

The Renminbi's Dollar Peg at the Crossroads

Keynote Speech by Maurice Obstfeld

In the face of huge balance of payments surpluses and internal inflationary pressures, China has been in a classic conflict between internal and external balance under its U.S. dollar currency peg. Over the longer term, China's large, modernizing, and diverse economy will need exchange rate flexibility and, eventually, convertibility with open capital markets. A feasible and attractive exit strategy from the essentially fixed renminbi (RMB) exchange rate would be a two-stage approach, consistent with the steps already taken since July 2005, but going beyond them. First, establish a limited trading band for the RMB relative to a basket of major trading partner currencies. Set the band so that it allows some initial revaluation of the RMB against the dollar, manage the basket rate within the band if necessary, and widen the band over time as domestic foreign exchange markets develop. The ultimate goal is a floating exchange rate coupled with some relative of inflation targeting. Second, put on hold ad hoc measures of financial account liberalization. They will be less helpful for relieving exchange rate pressures once the yuan/basket rate is allowed to move flexibly within a band, and they are best postponed until domestic foreign exchange markets develop further, the exchange rate is fully flexible, and the domestic financial system has been strengthened and placed fully on a market-oriented basis.

Keywords: Renminbi; China currency; China balance of payments;
Fixed exchange rate exit strategy

JEL Classification: F32

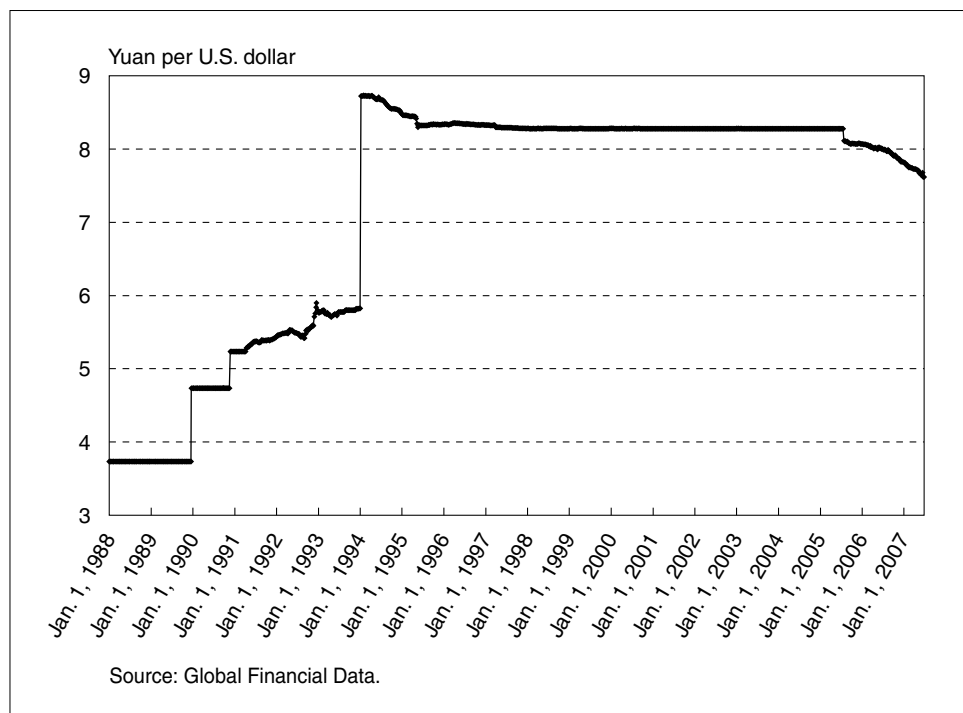
University of California, Berkeley (E-mail: obstfeld@econ.berkeley.edu)

I thank Tyler Sorba and José Antonio Rodríguez-Lopez for research assistance, and Ji Min and Shang-Jin Wei for help in obtaining data. Comments from Edwin Lim and Yu Yongding helped improve the paper. This paper was prepared under the auspices of the China Economic Research and Advisory Programme, sponsored by the East Asian Institute of the National University of Singapore. An earlier version of this paper was published in Chinese in He Fan and Zhang Bin, eds. *In Search of an Internally and Externally Balanced Development Strategy: China and the Global Economy in the Coming Decade* (Shanghai: Shanghai Finance and Economic University Press, 2006).

I. Introduction

From 1997 until July 21, 2005, the Chinese authorities pegged the renminbi (RMB) price of the U.S. dollar within a very narrow range. On July 21, 2005, China's authorities moved to an adjustable basket peg against the dollar, at the same time carrying out a 2.1 percent step revaluation of the central yuan/dollar rate relative to the prior central rate of 8.28 yuan per dollar. Figure 1 shows the course of the yuan/dollar nominal exchange rate over a longer historical perspective. Following a period of substantial cumulative inflation, the official rate of the RMB was devalued sharply in 1994, albeit in tandem with unification of the official and parallel exchange markets.¹ A slight appreciation followed. Very notably, in view of the claims that China's exchange rate policy is dictated by the imperative of maintaining an undervalued currency, the authorities resisted substantial devaluation pressures, at the cost of some deflation, during the Asian crisis period starting in 1997. For some time now, the situation has been reversed, with strong revaluation pressures, speculative capital inflows, and gathering inflationary momentum in the economy. The ability to resist speculative pressures comes from the maintenance of restrictions on private capital flows, especially inflows, as well as from administrative controls useful in restraining inflation.² Nonetheless, "hot money" inflows and a burgeoning current account surplus have helped swell China's foreign reserves immensely in recent years.

Figure 1 Yuan/U.S. Dollar Nominal Exchange Rate



1. At the time of unification, the parallel rate already stood at a depreciated level relative to the official rate.
2. Prasad and Wei (2007) offer an excellent discussion.

Prior to July 21, 2005, most observers, and indeed the Chinese government itself, acknowledged that China's exchange rate arrangements were unsustainable and undesirable as a long-term foundation for responding, without disruptive episodes of inflation or deflation, to inevitable real-side shocks, as well as to secular changes in the economy such as real appreciation due to Balassa-Samuelson effects. The July 2001 revaluation-cum-"flexation" is a response to the situation, including the external trade pressures it had generated, but leaves questions about how flexibility will be exploited in the future. So far, even the narrow margins of yuan/dollar flexibility that currently exist (± 0.5 percent) have not been utilized fully. The rate of trend revaluation, although it has accelerated noticeably over time (see Figure 1), has been moderate. Furthermore, capital markets that are open to the world seem a prerequisite for a modern high-income economy of the type that China seeks to become. The issues concern the transition. How might China best move toward a genuinely more flexible exchange rate regime? How might it best dismantle capital controls? And how might it optimally sequence these two conceptually distinct liberalization initiatives? These issues are closely interrelated, of course, and are central components of a more comprehensive program for rebalancing the Chinese economy, where consumption, especially of certain services, is too low, and investment, though high, is inefficient. More broadly, China's financial development and rebalancing is critical for a smooth rebalancing of the global economy.³

This paper has five goals. First, to provide a brief overview of developments in China's real exchange rate, external accounts, and inflation, thereby filling in some concomitants of the nominal exchange rate trajectory in Figure 1. Second, to draw parallels with the experience of Germany (still an exporting powerhouse) during the Bretton Woods era. Third, to discuss the rather successful experiences of Chile and Israel in transiting from pegged exchange rates with capital controls to floating rates with financial opening. Fourth, to draw some parallels with the experiences of Japan and Korea. Fifth and finally, to sketch a blueprint for gradually flexing the RMB's exchange rate in advance of capital account liberalization.

