

CHINA'S EMERGING FINANCIAL MARKETS

CHALLENGES AND OPPORTUNITIES

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THE MILKEN INSTITUTE SERIES ON FINANCIAL
INNOVATION AND ECONOMIC GROWTH

 Springer

 MILKEN INSTITUTE

The RMB Debate and International Influences on China's Money and Financial Markets*

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Abstract Section 2 explores a number of aspects of the debate about China's exchange rate policy. The focus is not to recommend specific policies but to expose a number of false arguments that have been made in the debate in order to separate out the serious considerations on which discussions should be based. While we argue that the adoption of a floating rate is not a panacea, we suggest that exchange rate adjustments can play a productive role as part of a coordinated policy strategy.

Section 3 deals with the effects of the large payments surpluses and international capital flows on China. We find that the People's Bank of China (PBOC) has been able to successfully sterilize most of the effects of the payments surpluses on the domestic money supply so that these have not been a major cause of inflation. Speculation on currency appreciation has not been as disruptive as some expected, and international capital flows have not been a major cause of the rise and fall of China's stock market. Thus, while China has become a major force in the global economy, it has managed to maintain considerable domestic monetary and financial autonomy.

Keywords Exchange rate policy · International reserves · Capital flows · Money supply · Stock market · Inflation

*An early version of section 2 was presented at the Conference on Global Imbalances cosponsored by the Central University of Economics and Finance and the People's Bank of China in Beijing, October 2006. Valuable comments from a number of participants are gratefully acknowledged. A revision was published in Chinese in *The Chinese Banker*, 2007. The discussion has been substantially reorganized and updated for this paper.

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1 Introduction

In Section 2, we offer a perspective on the recent debates over revaluation of the RMB. Few issues in economics have generated as much controversy and conflicting arguments as the recent debates about whether there should be a substantial appreciation of China's RMB and whether the failure of this to occur has been a major cause of worrisome global imbalances. The Chinese government's recent policy of small gradual appreciations against the dollar has done little to reduce the debate on this subject and, if anything, pressures in the US Congress to take retaliatory actions have increased.

Far too often commentators on these subjects have engaged in delivering debating points rather than balanced assessments. The forcefulness with which various points are often argued distorts the complex nature of these issues and the uncertainties about some of the key empirical parameters involved. Sadly arguments sometimes even fail to follow the rules of simple logic.

A balanced analysis suggests that both China and the United States have contributed importantly to global imbalances. China's currency remains substantially undervalued and further appreciation is in the longer-run interests of both China and the rest of the world. Short-run and special interests provide major obstacles to needed adjustments, however. Exchange rate adjustments alone will not be sufficient to restore global balance, but they are an important part of the lowest-cost policy mix for doing so.

One of the major arguments that substantial revaluation is in China's own interest is the potential disruption that continuing large surpluses generate for the domestic economy. In Section 3, we analyze key aspects of such concerns. Relevant here are both the direct effects of international capital flows on domestic financial markets and the potential indirect effects of reserve inflows on excessive expansion of the money supply and credit if these inflows are not effectively sterilized. We find that to date international capital flows have not played a major role in the fluctuations in the Chinese stock markets nor have they been a major cause of domestic money and credit expansion, i.e., the PBOC has been able to effectively sterilize the large majority of these inflows. We also find that contrary to expectations, hot money flows based on expectations of RMB appreciation have not been highly disruptive.¹ These findings help explain why the Chinese government has continued to strongly limit RMB appreciation. We caution, however, that sterilization is becoming increasingly difficult, and financial liberalization is contributing to an increase in China's financial interdependence with the global economy. Thus past success in managing the limited appreciation of the RMB is no assurance of continued success.

¹ Studies have, however, found that exchange rate expectations affect the price differentials of Chinese stocks denominated in different currencies. See, for example, Burdekin (2008).

2 Sense and Nonsense in the RMB Debate

In this section, we analyze some of the key aspects of this debate, with an eye to highlighting questionable and false statements in order to help clarify the issues. The arguments we analyze are not always stated in the recent debates as starkly as they are summarized below, but this presentation is most definitely not just attacking a group of straw men. Sometimes the non sequiturs are implied rather than explicitly stated. To illustrate the nature of these non sequiturs the general format will be to begin with a true (or at least likely true) statement, followed by a false inference often made from the first statement. Some of the latter statements may in fact turn out to be true but are not valid conclusions in the sense that they logically follow from the previous premises. Each true and false statement is then followed by explanatory comments.

1. True: Much of the pressure coming from the US Congress for China to revalue or have a large tax be placed on US imports from China is based on protectionist motives and/or shaky economics.

False: Therefore, China should not revalue.

Comment: This is a classic non sequitur. Showing that a particular argument against a proposition is false does not logically imply that the proposition is therefore true. The same holds with respect to arguments that the current China-US imbalance is all the fault of the United States. The policies of both countries have clearly contributed to the problem, and just blaming each other is not helpful (except for domestic political consumption). Clearly a solution requires action by both countries (and others as well).

2. True: The huge US trade deficit cannot all be blamed on China.

False: Therefore, China should not need to adjust its exchange rate.

Comment: This is another non sequitur. Adjustments by China, the US, and a number of other countries are all needed if global imbalances are to be reduced to safe levels.

3. True: Exchange rate adjustments alone will not correct the imbalance.

False: Therefore there is no point in adjusting exchange rates.

Comment: This is a third common non sequitur. Just because a change in the exchange rate cannot do everything it does not mean that it cannot help. The theory of economic policy shows that in general we need as many policy instruments as we have policy objectives. Both China and the United States today have internal as well as external imbalances. China has insufficient domestic spending relative to its savings, while the United States is in just the reverse position. Combining domestic policy adjustments with changes in exchange rates will allow these multiple imbalances to be reduced at lower costs than if fewer policies were used.

4. True: In monetary models, exchange rate changes will have only very temporary effects at most.

False: Therefore China should not alter its exchange rate.

Comment: The monetary model gives us many insights, but it also leaves out important considerations. The monetary model correctly shows that exchange rate changes cannot be used to create permanent disequilibrium, but the role of exchange rate adjustments is to remove disequilibrium or keep it from emerging, not create permanent disequilibrium. Economists such as McKinnon (2003, 2004), who draw heavily on the monetary model but argue that China should not undertake a major revaluation sometimes forget to point out that where a country is running a large surplus, the longer run alternative to revaluation in the monetary model is higher inflation. Contrary to the standard assumptions of the monetary model, China has been largely successful so far in keeping its surplus from substantially increasing domestic inflation. Most economists think that this has been a wise choice, but it cannot be continued indefinitely. Thus to many economists, a major argument for greater appreciation is a way to avoid high inflation.

5. True: The recent large US deficits have been a major stimulant to global demand and economic growth.

Questionable: Therefore they have been good for the world.

False: And therefore there is no reason to try to reduce them.

Comment: There is no question that the US deficits have been an important engine of global growth in recent years. In many ways the short-run effects have been favorable for the US and the world. But these short-run benefits are coming at the cost of future problems. It is like someone on a spending spree using borrowed money. It is fun while it lasts, but it will eventually have to come to an end, and when it does, it will be painful.

Current account deficits of the size the US has been running are not sustainable in the judgments of the vast majority of international monetary experts. The question is how the necessary adjustments will eventually be made. The longer they are postponed, the more likely is a major crisis, and the more painful and perhaps even destructive will be the final adjustments. The US needs to start bringing its excessive spending under control and countries that have been running large current account surpluses need to begin relying more on domestic stimulants to growth.

6. True: Even though it is quite large in absolute size, the US current account is not a high proportion of total world savings.

False: Therefore, we do not need to worry about continued international financing of large US deficits.

Comment: Only a proportion of global savings are effectively mobile internationally, and we cannot confidently estimate how large this proportion is. Thus we do not know how large a US current account deficit would be sustainable over the medium term. A frequently used guess is that a deficit of 2 to 3% of US GDP would be sustainable, while the current deficit is on the order of 6%.²

² For a more optimistic view of the sustainable size of capital inflows and hence US current account deficits see Cooper (2005).

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Views vary considerably about the medium-term sustainability of capital inflows. There is strong evidence that international financial flows do not typically behave like either the farsighted fully efficient markets so popular in economic models or the wild irrationality frequently asserted by market critics. Experience does suggest that market attitudes can change swiftly, as evidenced by the frequency of sudden stops in capital flows to emerging markets. Thus it is not safe to assume that because financing for the US current account deficits has been easily forthcoming so far, we can count on their continuing for the indefinite future.³

7. True: Economists' models do not agree on how much the RMB is undervalued.

False: Therefore it does not make sense to revalue the RMB.

Comment: Estimates of the amount of RMB undervaluation, given current policies, does vary by a huge amount – from almost zero to as much as 60%. An extremely useful illustration of our inability to precisely estimate the equilibrium value of the RMB has recently been provided by Cheung et al. (2007).

Their one standard deviation confidence bounds for their estimates are around 50% of the current value of the RMB, and the two standard deviation ranges are almost 100%, including possible undervaluation. Other types of models will give different point estimates and confidence bounds, but we clearly should not put much faith in any point estimates of the degree of RMB undervaluation.⁴

This does make official management a great deal harder, but is not a valid argument against the need for substantial further revaluation. Simple measures of equilibrium exchange rates such as calculations of purchasing power parity can be way off the mark both because of problems with price indices and changes in equilibrium real exchange rates. The strongest evidence of substantial overvaluation or undervaluation is a sustained surplus or deficit in the balance of payments. Through 2003 or so it was possible to argue that China's surplus was not a fundamental disequilibrium, since it was due largely to capital inflows that could be judged to be based only on short-term speculation that would later reverse. The continued evolution of China's balance of payments, detailed in the following section, makes this argument no longer credible.

³ A number of useful papers on global imbalances were presented at the following conferences: "Revived Bretton Woods System: A New Paradigm for Asian Development?" held at the Federal Reserve Bank of San Francisco on February 4, 2005, under the joint sponsorship of the Bank's Center for Pacific Basin Studies and the University of California at Berkeley's Clausen Center for International Economics (details available at <http://www.frbsf.org/economics/conferences/0502/>); and "Global Imbalances and Asian Financial Markets" held at University of California, Berkeley, September 29–30, 2005. (details available at <http://elsa.berkeley.edu/users/eichengr/af/agenda.html>).

⁴ For a valuable review of recent studies and their methodologies see Cline and Williamson (2008).

For reasons that are not clear the IMF was very slow to acknowledge the fundamental nature of China's disequilibrium, but its recent reports clearly acknowledge that this is not just a temporary disequilibrium. While the RMB has been allowed to rise considerably now against the dollar, the dollar's depreciation against other currencies has meant that the RMB's overall appreciation has been much less. There is a considerable question of whether the RMB was substantially less undervalued in 2008 than it was in 2005 when appreciation began.

