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Article

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ANTICIPATED EFFECTS OF FOREIGN CURRENCY RESERVE DIVERSIFICATION IN ASIAN COUNTRIES: DO CHINA AND INDIA MATTER FOR COORDINATION?

FRIEDRICH L. SELL*

China achieved an extraordinary GDP growth rate of 10.7 percent in 2006 which is the highest since 1995. In addition, its level of international reserves has risen to a level of more than USD 1 trillion. Such continuous foreign currency reserve accumulation since 2000 does not appear to be unique, however. Other emerging economies like India and Brazil seem to mimic China's strategy. Figure 1 demonstrates a clear upward trend in the world's international reserve accumulation and it also shows that China and India have greatly contributed to this process. China meanwhile accounts for more than 20 percent of these reserves.

Regardless of the speculation whether this might lead to a real depreciation of their currencies or not, one can *a priori* argue that the price of their currencies is (still) definitely undervalued in the foreign exchange markets. While most of these countries have strongly favoured the USD in the past, they now fear a sharp devaluation of the USD. In this context some interesting questions emerge:

- What sense does it make to hoard foreign currencies more than 30 years after the end of the Bretton Woods

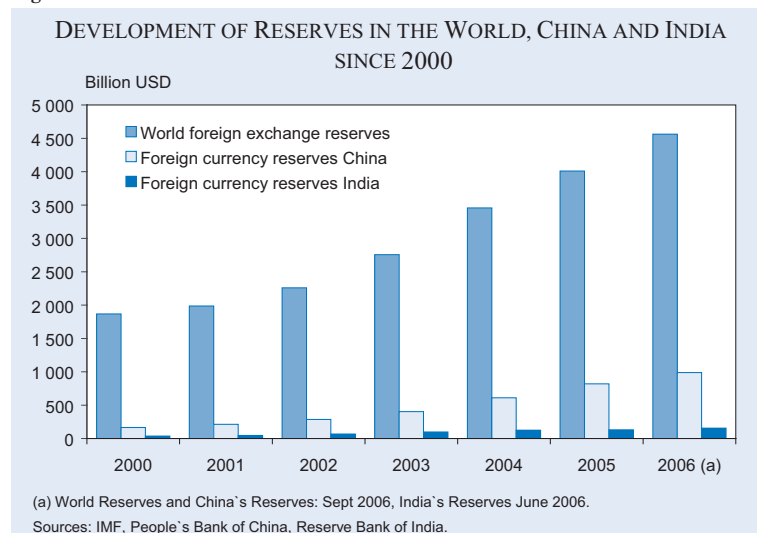
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system and the transition to flexible exchange rates in major markets?

- Some emerging economies nowadays still peg their currency to the USD or at least manage their exchange rates. What is the rationale behind this?
- What are the opportunity costs of accumulating reserves, and how can these countries hedge the risk of value losses in terms of domestic currency of their stock of reserves?
- How can these reserves be continuously diversified? Is there an optimal strategy for the management of these economies' foreign exchange reserves?

Major emerging economies such as China and India are nowadays in a totally different balance of payments position vis-à-vis the industrialized countries, especially the United States than in past years. They are running huge balance of payments surpluses and their exchange rate policy can have a significant impact on the size and allocation of the US current account deficit. Other industrialized countries, too, are beginning to worry about the exchange rate policies of emerging economies, as they feel that these hamper their own export potential to these countries. Many emerging economies have organized a complete turnaround in their exchange rate policies since the beginning of the new millennium. After the

Figure 1



experiences gained during the Mexican, the Asian, the Russian, and the Brazilian financial crises in the 1990s as well as the Argentinean crisis some years ago, they developed a combination of new strategies that include: (1) Paying back their debt to international organizations like the IMF as soon as possible¹, (2) pegging their currency to a single currency or to a basket of currencies without committing to a strict and passive rule as a currency board would command, (3) accumulating foreign exchange reserves aimed at better overcoming a balance of payments crisis or at easily depreciating their own currency through foreign exchange market interventions.