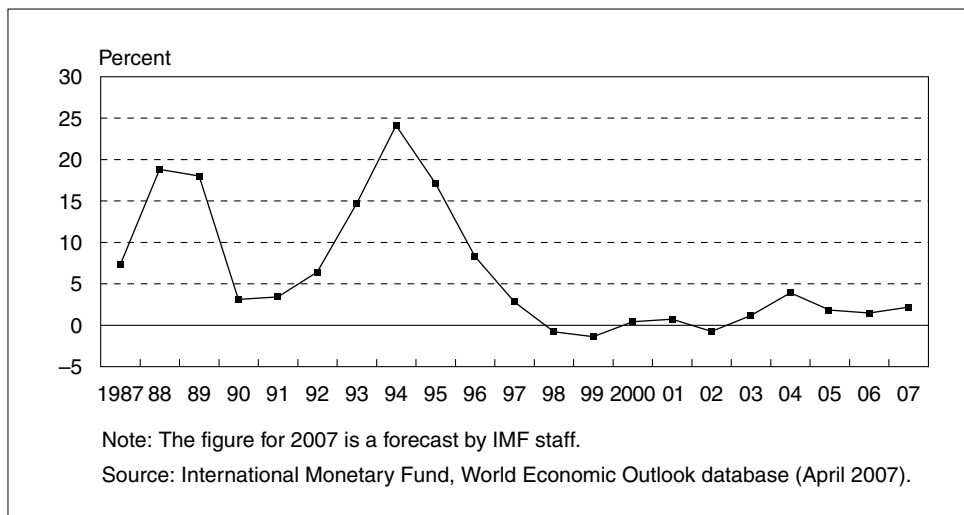
II. Recent Trends

Up until the large devaluation-cum-unification of 1994, China's nominal exchange rate against the U.S. dollar moved upward over time to accommodate relatively rapid domestic inflation. Since 1994, the RMB has not depreciated over any significant time interval, and it was absolutely fixed in recent years until July 2005. The dollar has fluctuated against other industrial-country currencies, however, and in China itself, inflation has been variable and, at times, high. The result has been substantial variability in the *effective* (or multilateral) real exchange rate of the RMB.

Figure 2 shows the behavior of the official consumer price index (CPI) inflation rate for China since the late 1980s. Earlier spikes in inflation were associated with social unrest. Inflation was brought down after the mid-1990s, however, and, as

3. On China, see Blanchard and Giavazzi (2005), Lardy (2006), and Goldstein (2007). On the global dimension, see Roubini (2007).

Figure 2 CPI Inflation Rate for China



noted earlier, even became negative during the late 1990s. Data for 2004 showed, however, a fairly sharp increase in inflation, to 3.9 percent per annum. Annual inflation dropped to 1.8 percent for 2005 and 1.5 percent for 2006, surprisingly low given the underlying monetary landscape, and within the presumed comfort range of the People's Bank of China (PBOC). According to People's Bank of China (2007, figure 3), however, the year-on-year rates of increase in the CPI, consumer goods prices, and agricultural prices were all rather high in the final months of 2006. The inflation rate reached 3.4 percent annualized in May 2007, having been at 3 percent or higher also in March and April. In August 2007, inflation hit an 11-year high of 6.5 percent, leading China's government to freeze government-controlled prices ranging from electricity to parking fees. The dispersion of inflation across China's regions is sizable compared to the situation in richer countries, and many observers suspect that the official CPI understates true inflation. The PBOC has raised interest rates several times in recent years.

If the RMB is indeed undervalued relative to its long-run equilibrium position, as many policymakers in China's export markets and economists claim, then the eventual approach to long-run equilibrium necessarily must involve some combination of domestic inflation (relative to foreign inflation rates) and nominal currency appreciation (relative to foreign currencies). If we assume a continuation of the cautious pace of nominal appreciation thus far, this perspective would suggest that an acceleration of domestic inflation is inevitable.

Figure 3 shows China's real effective CPI exchange rate index, as calculated by the International Monetary Fund (IMF) (with an increase being a real appreciation of the RMB). As inflation was brought down after the late 1980s, the currency depreciated in real terms, then appreciated in real terms, notwithstanding the 1994 nominal depreciation against the dollar, in the face of renewed domestic inflation. In the late 1990s, the real external value of the RMB stabilized, as did the price level. Most recently, the RMB has depreciated in real terms to somewhat below its

Asian-crisis levels, in tandem with the dollar's overall depreciation, with a very slight rebound evident after 2005.

These swings in the real exchange rate bear no transparent contemporaneous relationship to the behavior of China's current account balance, shown in Figure 4 as a percentage of GDP. In strong surplus in the first years of the 1990s, the current account

Figure 3 China's Real Effective CPI Exchange Rate Index

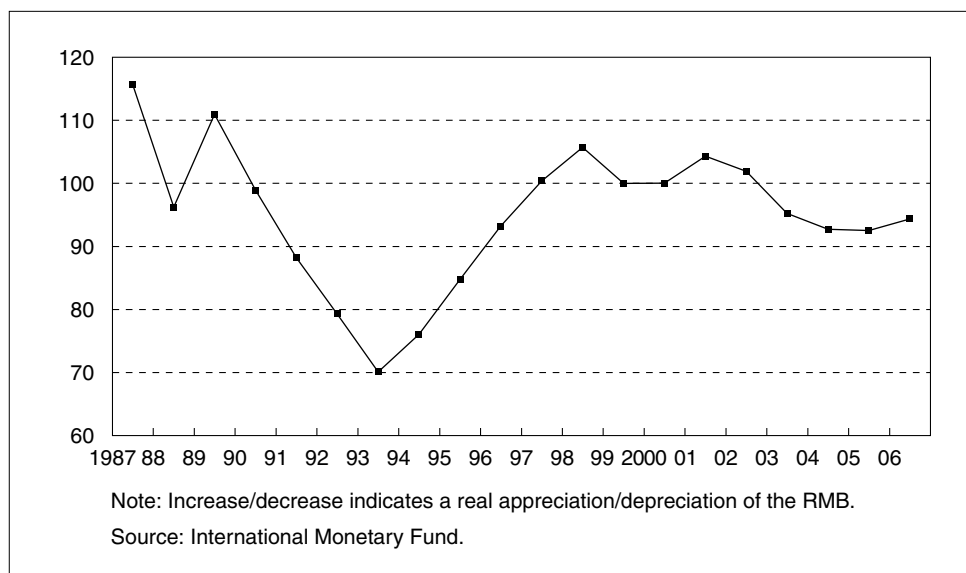
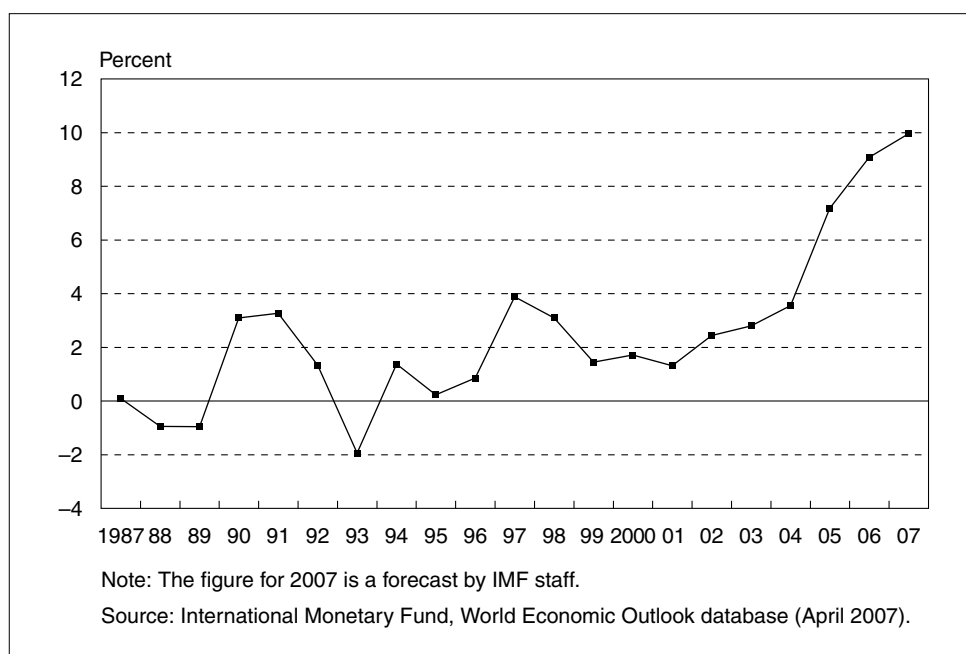