8. Likely True: If China abolished all capital controls and went to a free float, the RMB would be more likely to fall than rise.

False: Therefore, the RMB is not currently undervalued.

Comment: Both balance of payments disequilibria and the corresponding concepts of currency overvaluation or undervaluation of currencies are based on the failure of a number of variables to be in an equilibrium relationship to one another. Thus, there are many ways to correct a disequilibrium. Comments about currency overvaluation or undervaluation are about how the exchange rate would need to change to restore equilibrium if other policies and variables remained the same. Often the optimal policy strategy is to change both the exchange rate and other policies. Further revaluation of the RMB in current circumstances should be accompanied by an expansion of domestic demand to help offset the contractionary effect of the revaluation. Likewise on the US side, depreciation by itself is not optimal. The budget deficit also needs to be cut and arguably domestic savings needs to rise.

9. True: A large revaluation would have a disruptive effect on China's economy.

False: Therefore, no revaluation should be undertaken.

Comment: The fact that sudden large adjustments are disruptive is a major reason why exchange rates for most countries should be reasonably flexible to avoid the buildup of large disequilibrium.

Because of the current large disequilibrium there is no easy way to deal with the problem. However, almost certainly a mix of policy responses should be undertaken, rather than relying only on one type. Most economists believe that revaluation should be accompanied by measures to stimulate greater domestic spending and to help the reallocation of workers who lose jobs as a result of the revaluation.

10. True: Much of China's exports contain substantial imported inputs.

False: Therefore, exchange rate adjustments would not influence China's trade balance.

Comment: High import content of exports affects how much revaluation is needed, not whether exchange rate adjustments will work. High levels of imported inputs reduce the effective elasticity of demand for exports. Therefore, for a given total amount of trade, a larger exchange rate adjustment is required to bring about a given percentage change in the trade balance.

The heavy use of imported inputs in China's exports also has a large influence on the geographic distribution of China's trade. The result is to channel a larger amount of the total global imbalances onto the China-US imbalance, making it look more like just a bilateral China-US issue than is really the case.

11. True: The RMB value of China's international reserves will fall if the RMB is revalued against the dollar.

False: A major cost of revaluation for China is the loss in the value of its international reserves that would be generated.

Comment: The usefulness of international reserves is based on their foreign currency, not domestic currency, value. A revaluation of the RMB would generate an accounting loss for the central bank but not a real loss for China's economy. What would cause a real opportunity cost to China is a depreciation of the dollar relative to other reserve currencies that China might hold, thus reducing the value of its dollar holdings in terms of the other reserve currencies. A note of caution is in order, however. Since China is such a large holder of dollars, if the market perceived that it is rapidly switching out of dollars, this would move the market against the dollar and generate greater losses for China.

The effects on the balance sheets of China's banks and businesses can also be relevant. The domestic currency value of both dollar assets and liabilities will be reduced.

12. True: On a per capita basis, China's international reserves are not particularly high.

False: Therefore, China needs all of its huge reserve accumulations.

Comment: The purpose of accumulating international reserves is to help provide external stability and protect the economy from a shortage of foreign exchange. There is no agreement among economists about how best to calculate optional reserve levels, but there is general agreement that reserve adequacy should be related to the size of potential payments deficits, including those generated by international capital flows. This in turn is related to the degree of a country's economic and financial internationalization, not directly to the size of its population. By any reasonable estimate, China's international reserves are far larger than needed.

13. True: Pegged exchange rates have sometimes been useful sources of stability.

False: The use of China's pegged exchange rate as a nominal anchor has been the major reason for its good recent inflation performance.

Comment: Pegged rates have both costs and benefits. While the use of the exchange rate as a nominal anchor has had a number of successes, it has also had a number of failures (see Willett, 1998). They can sometimes be sources of instability. In the case of China, most of the effects of international reserve flows in recent years have been sterilized. Therefore, the effects on domestic

inflation have been fairly limited. If these flows had not been largely sterilized, inflation in China in the last few years would have been much higher.

Pegged rates also tend to be crisis-prone. This is more of a problem for overvalued rather than undervalued currencies and with a high rather than low degree of international financial integration. Thus, this has not been as big a problem for China as for the currencies caught in the crisis of 1997–98, but speculative inflows in anticipation of RMB appreciation have been a problem at times, and as financial liberalization proceeds this will become more of a problem over time. Thus the Chinese government wisely views greater exchange rate flexibility and financial liberalization as moving together over time. The big issue is the speed at which this process should proceed.

It should also be recognized that it is not just the RMB's value against the dollar that is important. Over the 10-year period while the RMB was fixed to the dollar, China's real effective exchange rate has varied by more than 20% and switched its direction of change several times.

14. True: To work well, free floating exchange rates and international financial flows need well-developed financial markets and a strong banking system.

False: Market-oriented principles imply that China should immediately terminate all of its capital controls and allow the RMB to float freely.

Comment: Well-functioning foreign exchange and financial markets do not spring up immediately when controls are removed. A highly flexible exchange rate for China is an appropriate medium or long-term goal, not a short-term one. The rash of currency and financial crises in emerging market countries during the 1990s provide ample evidence of the need to move carefully in the process of liberalization. There is also a danger, however, that such valid concerns can be used as a smoke screen to avoid needed adjustments.

15. True: China had capital controls during the Asian crisis.

True: China was not hit hard by the Asian crisis.

False: Therefore, capital controls were the important factor that protected China from the Asian crisis, and hence should not be liberalized.

Comment: The assertion that capital controls saved China (and India also) from the Asian crisis is often made, but there is little serious evidence to back it. Simple correlations provide only very weak support. Econometric analysis by Willett et al. (2004) suggests that China's and India's fundamentals were sufficiently strong in 2007 that they would not have faced heavy speculative attacks even with no capital controls. This finding of course does not prove that controls did not help, but the general empirical literature on capital controls and currency crises fails to show evidence that capital controls generally provide strong protection against crises. Indeed, several studies find that controls are associated with higher probabilities of crises. There are a number of good reasons why China should not immediately abandon all of its capital controls, but protection from imported crises is likely not one of them.

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16. True: There are a number of similarities between today's international monetary system and the Bretton Woods system.

False: Therefore, there is no reason to worry about today's global imbalances.

Comment: There are both similarities and differences between today's system and Bretton Woods. To the extent they are similar, a key issue is whether the current situation is more like the early days of Bretton Woods as Dooley et al. (2004) suggest or more like the last days before it collapsed. The current US macroeconomic imbalances are distressingly similar to those of the United States in the last days of the Bretton Woods pegged rate regime and the large surpluses in Asia and the Middle East parallel the large surpluses of Germany and Japan. Thus seeing similarities between today's regime and Bretton Woods should not necessarily be a source of optimism. For discussions of the similarities and differences between Bretton Woods and the current situation, see Eichengreen (2004) and Rose (2006).

17. True: Financial markets have not built a substantial risk premium into US interest rates (at least until the recent subprime mortgage problems).

False: This is a strong indication that the worries of economists about the US budget deficits and global imbalances are greatly exaggerated.

Comment: Financial markets have in a number of cases been short-sighted and failed to give strong early warning signals of coming crises. Examples include Europe in 1992–93, Mexico in 1994–95, Asia in 1997–98 and Argentina in 2001–02. The investment of other countries' payments surpluses in the US has been a major factor helping to hold down US interest rates, with some estimates suggesting that this effect has been as much as 100–150 basis points.

18. True: China has not undertaken the type of competitive devaluation that was a major problem during the 1930s and was a major source of concern by the creators of the Bretton Woods system.

False: Therefore, China's current policy has not violated its international obligations and should not be the subject of international pressure and IMF investigation.

Comment: The Bretton Woods system was extremely successful in avoiding a repeat of the beggar-thy-neighbor devaluations that were so destructive during the Great Depression of the 1930s. It was not so successful, however, in avoiding disequilibria generated by the failure of surplus countries to adjust. The problem became one of too little rather than too much adjustment.

During the Bretton Woods era, it became recognized that the failure to appreciate one's currency in the face of strong continuing payments surpluses was also a source of problems both for other countries and the stability of the system and should be avoided. This was made explicit in the international reforms that followed the breakdown of the Bretton Woods pegged exchange rate regime in the 1970s. This is the basis for IMF pressure on China to appreciate more.

In its slowness to adjust, China is being no worse than Germany and Japan in the last years of the Bretton Woods pegged exchange rate regime, but as with Germany and Japan then, this is causing serious problems for the international monetary system. (And like them, on the deficit side the United States also shares blame for inappropriate policies.)

Of course there have been many charges by members of the US Congress that China has been guilty of manipulating its exchange rate and thus should be subject to punitive tariffs according to US law. Prohibitions on exchange rate manipulation are also contained in IMF agreements, and most economists believe that the IMF rather than individual countries should make judgments about whether international guidelines are being followed. The US Treasury has resisted finding that China has been manipulating its exchange rate on a combination of technical and political grounds, but these should not be taken as strong evidence that China is playing by the rules of the international monetary system.⁵

The use of manipulation in the language of the IMF and US legislation is unfortunate, since it carries a connotation of active efforts to promote exports, while as noted above, failure to correct imbalances can also lead to major problems. What does seem clear is that we are more likely to get needed adjustments in the context of discussion of coordinated policy responses to mutual imbalances than by pointing the finger at individual countries.

3 International Influences on China's Money and Financial Markets

3.1 *Evolution of China's Balance of Payment Accounts*

An examination of trends in the growth of China's reserves suggests that one can identify various subperiods since 1990 (Fig. 1).

China's reserves remained stagnant in 1990 and 1991 and actually declined in 1992, as small surpluses on the current and capital accounts were more than offset by capital flight, as witnessed by the negative balance in the errors and omissions category. However, things changed once the Chinese Yuan was officially devalued from 5.8 CNY per US dollar to 8.45 in January 1994. Between 1992 and 1996 the surplus in the capital account exceeded the current account deficit, and "illegal" capital flight (as proxied by the errors and omissions balance), such that reserves rose briskly during this period. The country's current account shifted to a surplus from 1997 onwards, though the capital account surplus diminished, while capital flight continued. In aggregate, between 1997 and 2000, China's reserves remained more or less stagnant. Since 2001, however, China has experienced large and growing surpluses on both the capital and

⁵ For a detailed analysis of the US Treasury's reports on China see Frankel and Wei (2007).

