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# Growth in the International Reserves of Russia, China, and India: A Comparison of Underlying Mechanisms

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**Abstract:** A noted international specialist on the Russian economy compares the different mechanisms by which the emerging powerful economies of Russia, China, and India accumulated substantial foreign reserves during the 2000s in the lead-up to the global financial crisis. He also investigates the costs incurred by these countries of intervention into exchange markets to maintain exchange rate regimes supporting such accumulation, as well as measures undertaken after the crisis to address sudden and massive outflows of foreign private capital and considerable decreases in demand for imports in developed countries. The author argues that each of the three countries can be viewed as a prototype for a particular means of reserve accumulation among emerging market countries that has led to the revival of the Bretton Woods international monetary system. *Journal of Economic Literature*, Classification Numbers: E500, F310, F320, F400, O570. 8 figures, 3 tables, 44 references. Key words: Russia, China, India, foreign reserves, exchange rates, currency intervention, Central Bank of Russia, Stabilization Fund, Bretton Woods system.

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## INTRODUCTION

The idea for this paper can be traced to a consideration of common features in the economic models of Russia, China, and India. These include the fact that each of the three countries has strongly intervened in foreign exchange markets and, as a result, amassed substantial foreign reserves during the 2000s. Table 1 demonstrates that China, Russia, and India ranked first, third, and sixth in the amount of foreign reserves accumulated by the end of 2007, the year before the Lehman bankruptcy ushered in the global financial crisis of 2008 and 2009. Together the three countries accounted for 33.3 percent of the world's total foreign currency reserves at that time, and for 42.7 percent of the increase in the world's official reserves from 2001 through 2007. Figure 1 depicts graphically how rapidly the international reserves of these countries increased in the 2000s.

During the past decade, noted economists and bankers have been discussing the growing global economic imbalance and the revival of the Bretton Woods international monetary

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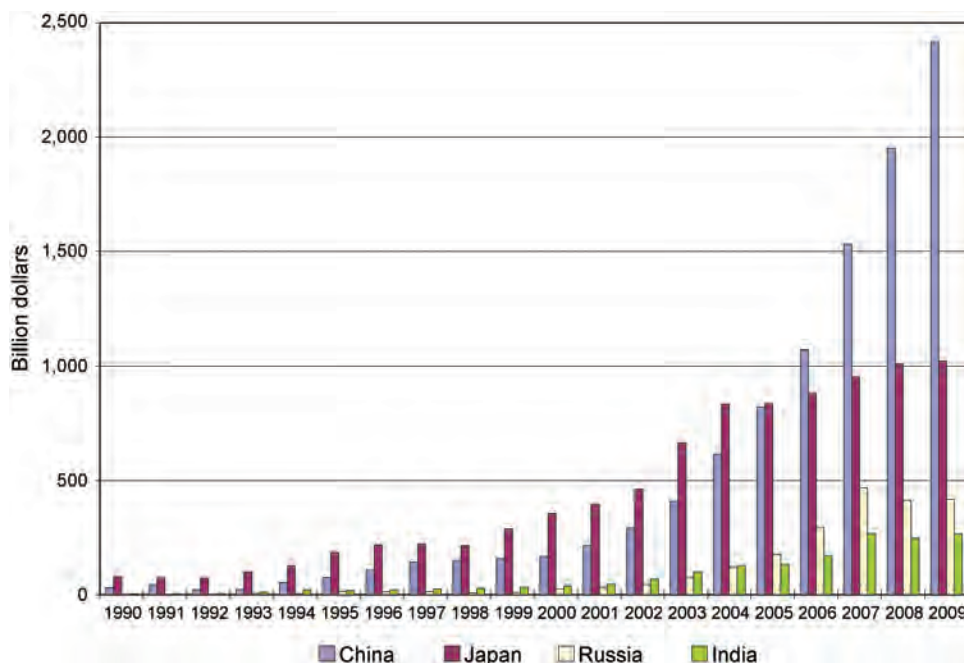
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Table 1. Ranking of Foreign Reserves, 2001–2009

Rank	Country	In billion dollars							In percent of total		
		2001	2007	2008	2009	Increase from 2001 to 2007	2001	2007	Increase from 2001 to 2007		
1	China	216.3	1,531.3	1,950.3	2,417.9	1,315.0	9.9	22.5	28.5		
2	Japan	396.2	954.1	1,010.7	1,023.6	557.9	18.1	14.0	12.1		
3	Russia	33.1	467.6	412.7	417.8	434.4	1.5	6.9	9.4		
4	Saudi Arabia	17.8	305.6	442.6	409.7	287.8	0.8	4.5	6.2		
5	Taiwan	122.8	271.1	292.4	348.9	148.3	5.6	4.0	3.2		
6	India	46.4	267.6	248.0	266.2	221.2	2.1	3.9	4.8		
7	Korea	102.8	262.2	201.2	270.0	159.4	4.7	3.9	3.5		
8	Brazil	35.6	179.5	192.9	237.4	143.9	1.6	2.6	3.1		
9	Singapore	75.7	163.0	174.2	187.8	87.3	3.5	2.4	1.9		
10	Hong Kong	111.2	152.6	182.5	255.8	41.5	5.1	2.2	0.9		
11	Algeria	18.3	110.6	143.5	149.3	92.3	0.8	1.6	2.0		
12	Malaysia	29.6	101.1	91.2	95.5	71.5	1.3	1.5	1.6		
13	Mexico	44.8	87.1	95.1	99.6	42.4	2.0	1.3	0.9		
14	Thailand	32.5	85.4	108.8	135.6	52.9	1.5	1.3	1.1		
15	Libya	15.0	79.7	92.6	99.3	64.7	0.7	1.2	1.4		
16	UAE	14.2	77.2	31.7	36.1	63.1	0.6	1.1	1.4		
17	U.S.	69.2	74.0	80.7	134.1	4.8	3.2	1.1	0.1		
18	Turkey	19.0	73.6	70.6	71.1	54.5	0.9	1.1	1.2		
19	Poland	25.8	63.1	59.5	76.1	37.4	1.2	0.9	0.8		
20	Norway	23.3	60.8	50.9	48.7	37.5	1.1	0.9	0.8		
	World total	2,192.1	6,803.9	7,457.7	8,594.0	4,611.9	100.0	100.0	100.0		

<sup>a</sup>At end of year; in order of foreign reserve volumes as of the end of 2007.

Sources: Compiled by author by converting data expressed in Special Drawing Rights (SDRs—an international reserve created by the IMF to supplement its member countries' official reserves) obtained from IFS, n.d. into dollars.



**Fig. 1.** Foreign reserves of four major countries, 1990–2009 (at end of year). *Sources:* Compiled by author by converting data expressed in SDRs (IFS, n.d.) into dollars.

system (e.g., Dooley et al., 2003; Eichengreen, 2007). On the one hand, a tremendous amount of foreign reserves has been accumulated in some emerging countries, most of which is invested in U.S. Treasury securities, and on the other, the current account deficit of the United States has continued to increase at an unprecedented rate. Thus, in this formulation of a new Bretton Woods system, the emerging markets of Asia have reestablished the United States as the center of the world monetary system by forming a new periphery (supplanting the original of the 1950s consisting of Europe and Japan) through their commitment to export-led growth based on the maintenance of an undervalued exchange rate.