China and India: Common properties and differences in exchange rate policy

As Genberg (2006) puts it, the current exchange rate arrangements in East Asia range from the strict Hong Kong type of currency board arrangement to the (managed) float of the Japanese yen. For many years in the past, China had pegged its currency, the yuan, to the US dollar. On 21 July 2005, Chinese authorities announced three important changes in the exchange rate regime. The major purpose of these measures was: (1) stabilizing the value of yuan with reference to a currency basket in the future, (2) letting the yuan appreciate by 2.1 percent against the dollar, and (3) allowing the exchange rate to fluctuate within a ± 0.3 percent band around a daily fixed central parity. In recent years the yuan has gradually appreciated against the dollar (see Figure 2).

According to Chinese official statements, there is presently a type of basket pegging and the stabilization of an effective exchange rate in operation. The currency basket consists of the US dollar, the euro, the yen, and the Korean won. In addition, the Singapore dollar, the British pound, the Malaysian ringgit, the Australian dollar, the Russian rouble, the Thailand baht

¹ Argentina and Brazil have paid in full – and earlier than expected – their entire outstanding obligations to the IMF amounting to USD 15.46 billion and USD 9.6 billion, respectively in December 2005.

and the Canadian dollar are also taken into account (Siebert 2006). Market experts, however, argue that the yuan is still strongly pegged to the US dollar. More precisely, the yuan seems to have recently followed the path of an appreciating crawling peg (see Figure 2).

As a measure of controlling inflation, the People's Bank of China (PBC) sells securities in order to drain off the excess liquidity which is created when the bank buys foreign currencies. The PBC has made a huge profit out of its foreign exchange operations. The PBC sells the yuan-denominated central bank bonds to the good burghers of Shanghai while buying much higher yielding dollar bonds (McKinnon and Schnabl 2006). According to the Bank for International Settlement (BIS), China hereby is earning up to one percent of its annual GDP. In a two year period from 2003 to 2004 the stock of sterilization papers increased by about 265 percent, which expanded again by about 88 percent (or by a value of USD 117 billion) from 2004 to 2005 – reaching USD 250 billion for the overall stock of bonds. However, the growth of the stock of central bank bonds held by domestic banks comprises only slightly more than half of the increase in total reserves. Hence, not all of the external money is being sterilized; there is also an increase in liquidity leading to the decline of inter-bank interest rates and the accompanied strong credit growth.

The type of exchange rate policy chosen by India seems to have a number of common elements with that of China. This applies above all to the accumulation of reserves (see Figure 1). But the dimensions are quite different: India's reserves amounted