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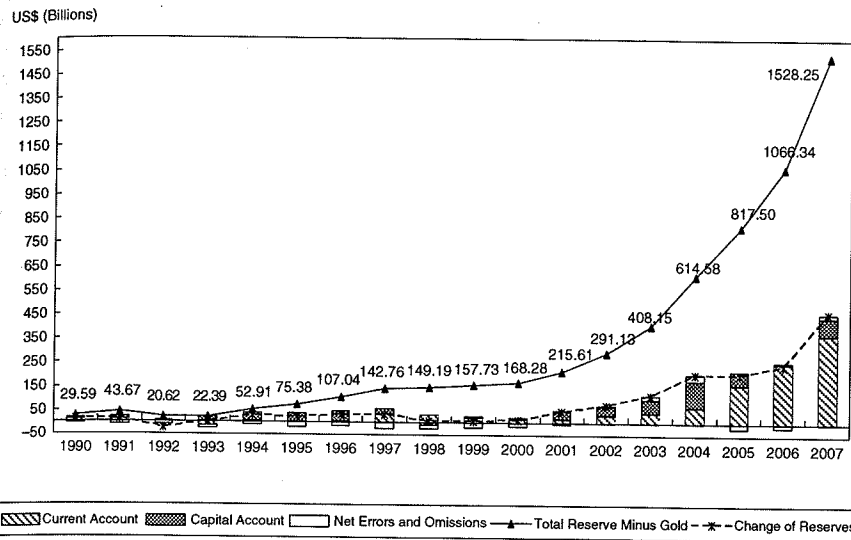


Fig. 1 Trends in China's balance of payments transactions, 1990-2007
Source: IFS Data published by IMF.

current accounts, while even the errors and omissions balance turned positive. Thus, reserves increased markedly during this period – almost eightfold.

3.1.1 The Composition of China's Current Account

China's current account has been in surplus since the devaluation in 1994 and has risen briskly after China joined WTO in 2001. Figure 2 shows that China's trade surplus is the main contributor to the huge current account surplus. The amount has increased from US \$34 billion in 2001 to US \$315 billion in 2007, reaching 11.3% of GDP. The preferential tariff policy and inexpensive labor costs have attracted many foreign-funded enterprises to transfer their processing sector into China. The consequence is that the processing trade resulting from foreign-funded enterprises has contributed 81% of the total trade surplus. To lower the trade surplus, China has made policy adjustments, such as canceling export tax rebates for 553 high-pollution and high-energy-consumption products, and lowering import tariffs for some products. In addition, current transfers have also been increasing, and reached US \$38 billion by 2007. Some of the increase has likely been short-term speculative capital flows into China through personal remittances.⁶

⁶ The evidence of a large amount of short-term speculative capital inflows into China could be found from the increase in the current transfer, security investment, and the error and omissions (Zhang, 2005).

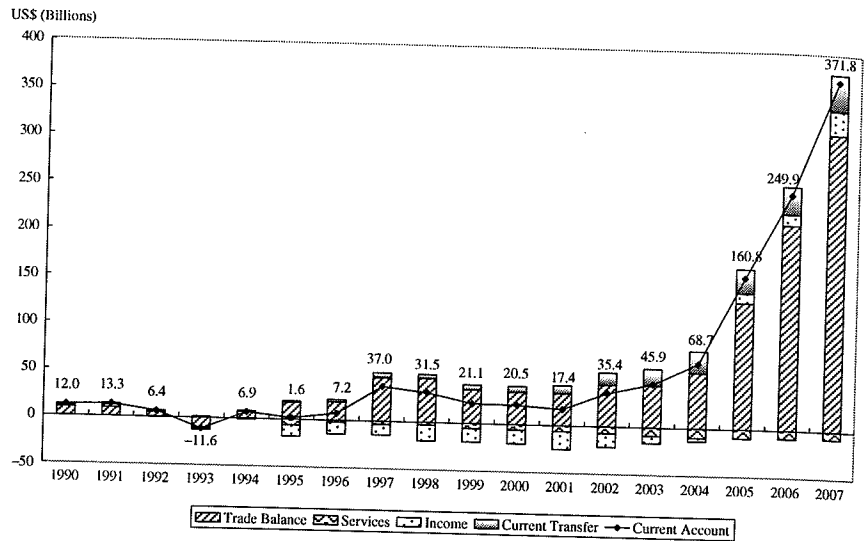


Fig. 2 Composition of China's current account, 1990–2007
 Source: IFS data published by IMF.

3.1.2 The Composition of China's Capital Account

Figure 3 shows the composition of China's capital account. The capital account reached its highest point of US \$110.65 billion in 2004. But since then, the capital surplus sharply decreased to US \$6 billion in 2006 due to a large amount of portfolio investment outflow. A large part of capital outflow was due to

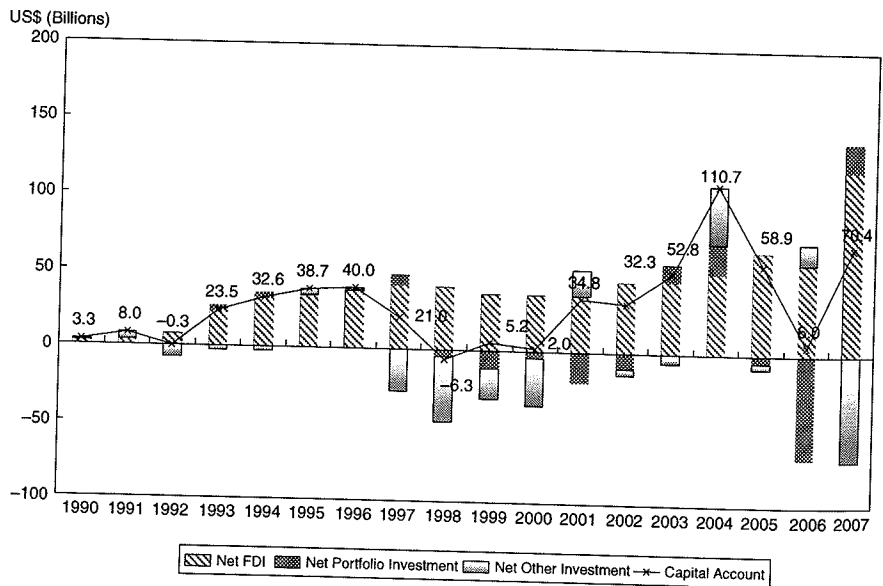
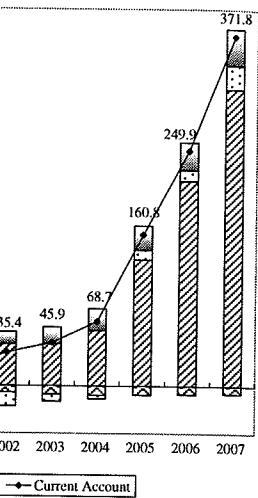
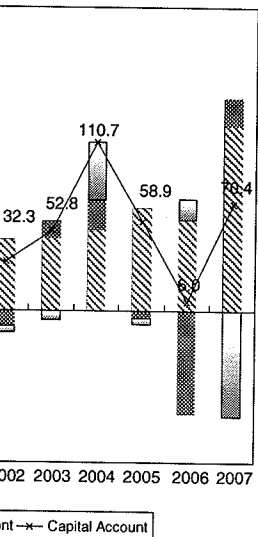


Fig. 3 Composition of China's capital account, 1990–2007
 Source: IFS data published by IMF.



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domestic enterprises and financial institutions engaging in IPOs overseas in 2006. Thirty-four domestic enterprises generated over US \$38.7 billion through IPO or issuance of new shares in Hong Kong stock market, while three big financial institutions, Bank of China, China Merchants Bank, and Industrial and Commercial Bank of China, also generated US \$11.12 billion, US \$2.53 billion, and US \$16.04 billion, respectively. The capital account surplus has risen sharply again to US \$70 billion due to a surge of net FDI in 2007.

Since early 1990s, FDI has consistently been in surplus. Figure 4 shows the FDI inflows and outflows in China. In a single year of 2007, the net FDI grows almost double compared to the previous year. Most FDI inflows go into nonfinancial sectors, such as manufacturing and real estate sectors in China.

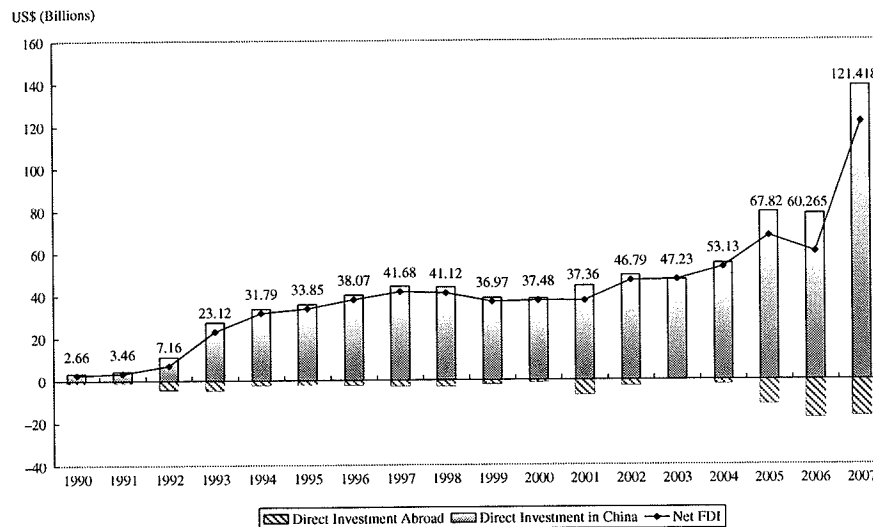


Fig. 4 China's FDI, 1990-2007
Source: IFS Data published by IMF.

Figure 3 also shows that portfolio and other investments are more volatile than FDI. Until recently foreign investors were not allowed to use the RMB to invest in China's stock market, but were only allowed to use foreign exchange to invest in certain authorized shares that are called B shares. But at the end of 2002 China launched the Qualified Foreign Investment Institutions (QFIIs) to invest in domestic securities markets (which include A-shares, treasuries, convertibles and corporate bonds); it obviously contributed part of the increase in both equity and debt securities investment.⁷ In addition, China also launched the Qualified Domestic Investment Institutions (QDIIs) in May 2006 to generate domestic funds investing abroad. By the end of 2007, QDIIs has

⁷ Forty six QFII investors with a total US\$9.5 billion got approved from the China Securities Regulatory Commission by early 2007.

contributed US \$35.3 billion capital outflows. Figure 5 shows the changes of the composition of the portfolio investment from 1990 to 2007.