I argue here, however, that it is not only China and other Asian emerging markets, but also Russia and other resource-exporting countries that have supported a revived Bretton Woods system, by keeping their exchange rates low and accumulating foreign reserves, as evident in Table 1.<sup>2</sup> Furthermore, there appear to be at least three different mechanisms among such countries for accumulating foreign reserves. One mechanism applies to oil and gas exporting countries, another to countries with a large current account surplus derived from exports of manufacturing goods, and a third to those receiving substantial foreign investments while maintaining a small positive or negative current account balance. The prime examples (“prototypes,” if you will) of each mechanism can be found in Russia, China, and India, respectively. Among countries listed in Table 1, Norway, Saudi Arabia, and Libya may be included in the Russian type (oil and gas exports); Hong Kong, Malaysia, and Singapore belong to the Chinese type (manufacturing exports); and Korea, Brazil, and Mexico are candidates for the Indian type (inward FDI).<sup>3</sup>

<sup>2</sup>For the first suggestion of Russia’s involvement in this system, see Gaddy and Ickes (2010, pp. 288–289).

<sup>3</sup>I ran a cluster analysis using the ratio of current account surplus to GDP and the ratio of oil and natural gas

The objective of this paper is to analyze these three mechanisms in greater detail, in order to gain insights into the sustainability of the revived Bretton Woods system. After analyzing these mechanisms in the next section, I consider the costs of maintaining them in Russia, China, and India, respectively, as well as changes in these countries in response to the global financial crisis.

### MECHANISM FOR ACCUMULATING FOREIGN RESERVES

This section of the paper examines exchange rate regimes, increased foreign currency earnings, and the investment and savings (IS) balance in Russia, China, and India. The focus is on the period from 2001 to early 2008—i.e., the period preceding the global financial crisis.

#### Russia

After the currency and financial crisis in 1998, Russia allegedly adopted a managed floating exchange rate policy. However, the International Monetary Fund (IMF) regarded it as a *de facto* pegged arrangement during the period from March 2006 through August 2008, because fluctuations in exchange rates were very small (IMF, 2008, pp. 1152–1153). More specifically, since 2005 Russia has utilized a currency basket to determine its exchange rate. The coefficients of the dollar and euro used to calculate the ruble's exchange rate with the currency basket have been 55 percent and 45 percent, respectively, since February 2007.<sup>4</sup> Accordingly, the ruble was almost pegged to the currency basket during most of the period since 2007, as shown in Figures 2 and 3 (see also Tabata, 2009, pp. 685–686).<sup>5</sup>

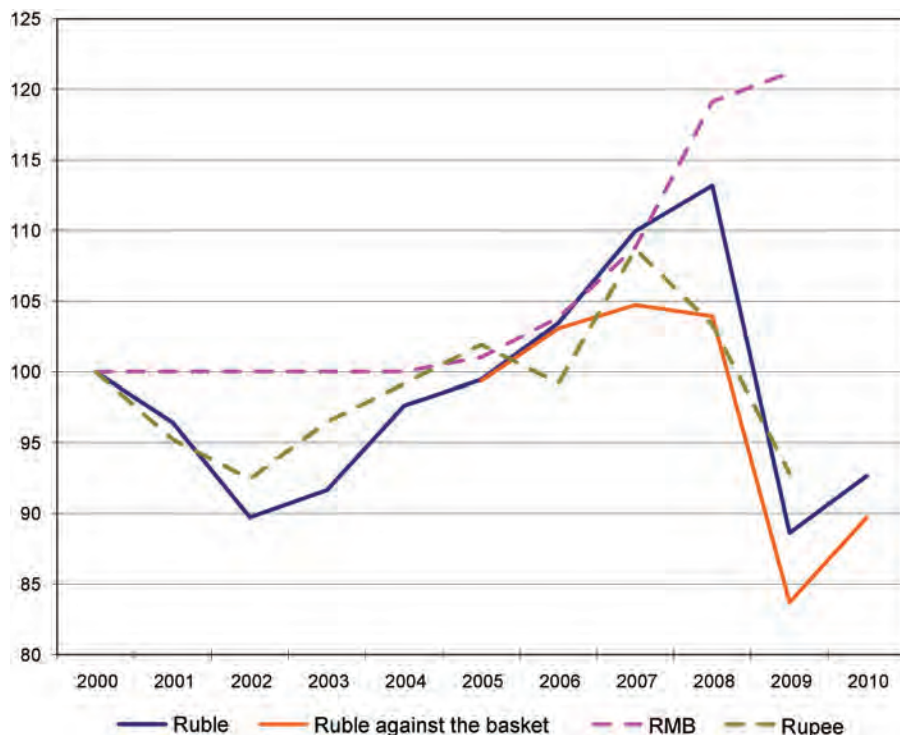
The reason for adopting this policy—i.e., keeping nominal exchange rates of the ruble stable—may be explained by efforts to avoid some of the more negative symptoms of Dutch disease, such as cost inflation of exports of non-energy related items (e.g., manufactured goods). The real effective exchange rate (REER) of the ruble, however, continued to increase due to high rates of inflation. From 2000 to 2007, REER increased by 8.1 percent annually and in the latter year was 73 percent higher than in 2000. The consumer price index (CPI) rose on average by 13.7 percent annually during this period. Inflation was mainly caused by an increasing money supply, which in turn resulted from interventions in exchange markets by the Central Bank of Russia (CBR), as discussed below.

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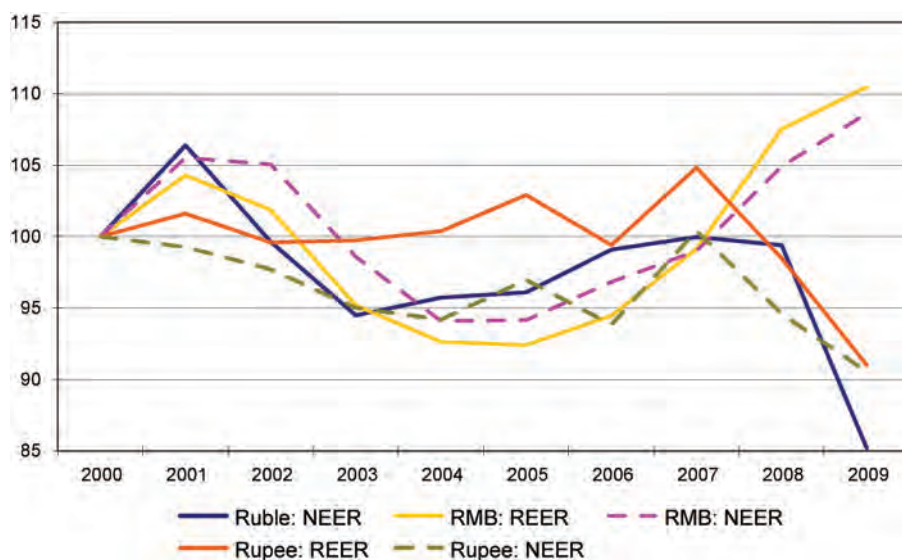
exports to total exports in 2007 as two variables for 17 of the 20 countries listed in Table 1 (excluding Taiwan, Algeria, and UAE, for which current account balance data are unavailable from the International Financial Statistics database [IFS, n.d.]). Oil and gas export data were obtained from UN Statistics Division's website (UN Comtrade, 2011) except for Libya, for which these data are calculated using export quantity data from IEA (2010a, 2010b) and its price data from IFS (n.d.). As a result of this analysis, 16 of the countries could be classified into the three groups mentioned above. The India group includes not only the three countries listed above, which ranked nearest to India in the cluster analysis, but the remaining classified countries (Japan, Thailand, Turkey, and Poland) not assigned to either of the two remaining groups. (The United States, as the center country in the international monetary system, was not classified, and is not investigated further in a direct sense in this paper.) Two of the countries not classified due to lack of current account balance data, namely Algeria and the UAE, could probably be assigned to the Russian type.