Figure 4 China's Current Account Balance/GDP

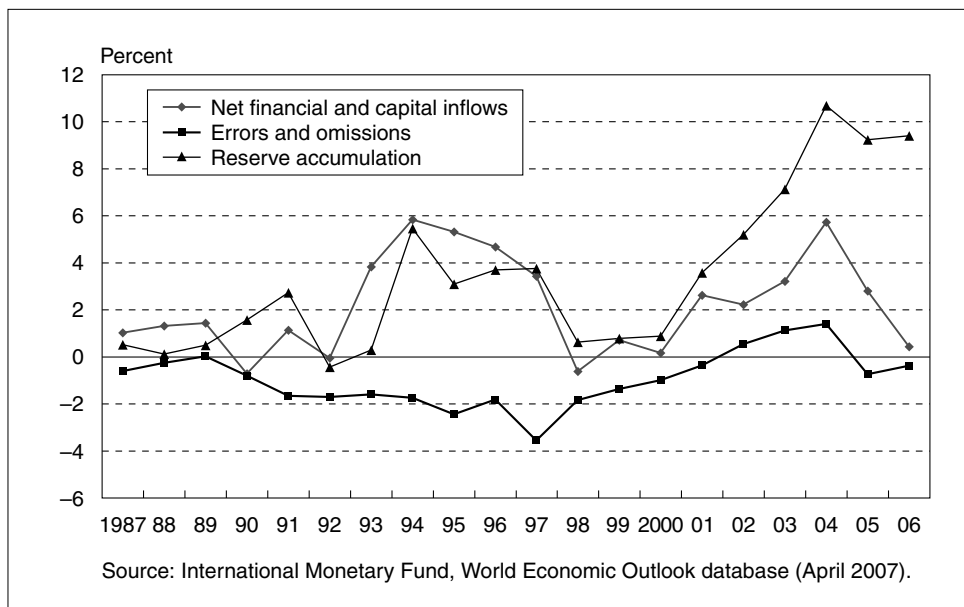


turned negative in 1993. It then returned to surplus, reaching a local peak of about 4 percent of GDP on the eve of the Asian financial crisis. Since 2001, the net export surplus has grown (according to IMF calculations) to far exceed its prior 1997 peak.

Standing now at around 10 percent of GDP, China's current account surplus, taken alone, would contribute to a substantial balance of payments surplus, to growth in foreign reserves, and, absent sterilization, to growth in the monetary base and in broader monetary and credit aggregates. However, other balance of payments flows have reinforced these effects strongly. Net inflows of foreign direct investment (FDI) averaged near 4.5 percent of GDP from 1993 until 1998. Since then, net FDI has been on a declining trend, but still remained between 2 and 3.5 percent of GDP from 1999 until 2006.⁴ FDI is, however, only one category in the private financial account. In that context, the balance of payments developments of 2003–06 have been quite significant.

Figure 5 illustrates these developments, a standard speculative response by the private sector to expectations of RMB revaluation. Especially between 2001 and 2004, financial and capital inflows accelerated sharply, reaching around 6 percent of GDP in 2004. Errors and omissions, once negative, turned strongly positive and probably reflected covert financial inflows. In 2004, unrecorded inflows attributed to errors and omissions amounted to just over 1.6 percent of GDP. It is probable that, through the mechanism of leads and lags, the measured current account balance also has been distorted in an upward direction. As a result, China's pace of foreign reserve accumulation (the sum of the two other series in Figure 5 plus the current account

Figure 5 China's Reserve Flows and Financial Components/GDP



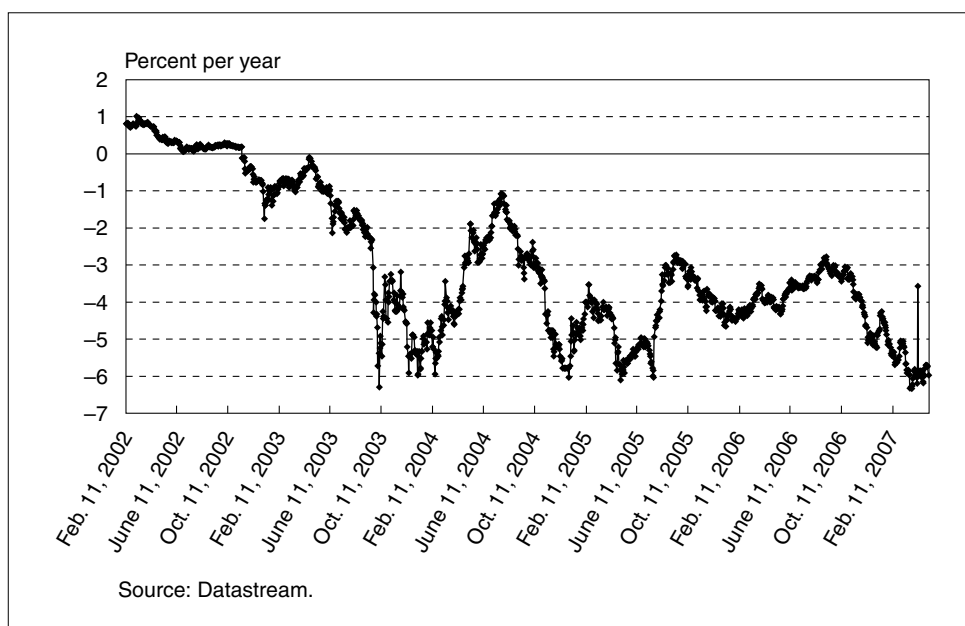
4. Until recently gross and net FDI inflows have been close, but that correspondence is changing and will change even more as the pace of China's direct investment abroad accelerates.

surplus) has been remarkable: it exceeded 5 percent of GDP in every year from 2002 to 2006, and exceeded 9 percent of GDP in every year from 2004 to 2006.

By the end of 2006, China's international reserves stood at over US\$1 trillion, and the accumulation has continued at a rapid clip into 2007, with reserves at the end of March 2007 standing at US\$1.2 trillion. During the first quarter of 2007, China's US\$135.7 billion reserve increase was more than half the increase over the entire previous year.

Additional evidence on the state of market expectations comes from the Hong Kong market for non-deliverable forward RMB—a market in which settlement is based on payment in non-RMB currency of the notional profit on the forward contract on the settlement date.⁵ Figure 6 shows an approximation to the annualized forward premium on the dollar against the RMB at the one-year maturity. Clearly the expectations driving these rates are quite volatile, and also, at times, have been consistent with significant expected depreciation rates of the dollar against the RMB. As of May 7, 2007, the one-year-ahead forward premium on dollars was just above -6 percent. We know that the expectations theory of the forward premium is not accurate, but on the other hand, such large premiums could not have existed prior to July 21, 2005 had the RMB peg been fully credible then. If we tentatively accept the expectations theory as a rough guide, we conclude from Figure 6 that devaluation expectations turned to revaluation expectations late in 2002. By this measure, revaluation expectations have persisted after the small step revaluation of July 21, 2005, lately returning to a range of 6 percent on an annualized basis (where they were before the July 2005 regime change). That is, assuming the expectations theory, the

Figure 6 One-Year Forward Premium on the U.S. Dollar versus the RMB, Hong Kong



5. See Ma, Ho, and McCauley (2004).

expected rate of revaluation of the RMB against the dollar over the year following May 7, 2007 was roughly 6 percent. This is somewhat above the actual rate of appreciation over 2006, and above the rates the Chinese government has indicated for the coming 12 months (which are in the 3–4 percent range). On the other hand, market actors do not seem to anticipate a maxi-revaluation.