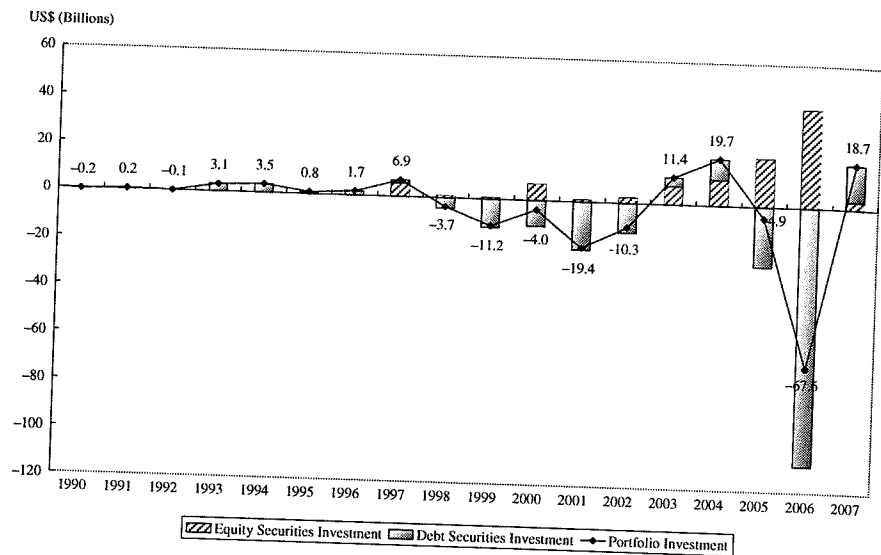


Fig. 5 Composition of China's portfolio investment, 1990-2007
Source: IFS data published by IMF.

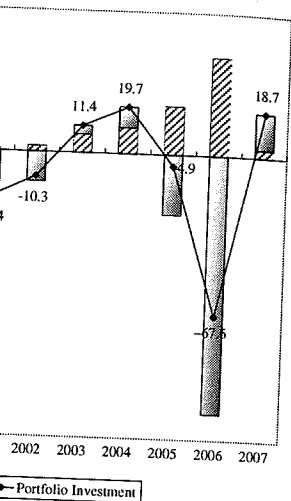
Other investment includes short- and long-term loans, trade credits, and transactions in currency. Due to the government injection of US \$45 billion into four state-owned banks to recapitalize, other investment had a US \$58.82 billion deficit in 2003. There was a US \$70 billion deficit in other investments in 2007, mainly contributed by the increase in trade credits.

3.2 Monetary Sterilization Policies in China

What are the monetary consequences of the huge reserve buildup in China? Figure 6 shows that, since December 2002, domestic high-powered money creation proxied by the growth in broadly defined net domestic assets (NDA)⁸ has remained rather low if not negative. This helped moderate the increase in the domestic monetary base (MB) and overall money supply (M2) (Fig. 7), suggesting that the Peoples Bank of China (PBC) was actively neutralizing the impact of the reserves buildup using various policies and instruments. Two conventional sterilization policies frequently used by the PBC are open market

⁸ Broadly defined net domestic assets (NDAs) equals monetary base (MB) minus net foreign assets (NFAs).

Figure 5 shows the changes of the ... to 2007.



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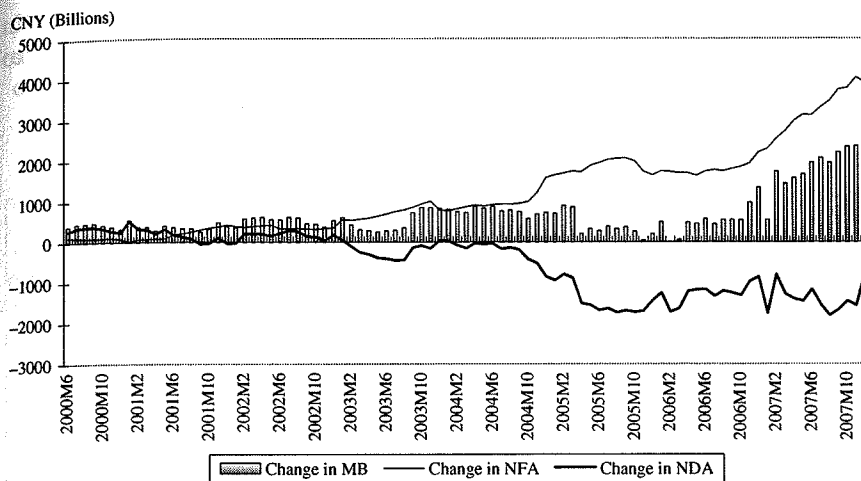


Fig. 6 Monthly annual change in NFAs, NDAs, and reserve money in China, 2000
Source: IFS data published by IMF.

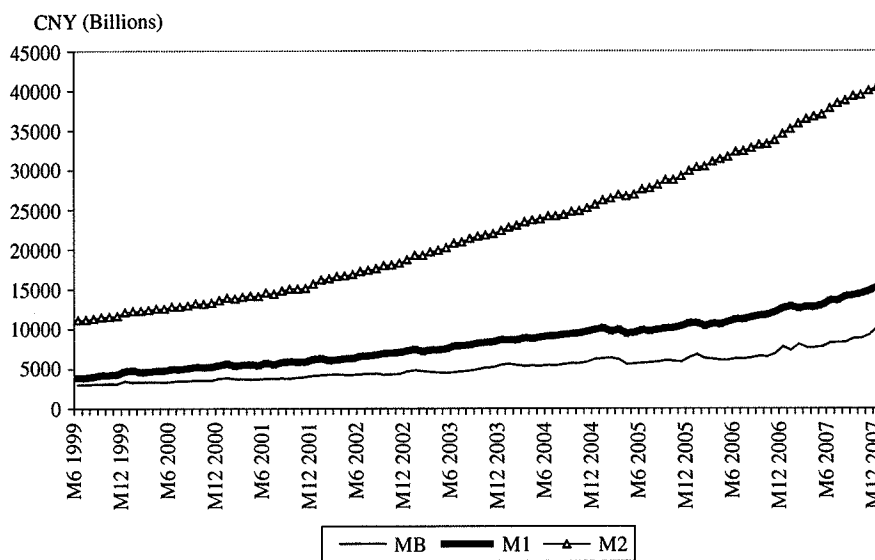


Fig. 7 Reserve money in China, 1999-2007
Source: IFS data published by IMF.

operations (OMOs) and raising reserve requirements (He et al., 2005). In early 1998, the PBC used treasury bonds or securities as the sterilization tools. But since September 2002, the PBC has replaced all outstanding securities with central bank bills (CBCs) for use in its open market operations (OMOs).

Figure 8 reveals the sharp growth in PBC issuances in the last five years. In addition, the PBC has begun to issue short-term repurchases ranging from 7 to 182 days to do sterilization in these three years.⁹

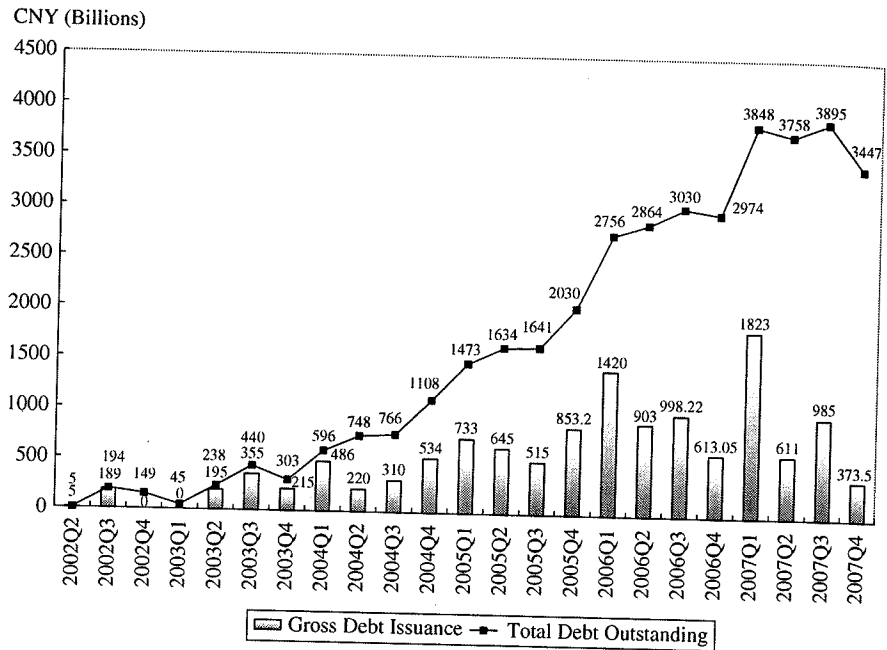


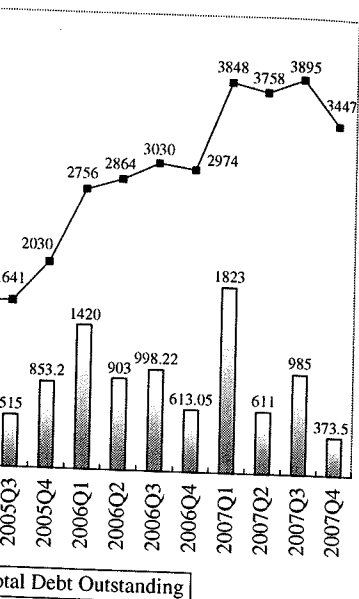
Fig. 8 Issuance of central bank bills and total PBC debt outstanding, 2002–2007
Source: IFS data published by IMF and the PBC website.

Since 1998, the PBC has required state banks to hold greater levels of bank reserves to reduce the money multiplier. The PBC has also been increasing the benchmark interest rate to curb liquidity growth and has undertaken a series of market-based interest rate reforms, such as broadening the floating band of financial institution lending rates at the beginning of 2004.¹⁰ These monetary policy actions have been accompanied by administrative measures including window guidance to halt the nongovernment-approved construction loans and cool down specific sectors. Other measures, such as moral suasion and risk warnings, have also been conveyed to commercial banks to try to maintain “reasonable” credit growth and optimize resource allocation. The government also introduced measures to curb the rapid escalation of property prices in May

⁹ He et al. (2005) outline some of the improvements/changes made by the PBC in its conduct of OMOs in 2003–2004.

¹⁰ In addition, commercial banks have been allowed a greater degree of autonomy in deciding medium and long-term CNY loan interest rates.

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total outstanding, 2002–2007
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2006 (Ma, 2006). China has used new monetary sterilization instruments to make its monetary policies more flexible. In the following section, we will discuss what kinds of instruments the PBC has used for sterilization.

3.2.1 Open Market Operations

The PBC has used open market operations (OMOs) to sterilize more frequently in recent years. In early 1998, the PBC used treasury bonds or securities as the sterilization tools. But since the PBC replaced all outstanding securities with central bank bills in September 2002, central bank bills have been broadly used in the open market operations. Figure 8 shows that the PBC has issued CNY 765 billion in 2003 and then has issued even more central banks bills in 2007, up to RMB 3,793 billion, to control monetary growth pressure that resulted from the huge reserve accumulations. The PBC began to carry out repurchases in May 2004 to enhance the efficiency of open market operations. Since then, the PBC has frequently used short-term obverse repurchases of open market operations to mop up the excess liquidity. The repurchase operations range from 7 to 182 days. From the updated data, CNY 280 billion central bank bills and CNY 231 billion obverse repurchases have been issued in the first five months in 2008.