<sup>4</sup>The exchange rate of the ruble against the basket of currencies is calculated as the sum of its rate against the dollar multiplied by 0.55 and its rate against the euro multiplied by 0.45. When the ruble's rate was 24.44 rubles per dollar and 35.98 rubles per euro as of the beginning of 2008, its basket rate was 29.63 rubles. In this case, the weights of the dollar and the euro are 45 percent ( $24.44 \times 0.55/29.63$ ) and 55 percent ( $35.98 \times 0.45/29.63$ ), respectively. Thus, the weight of the euro has been larger than the dollar for most of the period since February 2007. On this matter, see the information published at Central Bank of Russia's website (CBR, 2007).

<sup>5</sup>In Figure 3, the real effective exchange rate (REER) of the ruble is excluded, because it increased too rapidly.



**Fig. 2.** Nominal exchange rates of three currencies against the dollar, annual average in percent (2000 = 100), 2000–2010. *Sources:* Compiled by the author from IFS and CBR websites.



**Fig. 3.** Nominal and real effective exchange rates of three currencies, annual average in percent (2000 = 100), 2000–2009. NEER = nominal effective exchange rate; REER = real effective exchange rate. The effective rate is the weighted average of a country's currency against other major currencies. Weights are usually calculated based on weights in bilateral trade. *Sources:* Compiled by the author from IFS and RBI websites.

Table 2. Factors Contributing to the Increase in Foreign Reserves in Russia, China, and India, 2000–2009

Factor	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average		
	In billion dollars										2000–03	2004–07	
<b>Russia</b>													
Increase in foreign reserves	16.0	8.2	11.4	26.4	45.2	61.5	107.5	148.9	-38.9	400.5	67.7	296.5	90.8
Current account surplus	46.8	33.9	29.1	35.4	59.5	84.6	94.7	77.8	103.7	297.1	29.8	213.6	79.1
Direct investment	-0.5	0.2	-0.1	-1.8	1.7	0.1	6.6	9.2	19.4	-7.7	34.3	42.2	4.4
Portfolio investment	-13.2	-0.7	3.0	-4.5	0.6	-11.4	15.7	5.6	-35.4	-2.2	38.7	-5.6	8.5
Other investment	-20.6	-3.3	-2.0	8.7	-7.3	12.5	-19.1	79.7	-114.4	-18.5	-6.2	-5.6	16.5
<b>China</b>													
Increase in foreign reserves	10.7	47.4	75.2	137.5	189.8	251.0	284.7	460.7	479.6	400.5	67.7	296.5	90.8
Current account surplus	20.5	17.4	35.4	45.9	68.7	160.8	253.3	371.8	436.1	297.1	29.8	213.6	79.1
Direct investment	37.5	37.4	46.8	47.2	53.1	67.8	56.9	121.4	94.3	34.3	42.2	74.8	4.4
Portfolio investment	-4.0	-19.4	-10.3	11.4	19.7	-4.9	-67.6	18.7	42.7	38.7	-5.6	-8.5	8.5
Other investment	-31.5	16.9	-4.1	-5.9	37.9	-4.0	13.3	-69.7	-121.1	69.8	-6.2	-5.6	16.5
<b>India</b>													
Increase in foreign reserves	6.0	8.7	18.9	26.2	23.6	14.6	29.2	87.5	5.0	16.8	14.9	38.7	9.5
Current account surplus	-4.6	1.4	7.1	8.8	0.8	-10.3	-9.3	-8.1	-31.0	-26.6	3.2	-6.7	9.2
Direct investment	3.1	4.1	3.9	2.4	3.6	4.6	6.0	8.2	22.9	19.7	3.4	5.6	3.4
Portfolio investment	2.3	2.9	1.0	8.2	9.0	12.1	9.5	33.0	-15.1	20.9	3.6	15.9	15.9
Other investment	4.9	1.1	7.0	5.8	9.6	8.5	22.2	53.1	26.0	3.4	4.7	23.4	23.4
<b>Russia</b>													
Increase in foreign reserves	6.2	2.7	3.3	6.1	7.6	8.0	10.8	11.6	-2.3	0.3	4.6	9.5	9.5
Current account surplus	18.0	11.0	8.5	8.2	10.0	11.0	9.6	6.1	6.2	4.0	11.4	9.2	9.2
Direct investment	-0.2	0.1	0.0	-0.4	0.3	0.0	0.7	0.7	1.2	-0.6	-0.1	0.4	0.4
Portfolio investment	-5.1	-0.2	0.9	-1.0	0.1	-1.5	1.6	0.4	-2.1	-0.2	-1.4	0.2	0.2
Other investment	-7.9	-1.1	-0.6	2.0	-1.2	1.6	-1.9	6.2	-6.8	-1.5	-1.9	1.2	1.2
<b>China</b>													
Increase in foreign reserves	0.9	3.6	5.2	8.3	9.8	11.0	10.2	13.2	10.6	7.9	4.5	11.0	11.0
Current account surplus	1.7	1.3	2.4	2.8	3.5	7.0	9.1	10.6	9.6	5.9	2.1	7.6	7.6
Direct investment	3.1	2.8	3.2	2.9	2.7	3.0	2.0	3.5	2.1	0.7	3.0	2.8	2.8
Portfolio investment	-0.3	-1.5	-0.7	0.7	1.0	-0.2	-2.4	0.5	0.9	0.8	-0.5	-0.3	-0.3
Other investment	-2.6	1.3	-0.3	-0.4	2.0	-0.2	0.5	-2.0	-2.7	1.4	-0.5	0.1	0.1
<b>India</b>													
Increase in foreign reserves	1.3	1.8	3.7	4.4	3.3	1.7	3.1	7.3	0.4	1.3	2.8	3.9	3.9
Current account surplus	-1.0	0.3	1.4	1.5	0.1	-1.2	-1.0	-0.7	-2.4	-2.1	0.5	-0.7	-0.7
Direct investment	0.7	0.8	0.8	0.4	0.5	0.6	0.6	0.7	1.8	1.5	0.7	0.6	0.6
Portfolio investment	0.5	0.6	0.2	1.4	1.3	1.4	1.0	2.8	-1.2	1.6	0.7	1.6	1.6
Other investment	1.1	0.2	1.4	1.0	1.3	1.0	2.4	4.4	2.0	0.3	0.9	2.3	2.3

Sources: Author calculations based on data compiled from IFS, n.d.

In Russia, the increase in foreign reserves in the 2000s was largely the result of a substantial current account surplus (Table 2), caused largely by oil price increases. It is also true that oil exports increased considerably in terms of volume—by 78 percent from 2000 to 2004, or at an average annual growth rate of 15.6 percent.<sup>6</sup> According to IEA (2005, 2010a), 60.8 percent of the increase in world oil exports during this period was accounted for by Russia alone. Although imports grew rapidly as well, at least partly due to the continued appreciation of the ruble in real terms, the current account surplus increased year by year in 2003–2006 owing to oil price increases. In 2007, the current account surplus finally declined (by 18 percent), when imports surged by 36 percent (Tabata, 2009, pp. 688–689).