Figure 2

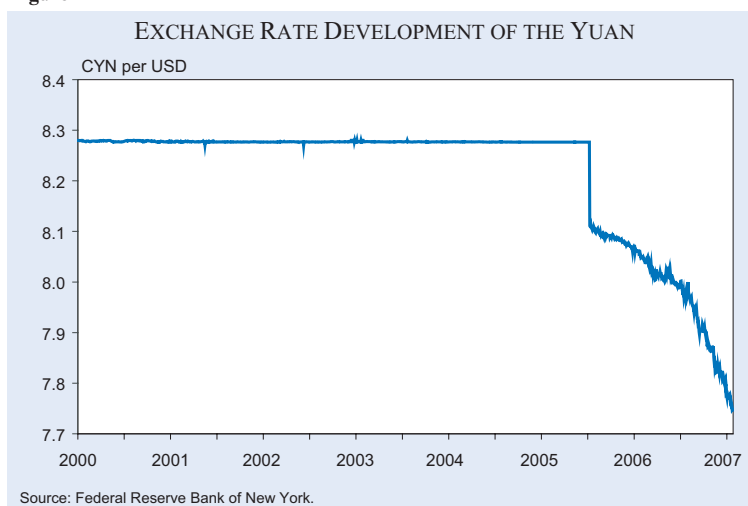
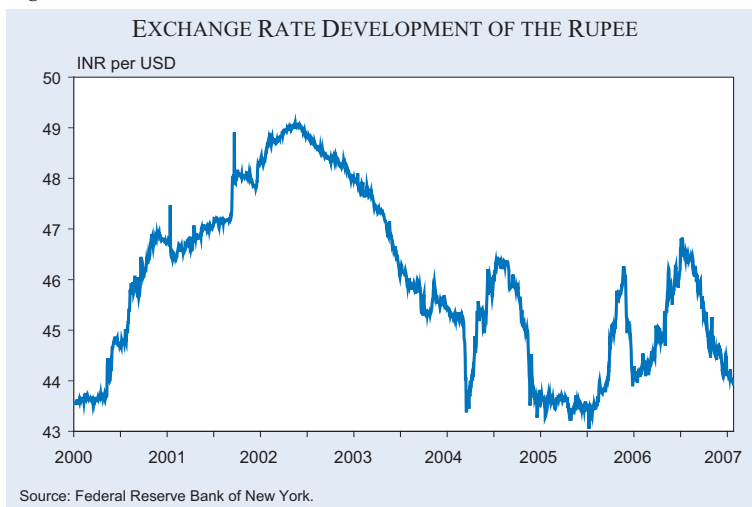


Figure 3



to roughly USD 200 billion in 2006 which represents less than 20 percent of China's (Reserve Bank of India 2006). The Reserve Bank of India (RBI), however, has to struggle even more than the PBC does in order to neutralize the monetary effects of the purchase of foreign exchange. Due to the lack of central bank securities, the RBI has to fall back on open market operations and must face the scarcity of obligations denominated in rupee. And, more importantly, India has been losing money by accumulating reserves (about 1.2 percent of GDP p.a.), because domestic interest rates exceed the US level. As a consequence, an additional fiscal burden emerges from central bank interventions. This also applies to other emerging economies such as Brazil.

Most experts expect the rupee to remain pegged to the US dollar (Jayakumar et al. 2005). Officially, an exchange rate determined by market forces has existed since June 2004. In fact, Figure 3 shows the exchange rate movements in the short run. Taking a medium-run perspective, however, a moderate revaluation of the rupee against the US dollar can be observed since the spring 2002. On the one hand, this is not a fully unexpected development, given the well-known weakness of the greenback in the foreign exchange markets during the same period. Yet, there is something to be noted. Particularly since

2001, the foreign exchange market interventions of the RBI have contributed to a continuous increase in the official reserves of the country (see Figure 1). The Indian authorities, despite the "structural deficiencies" and the fiscal burden mentioned above, are scrupulously sterilizing a high percentage of the foreign exchange market interventions. This has not been the case in China. Moreover, the flow of foreign capital into India has been rising over the years. This also helps to explain the improved economic growth in recent

years, but it makes the task of sterilization – which seems even more important than in China given a soaring inflation rate (see Figure 4) – much more difficult for the central bank.

Balance of payments development in China and India

Let us have a look at the balance of payments position of China and India (see Table 1). China is in the comfortable position recording a "double surplus", a surplus both in the current as well as in the capital accounts. Both balances add up (after correcting for errors and omissions) to the increase in international reserves. Notice that the implicit deficit in the Chinese capital account of 2006 is only due to the preliminary and asynchronous nature of the report-