In addition to issuing central bank bills and doing repurchases, the Chinese government issued CNY 1,550 billion Special Treasury Bonds to domestic commercial banks on the inter-bank bond market to purchase US \$200 billion foreign exchange for the National Foreign Exchange Investment Company as operating capital. This not only contracts domestic liquidity, but also increases the PBC's holdings of treasury bonds, and provides another effective tool to do open market operations.

3.2.2 Legal Reserve Requirement Ratio

Another tool to manage the excess liquidity in the money market is to adjust legal reserve requirement ratios. This can reduce the money multiplier, and further decrease money creation. Table 1 shows that the PBC has increased the legal reserve requirement ratios considerably since 2007. The ratio has been raised 10 times in a single year of 2007, and then another 4 times to 17% in the first half of 2008.

3.2.3 Interest Rate Policy and Market-Based Interest Rate Reform

Interest rate policy is another instrument used frequently by the Chinese government to manage excess liquidity in the money market, including the adjustment of central bank base interest rates, central bank lending rates, rediscount rates, and deposit reserve rates. The PBC raised the base deposit and lending rates eight times in 2007. Tables 2, 3, and 4 list China's deposit reserve rates, central bank lending rates, and rediscount rates, base deposit, and lending rates, respectively.

Table 1 Legal reserve requirement ratio in China, 1984–2008

1984	Reserve requirement was 20% on business deposits, 40% on demand deposits, and 25% on demand deposits in rural credit cooperatives.
1985	Reserve requirements reduced to 10% for all deposits.
1987	Reserve requirement raised to 12% to control overheating and inflation.
1988	Reserve requirement raised to 13%.
March 1998	Legal reserve requirement reduced to 8%. Financial institutions can now decide the excess reserve requirement.
November 1999	Legal reserve requirement reduced to 6% to stop deflation.
September 2003	Legal reserve requirement raised to 7% to prevent inflation.
April 2004	The system of differentiated reserve requirements ratio was re-adopted. Legal reserve requirement raised to 7.5% for most financial institutions. However, in order to support the agricultural credit and reform of the rural credit cooperatives, urban and rural credit cooperatives were exempt from the new reserve requirement for the time being, while the current 6% ratio still applied to them. The reserve requirement for financial institutions with poor capital adequacy and asset quality rose to 8%.
2006 July 5	Legal reserve requirement raised to 8%.
August 15	Legal reserve requirement raised to 8.5%.
November 15	Legal reserve requirement raised to 9%.
2007 January 15	Legal reserve requirement raised to 9.5%.
February 25	Legal reserve requirement raised to 10%.
April 16	Legal reserve requirement raised to 10.5%.
May 15	Legal reserve requirement raised to 11%.
June 5	Legal reserve requirement raised to 11.5%.
August 15	Legal reserve requirement raised to 12%.
September 25	Legal reserve requirement raised to 12.5%.
October 25	Legal reserve requirement raised to 13%.
November 26	Legal reserve requirement raised to 13.5%.
December 25	Legal reserve requirement raised to 14.5%.
2008 January 25	Legal reserve requirement raised to 15%.
March 25	Legal reserve requirement raised to 15.5%.
April 25	Legal reserve requirement raised to 16%.
June 15	Legal reserve requirement raised to 17%.

Source: Adapted from China's 2003 and 2004 Annual Monetary Report and the PBC website.

In addition, the PBC has undertaken a series of market-based interest rate reforms, such as broaden the floating band of financial institution lending rates in the beginning of 2004. For commercial banks and urban credit cooperatives, the upper band was extended to 170% of the benchmark rate announced by the PBC and to 200% for rural credit cooperatives. The lower band remained at 90% of the benchmark. Meanwhile, commercial banks were allowed to have more discretion. For example, the lender and borrower can both decide the medium and long-term CNY loan interest rates. The upward floating of interest rate and higher discretion not only provide more space for commercial banks to do risk management, but may also be able to reduce lending turnovers (decreasing the money multiplier) by increasing the borrowing costs.

n China, 1984-2008

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Table 2 Deposit reserve rates, central bank lending rates, and rediscount rates in China

Adjustment date	Legal reserve rate (%)	Excess reserve rate (%)	Central bank lending rate					Rediscount rate (%)
			One-year (%)	Within six months (%)	Within three months (%)	Within twenty days (%)		
5-1-96	8.82	8.825	10.98	10.17	10.08	9	**	
8-23-96	8.28	7.92	10.62	10.17	9.72	9	**	
10-23-97	7.56	7.02	9.36	9.09	8.82	8.55	**	
3-21-98	5.22		7.92	7.02	6.84	6.39	6.03	
7-1-98	3.51		5.67	5.58	5.49	5.22	4.32	
12-7-98	3.24		5.13	5.04	4.86	4.59	3.96	
6-10-99	2.07		3.78	3.69	3.51	3.24	2.16	
9-11-01							2.97	
2-21-02	1.89		3.24	3.15	2.97	2.70	2.97	
12-21-03		1.62						
3-25-04			3.87	3.78	3.6	3.33	3.24	
3-17-05		0.99						
1-1-08			4.68	4.59	4.41	4.14	4.32	

Source: PBC website.

Note: 1. The legal reserves account was combined with the excess reserves account in March 1998.

2. ** represents that the rate float 5-10% below the central bank lending rate with the same maturity.

Table 3 Base deposit rates and time deposit rates in China

Adjustment date	Deposit rate (%)	Time deposit					
		Three-month (%)	Six-month (%)	One-year (%)	Two-year (%)	Three-year (%)	Five-year (%)
4-15-90	2.88	6.30	7.74	10.08	10.98	11.88	13.68
8-21-90	2.16	4.32	6.48	8.64	9.36	10.08	11.52
4-21-91	1.80	3.24	5.40	7.56	7.92	8.28	9.00
5-15-93	2.16	4.86	7.20	9.18	9.90	10.80	12.06
7-11-93	3.15	6.66	9.00	10.98	11.70	12.24	13.86
5-1-96	2.97	4.86	7.20	9.18	9.90	10.80	12.06
8-23-96	1.98	3.33	5.40	7.47	7.92	8.28	9.00
10-23-97	1.71	2.88	4.14	5.67	5.94	6.21	6.66
3-25-98	1.71	2.88	4.14	5.22	5.58	6.21	6.66
7-1-98	1.44	2.79	3.96	4.77	4.86	4.95	5.22
12-7-98	1.44	2.79	3.33	3.78	3.96	4.14	4.50
6-10-99	0.99	1.98	2.16	2.25	2.43	2.70	2.88
2-21-2002	0.72	1.71	1.89	1.98	2.25	2.52	2.79
10-29-04	0.72	1.71	2.07	2.25	2.70	3.24	3.60
8-19-06	0.72	1.80	2.25	2.52	3.06	3.69	4.14
3-18-07	0.72	1.98	2.43	2.79	3.33	3.96	4.41
5-19-07	0.72	2.07	2.61	3.06	3.69	4.41	4.95
7-21-07	0.81	2.34	2.88	3.33	3.96	4.68	5.22
8-22-07	0.81	2.61	3.15	3.60	4.23	4.95	5.49
9-15-07	0.81	2.88	3.42	3.87	4.50	5.22	5.76
12-21-07	0.72	3.33	3.78	4.14	4.68	5.40	5.85

Source: PBC Web site.

Table 4 Base lending rates in China

Adjustment date	Base lending rates (%)				
	Six-month (%)	One-year (%)	One to three years (%)	Three to five years (%)	Above five-year (%)
4-21-91	8.1	8.64	9	9.54	9.72
5-15-93	8.82	9.36	10.8	12.06	12.24
7-11-93	9	10.98	12.24	13.86	14.04
1-1-95	9	10.98	12.96	14.58	14.76
7-1-95	10.08	12.06	13.5	15.12	15.3
5-1-96	9.72	10.98	13.14	14.94	15.12
8-23-96	9.18	10.08	10.98	11.7	12.42
10-23-97	7.65	8.64	9.36	9.9	10.53
3-25-98	7.02	7.92	9	9.72	10.35
7-1-98	6.57	6.93	7.11	7.65	8.01
12-7-98	6.12	6.39	6.66	7.2	7.56
6-10-99	5.58	5.85	5.94	6.03	6.21
2-21-02	5.04	5.31	5.49	5.58	5.76
10-29-04	5.22	5.58	5.76	5.85	6.12
4-28-06	5.4	5.85	6.035	6.12	6.39

rates in China

Two-year (%)	Three-year (%)	Five-year (%)
10.98	11.88	13.68
9.36	10.08	11.52
7.92	8.28	9.00
9.90	10.80	12.06
11.70	12.24	13.86
9.90	10.80	12.06
7.92	8.28	9.00
5.94	6.21	6.66
5.58	6.21	6.66
4.86	4.95	5.22
3.96	4.14	4.50
2.43	2.70	2.88
2.25	2.52	2.79
2.70	3.24	3.60
3.06	3.69	4.14
3.33	3.96	4.41
3.69	4.41	4.95
3.96	4.68	5.22
4.23	4.95	5.49
4.50	5.22	5.76
4.68	5.40	5.85

Three to five years (%)	Above five-year (%)
9.54	9.72
12.06	12.24
13.86	14.04
14.58	14.76
15.12	15.3
14.94	15.12
11.7	12.42
9.9	10.53
9.72	10.35
7.65	8.01
7.2	7.56
6.03	6.21
5.58	5.76
5.85	6.12
6.12	6.39

Table 4 (continued)

Adjustment date	Six-month (%)	One-year (%)	One to three years (%)	Three to five years (%)	Above five-year (%)
8-19-06	5.58	6.12	6.3	6.48	6.84
3-18-07	5.67	6.39	6.57	6.75	7.11
5-19-07	5.85	6.57	6.75	6.93	7.2
7-21-07	6.03	6.84	7.02	7.20	7.38
8-22-07	6.21	7.02	7.20	7.38	7.56
9-15-07	6.48	7.29	7.47	7.65	7.83
12-21-07	6.57	7.47	7.56	7.74	7.83

Source: PBC website.

China introduced the Shanghai Interbank Offered Rate (SHIBOR), the Chinese LIBOR, into market on January 4, 2007 as a landmark in China's interest rate system reform. Figure 9 shows the movement of SHIBOR since October 8, 2006. The SHIBOR is calculated by China's National Interbank Funding Center, based on the arithmetic average of interbank loan interest rates quoted by 16 commercial banks, which are primary dealers in the interbank market or the market makers in the foreign exchange market. The rate ranges from overnight to one year. The launch of the SHIBOR is a touchstone to further liberalize interest rates and the benchmark to form the market-based basis interest rates.

