversion and reducing the demand for assets that are increasingly perceived as risky, making the currency carry trade less appealing. In summer 2007, currency carry trade towards the Brazilian real was unwinding, in part due to the increasing volatility of both the Japanese yen and the US $. Despite a persistently large interest differential between Brazilian assets and the latter currencies, fearful investors were looking towards safer assets (figure 7).

(Figure 7 about here)

The yen carry trade unwinding affected the Chinese currency only indirectly. Figure 8 shows the renminbi/yen exchange rate (upper left) and its daily rate of change (upper right) and renminbi/dollar exchange rate (lower left) and its daily rate of change (lower right). The volatility increases in period of large uncertainties on the value of the yen and the dollar such
as in the summer 2007, with the consequent fluctuations of the renmimbi vis-à-vis the two currencies.

(Figure 8 about here)

Figures 9 to 13 below show for some selected economies how alternative exchange-rate regimes and different monetary policies generate varying degrees of profit opportunities for international speculators; it also shows how much real appreciation (with a loss of overall competitiveness) can result from speculation that is driven by interest rate differentials.

We define \( \omega, \rho, \delta, \pi, \) and \( \pi^* \) as the uncovered interest return, the real appreciation, the nominal appreciation, the domestic and foreign inflation rates, respectively, and observe that
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\rho = \pi - \pi^* + \delta, \quad \text{and} \quad \omega = i - i^* + \delta, \]
that is, the rate of real appreciation is the sum of the inflation differential and the nominal rate of appreciation, while the uncovered interest return is the sum of the interest rate differential and the nominal appreciation.

In figure 7, for instance, the short-term speculative potentials, \( \omega, \) (right charts) are graphed together with the inflation differential and the real exchange rate dynamics (left charts). In the left charts, the green solid line represents the inflation rate differential between the selected economy and the United States, \( \pi - \pi^* \), while the shaded area is the change in the real exchange rate, \( \rho \), that is, the sum of inflation rate differential and the change in the nominal exchange rate vis-à-vis the dollar, \( \delta \), (blue thin line in the right charts). An index of the real exchange rate is plotted on the left chart (blue dashes) and measured on the right vertical axis.\(^6\) While the dollar is used as reference for comparison between the countries’ trends and the rest of the world, it is easy to estimate the potentials of yen-funded carry trade by combining the latter figures with figure 3.

Prior to the 1999-crisis, the situation in Brazil was characterized by an overvalued real exchange rate and a large differential between domestic and international interest rates aimed at maintaining capital inflows. During the same period, Mexico also had high domestic interest rates, while relatively high inflation rates were appreciating the real exchange rate. Brazil's 1999-crisis forced a large nominal depreciation of the real and led to an interest rate hike that also affected interest rates in Mexico and Argentina. After the 1999-crisis, Brazil adopted a floating exchange rate regime and implemented an inflation-targeting monetary policy (Barbosa, 2006). The 2001-crisis in Argentina and the 2002-depreciation of the Brazilian real triggered a surge in inflation rates following by a rise in interest rates. While interest rate differentials aimed at curbing inflation have been significantly reduced in Mexico, Brazil is still offering considerable potential gains for short-term speculation. Argentina, on the other hand, was able to contain real appreciation and succeeded in moderating inflation although preserving low interest rates (figure 9). The average real exchange rate of Brazil was about 80 per cent of its pre-1999 crisis level.

(Figure 9 about here)

Turkey provides an example of frequent changes in the monetary regime, resulting in large and volatile nominal exchange-rate changes and frequent real appreciation (mostly induced by large inflation rate differentials), and constantly associated with large uncovered returns on short-term capital (generated by the large interest rate differentials). Financial turbulence struck the country in 1999 and culminated in November 2000 (figure 10). Despite substantial financial assistance by the IMF (since December 1999) and substantial portfolio capital inflows, the financial situation once again became unsustainable in February 2001. GDP contracted by 5 per cent in 1999, grew by 7 per cent in 2000 and ended up with a fall of -7.4