Among the factors supporting the increase in foreign reserves, the contribution of “other investments” from abroad, mostly loans provided to Russian firms and banks, need to be mentioned. This was especially true in 2007, when massive foreign investments poured into Russia, which in turn were promoted by the unprecedented excess of financial resources in the global market. It should be noted that although the contribution of inward foreign direct investment (FDI) appears to be insignificant in Table 2, this is due to a considerable increase in outward FDI. During the period from 2004 to 2007, outward FDI averaged \$23.9 billion annually,<sup>7</sup> while inward FDI was \$28.3 billion. The tremendous increase in outward FDI was one of the distinctive trends for Russia during this period (Hanson, 2010, pp. 633–635; Uegaki, 2010, p. 67).<sup>8</sup>

As a percentage of GDP, Russia’s current account surplus exceeded that of China for the period from 2004 through 2007 (Table 2). Compared with the previous period (2000–2003), the contribution of foreign investments increased significantly.

In the framework of the macroeconomy, the fact that the current account surplus was large implies that savings exceeded investments in the economy as a whole (Fig. 4). As shown in Table 3, a surplus of savings over investments (net lending) in the period from 2004 to 2007 in Russia was mainly a result of government-sector actions. The reason why savings and net lending of the government sector were so large is explained by the allocation since 2004 of a portion of the tax revenues on crude oil to the Stabilization Fund (Tabata, 2007). If we look at the preceding period (from 2000 through 2003), while the savings rate of the entire economy was approximately the same (31.4 percent), the savings of firms and of the government were 18.1 percent and 8.1 percent, respectively. Thus, after 2004 savings moved from firms to the government sector. This might serve as a typical case for oil and gas exporting countries that maintain sovereign wealth funds.

On the other hand, savings and net lending in households were quite small, namely 6.9 and 2.6 percent, respectively. This may reflect the specificity of the Russian economic growth model, in which GDP growth has been driven by increases in household consumption (Tabata, 2009, p. 684). It should be noted that a considerable part of the increased household demand has been satisfied by cheap imported goods, thanks to the appreciation of the ruble in real terms. Because net borrowing (deficit of savings against investments) in firms was also small, savings surpassed investments by 8.7 percent for the entire economy in 2004–2007.

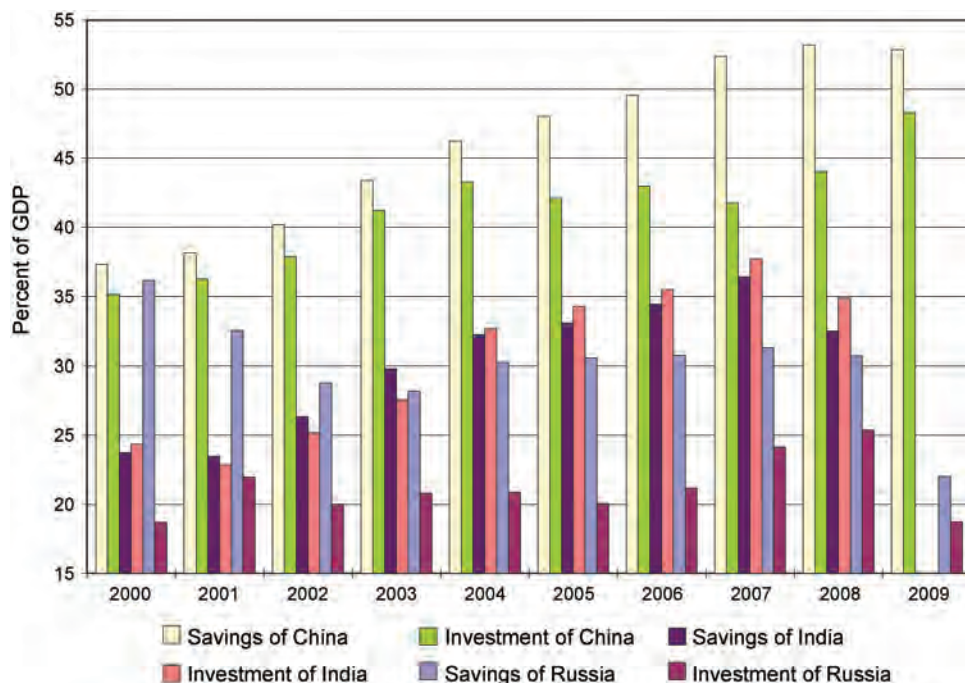
## China

In China, the renminbi (RMB) was pegged to the dollar from 1997 to 2005 at a rate of 8.28 RMB per dollar. On July 21, 2005, a basket of 11 currencies was introduced, without

<sup>6</sup>This figure is based on the author’s calculations of data from FCS and *Belarus*’ (various years).

<sup>7</sup>China’s outward FDI during that period was on average \$12.8 billion.

<sup>8</sup>As a percentage of GDP, inward and outward FDI of Russia amounted on average to 2.9 and 2.5 percent, respectively during 2004–2007, while corresponding figures for China’s were 3.3 and 0.5 percent, respectively.



**Fig. 4.** Investment and savings rates for China, India, and Russia, in percent of GDP, 2000–2009 (data for India are from April through March of the respective year). *Sources:* Compiled by the author from *NSR* (various years), *NBS* (various years), *MSPI* (n.d., 2010), and *IFS* (n.d.).

disclosure of the respective weights of each currency (Frankel, 2009, p. 347). From July 2005 to July 2008, the RMB appreciated against the dollar by 20.4 percent in nominal terms (Fig. 2),<sup>9</sup> prompting the IMF (2008, pp. 304–305) to recognize the Chinese exchange arrangement during that three-year period as a crawling peg. In July 2008, China returned to the dollar peg.

There are different assessments of the reasons behind the appreciation during 2005–2008; more specifically, they involve differing interpretations of the weight of the dollar in the currency basket. On one hand, Patnaik and Shah (2009) asserted that the basket assigned overwhelming weight to the dollar, implying that there was an appreciation of the RMB against the basket. On the other, Frankel (2009, 2010) demonstrated that the weight of the euro was significant. He concluded as a result of regression analyses that by mid-2007 the weight of the dollar had fallen to 0.6 and the weight of the euro had risen correspondingly to 0.4 (Frankel, 2009, p. 357). This implied that the exchange rate regime in effect in 2007 could be better described as a basket peg, and that appreciation of the RMB against the dollar was attributable to appreciation of the euro against the dollar.

According to the data of nominal effective exchange rates (NEER) of the RMB reported in *IFS* (n.d.), the RMB appreciated by 9.8 percent in three years after July 2005 (Fig. 3). This is far below the appreciation of the RMB against the dollar (20.4 percent). This seems to suggest that both factors are relevant: there was an appreciation of the RMB against the currency basket and there was an influence of the appreciation of the euro against the dollar.

<sup>9</sup>Calculated from monthly average data in *IFS* (n.d.).