Figure 4

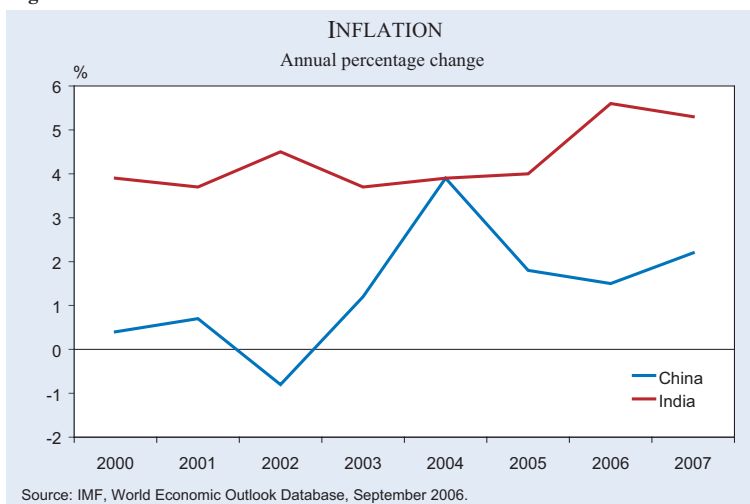


Table 1
Development of China's and India's Net Exports, Net Capital Flows and Reserves since 2000

China	Current Account (USD billion)	Capital Account (USD billion)	Changes in Reserves (USD billion)
2000	20.5	1.9	- 10.5
2001	17.4	34.8	- 47.3
2002	35.4	32.3	- 75.5
2003	45.9	52.7	- 117.0
2004	68.7	110.7	- 206.3
2005	160.8	63.0	- 207.0
2006	184.2 ^{a)}	- 15.2 ^{b)}	- 169.0 ^{c)}

^{a)} IMF estimation. – ^{b)} Own calculation. – ^{c)} Sept 2006.

Source: State Administration of Foreign Exchange, China.

India	Current Account (USD billion)	Capital Account (USD billion)	Changes in Reserves (USD billion)
2000	- 4.7	10.4	- 6.4
2001	- 2.7	8.8	- 5.9
2002	3.4	8.6	- 11.8
2003	6.3	10.8	- 17.0
2004	14.1	16.7	- 31.4
2005	- 5.4	31.0	- 26.2
2006	- 10.6	24.7	- 15.0

Source: Reserve Bank of India.

ed data for this year. As opposed to this, India shows alternating signs in its current account. The capital account has recently been in surplus and has easily compensated the current account deficit in some years. Both countries have accumulated reserves in every year since 2000. This fact underlines the existence of a strategic exchange rate policy while these countries have also been forced to solve the sterilization problem in their national monetary policy.

Autonomous versus coordinated management of reserves

Beyond the already mentioned flow problems associated with the strategic exchange rate/balance of payments policy in emerging economies, there is another problem, which we may call the stock problem. The stock problem emerges from the accumulation of foreign exchange reserves and has two economic aspects. More precisely, it is the stock of reserves held by a central bank of an emerging economy and the composition of these reserves that matter. In order to keep the exchange rate of the yuan against the US dollar (more or less) fixed, Chinese monetary authorities had accumulated around USD 1 trillion by the first quarter of 2007 and “the spike in the pace of reserve accumulation during the period of 2001 to 2004 is largely attributable to a surge in

speculative capital inflows” (Goodfriend and Prasad 2006, 23). In China, the pressure to appreciate the currency has recently been driven as much by capital inflows as by current account surpluses (Mohanty and Turner 2006).

Asian emerging economies, predominantly China and India, have been accumulating their foreign exchange reserves mainly in US dollar denominated assets, primarily US state bonds (Sell 2006). Such a policy has kept the price of the dollar high and, at the same time, widened the US current account deficit. That is why a new fear of floating is arising: the dollar might suffer from a rapid fall in value in the foreign exchange markets which then would necessarily affect the value of other countries' own foreign exchange reserves held in dollar denominated assets. Such a monetary risk would also force the central banks of a number of emerging economies to continuously buy US dollars and thereby contribute to the stabilization of the greenback in the international foreign exchange markets (Sell 2007). Of course, such a policy makes the reserves grow further and accordingly the size of possible losses which accrue, at least in domestic currency equivalents, in the case of a more or less pronounced devaluation of the dollar. This would suggest, at first glance, that the incentives to intervene in the foreign exchange market will tend to rise.