\(^6\) To reduce its volatility, induced by monthly nominal exchange rate fluctuations, we use a 6-month moving average of the real exchange rate, with 2000 as the basis year.
per cent in 2001, displaying an extreme kind of boom and bust. The central bank officially
gave up control of the exchange rate and, since November 2002, the post-crisis IMF
stabilization programme has been officially based on two pillars of financial restraint: a
primary surplus target for fiscal deficits and an inflation-targeting framework for monetary
policy. However, this again has resulted in a strong tendency towards real appreciation and
large uncovered interest returns. Only recently has the country managed to significantly
reduce the interest rate differential, which fell below 3 per cent between July 2005 and March
2006. But with a very high real exchange rate and widening current-account deficits, the value
of the currency dropped at the end of 2006 preceded by significant capital outflows. Turkey’s
frequent boom-bust cycles are clearly driven by the effects of potential and actual short-term
capital flows (Telli, Voyvoda and Yeldan, 2007).

(Figure 10 about here)
Following the recent adoption of inflation targeting, South Africa has experienced large
nominal and real appreciation that have undermined its competitive position and led to a large
current account deficit. Before the 2001 exchange rate fall, frequent depreciations had
preserved the real exchange rate at rather undervalued levels. Interest rate differentials have
been declined after the upswing of 2001, but significant outflows in 2005 and 2006 have led
to large depreciations followed by sharp appreciation and return of portfolio flows.

The picture for Eastern Europe, has been characterized by large interest rate differentials and
aimed at controlling inflation and preserving capital inflows or avoiding outflows. The recent
decline in the interest rates has not accompanied a reduction in the inflation rates, nor
substantial depreciations. The real exchange rate has been persistently rising across the
economies in the group. Hungary high interest rates and appreciating currency have attracted
capital inflows that accompanied by large current account deficit have induced large fragility
in the financial sector and volatility in the currency market (figure 11).

(Figure 11 about here)
Some Asian emerging markets such as Korea and Thailand have adopted managed floating
regime after the Asian financial crisis. Experience of the Asian group as a whole has been
characterized by moderate inflation and low interest rates, which has stabilized expectations
of investors in fixed capital and limited short-term speculative capital inflows (figure 12).

(Figure 12 about here)
Chinese exchange rate, capital market and monetary regimes have been very stable over a
long period of time (in figure 13 the scale of the variables is 4 times larger than in previous
ones). A pegged exchange rate, low inflation and low interest rates have led to expectations of
stability by investors in fixed capital, and have not attracted short-term carry-trade speculators.
Low nominal and real interest rates have caused short-term speculative profit returns to be nil
or even negative, thereby discouraging speculative capital inflows of the carry trade type. A
slight and consistent tendency towards real depreciation vis-à-vis the dollar has only recently
levelled off following some inflationary pressures between 2003 and 2004 and the authorities’
decision to allow a moderate nominal appreciation since 2005.

(Figure 13 about here)

To summarize, in many past experiences, managed depreciation or pegging of exchange rates,
associated with large interest rate and inflation rate differentials, have led to real appreciation
and the loss of competitiveness, and have offered opportunities for speculation. This occurred
to a large extent in pre-crisis Brazil, Thailand, the Republic of Korea and the Russian
Federation in the 1990s. Unfortunately, the regime switch to floating and inflation targeting
improved the situation only in those countries that were able to consistently reduce their
interest rate differential against the United States. In many other cases, despite slightly lower
inflation and interest rate differentials, the tendency towards real appreciation continued unabated. Moreover, the opportunities for international speculation, though subject to larger
exchange-rate risk, have not faded; instead, they remain a major source of instability and risk.
Short-term interest rates, as the main instrument to combat inflation, have generated new opportunities for large-scale speculation on the currency market. The real costs for the economies will be very high if the restrictive effects of chronic real appreciation add to high real interest rates and penalize non-subsidized domestic capital formation.