**Table 3.** Investment and Savings Balance by Institutional Sector, Annual Average for 2004–2007, in percent of GDP

Sector	Total	Firms	Households	Government
Russia				
Total savings	30.7	11.4	6.9	12.4
Total investments	21.6	13.7	4.2	3.6
Net lending	8.7 <sup>a</sup>	–2.3	2.6	8.8
China				
Total savings	49.1	20.7	21.3	7.0
Total investments	42.5	28.7	9.0	4.8
Net lending	7.7 <sup>a</sup>	–8.0	12.2	2.3
India <sup>b</sup>				
Total savings	34.0	7.7	23.0	3.3
Total investments	35.0 <sup>c</sup>	13.6	12.2	8.2
Net lending	–0.3 <sup>a</sup>	–5.9	10.8	–4.8

<sup>a</sup>Excludes statistical discrepancies.

<sup>b</sup>April–March data.

<sup>c</sup>Includes net acquisitions of valuables and errors and omissions.

Sources: Compiled by the author from *NSR* (various years); NBS, 2010; MSPI, 2010.

The increase in China's foreign reserves during 2004–2007 largely stems from the growth in its current account surplus (Table 2). Compared with the previous period (2000–2003), the growth in China's current account is remarkable (over sevenfold). One may wonder what caused the undervalued RMB. Was it China's growing trade surplus or the intervention in exchange markets (that had effectively kept the RMB's value low) prompted by the influx of foreign currencies?<sup>10</sup> At present, these two possibilities appear to be components of a vicious circle. It should be noted that in addition to the current account surplus, FDI was a major contributor to the accumulation of China's foreign reserves.

As in the case for Russia, China's savings have exceeded investments in recent years, although China's investment rate has been clearly higher than that of Russia (Fig. 4).<sup>11</sup> Both China's savings and investment rates have in recent years been the highest among the world's major economies (Ma and Yi, 2010, pp. 4–7). In particular, savings and net lending of households were very large (Table 3). At the same time, savings by firms were large by international standards as well, although investments by firms surpassed their savings by 8 percentage points. In the economy as a whole, net lending amounted to 7.7 percent, due to the large net lending by households (12.2 percent). A conventional structure of the flow of funds, whereby

<sup>10</sup>For more on whether the undervalued RMB or domestic demand (savings glut) has been the main cause of China's increasing current account surplus, see Ogawa and Iwatsubo (2009).

<sup>11</sup>In Figure 4, China's investment data were obtained from tables of "GDP by Expenditure Approach" and savings data for 2004–2007 from flow of funds tables. Figures for 2000–2003 and 2009 were calculated as the sum of gross capital formation, current account surplus, and statistical discrepancies, because savings data from flow of funds tables were too small (for unknown reasons) in 2000–2003 and not available for 2009; all data were obtained from the *China Statistical Yearbook* (NBS, various years), except for the exchange rate (obtained from IFS, n.d.).

the deficit of funds in firms is compensated by considerable net lending in households, has been established in China (Ohashi and Marukawa, 2009, pp. 29–30). Prime (2009, p. 628) has explained the high saving rate of Chinese households by needed savings for education, health care, and retirement.<sup>12</sup> If one compares China and Russia in this regard, Russia's households have benefited from the significant increase in wages in real terms (denominated in dollars) and massive cheap imports of consumer goods. China's households do not enjoy the same bounty, due to the undervalued RMB in nominal and real terms. In addition, high and rising saving rates in China imply that the share of final consumption expenditure in gross domestic expenditure is low and falling, which is in sharp contrast to Russia as well.

## India

India adopted a managed floating exchange rate policy in March 1993 (IMF, 2008, p. 623). However, there is, solid consensus among specialists that at least for the first two years, the arrangement was *de facto* a pegged one against the dollar (Reinhart and Rogoff, 2002, p. 74; Patnaik and Shah, 2009, pp. 162–163; Sato, 2009, p. 9). In the period after July 1995, and extending to December 2001, Reinhart and Rogoff (2002, p. 74) argued that the Indian exchange regime could be classified as a “de facto crawling peg to the dollar,” whereas the IMF (2008, p. 623) recognized it as a managed float.<sup>13</sup>

Ouyang and Rajan (2008, p. 75) stated as a general understanding that the Reserve Bank of India (RBI) has targeted the real effective exchange rate in recent years. This assertion is supported by the trend of the REER of the rupee shown in Figure 3. It should be recalled that Savak Tarapore, a former Vice President of the RBI, was a staunch advocate of stability in REER (Tarapore, 1998, pp. 68–70).<sup>14</sup> India's currency authorities appear to have pursued the stability in exchange rates in real terms under circumstances of intermittent inflation in order to control the country's trade deficit and attract foreign investments.

During most of the 1990s and 2000s, India has recorded a current account deficit. In fact, its trade deficit was significantly larger than the current account deficit. From 2004 to 2007, the former was 3.9 percent of GDP, while the latter was 0.7 percent. The trade deficit was largely compensated by a current transfer surplus, most in the form of remittances from abroad, which on average amounted to \$27.3 billion (2.9 percent of GDP) in 2004–2007.<sup>15</sup> Therefore the growth in India's foreign reserves resulted totally from the influx of foreign investment. As shares of GDP, portfolio and other investments were larger in India than in China and Russia (Table 2), increasing very substantially in 2004–2007 in comparison with the preceding period (2000–2003).

The fact that India usually runs a current account deficit implies that a deficit of savings against investments exists in the economy as a whole (Fig. 4 and Table 3). In this respect, the situation in India is completely different from China and Russia. Although Indian and Chinese households have the highest savings and net lending in the world (Ma and Yi, 2010,

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<sup>12</sup>There is a large literature on the causes of the high savings rate of Chinese households, including Ma and Yi (2010, pp. 16–20).

<sup>13</sup>Patnaik and Shah (2009, pp. 162–163) divided this period into the one before August 1998 and the period after that to March 2004, and insisted that in the former period the Indian rupee was pegged to the dollar with significant flexibility, but in the latter returned to a more fixed dollar peg. According to their analysis, the Indian exchange regime again became more flexible after March 2004.

<sup>14</sup>He also supported the idea of accumulating an adequate level of foreign reserves (Tarapore, 1998, p. 70).

<sup>15</sup>China's current transfer surplus was large as well, amounting to \$29.0 billion (1.1 percent of GDP) in 2004–2007. Russia during this period registered a small current transfer deficit (\$1.7 billion and 0.2 percent of GDP).

p. 7), investments in India have slightly surpassed savings in the overall economy, due to large net borrowing by the government—i.e., a budget deficit. In addition, although savings in India's firms are relatively low, investments by firms recently have been expanding.<sup>16</sup> As Uegaki (2009, p. 65) has observed, India is now showing the features of a typical capital-shortage, developing industrial country, in which investments are actively undertaken and public spending is growing to cover social needs in a rapidly changing society.

A comparison of the IS balances of China and India indicates that the major difference lies in the government sector. For India, one of the most important objectives of the economic reforms launched in 1991 under the guidance of IMF and World Bank was reduction of the country's budget deficit. Although the budget deficit of India's central government as a percentage of GDP has been declining in recent years, if the budget deficits of regional (state) governments are considered, the total deficit was around 6–8 percent of GDP in 2003–2006 (Sato, 2009, pp. 121–126). The budget deficit remains one of India's most serious problems.