This statement, however, only holds with some qualifications, because, first of all, there is a hidden free-rider phenomenon (Sell 2006a). One could also call it an implicit alliance problem. Even though every single emerging economy (for which the above described scenario holds) has a great interest in a stable US dollar, it may be less enthusiastic to contribute to its stabilization by own foreign exchange purchases. A smaller share of US dollars in its foreign exchange reserves through diversification (in terms of a portfolio containing dollars, yen, euros, etc.) serves as a hedge against expected devaluations of the US dollar. In addition, a larger number of currencies in the central bank reserves enables the authorities to switch from the *de facto* pegging to the US dollar to a more or less flexible peg against a basket of different currencies. In such a basket one would expect the currencies of the major trading partners of the emerging economy in concern.

Moreover, it is often argued that the longer the diversification in the currency composition of central bank reserves is postponed, the higher will be the expected loss in value of the foreign exchange reserves. Assume as a type of rational expectations that every monetary authority is well aware of this matter. Consequently, those emerging economies with a huge stock of dollar reserves will be tempted to take the initiative and start with an autonomous reallocation of their foreign exchange reserves. Yet such an argument contains a fallacy because it neglects an important general equilibrium aspect of (interrelated) foreign exchange markets. When the central banks of emerging economies sell US dollars, this action tends to depress the price of dollars, while the other currencies which are exchanged for dollars will gain in value by exactly the same amount. In principle, the involved central banks could, therefore, avoid any value losses in the process of diversifying their portfolio of foreign exchange reserves.

In reality, however, the central banks will surely attempt to minimize those losses. Why is there a difference between the theory and the reality? In general, a reallocation of reserves and/or the exchange of currencies within the portfolio of a central bank's reserves go along with the ordinary market forces, which, for example,

tend to reduce the value of one currency, say the US dollar, but raise the value of the euro and/or the British pound in a either progressive or regressive manner. This mismatch is illustrated in the following, based on a simple example which assumes that the reserves of China consist of US dollars and euros exclusively. Formally, the domestic value equivalent of China's international reserves can be expressed as:

$$(1) \quad \underset{\text{Reserves in Yuan}}{R^Y} = \underset{\text{Domestic equivalent of USD reserves}}{\$ \cdot \left(\frac{Y}{\$}\right)} + \underset{\text{Domestic equivalent of Euro reserves}}{\epsilon \cdot \left(\frac{Y}{\epsilon}\right)}$$

A complete differentiation of equation (1) leads to the condition:

$$(2) \quad dR^Y = \left(\frac{Y}{\$}\right)d\$ + \$d\left(\frac{Y}{\$}\right) + \left(\frac{Y}{\epsilon}\right)d\epsilon + \epsilon d\left(\frac{Y}{\epsilon}\right) \stackrel{!}{=} 0, \text{ hence}$$

$$\left(\frac{Y}{\$}\right)d\$ - \$d\left(\frac{Y}{\$}\right) \stackrel{!}{=} \left(\frac{Y}{\epsilon}\right)d\epsilon + \epsilon d\left(\frac{Y}{\epsilon}\right)$$

Suppose the authorities hold their reserves in the quantities of USD 1,000 and EUR 500 in the initial year (period 0); the original exchange rates are assumed to be 7.76 for the CNY/USD and 10.03 for the CNY/EUR respectively:

$$R^Y = 1,000 \cdot 7.76 + 500 \cdot 10.03 = 12,780$$

As shown in the following calculation, the risk-free condition for which the Chinese central bank can diversify the reserves in the subsequent period (1) taking advantage of an appreciating (depreciating) trend of the euro (US dollar) is:

$$R^Y = 500 \cdot 7.00 + 917 \cdot 10.12 = 12,780$$

Example:

	$\left(\frac{Y}{\$}\right)^0$	$d\left(\frac{Y}{\$}\right)^{0,1}$	$\left(\frac{Y}{\epsilon}\right)^0$	$d\left(\frac{Y}{\epsilon}\right)^{0,1}$
\$ ¹		-380		
d \$ ^{0,1}	-3,880			
€ ¹				82.53
d € ^{0,1}			4,182.51	

∑ losses in value = 4,264 ∑ gains in value = 4,264

The true problem emerging in this context is not so much the question of when the process of diversification gets started, but rather how it is organized; i.e. whether it will occur autonomously or in a coordinated way. An autonomous strategy chosen by a single (but significant) emerging economy like China could probably create an unpleasant and extremely volatile situation in the foreign exchange markets. The reason is the likelihood of possible panic reactions among other emerging economies following the first mover (China in our example). Each of these countries would then be tempted to immediately sell as many US dollars as possible in order to limit the anticipated value losses. The risk of losses may become more acute if the uncoordinated actions by the central banks selling a high share of their foreign currency reserves in a short period of time induce other market participants to bet against the US dollar, leading to a sharp devaluation of this currency in the end. Although each involved central bank would behave rationally from its own point of view, the group of the emerging economies' central banks could, however, endanger the stability of the world's financial markets. This scenario reminds us of panic sales in the equity markets.

How could such a run by the monetary authorities on their own reserves (!) be possibly avoided? A possible solution would be for the involved central banks of emerging economies (especially in Asia) to agree to proceed in a coordinated way. Not only the United States, but also other major industrialized countries would have an interest in such coordination, given that they also want to avoid a sharp depreciation of the dollar. The coordinated sales of gold carried out by central banks of industrialized countries in recent years, which have more than an eye on the gold price and its cyclical moves, could serve as a good example. Let us make the argument clear by two alternative game situations: When both monetary authorities (CB1, CB2) have an intermediate level of reserves as shown in scenario 1, holding reserves is a strictly dominant strategy and the Nash equilibrium (0, 0) is in the southeast corner of the payoff matrix. A central bank which holds its dollar reserves (regardless of what its counterpart attempts) receives a negative payoff of -1 . The reason is that the dollar continues to devalue at a moderate pace in the international foreign exchange markets and that continuing to hold reserves means giving up the gains of diversification (0).

		CB ₂		
		Hold	Sell	
CB ₁	Hold	-1, -1	-1, 0	Intermediate Reserves Game
	Sell	0, -1	0, 0	

		CB ₂		
		Hold	Sell	
CB ₁	Hold	-1, -1	-3, -1	Large Reserves Game
	Sell	-1, -3	-2, -2	

Referring to scenario 2, where both monetary authorities have a large level of reserves, things become more complicated. If one of the central banks sells its dollars in the foreign exchange market, the devaluation of the dollar will accelerate. If the other central bank continues holding dollars, its losses will be extremely high, say (-3) . The selling authority also faces losses, but these are in part compensated by the investment in appreciating currencies (-1) . If both authorities get rid of their dollars, the downward trend of the dollar will be much more pronounced. Hence, each central bank incurs losses (-2) in this case, which are greater than in the case of jointly holding dollars (-1) . Therefore, the north-east corner could be a coordination equilibrium, provided that both central banks are confident that neither will sell dollars. If each central bank is convinced that the other will sell dollars, then the south-east corner will be a Nash-equilibrium.

Outlook

The answer to the question in the title of this paper is yes: China and India matter for the coordination of foreign currency reserve diversification in Asian

countries. Their importance for the distribution of international reserves among the economies in the world is gradually growing. Reserve diversification is incompatible with an aggressive intervention policy in the foreign exchange markets which aims at keeping one's own currency undervalued against the US dollar. On the other hand, such a policy goes perfectly along with a medium-term strategy of stabilizing the value of the domestic currency against a basket of currencies. A basket peg offers the advantage of combining higher stability (rule character) with sufficient flexibility (to external shocks).

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