Brazil, Hungary, Mexico, and South Africa have recently adopted an inflation-targeting monetary regime that typically requires a free float of the currency and control of inflation rates through interest rates. Although the post-crisis regime marked deep structural changes for Brazil, Hungary, and Mexico, with a clear shift towards a lowering of interest rates and inflation rate differentials, the level of interest rates is still very high, volatility is large, and the tendency towards real appreciation and a deterioration in overall competitiveness persists for Brazil, Hungary, and South Africa. Their high real interest rate, consistently larger than the United States benchmark, constrains capital accumulation and may generate inflationary pressures by reducing capacity growth in the longer run.7

4. Conclusions: national and international policies

A stable and prospering external sector is often fundamental ingredient for an effective development strategy. Recent studies have found that a “competitive and stable” real exchange rate is a key economic policy tool for developing countries because it enables a persistent pattern of export expansion and investment growth based on a profit–investment nexus (UNCTAD 2004 and 2006; Rodrik, 1995) allowing to take advantage of favourable fundamentals, externalities and proper institutions (Eichengreen, 2007). The challenge for national policies is to combine the control of inflation rates, which has taken centre stage in many developing countries, with international competitiveness and low exchange-rate variability and in a world of free and volatile short-term capital flows.

As emphasized in UNCTAD (2004 and 2007), large inflation differentials lead to large interest rate spreads, because central banks use the interest rate as the principal instrument to curb inflation via a contraction in credit and demand. But nominal returns are the focus of carry trade by financial investors. These investors are not concerned with inflation differentials and other fundamentals per se, as long as they do not constitute a threat to the stability of the currency and therefore to their expected profits. The capital inflows induced by nominal interest rate spreads, coupled with an exchange rate that is perceived as either stable or appreciating, on average, or even depreciating but still allowing for sufficient returns, have huge repercussions for the real economy and for current-account imbalances worldwide. The financial and real systemic effects of portfolio capital inflows vary according to the specific institutional, structural and even cyclical situation of the recipient economy. Financial development and intermediation, the size of the inherited internal and external debt, the composition of production and of the trade balance affect the capacity to absorb the flows and their impact on relative prices and on growth. Nevertheless, the scenarios that characterize emerging market financial fragility and volatility share common features. Under a fixed exchange rate or crawling peg regime, capital inflows boost reserves, money creation and credit expansion, which may induce consumption growth and inflation and an import surge. Traditional macroeconomic analysis typically assumes that currency volatility tends to reduce any form of speculation. However, even allowing for a certain degree of risk aversion on the part of speculators (meaning that for identical expected returns they will choose the assets with a smaller risk), exchange-rate flexibility does not discourage portfolio and currency speculation unless interest rate differentials could be offset by the risk of depreciation, in

7 For a more detailed country by country analysis see UNCTAD (2007) chap. 1 Section D.
periods of extreme volatility. In particular, if the herd behaviour of speculators is sufficient to appreciate the target currency, the appeal of large returns is sufficient to generate them. An overvalued exchange rate penalizes exports and reduces competitiveness, and therefore the growth of firms in the traded-goods sector. This in turn adversely affects income and growth in general. Finally, deteriorating economic conditions may make the country the object of a renewed focus on “bad fundamentals”; the exchange rate may sharply devalue and the central bank’s ability to contain inflation may be called into question.

The stable growth performance of China would not have been possible without the strategy of unilaterally fixing the exchange rate, which has been implemented since 1994. This strategy was successful because it was accompanied by a reform of the wage-setting regime in the mid-1990s, a heterodox macro-economic demand management that has addressed the country’s needs and a rather closed capital account. This arrangement has made it possible for China to both master the challenges of globalization and modernize the domestic economy at the same time.

Inflation in China has been remarkably low for a country that has reached a double digit GDP growth rate. Chinese recent inflationary pressures appears to have two main sources: (i) a slow down in the productivity growth rate and relative acceleration of the wage rate that has been pushing up unit labour costs in the last four years, (ii) and a relative price increase of food supply and oil. While the latter inflationary source can generate structural change in the relative prices of food and manufactures and can be contained, the latter source of price increase may have a more persistent effect by generating some inertial wage-price dynamics and inflation expectations. Inflation scares have been traditionally avoided by a strong commitment of the government to control some prices, notably of government services and utilities. Although the rage of prices under direct administrative control is limited, inflation expectations can be dampened by the credibility and reputation capital of the government commitment. Rising unit labour costs may on the other hand structurally increase inflation; the wage-price setting mechanism may contain the rise of inflation on this latter front. Moreover, both before and after the exchange rate regime change in July 2005, the large and persistent capital inflows mostly FDIs and current account surpluses have induced strong pressures on the renminbi peg to the dollar and to the reference currency basket, respectively, that have required large intakes of foreign reserves. There is a widespread perception that large inflows are including speculative positions waiting for large appreciations of the renminbi or even a further one-off appreciation.