### COSTS OF INTERVENTION IN EXCHANGE MARKETS

Foreign trade and FDI from abroad contributed to high rates of economic growth in all three countries in the 2000s. Hence, one could say that the policies pursued by their governments to maintain an undervalued exchange rate have been successful in this context. However, the costs of such intervention in exchange markets should be taken into account. Generally speaking, these costs include inflation resulting from incomplete sterilization and the gap between the interest rate earned abroad on foreign reserves and the higher interest rate that the respective central bank must pay domestic investors to hold some form of sterilization bonds.

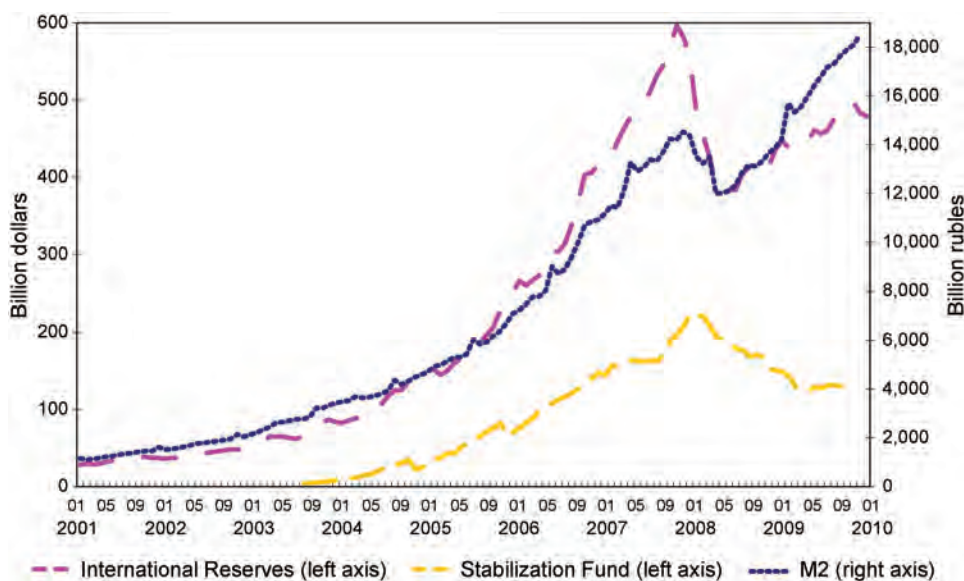
#### Russia

A marked correspondence between the magnitude of growth in foreign reserves and in money supply (M2) from the mid-2000s to the middle of 2008, shown in Figure 5, suggests that the level of sterilization in Russia has not been adequate (Tabata, 2009, pp. 685–687). The Stabilization Fund, founded in 2004 from a portion of the tax revenues from crude oil (extraction taxes and export duties), has been employed in an effort to sterilize the money supply, and has virtually comprised the only tool for sterilization employed in Russia.<sup>17</sup> Since mid-2006 the Ministry of Finance has been empowered to purchase foreign currencies (dollars, euros, and pounds sterling) using reserves from the Stabilization Fund (Fig. 5; see Tabata, 2007, pp. 702–704).

The increase in money supply due to the CBR's massive intervention in foreign exchange markets was one of the major factors leading to rapid inflation—an average annual increase in the CPI of 13.7 percent from 2000 through 2007. As high inflation continued, exchange rates of the ruble in real terms increased as well, because its nominal rates were kept stable. This was a kind of vicious circle. Interventions for the purpose of keeping nominal ruble rates stable made real ruble rates appreciate. In other words, Russian policymakers faced a painful dilemma, being forced to choose between restricting ruble appreciation and controlling inflation.

<sup>16</sup>Savings and investment rates in firms were 4.0 percent and 5.8 percent, respectively, on average during the period from 2000 through 2003 (calculated from data in MSPI, n.d.).

<sup>17</sup>In February 2008, the Stabilization Fund was transformed into the Reserve and National Welfare funds. After 2008, the sum of these two funds is shown.



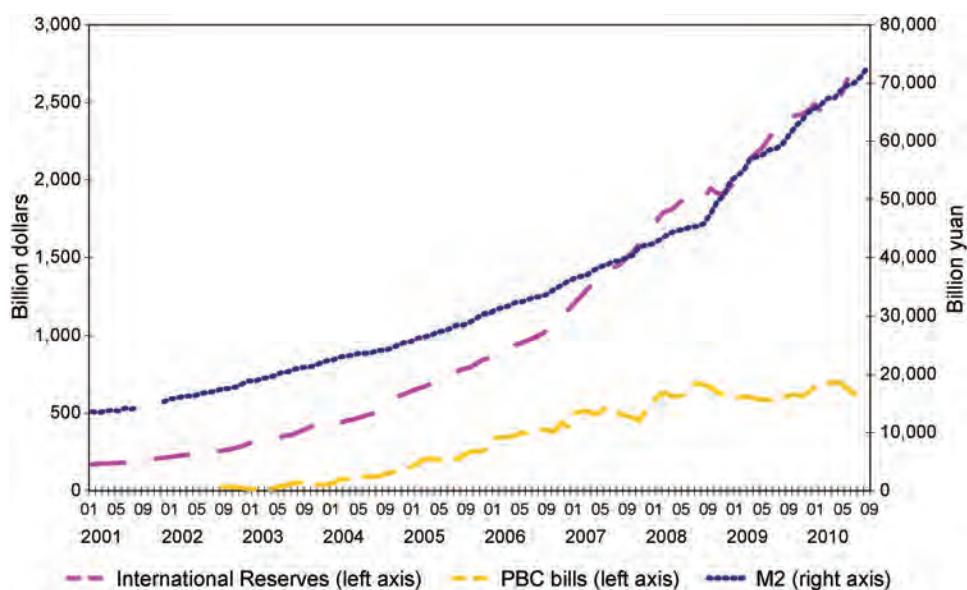
**Fig. 5.** International reserves, Stabilization Fund, and money supply (M2) in Russia, 2001–2011 (at beginning of month). *Sources:* Compiled by the author from websites of the CBR (<http://www.cbr.ru/>), Federal Treasury (<http://www.roskazna.ru/p/stabfond/stabfondinfo.html>), and Ministry of Finance, Russia (<http://www.minfin.ru/ru/>).

## China

There was a general perception that China had succeeded in monetary sterilization until 2003, when there was a shortage of government securities to sell in open market operations. In April 2003, the People's Bank of China (PBC) began to issue PBC bills to further support the sterilization effort (Kwan, 2006, p. 2). China's commercial banks have an incentive to hold PBC bills rather than increase their lending, inasmuch as corporate lending carries a capital requirement of 100 percent, whereas no capital needs to be set aside for lending to the government. Thus, there is considerable demand for PBC bills even at relatively low interest rates (Prasad, 2007, pp. 7–8). Note that private savings rates (both household and corporate) are very high in China, and most savings flows into the banking system because there are few alternatives. Under these circumstances, yields on PBC bills remained well below those of U.S. Treasury Bills, resulting in inflows of profits to the PBC.

The situation, however, appears to have changed gradually. In May 2006, PBC bills were issued by means of a “targeted issue” scheme in combination with sales at auction. This scheme is intended to force specific targeted commercial banks to underwrite PBC bills at a yield lower than prevailing market rates (Kwan, 2006, p. 3). The amount of PBC bills outstanding increased rather rapidly, from \$37 billion at the end of 2003 to \$538 billion in August 2007 (Fig. 6).<sup>18</sup> But it did not subsequently increase for half a year, although foreign reserves increased continuously during that period. It peaked at \$695 billion in October 2008. Based

<sup>18</sup>This figure was obtained by converting to dollars data on “bond issues” in yuan obtained from the PBC's website (<http://www.pbc.gov.cn/publish/english/963/index.html>).