One way to gauge the magnitude of the incipient pressure that has characterized the asset markets is to note that, were China's capital account fully open and not subject to political risks, then the *covered* interest parity theorem, which does hold quite closely in open financial markets, would at some times have implied zero or *negative* nominal RMB rates of interest. Covered interest parity would equate the difference between RMB and dollar nominal interest rates to the forward premium on dollars against RMB. Given the prevailing level of dollar interest rates, the resulting "virtual nominal RMB interest rate" can be negative in the data. With an open capital market, the result of such a situation would have been a massive speculative attack driving RMB nominal interest rates down to zero, though the precise dynamics are hard to pin down without an explicit model of such a revaluation attack.

One cannot but conclude that expectations of revaluation (and lately, of equity-market appreciation, promoted by ample domestic liquidity) have been helping to drive capital inflows into China, notwithstanding the administrative controls that are in place.⁶ The PBOC has attempted to sterilize much of this increase in foreign exchange reserves, ultimately resorting to the issuance of special sterilization bills, increases in required reserves, and direct credit controls to limit inflationary pressures. (If, under open capital markets, speculation were to drive RMB interest rates to zero, then the sterilization bills would of course become perfectly substitutable for money.) One effect of sterilization can be seen in the central bank's balance sheet. According to People's Bank of China (2005), net foreign assets made up about 60 percent of total assets in 2004, as compared with 33 percent in 1995. Today's percentage is even higher. China has also opportunistically lowered some barriers to outward investment to ease financial account pressures on the balance of payments.⁷

Clearly, the PBOC has been in a difficult position: it would like to maintain a relatively high interest rate to discourage overheating of the economy, yet a high interest rate enhances the incentive for capital inflows, which already are sizable as a result of exchange rate expectations. As Blanchard and Giavazzi (2005), Frankel (2005), and others have observed, the PBOC has been facing a classic conflict between internal and external balance, in which the monetary policies that restrain inflation simultaneously magnify the external surplus and thus work to undermine the anti-inflationary monetary measures.

6. The claim is sometimes made that the recent speculative inflows represent repatriation capital and therefore are a temporary problem. That argument seems inconsistent with the magnitude of the inflows that have occurred, including disguised financial inflows that can be effected through the current account or FDI. Following the dramatic increase in financial inflows in the first months of 2007, China's State Administration of Foreign Exchange sanctioned 29 banks, 10 of them international banks, for "assisting speculative foreign capital to enter the country disguised as trade or investment." See "China Hits Out Over 'Hot Money,'" *Financial Times*, June 28, 2007, p. 13.

7. On the evolution of China's capital-control regime, see Lane and Schmukler (2006) and Zhao (2006). On August 20, 2007, the government announced that individuals would be allowed to buy foreign exchange to invest in Hong Kong securities. A month later, the chair of the China Banking Regulatory Commission disclosed that the total amount of foreign exchange available for the scheme would be limited.

The ability to use quantitative operations and interest rate policy somewhat independently has so far aided the Chinese authorities, but such tactics raise stability issues as in the classic Mundellian assignment problem, with the stable assignment depending on the level of international capital mobility. In any case, the medium-term goal of the authorities is, appropriately, to move toward a more competitive internal financial system in which independent management of prices and quantities in the money market will no longer be an option. Such an evolution is also necessitated by the need to move toward an alternative nominal anchor for monetary policy once the dollar peg is modified, preferably some relative of domestic inflation targeting, in which a short-term interest rate is the prime instrument of the monetary authority.⁸

On July 21, 2005, China's authorities revalued the RMB by about 2.1 percent against the dollar, announcing at the same time that

- China was “moving into a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies.”
- The PBOC would ensure that “[t]he daily trading price of the US dollar against the RMB in the inter-bank foreign exchange market will continue to be allowed to float within a band of ± 0.3 percent around the central parity published by the People's Bank of China, while the trading prices of the non-US dollar currencies against the RMB will be allowed to move within a certain band announced by the People's Bank of China.”
- The PBOC “will make adjustment of the RMB exchange rate band when necessary according to market development as well as the economic and financial situation” and maintain “the RMB exchange rate basically stable at an adaptive and equilibrium level, so as to promote the basic equilibrium of the balance of payments and safeguard macroeconomic and financial stability.”⁹

These announcements did not spell out the nature or schedule for future changes in the RMB exchange rate, but they did open the door to transitional arrangements very much like those that have been pursued successfully in other emerging-market countries, such as Chile and Israel, which have ultimately achieved healthy economic growth coupled with low inflation, financial stability, full currency convertibility, and a fully floating exchange rate. (See the discussion below.)

What seems to have happened so far is a willingness by the PBOC to exploit *slightly* more aggressively than in recent years the narrow bands for the RMB's dollar exchange rate. Strategically, this willingness is important for at least two reasons. First, even a small degree of day-to-day *symmetric* uncertainty about the exchange rate is a deterrent to capital inflows speculating on further RMB revaluations. Given the width of the band, there is the potential for a meaningful squeeze of dollar bears.

8. See Goodfriend and Prasad (2006) for an excellent discussion. As Dooley, Dornbusch, and Park (2002) put it in the context of inflation versus exchange rate targeting in Korea, “An inflation target would provide a superior anchor for private expectations about monetary policy in Korea because the relationship between the monetary base, short-term interest rates, and inflation is much better understood than the relationship between the exchange rate and any variable over which the authorities have control.” At the start of 2007, China authorized formally the calculation and publication of the benchmark Shanghai Interbank Offered Rate (SHIBOR), with maturities ranging from overnight through one year. This official benchmark is intended to enhance the efficient functioning of financial markets and the transmission mechanism for monetary policy.

9. See “Public Announcement of the People's Bank of China on Reforming the RMB Exchange Rate Regime” (July 21, 2005) (<http://www.pbc.gov.cn/english/detail.asp?col=6400&ID=542>).