This raises question on whether restrictive monetary policies are necessary to contain the emerging inflation in China and whether a rise in the reserve requirements and a money-growth contraction would really curb inflation even at the cost of raising the interest rates and adversely affecting the cost of keeping the newly acquired lower yielding US$ reserves.

According to Marvin and Prasad (2006) and Prasad et al. (2005), a greater flexibility and mild form of inflation targeting would allow a better domestic macroeconomic management. Viewed in terms of the much celebrated open economy trilemma, China would shift from a regime of limited capital account openness and fixed exchange rate system to a regime of more openness and flexibility. The flexibility of the exchange rate would be the requisite for maintaining an independent monetary policy while progressively opening up to foreign flows and increasing the interdependence with the global economy. A greater exchange rate flexibility would increase the scope for an independent monetary policy, while gradually improving the soundness of the financial and moving towards greater capital account liberalization. Greater exchange rate flexibility would require and stimulates the development of currency risk management instruments such as forward and hedge instruments which on the other hand allows for the creation of speculative positions.

Proponents of the "corner solution" to the postulated open economy macroeconomic trilemma
are divided on which the right corner for China should be. According to some prominent monetarist economists (McKinnon and Schnabl, 2003 and Mundell, 2003) China should have not changed its regime, since real imbalances could not be cured with monetary measures, that would lead to more currency volatility.

The past and recent experience of developed and emerging market economies shows that the trilemma between (i) independent monetary policy, (ii) fixed exchange rate and (iii) capital mobility does not represent a useful predetermined menu from which a single economy can pick up two (notably (i) and (iii) as in the case of inflation targeting) and obtain monetary and exchange rate stability and economic growth. The ongoing carry trade from the yen or Swiss franc, from countries with very low inflation and very low nominal interest rates to countries with higher inflation and higher interest rates, such as Brazil, Hungary or New Zealand, breaks the vital link between interest rate differentials and the risk of currency depreciation. If floating exchange rates do not follow the purchasing power rule in the short term and destabilize the external accounts, then international policy should aim at preserving this rule as a policy target. Unhedged borrowing by hedge funds and other speculators more than anything else raises questions about the wisdom of widespread acceptance of floating as the only feasible solution to the problem of the external balance.

Given the experience with rigidly fixed and freely floating exchange rates, “intermediate” regimes have become the preferred option in most developing countries with open capital markets; they provide more room for manoeuvre when there is instability in international financial markets and enable adjustment of the real exchange rate to a level more in line with a country’s development strategy. None of the “corner solutions” offer these possibilities. Developing countries that are not members of a regional monetary arrangement that could deal with the vagaries of the global financial markets thus have to resort to controls of short-term capital flows or adopt a strategy of undervaluation and unilateral fixing (UNCTAD 2004).

The heterodox national macroeconomic policies such as those applied in China with outstanding success still preserve their role. In this approach, monetary policy focuses also on the external sector, including the exchange rate. Inflation is controlled by other factors and policies than those controlled by the central bank: typically, well-designed income policies taking into account the existing labour market institutions have played a leading role. Avoiding large gains for foreign investors from short-term arbitrage operations keeps the actual rate of appreciation in check and cuts the link between these capital flows and the real exchange rate, thus maintaining a country’s competitiveness. This may require policies to restrain short-term capital inflows and outflows through regulation as long as the expected profitability from speculation cannot be reduced by a traditional set of policies like an interest rate reduction. Internal and external debt restructuring may help limit the effect of international speculation by reducing nominal interest rates.