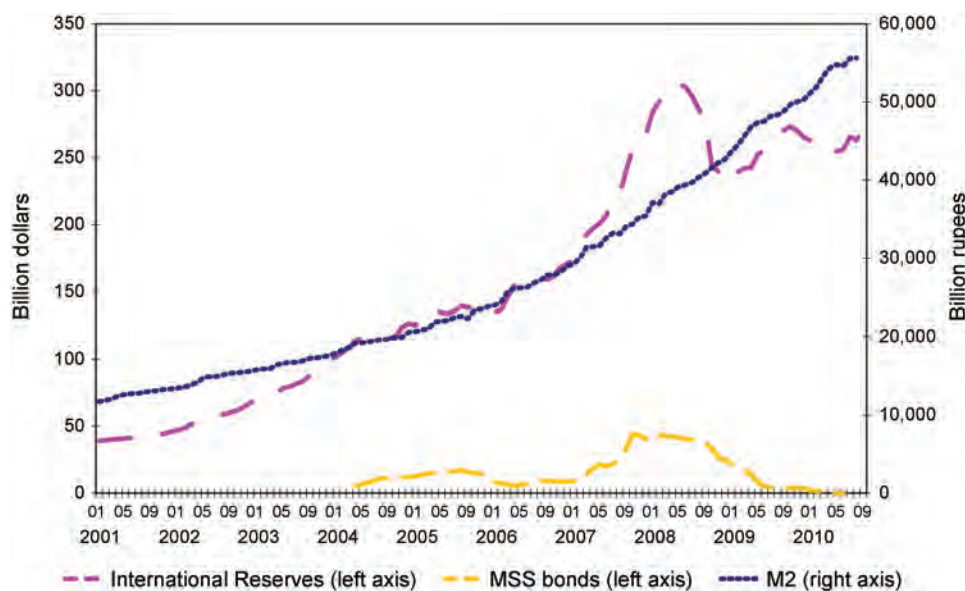
**Fig. 6.** International reserves, PBC bills and money supply (M2) in China, 2001–2010 (at end of month). PBC bills are converted from yuan to dollars. International reserves exclude gold, SDRs, and reserve position in the IMF. *Sources:* Compiled by the author from websites of the PBC and State Administration of Foreign Exchange, China (<http://www.safe.gov/cn>).

on econometric analyses, Ouyang et al. (2010, p. 969) have asserted that while sterilization in China was virtually complete until early 2007, it has since been partial, but still high—ca. 0.7 between late 2007 and late 2008. Frankel (2010, p. 6) is somewhat more critical, noting that in 2007 the negative consequences of which foreign economists had long warned began to materialize—in particular, higher domestic interest rates, rapid money growth, and inflation.

In addition, it has been argued that the true scale of China’s foreign reserves exceeded the officially reported figure by around \$300 billion in early 2009 (Setser and Pandey, 2009, p. 6; Tsuyuguchi, 2009, p. 4). The discrepancy reflects holdings of foreign assets by state banks as mandatory reserve requirements and swap transactions, as well as the establishment of the China Investment Corporation (CIC) as China’s sovereign wealth fund. The fact that the gap between the “true” and official figures widened after 2007 seemed to suggest that these manipulations were a part of sterilization efforts by the PBC. In particular, it should be noted that 1,550 billion RMB of special government bonds was issued to establish CIC, with an initial capital of \$200 billion in September 2007.

## India

Econometric analysis by Ouyang and Rajan (2008, p. 86) demonstrated that over 90 percent of India’s reserve accumulation had been sterilized during the period from 1998 to the end of 2004. However, toward the end of that period, in 2003, India also ran out of bonds to support its sterilization effort. Consequently, a new instrument known as the Market Stabilization Scheme (MSS) was introduced for sterilization purposes in April 2004, under which the RBI is empowered to issue government Treasury bills in order to absorb liquidity (Mohan,



**Fig. 7.** International reserves, MSS bonds, and money supply (M2) in India, 2001–2010 (on last Friday of month). MSS bonds are converted from rupees to dollars. International reserves exclude gold. *Sources:* Compiled by the author from IFS (n.d.) and the RBI's website.

2008, p. 248; Ouyang and Rajan, 2008, pp. 77–78). The difference between this program and that of China lies in the fact that in India, the RBI sells MSS bonds as an agent of the Ministry of Finance. The fiscal cost of MSS bonds clearly accrues to the Ministry (Patnaik and Shah, 2009, p. 166). A ceiling is set on the amount of outstanding MSS bonds that is subject to revision through mutual consultation between the RBI and the government (Ouyang and Rajan, 2008, pp. 78–79).

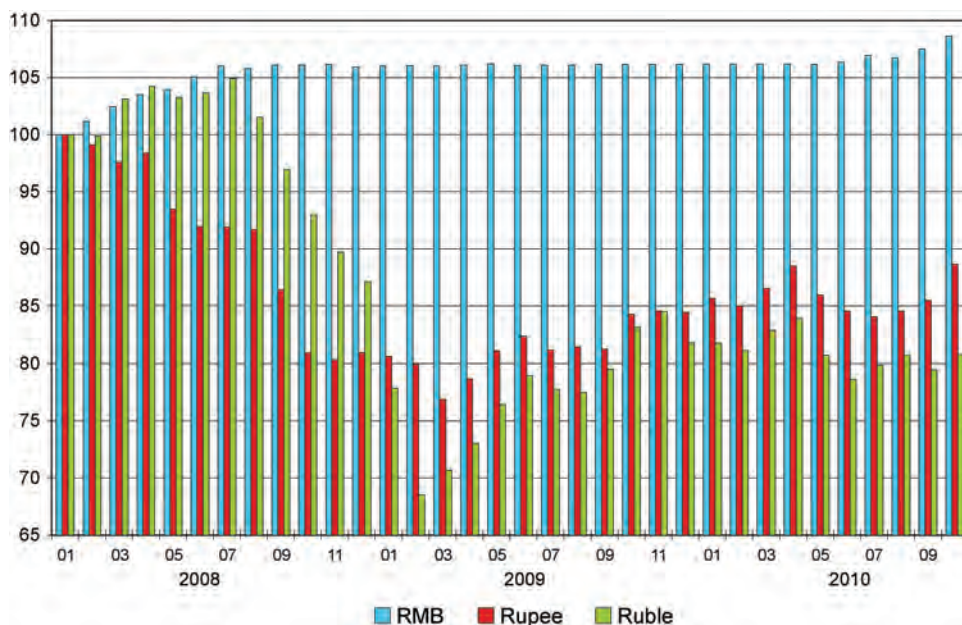
The volume of MSS bond issues was not substantial until 2007 (Fig. 7), but increased rapidly in the latter year in tandem with the increase in foreign reserves, peaking at \$44 billion in October 2007. Figure 7 suggests that the burden of sterilization for India became oppressive only in 2007 and early 2008.

### CHANGES DURING AND AFTER THE GLOBAL FINANCIAL CRISIS

In 2008, all three countries suffered a sudden and massive outflow of foreign private capital and considerable decreases in import demand for their products in developed countries. These circumstances had a substantial impact on their balance of payments.