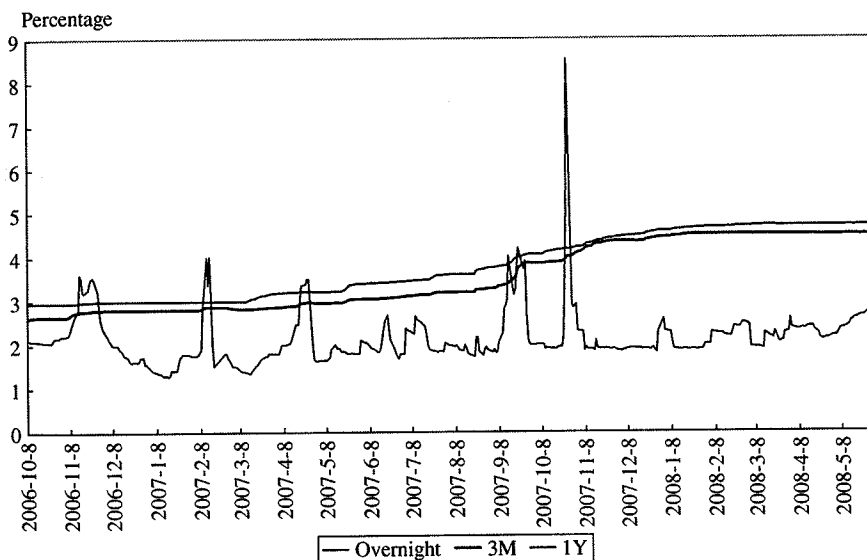


Fig. 9 Shanghai interbank offered rate (SHIBOR)

Source: SHIBOR website: <http://www.shibor.org/shibor/web/html/index.html>

3.2.4 Window Guidance

Since raising rediscount rates and legal reserve requirement may slow down macroeconomic activity the PBC has also used measures like window guidance to halt the nongovernment-approved construction loans to cool down specific sectors. This was used by the PBC three times in 2003 (July, August, and September) and once in March 2004.¹¹ To further contract hot money flowing into the real estate market, the Chinese government announced a strengthening of commercial real estate mortgages, and more frequently conducted window guidance to caution both domestic and foreign commercial banks on loan growth, especially loans for certain industries with high risks of excess capacity.

Meanwhile, financial institutions were also encouraged to increase their credit support to agriculture and small and medium-sized enterprises (SMEs). Commercial banks were required to offer quality financial services and funding for the procurement of agricultural produce. Other guidance, such as moral suasion and risk warnings, was also conveyed to commercial banks in the regular monthly meetings.

3.2.5 Capital Controls

While restricting speculative investments and short-term borrowings inflows, the PBC has loosened controls on capital outflows. China used to encourage long-term capital inflows, such as foreign domestic investment (FDI), and restrict capital outflows. But to ease appreciation pressures, a series of new policies for loosening controls on capital outflows have been issued by the PBC. For example, beginning in 2007, the cash limit of local currency that a person can carry in and out of the country was raised from the previous RMB 20,000 to RMB 50,000. Also, since December 2004, individual Chinese can transfer assets out of China, and Chinese students who study abroad can carry more money out of China. In addition, a Qualified Domestic Institutional Investors (QDII) system has been introduced. By the end of 2007, QDIIs had invested US \$30.3 billion (including National Social Security Fund) overseas.

3.2.6 Estimating the Extent of Sterilization in China

Most existing literature of estimating the extent of sterilization can be classified into three groups. With the assumption that capital flows are exogenously determined, the first group simply uses OLS to estimate a central bank's monetary reaction function such as the one below:

$$\Delta NDA_t = c_0 + c_1 \Delta NFA_t + X_t' \beta + u_t \quad (1)$$

¹¹ Refer to Terada-Hagiwara (2004) and China's Annual Monetary Policy Report in 2004.

where ΔM for domes reserves), influence internatio implies no ΔNDA_t . I internatio money). I 1990 to 20 of foreign increased the base m unit incre in the cha 0.11 units

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where ΔNDA_t and ΔNFA_t represent the change in net domestic assets (a proxy for domestic money creation) and net foreign assets (a proxy for international reserves), respectively, and X represents other explanatory variables that might influence a monetary authority's reaction. $c_1 = -1$ implies that an increase of international reserves is fully sterilized by monetary authorities, while $c_1 = 0$ implies no sterilization. But in some instances, ΔMB_t or $\Delta M2_t$ is used instead of ΔNDA_t . If this is the case then $c_1 = 0$ represents full sterilization since a rise of international reserves does not significantly impact the monetary base (or broad money). For example, Burdekin and Siklos (2008) use the quarter data from 1990 to 2002, and regress both the change of base money and M2 on the change of foreign reserves. They find that China's broad money had significantly increased by the reserve accumulation during the sample period, even though the base money remained quite constant. Based on their empirical results, one unit increases in the change of foreign reserves leads to decrease of 0.1–0.2 units in the change of based money, but M2 growth has significantly been raised by 0.11 units.

The second group uses a Vector Autoregression (VAR) model, to estimate the lagged effects of NDAs and NFAs. The standard form of a VAR model is as follows:

$$\Delta NDA_t = \alpha_{10} + \sum_{i=1}^k \alpha_{1i} \Delta NDA_{t-i} + \sum_{i=1}^k \beta_{1i} \Delta NFA_{t-i} + e_{1t} \quad (2a)$$

$$\Delta NFA_t = \alpha_{20} + \sum_{i=1}^k \alpha_{2i} \Delta NFA_{t-i} + \sum_{i=1}^k \beta_{2i} \Delta NDA_{t-i} + e_{2t} \quad (2b)$$

The advantage of using the VAR model is that one can trace the time path of the various shocks on the variables included in the VAR system through the derived impulse response function. For example, if an unexpected shock from foreign reserves results in an offsetting decrease in domestic money creation, i.e., β_1 will be close to -1 if monetary authorities fully sterilize, and then declined to zero if the effect gradually decrease. An important limitation that one has to be aware is that the VAR approach tends to treat all variables as symmetrically endogenous. Therefore, it cannot estimate the contemporary effect of variables without restrictions due to the issue of identification. He et al. (2005) and Cavoli and Rajan (2006) find that China has almost fully sterilized its reserve accumulation, but the extent of sterilization in China during the sample period of 2003 to 2004 is somewhat greater than the period between 1998 and 2002.

Due to the possible endogeneity issue between domestic and foreign components of the monetary base, the third group of studies estimates as set of simultaneous equations between NDAs, and NFAs. The typical model specification is:

$$X' \beta + u_t \quad (1)$$

$$\Delta NFA_t = \alpha_{10} + \alpha_{11} \Delta NDA_t + X_1' \beta_1 + u_{1t} \quad (3a)$$

$$\Delta NDA_t = \alpha_{20} + \alpha_{21} \Delta NFA_t + X_2' \beta_2 + u_{2t} \quad (3b)$$

where X_1 and X_2 are the vectors of controls in the balance of payment function and monetary reaction function, respectively. Equations (3a) and (3b) are the balance of payments and the monetary reaction functions, respectively. The value of α_{11} is referred to as so called the "offset coefficient", which can be used to measure the degree of capital mobility. $\alpha_{11} = 0$ implies no capital mobility since international capital flows are not affected by a change in domestic money creation. Follow the same logic, $\alpha_{11} = -1$ implies perfect capital mobility. The value of α_{21} is referred to as so called the "sterilization coefficient", which is used to measure the extent of sterilization. The expected value of the sterilization coefficient again is bound between 0 and -1 . The former represents no sterilization, while the latter represents fully sterilization.

Ouyang et al. (2007) uses monthly data between June 1999 and September 2005, and applies two-stage least squares (2SLS) to estimate the simultaneous equations. The empirical results show that the degree of capital mobility in China is around -0.63 to -0.7 , indicating a substantial degree of capital mobility despite China's capital controls. The estimated sterilization coefficients range around -0.92 to -0.97 , indicating a heavy sterilization policy was conducted during the sample period.

The paper has also used recursive estimation to find the dynamic behavior of offset and sterilization coefficients. The results suggest that the *de facto* capital mobility in China remained fairly stable between early 2003 and mid 2004, but increased significantly thereafter. In the early part of the estimation period the offset coefficients were quite low, around -0.1 to -0.2 , but by the end of the period had increased to around -0.7 , indicating a substantial increase in effective capital mobility. However the recursive estimation does not indicate any corresponding decline in sterilization. Indeed the extent of sterilization was found to have slightly increased in 2005 compared to 2004.

To sum up, most studies find that China has heavily sterilized the international reserves to release the substantial inflationary pressure since the 1990s. The extent of sterilization is generally over 90%. This in turn explains how China has been able to maintain relatively low rates of money growth and until recently, inflation (Fig. 10) despite the continuing large balance of payments surpluses.

3.3 RMB Appreciation Expectations and Their Influence on China's International Capital Flows and Stock Markets

Conceptually we may think of a country's balance of payments as having two major components – the underlying balance reflecting economic and financial

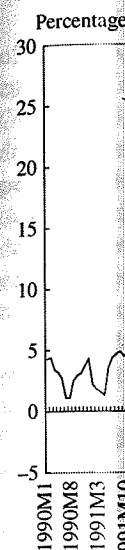


Fig. 10 Inflation
Source: IFS

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$$X_1' \beta_1 + u_{1t} \quad (3a)$$

$$X_2' \beta_2 + u_{2t} \quad (3b)$$

the balance of payment function equations (3a) and (3b) are the functions, respectively. The "sterilization coefficient", which can be used to imply no capital mobility by a change in domestic money supply, represents perfect capital mobility. The "sterilization coefficient", which is used to imply a change in the value of the sterilization policy, represents no sterilization.

in June 1999 and September 2000 to estimate the simultaneous degree of capital mobility in the degree of capital mobility sterilization coefficients range from 0 to 1. The sterilization policy was conducted

to find the dynamic behavior of the capital mobility. The results suggest that the *de facto* capital mobility was high in the early 2003 and mid 2004, but low in the estimation period the degree of capital mobility was -0.2, but by the end of the estimation period the degree of capital mobility was 0.2. The results do not indicate any change in the extent of sterilization was conducted from 1990 to 2004.