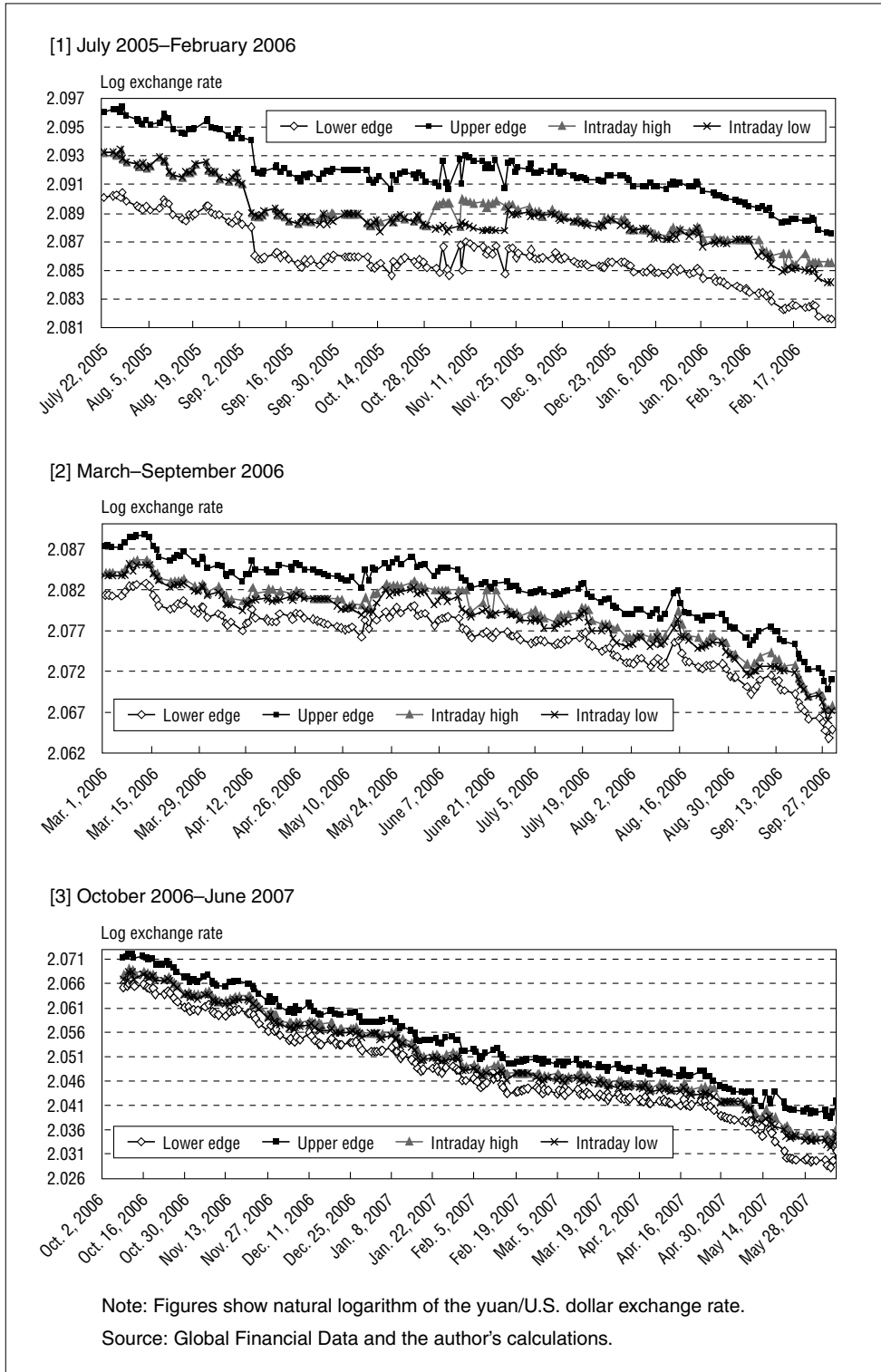
The second advantage of even the very limited degree of variability allowed so far is in terms of the development of the domestic foreign exchange market under conditions of limited but non-negligible exchange rate uncertainty. Markets in both spot and forward transactions will have to develop further as a prerequisite for allowing a greater play of market forces in determining the exchange rate—and indeed, the authorities have promoted these developments after July 2005 by introducing forward and spot over-the-counter (OTC) trading in the interbank market for foreign exchange. Both of these considerations—the need to deter speculation and the need to develop the market—suggest that as an immediate next step, even greater exchange rate variability should be allowed within the existing bands around the central parity. So far, nothing near even the limited range of flexibility implied by the narrow bands has been exploited. Nor has there been a huge trend appreciation, although the revaluation rate has been accelerating. (The rate of appreciation against the dollar was only about 1.6 percent in the first year following the initial 2.1 percent step revaluation of July 21, 2005, but rose to around 5.0 percent on an annualized basis from end-July 2006 through end-June 2007.)

At the time it altered its exchange regime in July 2005, the PBOC announced that the RMB central parity would be the previous day's closing rate. That central rate would then anchor the allowable ± 0.3 percent fluctuation band—a band that was widened to ± 0.5 percent on May 18, 2007. The three panels of Figure 7 show (for weekly data) the intraday high and low values of the log exchange rate within the log fluctuation limits implied by each day's central parity.¹⁰ The three panels correspond to the three successive periods July 2005–February 2006, March–September 2006, and October 2006–June 2007. In comparing the panels, keep in mind that because of the accelerating appreciation rate of the RMB after the initial announcement of July 2005, the scale of the vertical axis in panel 3 is larger than that in panel 2, which in turn is nearly double that in panel 1. The figure suggests that the PBOC, unlike in the initial months after flexation, now allows a moderate amount of intraday variation, but generally keeps the yuan/dollar rate centered within its band.

It remains unclear what the “basket” provision in the PBOC's stated exchange rate arrangements means, because the RMB has remained very stable against the dollar, while moving rather divergently against the euro and yen. In August 2005, the PBOC

10. With the introduction of OTC trading in January 2006, the PBOC changed its method of calculating the central RMB parity against the dollar. The PBOC announced, “After the introduction of the OTC transactions, the formation of the central parity of the RMB against the US dollar will be transformed from the previous arrangement based on the closing price determined by price matching transactions in the inter-bank foreign exchange market to a mechanism under which the China Foreign Exchange Trading System shall first enquire prices from all market makers before the opening of the market in each business day, exclude the highest and lowest offers, and then calculate the weighted average of the remaining prices in the sample as the central rate of the RMB against the US dollar for the day. The weights shall be determined by the China Foreign Exchange Trading System in line with the transaction volumes of the respective market makers in the market as well as other indicators such as the quoted prices etc.” See “Public Announcement of the People's Bank of China on Further Improving the Inter-Bank Spot Foreign Exchange Market” (January 3, 2006) (http://english.gov.cn/2006-01/04/content_146499.htm). Figure 7 bases its currency bands on the original central parity calculation, with closing yuan/dollar rates taken from Global Financial Data, until January 4, 2006; starting on that date, the figure uses the official central rates, kindly provided to me by Yu Yongding and Cui Wei. In general, the post-January 4, 2006 central rates are quite close to prior-day closing rates, differing by at most about 0.2 percentage point in absolute value and on the vast majority of days by far less. I have used linear interpolation to fill in holidays. An interesting question is how market makers ascertain the government's exchange rate preferences when they provide the quotations upon which the morning fixing is based.

Figure 7 Intraday Yuan/U.S. Dollar Spread within the Fluctuation Band



clarified that the currencies of the United States, the euro zone, Japan, and Korea would be the main components of the notional basket, but precise weights have never been announced.

The PBOC has stated that the RMB band will be adjusted in an “adaptive” way when this is desirable. That is, the exchange rate regime is, in principle, a managed float within an *adjustable* band. As is well known from many past experiences, notably the collapse of adjustable dollar parities toward the end of the Bretton Woods system, such a system is incompatible over the long run with increasing openness to international financial transactions—whether *de jure* (through changes in regulation) or *de facto* (through increased opportunities to circumvent regulation). Because broader convertibility of the RMB is a long-term goal of China’s authorities, the current exchange rate arrangement cannot be viewed as permanent. The July 2005 revaluation held off political and speculative pressures for further revaluation only temporarily, and subsequent appreciation has not resolved the tensions. The key questions that then arise are

- Toward what end point would the current currency system optimally evolve?
- Through what succession of stages should it pass to reach that goal?
- What sequencing of exchange rate regime change with financial regulatory change is most desirable?