#### Russia

The ruble exchange rate began to decrease in August 2008 with the beginning of the war with Georgia. During the period from September 2008 to January 2009, the CBR strongly intervened in foreign exchange markets to defend the ruble, but was unable to maintain the *de*



**Fig. 8.** Nominal average monthly exchange rates of three currencies against the dollar, 2008–2010 (January 2008 = 100). *Sources:* Compiled by the author from IFS (n.d.)

*facto* pegged arrangements against the basket. From November 11, 2008, the CBR explicitly adopted a policy of gradual depreciation, which, unfortunately, stimulated further depreciation. The ruble fell against the currency basket by 28.5 percent over a six-month period (i.e., from 29.27 rubles on August 6, 2008 to 40.94 rubles on February 6, 2009 (see Fig. 8). During the period from August 2008 to February 2009, Russia's foreign reserves decreased by \$210 billion (35.1 percent), from \$597 billion to \$387 billion (Fig. 5). And in the five months beginning in September 2008, the volume of foreign currency sales by the CBR in exchange markets amounted to \$209 billion.<sup>19</sup>

These interventions alleviated the burden on Russian banks and enterprises of paying back foreign loans extended to them during the time of the economic boom, particularly in 2006 and 2007. More specifically, the foreign assets of private banks and companies increased by an amount identical to the decrease in official reserves (Tabata, 2009, p. 694). Thus, foreign assets were transferred directly from the public to the private sector.

On January 23, 2009, the CBR abandoned the policy of gradual depreciation of the ruble and declared a new lower limit of the ruble rate against the basket, i.e., 41 rubles. In fact, within the range of 26–41 rubles against the basket, a narrower band, called a “floating interval,” was established at the same time (CBR, 2009, p. 9; 2010, pp. 8–9). The width of this interval was 2 rubles against the basket at the beginning, and then increased to 3 rubles on July 10, 2009 and 4 rubles on October 13, 2010. A rule or procedure existed for changing that interval, so that the exchange regime might be regarded as a crawling band according to the IMF's classification. Depreciation of the ruble stopped in February 2009, and on October 13, 2010, the CBR abolished the wider limit (26–41 rubles against the basket).

From February 2009 to October 2010, exchange rates of the ruble in nominal terms

<sup>19</sup>Calculated from the CBR's website ([http://www.cbr.ru/hd\\_base/VALINT.asp](http://www.cbr.ru/hd_base/VALINT.asp)).

fluctuated without considerable intervention by the CBR. During this period, Russia's foreign reserves increased by \$110 billion and net purchases of foreign currencies by the CBR amounted to \$97 billion. Although the CBR had repeatedly declared its intention to switch to a more flexible exchange regime involving fewer interventions, the change in performance after February 2009 appears to be simply due to the stagnant inflow of foreign currencies. As shown in Table 2, the current account surplus and inflow of private foreign capital were significantly smaller in 2009 than during the pre-crisis period. According to the forecast made by the CBR in its guidelines for currency-credit policy in the 2011–2013 period (CBR, 2010, pp. 19-25), increases in foreign reserves will depend on oil prices. All told, whether Russia has actually changed its exchange policy still remains to be seen.

### China

China returned to the dollar peg in July 2008 without any official explanation for this policy change. The exchange rate was fixed at 6.82–6.84 RMB per dollar (Fig. 8). Two years later, on June 19, 2010, China announced a return to the managed float (Fidrmuc, 2010, p. 3).<sup>20</sup> Frankel (2010) has argued that if China had retained the loose basket policy of 2007 instead of switching to the dollar peg in 2008, the value of the RMB would be lower and dollar-based producers abroad would be at more of a comparative disadvantage. In 2008 and 2009, the RMB significantly appreciated in tandem with the dollar (Fig. 3).

China's foreign reserves continued to increase during the crisis, although the rate of increase slowed after 2008 (Fig. 6). The amount of PBC bills outstanding stagnated after peaking in October 2008 (at \$695 billion).<sup>21</sup> As shown in Figure 6, sterilization seemed to be quite incomplete after 2008. At the same time, the increase in money supply from December 2008 through June 2009 is striking. It is not yet clear whether the new exchange regime launched in June 2010 will mark a substantial change.

### India

In January 2008, the exchange rate of the rupee reached its highest level in the 2000s (a monthly average of 39.4 rupees per dollar). The rupee subsequently depreciated by 23 percent to March 2009, reaching a level of 51.2 rupees per dollar (Fig. 8). Depreciation was particularly severe from September through October of 2008, when the rupee fell by 12 percent. India's foreign reserves decreased from \$306 billion in May 2008 to \$240 billion in February 2009 (by 21.6 percent). In October 2008 alone, foreign reserves fell by \$33 billion. These trends imply that the RBI (like the CBR) made efforts to defend the national currency, although with somewhat less difficulty than its Russian counterpart. One of the most important causes for depreciation was the increase in the current account deficit and the outflow of private foreign capital (Table 2).

Since the beginning of 2009, the rupee's exchange rate against the dollar has been increasing (Fig. 8), and international reserves have also increased. The amount of deposits made by the government for MSS stagnated in 2008 and decreased substantially in 2009 (Fig. 7). Thus, for India no changes appear to have been made in the exchange regime during and after the global financial crisis.

<sup>20</sup>It is interesting to note that Patnaik and Shah's (2009, p. 162) econometric analysis did not reveal any changes in China's exchange regime from July 2005 to April 2009.

<sup>21</sup>The new peak reached in July 2010 was only slightly higher, at \$701 billion.



## CONCLUDING REMARKS

In this paper, I have attempted to demonstrate the existence of three types of “vicious circles,” involving increases of foreign reserves by emerging economies. Russia has kept nominal rate of the ruble stable against the basket. However, due to inflation, resulting from incomplete sterilization, its real rate has appreciated fairly rapidly. Due to oil price increases, Russia’s current account surplus has increased despite the ruble’s appreciation in real terms, necessitating yet another intervention in foreign exchange markets. China’s currency authorities have kept the nominal rate of the RMB stable as well, but with almost complete sterilization. Because current account surplus has continued to be large, at least partly due to the maintenance of an undervalued RMB, another intervention in exchange markets also was necessary. Finally, India kept the real rate of the rupee constant with almost complete sterilization. When inflation rose for various reasons, here too an intervention in exchange markets was needed. Thus, in all three countries a trend toward increasing foreign reserves continued, although its underlying mechanisms have differed significantly. I argue that the experience of the three countries provided much of the background for the growth of international reserves in the emerging economies (more broadly during the 2000s).

I suggest that the costs of intervention in foreign exchange markets increased during the period leading up to the global financial crisis, especially in Russia and China, and that the financial crisis and the policy for recovery from it do not seem to have changed the mechanism of foreign reserve accumulation in each of the three countries. It should be noted that visible change in their IS balances needs to take place in order to produce a change in such mechanisms. It thus seems that Russia, China, and India will likely continue to accumulate reserves in the near future, signaling the persistence of the global monetary imbalance (revived Bretton Woods system) despite the increasingly obvious costs of maintaining that system.<sup>22</sup>

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<sup>22</sup>E.g., see the forecast in Chapter 4 (“Prospects for Growth and Imbalances beyond the Short Term”) in OECD (2010) and Blanchard and Milesi-Ferretti (2009).

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