China heavily sterilized the international capital mobility since the 1990s. This in turn explains how the degree of money growth and until the early 2003 and mid 2004, the large balance of payments

Their Influence on Stock Markets

of payments as having two major economic and financial

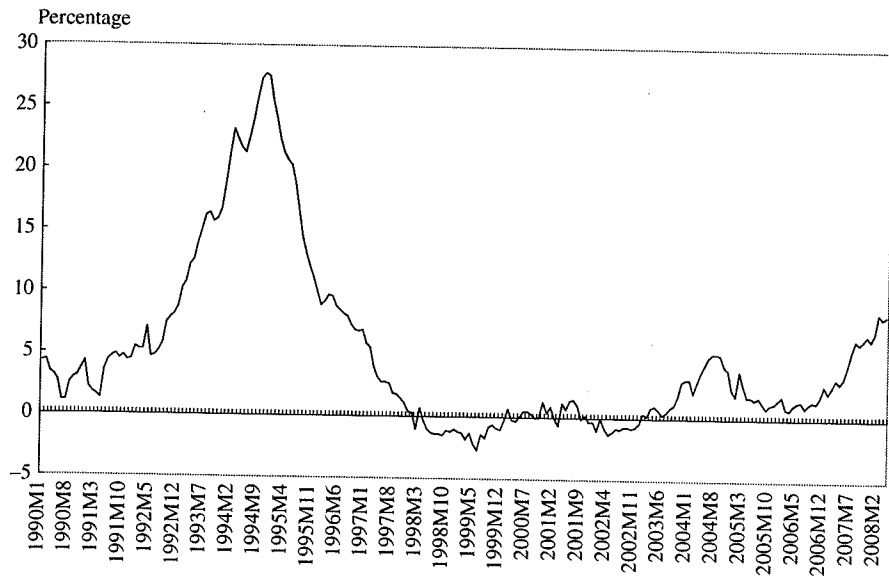


Fig. 10 Inflation in China (annual CPI percentage change), 1990-2008
Source: IFS data published by IMF and the National Bureau of Statistics of China website.

conditions and speculative capital flows reflecting expectations of changes in exchange rates and other policies. Considerable concern was expressed before the unpegging of the RMB in 2005 that while appreciation would reduce the underlying payments surplus, small appreciations from an initial position of substantial disequilibrium could generate expectations of greater future appreciation and hence generate large speculative capital inflows that could disrupt financial markets and lead to an overall increase rather than decrease in the balance of payments surplus. The continued growth in China's balance of payments surplus and the bubble in its stock market are consistent with these fears, but more detailed analysis of the data suggest that hot money flows were not the major cause of either development.

One year after China joined the WTO, China's net errors and omissions account turned into a surplus from a twelve-year continuous deficit. Such a shift generally reflects changes in unrecorded capital flows. A year later, China's net portfolio investment account followed suit and moved into surplus in 2003 (Table 5). These capital inflow trends continued in 2004. In addition, other investment account contributed US \$37.9 billion more inflows. Two popular measures of hot money flows, one, the non-FDI capital account, and two, the combination of portfolio flow and net errors and omissions, both showed hot money inflows to China during 2003 and 2004. The non-FDI capital account, in particular, reached US \$84.6 billion inflows in 2004. Economists suspected that widespread expectations of RMB appreciation had brought large speculative capital flows into China during these two years (Prasad and Wei, 2005).

Table 5 Balance of payments (US\$ billions)

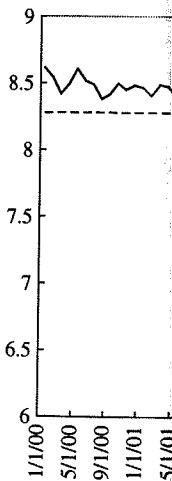
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Changes in international reserve	22.48	31.6	35.7	6.43	8.51	10.5	47.3	75.5	117	206.4	207	247	462
Current account	1.618	7.24	37	31.5	21.1	20.5	17.4	35.4	45.9	68.66	161	250	372
Goods	18.05	19.5	46.2	46.6	36	34.5	34	44.2	44.7	58.98	134	218	315
Service	-6.09	-2	-3.4	-2.8	-5.3	-5.6	-5.9	-6.8	-8.6	-9.7	-9.4	-8.8	-7.9
Income	-11.8	-12	-11	-17	-14	-14.7	-19	-15	-7.8	-3.52	10.6	11.8	25.7
Transfer	1.434	2.13	5.14	4.28	4.94	6.31	8.49	13	17.6	22.9	25.4	29.2	38.7
Financial account	38.68	40	21	-6.3	5.21	1.96	34.8	32.3	52.8	110.7	58.9	6.02	70.4
FDI	33.85	38.1	41.7	41.1	37	37.5	37.4	46.8	47.2	53.13	67.8	60.3	121
Portfolio investment	0.79	1.74	6.94	-3.7	-11	-3.99	-19	-10	11.4	19.69	-4.9	-68	18.7
Other investment			-28	-44	-21	-31.5	16.9	-4.1	-5.9	37.91	-4	13.3	-70
Net error and omission	-17.8	-16	-22	-19	-18	-11.9	-4.9	7.79	18.4	27.05	-17	-13	16.4
Hot money (port + net error/omission)	-17	-14	-15	-22	-29	-15.9	-24	-2.5	29.8	46.74	-22	-80	35.1
Non-FDI capital account (including errors and omissions)	-13	-14	-43	-66	-50	-47.5	-7.4	-6.7	23.9	84.57	-22	-63	-32

Source: IFS.

RMB Debate and

On July 21, of 2.1%, a swap currencies and On May 18, 2001 (dollar) from 0.15 per USD for the than 17% against depreciation, it not surprising had not occurred

The RMB's of RMB could RMB was severe further and economic tion would cause the RMB spot deliverable Forward November 2001

Fig. 11 RMB spot
Source: Bloomberg

As expected, growth. China's year. However, Analyzing the ba

On July 21, 2005, the Chinese government announced an RMB appreciation of 2.1%, a switch from pegging to the dollar to an undisclosed basket of currencies and a new policy of allowing gradual changes in parity over time. On May 18, 2007, it widened the daily floating band (for RMB against the US dollar) from 0.3 to 0.5%. On April 10, 2008, RMB traded at below seven Yuan per USD for the first time. By the end of May 2008, the RMB had gained more than 17% against the dollar since July 2005. However, because of the dollar's depreciation, the overall appreciation of the RMB was much less. Thus it was not surprising that a major turnaround in China's trade and current accounts had not occurred by mid 2008.

The RMB's 2005 adjustment was small, but it was the first sign that the value of RMB could be determined more by market forces in the future. Since the RMB was severely undervalued, market watchers expected it to appreciate further and economists were concerned that a one-way bet on RMB appreciation would cause huge speculative inflows. Figure 11 shows that appreciation of the RMB spot exchange rate has lagged behind that of the 12-month Non-deliverable Forwards (NDFs) rate (a measure of market expectations) since November 2002.

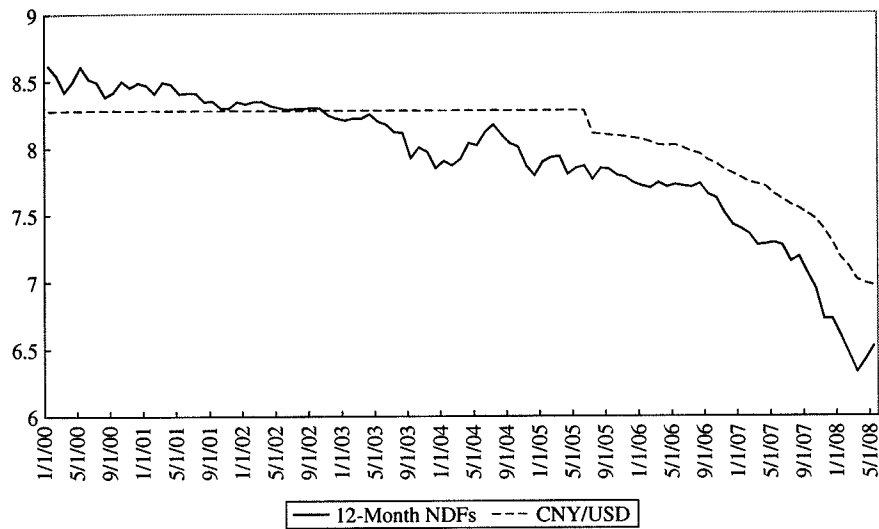


Fig. 11 RMB spot exchange rates and twelve-month non-deliverable forward rates
Source: Bloomberg.

As expected, the small appreciation in 2005 had little impact on China's trade growth. China's trade and current account surpluses grew by over 100% that year. However, its reserves that had been growing rapidly barely increased. Analyzing the balance of payments data, we find that China's decreasing rate of

Hot money (port + net error/omission)	-17	-14	-15	-22	-29	-11.9	-4.9	7.79	18.4	27.05	-17	-13	16.4
Non-FDI capital account (including errors and omissions)	-13	-14	-43	-66	-50	-47.5	-7.4	-6.7	23.9	84.57	-22	-63	-32
Source: IFS.									29.8	46.74	-22	-80	35.1

reserve growth was mainly due to reductions in the capital and financial accounts, which declined 46.8% to US \$58.9 billion in 2005. The reduction in the financial account was largely caused by portfolio and other investment outflows. Thus instead of stimulating greater capital inflows, as many feared, there was more capital outflow.

This unusual phenomenon continued in 2006 with strong trade and current account growth of over 50%, but with lower reserve growth of a little under 20%. China's financial account decreased another 90% to only US \$6 billion in 2006. Even though the account for other investments was in surplus, portfolio outflows were at a historical high of US \$67.6 billion. This absence of evidence of strong speculative capital inflows after the RMB began to appreciate is consistent with the behavior of ex rate expectations as reflected in the behavior of the forward rate. Rather than generating expectations of more rapid future appreciation as many economists feared, Fig. 11 records relatively little change in the rate of expected future depreciation for the first year after the RMB was unpegged.

Beginning in 2006 China's stock markets began to boom (Fig. 12). The three major Chinese stock indices – Shanghai Component Index (SH), Shenzhen Composite Index (SZ), and Hang Seng China Enterprise Index (HSCE) gained 121, 113, and 53%, respectively, during the year. A plausible hypothesis would be that with heightened appreciation anticipation, international speculative inflows would flow into the Chinese stock markets, contributing to their boom. On the contrary, however, not only was portfolio investment in deficit

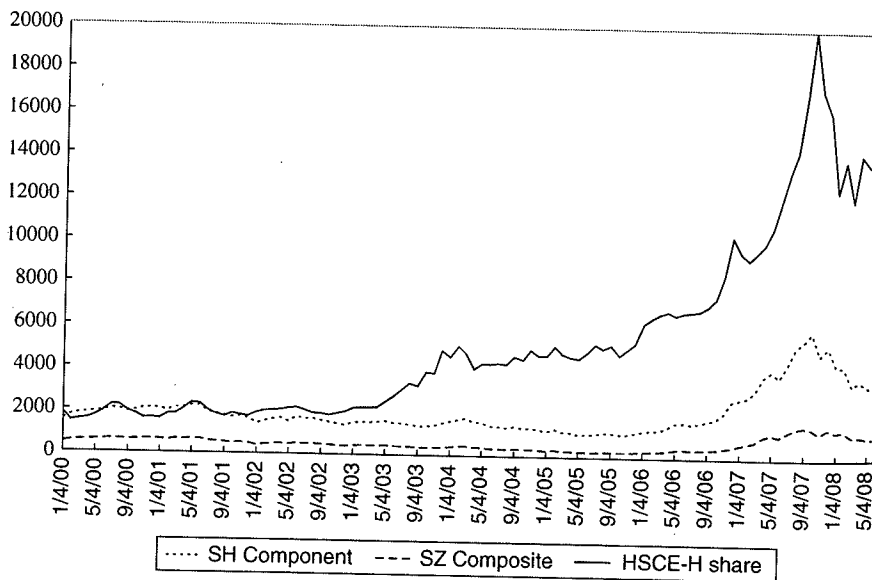


Fig. 12 Chinese stock indices
Source: Bloomberg.