The fundamental constraints on policy in an open economy guarantee that a fixed exchange rate, open capital markets, and a monetary policy geared toward domestic goals cannot all be attained at the same time. China, like the main industrial regions and the advanced emerging markets, will wish to be able to devote monetary policy toward some variant of flexible domestic inflation targeting, a process that will itself require further reform and development of the domestic financial system so that (as noted above) an interbank interest rate can be used as the prime proximate instrument of monetary policy. Experience shows that the success of an inflation-targeting regime requires low-inflation credibility, which in turn can be enhanced by the granting of statutory instrument independence to the central bank. But in such a system, the inflation target, rather than an exchange rate target, provides the nominal anchor for monetary policy. Given the desire for broader RMB convertibility and low inflation, then, a regime in which the RMB fluctuates—perhaps in a managed way—against trading partners’ currencies is inevitable. Importantly, the movement toward the ultimate goal of a floating exchange rate for the RMB can progress quite far, and optimally will do so, before further liberalization of financial account restrictions is undertaken. This last point will be returned to below, in the discussion of sequencing.

Other successful emerging markets have made a transition from a peg against the dollar to a basket peg that preserves competitiveness relative to a more comprehensive array of trading partners than simply the United States. Despite the announced intention of the PBOC to restrict the RMB’s rate against non-U.S. currencies to stated ranges while simultaneously restricting the yuan/dollar rate to a narrow range, it is hard to see how this will be possible in many circumstances. For example, a very large one-day shift in the dollar/euro exchange rate must result in a commensurate shift in the yuan/euro rate, unless the narrow yuan/dollar fluctuation limit is breached. Such large unexpected fluctuations in nondollar exchange rates may cause serious

adjustment problems for some market participants, providing the rationale for a rapid move to a basket peg in which the currencies of major trading partners receive weights proportional to the value of their trade with China. It transpired that, initially after July 21, 2005, the allowable fluctuation range for the yuan/euro and yuan/yen bilateral rates were to be ± 1.5 percent. On September 23, 2005, in a bow toward logic, necessity, and external political pressure—the move coincided with a G-7 meeting including China as an agenda item—those notional bands were widened to ± 3 percent.

While the transition to a *meaningful* basket target is a necessary first step, the most logical further step is a progressive widening over time of the width of the basket's fluctuation zone, with the eventual goal of a zone so wide that intervention limits are rarely if ever met—the case of a floating exchange rate. Naturally, intervention (or monetary policy more generally) could be used to smooth fluctuations within this zone. If the zone width is to be widened slowly, then a system in which the midpoint of the zone crawls, or in which the bands are widened asymmetrically over time, could be useful in accommodating long-run structural tendencies (for example, Balassa-Samuelson type dynamic trends of RMB real appreciation). To put the point differently: a variable crawl would be useful in controlling inflation. This type of currency regime is often referred to as a BBC—short for “basket, band, and crawl.”¹¹ Another advantage of a *gradually* expanding target range is the limitation of risks while market actors and institutions are adjusting to an environment of active currency trading and exchange rate uncertainty.

Finally, there is the question of sequencing. The current health of China's banking system does not allow a precipitous opening of the financial account, especially for inflows. That is no reason, however, to delay in embarking on a program of increasing exchange rate flexibility over time, along with the enhancement of domestic foreign exchange trading. Obviously, it is desirable under any realistic circumstances that exchange rate flexibility be substantial before the financial account is opened; otherwise, the risk of a crisis is high. Ultimately, however, a restructuring of bank portfolios, expanded prudential supervision, and deregulation, if carried out successfully, would allow substantial further financial opening. Another strong impetus for thorough domestic financial reform is that under a regime of managed floating, the central bank interest rate will provide the most effective tool for responding to exchange market developments when circumstances make such a response appropriate. Only a resilient financial sector, however, will be able to withstand the possibly sharp interest rate movements that could be needed either to smooth sharp incipient exchange rate movements or to respond to domestic inflationary pressures.

III. Germany's Postwar Experience Revisited

China's current situation illustrates the well-known open-economy trilemma—the impossibility of reconciling capital mobility with a fixed exchange rate and a monetary

11. See Williamson (2001) for a comprehensive discussion.

policy geared toward domestic objectives. China has been able to pursue exchange stability and price stability simultaneously (so far) mainly through the maintenance of its controls over financial capital movements. As the effectiveness of these controls erodes over time, however, as they are bound to do in a setting of expanding trade, the trade-offs implied by the trilemma will inevitably become harsher.

Germany's postwar experience provides an excellent illustration of this process. Over the course of the 1950s, the war-ravaged country emerged as an economic power and world-class exporter. Through most of the 1950s, the deutschemark (DM), like other European currencies, was inconvertible in both the current and financial account. In December 1958, European countries embraced nonresident convertibility in the current account under Article VIII of the IMF's Articles of Agreement; Germany went further, also embracing convertibility in the financial account.

Germany at the time had emerged as a "chronic" surplus country. In addition, Germany's relatively high rate of productivity growth in manufacturing suggested that the DM should appreciate in real terms over time—implying, at a fixed nominal parity against the U.S. dollar, inflation higher than the U.S. rate. The German authorities were unhappy about accepting this relatively high inflation. In embracing an open financial account at the start of 1959, they therefore retained a number of restrictions aimed at restricting short-term inflows of speculative "hot money" (see Obstfeld and Taylor [2004, pp. 156–157], and for a more detailed discussion of German experience, Emminger [1977]). There was also the hope that these measures would facilitate sterilization of surpluses, which the Deutsche Bundesbank pursued energetically.

Seeing a fall in the Bundesbank's foreign reserves in the spring of 1959, Germany optimistically lifted its inflow restrictions in May 1959, but was forced to reimpose them little more than a year later in the face of renewed speculative purchases of the DM. Finally, in March 1961 Germany revalued its currency by 5 percent against the dollar.

Revaluation provided a respite, but with wider convertibility and growing world trade came increased opportunities to circumvent capital controls. Germany progressively tightened its inflow controls in the late 1960s and early 1970s in the face of renewed speculation, first on a DM/French franc realignment, then on a DM/dollar realignment. Swamped by reserve inflows nonetheless, the authorities allowed a temporary DM float prior to the December 1971 Smithsonian realignment. Ultimately, however, continuing speculation during 1972 and early 1973, little deterred by a panoply of inflow restrictions and interest taxes, forced a closure of the foreign exchange markets and then the move to generalized floating in March 1973.

Table 1 indicates some comparative fundamentals of the German economy during the Bretton Woods period. (The data for Japan will be discussed later.) Given the pattern of relative sectoral productivity growth, one would expect the DM to appreciate in real terms over time against the dollar. With a fixed parity, however, this could be accomplished only through Germany tolerating a secular inflation rate above that in the United States. As the table shows, during the period of inconvertibility prior to 1960, Germany was able to maintain an inflation rate quite close to that of the

Table 1 Inflation Rates and Productivity Growth for Japan, Germany, and the United States

	Japan	Germany	United States
Inflation:			
1950–60	5.3	2.8	2.6
1960–71	5.5	4.1	3.4
Labor productivity growth by sector, 1950–73:			
Services	4.0	2.8	1.4
Industry (including construction)	9.5	5.6	2.2
Agriculture	7.3	6.3	5.4

Source: Obstfeld (1993).

United States. In the 1960s, with a much reduced scope for sterilization of balance of payments surpluses, Germany was forced to tolerate inflation further above the (higher) U.S. level that prevailed. Ultimately, the conflict between the authorities' inflation aversion and their Bretton Woods commitments led to a breakdown. As speculative capital flooded the money markets—without any corresponding restriction in U.S. liquidity, as might have been the case in a gold standard system—German inflation accelerated, forcing abandonment of the dollar peg.