Institutions and policies at the supranational level can contribute to the overcoming of the international macroeconomic dilemmas.

To prevent manipulation of the exchange rate, wage rates, taxes or subsidies in the bid for global market shares, and to deter the financial markets from driving the competitive positions of nations in the wrong direction, a new code of conduct is needed that would regulate the overall competitiveness of nations. Such a code of conduct, as part of the global governance system, would have to balance the advantages of one country against the disadvantages of other, directly or indirectly, affected countries. For example, changes in the nominal exchange rate that deviate from the fundamentals (inflation differentials) affect international trade in exactly the same way as do changes in tariffs and export subsidies. Consequently, such real exchange-rate changes have to be subject to multilateral oversight and negotiations. Reasons for the deviation from the fundamentals and the necessary size of the deviation have to be
identified by an international institution and enforced by a multilateral body. Such rules could help protect all trading parties against unjustified overall losses or gains from competitiveness, and developing countries could systematically avoid the trap of overvaluation that has been one of the major impediments to prosperity.

A long-term solution for the international financial system has to start with the recognition that the idea of a cooperative global monetary system is as compelling as the idea of a multilateral trading system. As with multilateral trade rules, a well-designed global financial system has to create equal conditions for all parties involved and help prevent unfair competition. Indeed, reasons for which the International Monetary Fund (IMF) was founded more than 60 years ago are still largely valid. Avoiding competitive depreciations and other monetary distortions that have negative effects on the functioning of the international trading system is more important in today’s highly interdependent world than at any other time in history.
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Figures

Figure 1: Simple average of current accounts by region over 5 year period
Figure 2: Long run relation between CA, growth and REER.
Notes. 8 year-moving averages. Blue line: CA/GDP (left scale). Black line: GDP growth (left scale). Red line: REER (right scale)

Note: A positive change in the exchange rate indicates an appreciation of the currency concerned. For an explanation of differentials, see text.

Figure 4: Yen carry trade on the Brazilian real and Turkey lira, between 2005 and 2007. Source: Calculations based on IMF, International Financial Statistics database; and national sources.
Figure 5: Potential for yen-funded and dollar-funded carry trade on the Chinese renminbi, between 2005 and 2007. A negative return on the dollar funded carry trade obviously implies a positive return in the renminbi funded carry trade on the dollar.
Source: Calculations based on IMF, International Financial Statistics database; and national sources.
Note: The scale of figure 3 is twice as the scale of figures 1 and 2.

Figure 6: Recent yen carry trade unwinding and currency volatility with the US dollar. Yen per US $ (left) and daily rate of change (right).
Source: Calculations based on Bank of Japan.
Figure 7: Recent dollar carry trade unwinding and currency volatility with the Brazilian real. Brazil real per US $ (left) and daily rate of change (lower left) and its daily change (lower right).

Source: Calculations based on Banco Central do Brasil.

Figure 8: Recent turmoil and the renminbi. Chinese renminbi per yen (upper left) and its daily rate of change (upper right) and Chinese renminbi per dollar (lower left) and its daily rate of change (lower right).

Source: Calculations based on Banco Central do Brasil.
Figure 9 - Brazil and Argentina - Uncovered interest returns, exchange rate changes, inflation and interest rates differentials, 1995-2007. Source: Calculations based on IMF, International Financial Statistics database; and national sources.
Figure 10. Turkey and South Africa - Uncovered interest returns, exchange rate changes, inflation and interest rates differentials, 1995-2007. Source: Calculations based on IMF, International Financial Statistics database; and national sources.
Figure 11: Hungary and Russian federation. - Uncovered interest returns, exchange rate changes, inflation and interest rates differentials, 1995-2007. Source: Calculations based on IMF, International Financial Statistics database; and national sources.
Figure 12: Republic of Korea and Thailand. Uncovered interest returns, exchange rate changes, inflation and interest rates differentials, 1995-2007. Source: Calculations based on IMF, International Financial Statistics database; and national sources.
Figure 13: China - Uncovered interest returns, exchange rate changes, inflation and interest rates differentials, 1995-2007. Source: Calculations based on IMF, International Financial Statistics database; and national sources.