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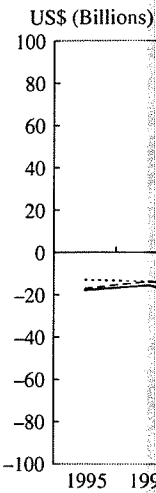
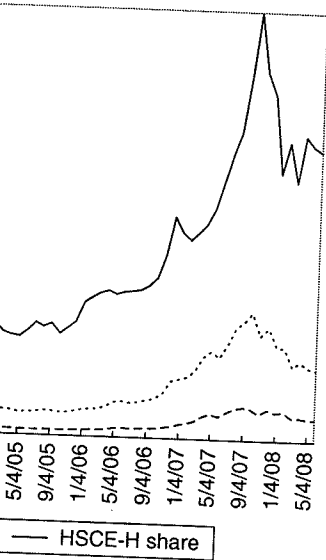


Fig. 13 Hot mon
Source: IFS and

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but also the net errors and omissions account turned negative in 2005 and 2006. Combining portfolio investment and net errors and omissions, there were US \$21.7 billion of hot money outflows in 2005. This rose to US \$80.4 billion in 2006. Another hot money measure, the non-FDI capital account, showed US \$21.6 and US \$63.6 billion outflows in 2005 and 2006 (Fig. 13). Thus, we cannot find evidence of speculative inflows into China from the official balance of payment data. The PBOC also confirmed that there were little speculative inflows from expectations of RMB appreciation.

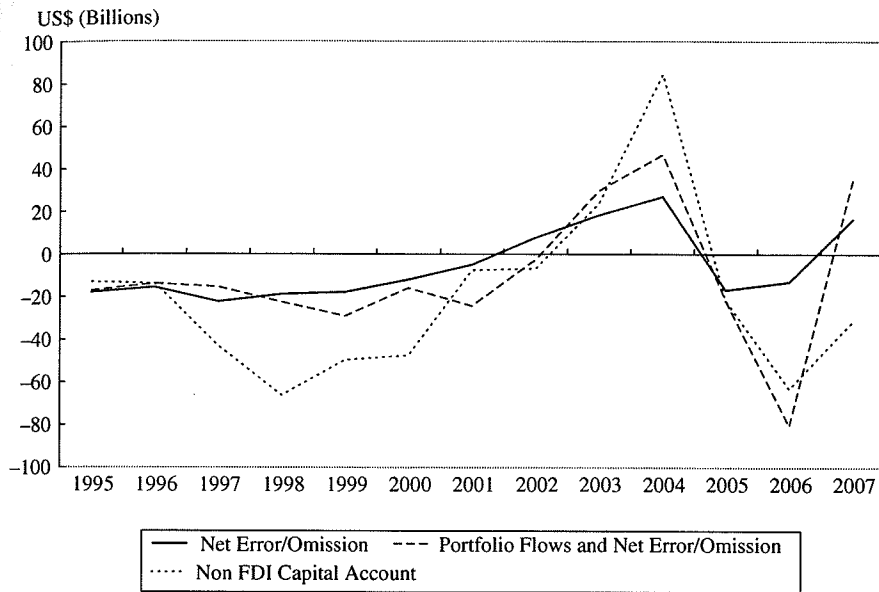


Fig. 13 Hot money flows
 Source: IFS and authors' calculations.

By 2004, interest rates had begun rising in China. The upward movement of interest rates accelerated in 2007 as inflationary concerns began to mount. In the United States, the fallout from the subprime crisis led the Federal Reserve to drive down the federal funds rate from 5.25% in September 2007 to 2.25% in March 2008 (Fig. 14). The interest rate differential between China and the United States reversed direction within a short period. Interestingly, as the interest differential shifted in favor of China, the expected rate of future appreciation of the RMB also increased. These developments combined to yield a substantial increase in the expected returns from holding short-term interest-bearing assets in China relative to the United States.

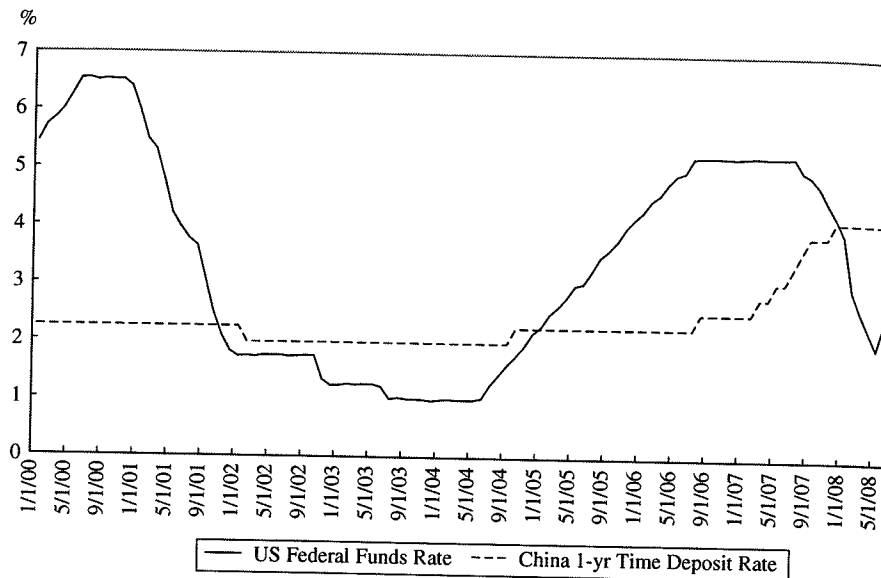


Fig. 14 US and China interest rates
Source: CEIC database.

The year 2007 also saw the Chinese stock bubbles peak and burst. The Shanghai Component Index (SH), the Shenzhen Composite Index (SZ), and the Hang Seng China Enterprise Index (HSCE) gained 114, 134, and 109%, respectively, within nine months, reaching peaks at the end of September 2007. The drops in the markets were as dramatic as their rises. By mid-2008, the two Mainland China indices had fallen by over 50%. The Hong Kong H-share Index lost 40% within 5 months.

China's financial account increased more than 11-fold to US \$70.4 billion in 2007. Portfolio inflows and the surplus on net errors and omissions add up to US \$35.1 billion, indicating hot money inflows. But the other hot money measurement, the non-FDI capital account, showed outflows of US \$31.5 billion for the year. Thus we do not get a clear picture of speculative flows in 2007 from the annual balance of payments data.

The greatest part of China's stock market boom occurred during the first 9 months of 2007. If international flows were a major reason for the Chinese stock markets overheating, we should have observed large inflows during the first half of the year. But portfolio investment showed a deficit of US \$4.8 billion for the first 6 months of the year. Hot money calculated from portfolio inflow and the errors and omissions surplus was only US \$8.3 billion. Thus, we can conclude that international capital flows were not a major cause of the Chinese stock market bubble during early 2007. Likewise, we cannot explain the bursting of the bubble by any major shift in exchange rate expectations. The bubble appears to have been largely home grown.

4 Concluding

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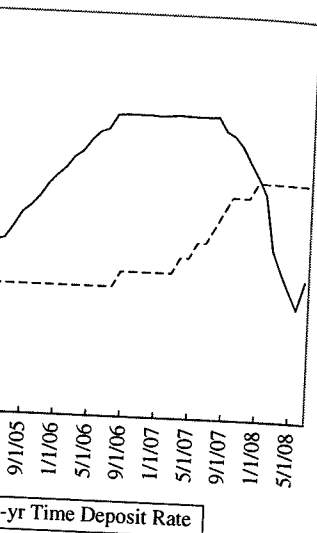
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¹² See Bird and... (2008).



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4 Concluding Comments

Most international monetary experts believe that the current global imbalances present a serious danger to the world economy over the medium-to-longer term. The current situation is unlikely to be sustainable and if needed, adjustments continued to be postponed, then the eventual adjustment will be much more painful, likely involving a major international financial crisis that will pose major challenges to international cooperation.

What is the outlook for bringing about substantial reductions in global imbalances before a major crisis erupts? There are some encouraging signs. The quality of the dialogue between the American and Chinese governments has improved greatly. The US government has backed off of its initial ill-founded advice that China should swiftly abolish all of its capital controls and move promptly to a free float. The Chinese government has acknowledged in turn China's self-interest in moving toward a more flexible exchange rate regime and rebalancing China's economy to increase domestic consumption and to become less reliant on exports as a primary source of growth. However, while the IMF has belatedly begun to play a role in attempting to promote coordinated actions to promote adjustments, its success so far has been meager at best.¹² Nor has the United States taken substantial steps to put its fiscal house in order. Thus the overall progress to date has been quite limited.

A major reason that China has continued to resist more rapid appreciation is that, as we have discussed, China has so far been quite successful in limiting the effects of capital inflows and the huge surpluses on its domestic money and financial markets. Its stock market boom and bust has not been correlated with changes in international capital flows or exchange rate expectations, and the PBC has been able to sterilize a high proportion of reserve inflows so that while there has been an overheating of the economy this has been caused primarily by domestic factors rather than monetary expansion generated by reserve increases. Furthermore, and contrary to the expectations of many economists, the slow appreciation of the RMB was initially accompanied by reduced rather than increased speculative capital inflows. Apparently the instability of heavily managed exchange rates applies much more strongly to overvalued than to undervalued exchange rates.

There are signs, however, that sterilization is becoming increasingly difficult for the PBC and is imposing substantial costs on the banking sector. With the rising concerns about inflation generated by the huge increases in food and raw material prices there should be stronger incentives for more rapid appreciation as an anti-inflationary measure.

On the other hand, the recent slowing of Chinese export growth will stimulate domestic pressures to reduce the rate of appreciation. The report of slower

¹² See Bird and Willett (2007). For a strong critique of the IMF's performance, see Mussa (2008).

growth in June 2008 was quickly followed by a call from a senior official from the communist part's policy research office calling for slowing appreciation.¹³

Still, the biggest problem is that most of the actions needed to promote longer run rebalancing of the world economy involve short-run costs that governments are reluctant to impose on themselves and their citizens. The major source of short-run political pressure is a perverse one – the forces that have pressured the US Congress into seriously considering imposing harsh trade sanctions on China unless substantially greater RMB appreciation is undertaken. Such measures would hardly be in the overall interests of the United States, much less the world economy, but it would benefit particular influential import competing economic interests in the United States, just as postponing major adjustments is in the short-run interests of Chinese exporters. Let us hope that both America and China will find a way to act based on their longer run interests that are harmonious, rather than on the conflicting short-run interests of particular groups.

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¹³ See "China's trade surplus shrinks by 20%" *Financial Times*, July 11, 2008, p. 4.

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