Having abandoned the DM's dollar peg, however, Germany was able to reestablish monetary control as well as control over inflation. Unlike some industrial countries (notably Japan), Germany did not experience an inflation surge as a result of the 1973–74 oil price shock. Furthermore, German unemployment remained low through the global recession of the early 1980s. German growth did decline in the 1970s compared to the earlier postwar years—real GDP growth was about 2.8 percent per year over 1970–80, slightly lower for 1981–90 (2.6 percent, with the emergence in that decade of very high unemployment)—though these figures for the West are favorable compared to the 1991–2001 1.5 percent growth rate for unified Germany. It is hard to blame the German growth slowdown immediately after the 1960s on floating—there was a worldwide productivity slowdown coupled with (and to some degree caused by) the oil shocks. Thanks to floating, Germany was able to lower its capital inflow controls and regain monetary independence. It later became the anchor for Europe-wide disinflation prior to the euro. Most observers would argue that Germany's overall experience with a floating DM and an open financial account was quite favorable. Germany remains a leading exporter and its longer-term structural problems seem not to have been caused or aggravated by its 1973–99 currency regime.

China finds itself at a juncture today similar to Germany's in the early or perhaps mid-1960s, although it faces a global capital market that is vastly deeper and broader than that of the 1960s. Having embraced Article VIII current account convertibility in December 1996, and in the face of speculative capital inflows, the Chinese authorities have opted to sterilize and selectively loosen controls on outflows, all in the hope of managing domestic liquidity to restrain inflationary pressures. The process is bound to become increasingly difficult. Furthermore, with capital outflows increasingly liberalized, it will be difficult if not impossible to close the door again should the RMB be subject to devaluation pressures down the road, as was true in the late 1990s.

And there is one other respect in which China's position is dramatically more precarious than that of Germany in the 1960s. It finds itself the leading target of protectionist pressures, emanating especially from the United States, and based on claims of exchange rate "manipulation" that, however debatable, seem to carry emotional and political currency with the electorates of the industrial countries.¹²

Greater RMB flexibility would serve China's macroeconomic objectives while simultaneously defusing some of the pressure from its trading partners. In July 2005, China announced a currency framework in which substantial flexibility is possible. Now China has the chance to implement a gradual exit strategy from its *de facto* currency peg.

IV. Experiences of Chile and Israel

Both Chile and Israel had considerable success in moving to floating exchange rates with financial account convertibility. Both now operate inflation-targeting monetary regimes; Chile has an independent central bank, and in Israel the move toward central bank instrument independence is high on the economic reform agenda. Both countries followed similar paths.¹³

Chile had a disastrous early experience of financial opening culminating in a 1982 crisis involving a huge output loss, steep currency depreciation, and nationalization of much privately contracted financial-sector external debt. This sobering history provides the background for the successful reforms undertaken since the mid-1980s.

On the currency side, from the mid-1980s the Chilean peso's U.S. dollar exchange rate was kept within a crawling band, the central parity of which was adjusted daily to reflect the inflation difference between Chile and its main trading partners. The goal of the crawl was to maintain competitiveness—though there is a danger in any such system that expectations feed into inflation, resulting in accommodation of the expectations via the exchange rate. Partly for this reason, no doubt, as well as due to pervasive indexation, inflation remained relatively high in Chile for a decade, dropping below double digits only in the mid-1990s. (In 1998, lagged domestic inflation was replaced by an inflation target in the definition of the crawl, a key reform in bringing inflation down further.) Although the top end of the band (a weak peso) was tested frequently prior to 1991, 1991–97 was a period similar to the recent past in China, with the peso near the strong edge of the band and attempts by the authorities to resist capital inflows and to sterilize. (Estimates of the quasi-fiscal costs of sterilization run about 0.5 percent of GDP per year, a huge number. Net international reserves peaked at 25 percent of GDP.)

In 1992, Chile redefined its central peso rate in terms of a basket including the DM and yen as well as the dollar. Variations in currency composition were made opportunistically. Starting in September 1998, in the wake of capital outflows

12. The contention of Dooley and Garber (2005) that China can easily sustain its currency peg for another decade or more seems vastly over-optimistic in view of the pressures that China already faces and its manifest efforts to ward them off. See also Goldstein and Lardy (2005).

13. For useful background on Chile, see Cowan and De Gregorio (2007) and Le Fort (2005). On Israel, see Bufman and Leiderman (2001) and Haas *et al.* (2005). See Williamson (1996) for a broad earlier survey.

associated with Asian-crisis spillovers, the currency-band width was set at ± 4 percent and widened continuously until December 1999, when free floating of the peso was declared.

In the financial account, prior to liberalization, Chile channeled transactions through a formal foreign exchange market consisting of the central bank, commercial banks, and specially authorized exchange trading houses. An informal (but completely legal) informal foreign exchange market existed for nonfinancial transactions; it had a floating exchange rate. Initially, however, exporters and importers of capital were obliged to sell foreign exchange proceeds in the formal market. The nonfinancial private sector was allowed to acquire foreign exchange informally. The strength of enforcement sometimes reflected balance of payments pressures. Only by the mid-1990s had the discrepancy between formal and informal exchange rates essentially disappeared. Chile still maintained, for some years afterward, its famous unremunerated reserve requirement on foreign capital inflows, but this was scrapped in the late 1990s. Prior to full financial liberalization and, shortly afterward, free floating, Chile extensively restructured its domestic financial system and imposed extensive regulation and supervision, with special attention to currency mismatches on balance sheets. There was also a substantial development of domestic forward exchange trading after 1995.

Israel adopted a peg to the dollar as part of its escape from very high inflation in 1985. In August 1986, the dollar peg was changed to a basket peg, and after a series of speculative devaluation attacks in 1988–91, a crawling band was introduced. Also at this time, an inflation target was introduced. The prior regime had involved fixed but adjustable bands, thereby encouraging speculation in light of Israel's continuing high inflation compared to trading partners. In the newer regime, the band width was widened over time in response to various market pressures.

After 1995—again analogous to China's current position—Israel went through some years of capital inflows, which it was forced to sterilize at an enormous quasi-fiscal cost approaching 1 percent of GDP per year. One response was a doubling of the currency band's total width in June 1997 from 14 to 28 percent, with further gradual widening in the future also announced at that time. As of 2005, the shekel's exchange rate floated, and inflation was comparable to that in the lowest-inflation industrial countries. Of course, these achievements have taken place in a political environment that has been remarkably unfavorable for most of the 2000s.

Israel removed exchange controls only after introducing considerable exchange rate flexibility, completing this move to convertibility in the late 1990s and early 2000s. Hand in hand with this went reforms in domestic financial markets aimed at greater stability and flexibility. Among other useful developments has been more extensive forward exchange trading.

V. Experience Elsewhere in East Asia: Japan and Korea

Japan and Korea provide instructive examples of how two other major Asian exporters made transitions from fixed exchange rate regimes with closed capital accounts to

broader financial openness convertibility coupled with exchange rate flexibility. Japan's evolutionary process began as the Bretton Woods system ended in the early 1970s, whereas Korea's began in 1980 under the military regime that followed the assassination of President Park Chung-hee. These examples show some striking similarities to China's position today, and yield some cautionary lessons.

Japan maintained an exchange rate of ¥360 to the U.S. dollar throughout the Bretton Woods period until August 1971, when U.S. President Richard Nixon, seeking a generalized dollar devaluation, closed the window for American gold outflows and imposed a surcharge on all imports. At the time, Japan had longstanding exchange and capital controls limiting both financial inflows and outflows; only in 1964 had it accepted Article VIII current account convertibility. Table 1 shows that to maintain a fixed exchange rate for so long a period despite high productivity growth in tradables relative to services, Japan accepted higher secular inflation than either the United States or Germany. Like China today, Japan was rapidly accumulating dollar reserves and was the target of increasing trade pressures from the United States—though at the time the pressure was diffused among several trade partners. Proponents of yen revaluation wished to deflect this pressure while simultaneously dampening inflation, while opponents feared disruption of the pattern of production, redistributive impacts, and a negative impact on overall growth.¹⁴ The “Nixon shock” of August 1971 forced Japan's hand.

For nearly two weeks after Nixon's August 16 announcement, the Bank of Japan maintained its prior peg.¹⁵ Then the yen was allowed gradually to float upward to ¥308 per dollar, a 15.6 percent (log change) revaluation. This was the new Smithsonian rate of December 1971. The adoption of expansionary monetary and fiscal policies at this juncture, rather than an earlier further revaluation, remains controversial. The yen was again allowed to float in early 1973 as the Smithsonian agreement unraveled, quickly reaching a level of ¥265 per dollar (overall, a 30.6 percent appreciation relative to the Bretton Woods peg). Notwithstanding the substantial appreciation in the face of commodity price shocks, and pre-existing internal pressures, Japanese inflation accelerated, reaching double digits in 1973 and more than 20 percent per year in 1974.

Japan then embarked on a program of gradual financial account liberalization, opportunistically relaxing various inflow (outflow) controls at times of yen weakness (strength). It is instructive in light of today's U.S.–China trade controversy that a decade later Japanese exports to the U.S. remained a topic of intense diplomatic antagonism between the two trade partners, with the U.S. pressing Japan to liberalize capital flows and domestic capital markets to end the “artificial” undervaluation of the yen. Frankel (1984) offers a comprehensive description and evaluation of this episode, concluding that the Japanese measures had little effect on the pattern of trade. Capital account liberalization culminated in the “big bang” of the mid-1990s, but only after the emergence and collapse of the Japanese asset bubble around the turn of the decade. The yen's float has been accompanied by extensive intervention

14. Useful comparative summaries of the Japanese experience in exiting the Bretton Woods peg include Aramaki (2006), Eichengreen and Hatase (2005), and Ito (2006).

15. Apparently the delay was intended in part to allow Japanese banks to close out their long dollar positions; see Eichengreen and Hatase (2005, footnote 59).

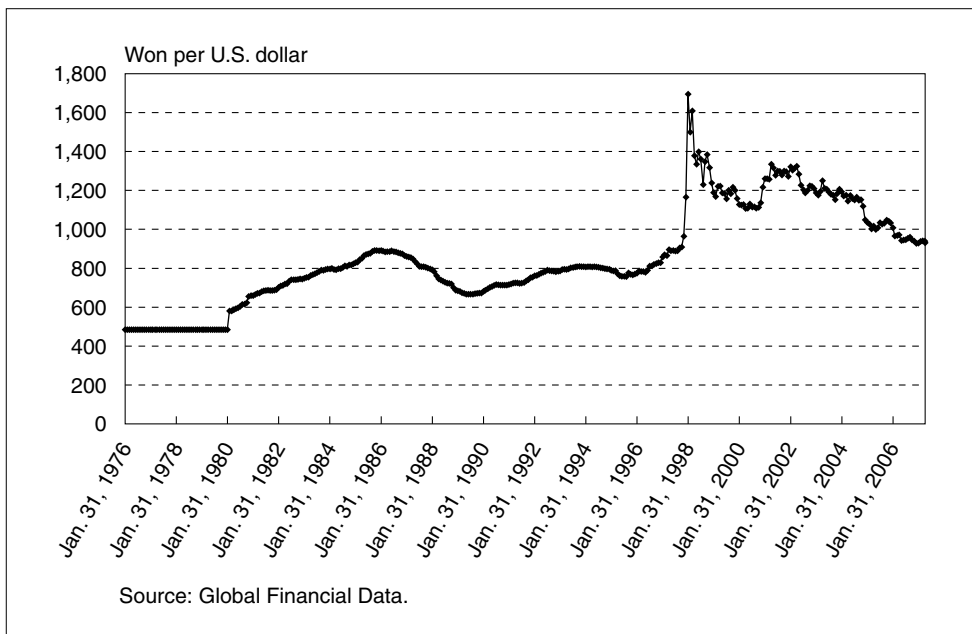
and accumulation of foreign reserves: Japan holds the world's second largest stock, after China's.

Major lessons from Japan's experience would include the importance of a planned and gradual exit from a peg, the avoidance of macroeconomic stimulus when inflationary pressures are already present, and the limited helpfulness of piecemeal financial account liberalization. In addition, Japanese experience shows that exchange rate adjustment is unlikely, in itself, to eliminate trade tensions: underlying saving and investment behavior must simultaneously be addressed. Reforms of the domestic financial market are part of that process, but these must be carried out in a way that does not promote financial instability down the road.

Although Korea experimented with a floating (and secularly depreciating) won in the late 1960s and early 1970s, the float was heavily managed. In mid-1972, the won/dollar rate was pegged. It remained so (undergoing a devaluation at the end of 1974) until 1980. Pervasive capital controls allowed the authorities to operate the adjustable currency peg.¹⁶

Figure 8 shows the course of the won/dollar exchange rate. After a large discrete devaluation in 1980, Korea announced a move to a basket peg with unspecified weights, but, notwithstanding the *de jure* regime, the won depreciated against the dollar and other basket components through early 1986. A bilateral Korean surplus with the United States emerged, and the U.S. Treasury began public complaints about the won's undervaluation, formally labeling Korea an "exchange rate manipulator" under the 1988 Omnibus Trade Act. In the face of this offensive, the won appreciated sharply

Figure 8 Won/U.S. Dollar Nominal Exchange Rate



16. On the Korean experience, see Nam and Kim (1999) and Noland (2007).

between 1986 and 1989. U.S. political pressure eased after Korea introduced a new market-average exchange rate system, somewhat reminiscent of the current RMB arrangement under which prior-day rates provide the central parity for the current day's ± 0.4 percent fluctuation margins (slightly wider than the current RMB margins). The currency band was widened starting in 1991 with the long-run goal of a floating won (the band reached a width of ± 2.25 percent in December 1995), but in fact little of substance changed, as Figure 8 shows.

In the 1990s, external financial liberalization began in piecemeal fashion in response to both domestic political pressures and American demands for access by U.S. financial service providers. The reactive and partial nature of the liberalization measures only enhanced the vulnerability of the Korean financial and corporate sectors. Removal of restrictions on short-term and foreign currency borrowing, for example, led to huge currency and maturity mismatches. These and other distortions laid the groundwork for the crisis that erupted in the second half of 1997.

A result of the crisis has been a more flexible exchange rate, a "comprehensive restructuring of South Korea's systems of finance, regulation, and corporate governance, and a dismantling of the pervasive controls on international capital flows that characterized the pre-crisis regime. Since the crisis South Korea has arguably made better progress on economic reform than the other heavily affected Asian crisis countries, or Japan for that matter" (Noland [2007]). A full liberalization of Korea's foreign exchange market is slated for completion by 2011. As a *de jure* matter the won floats within an inflation-targeting monetary regime, and while the currency fluctuates more freely than it did before the Asian crisis, Korea has accumulated substantial official international reserves in efforts to slow the won's appreciating trend after 2001. In 2006, Korea accumulated US\$28.6 billion in new foreign reserves, up from US\$11.3 billion the year before. At the end of February 2007, Korea held US\$243 billion in reserves and was the world's fifth biggest holder (following China, Japan, Russia, and Taiwan).

Korea has generally adjusted well to a floating currency, but only after thoroughgoing reforms that have substantially opened its financial markets and mitigated pre-crisis distortions. Economic growth seems to have moderated relative to the rates that characterized the period between the 1980 and 1997 crises, but remains strong relative to the rates in the established industrial countries. Inflation remains in a moderate range.

VI. An Exit Strategy for China

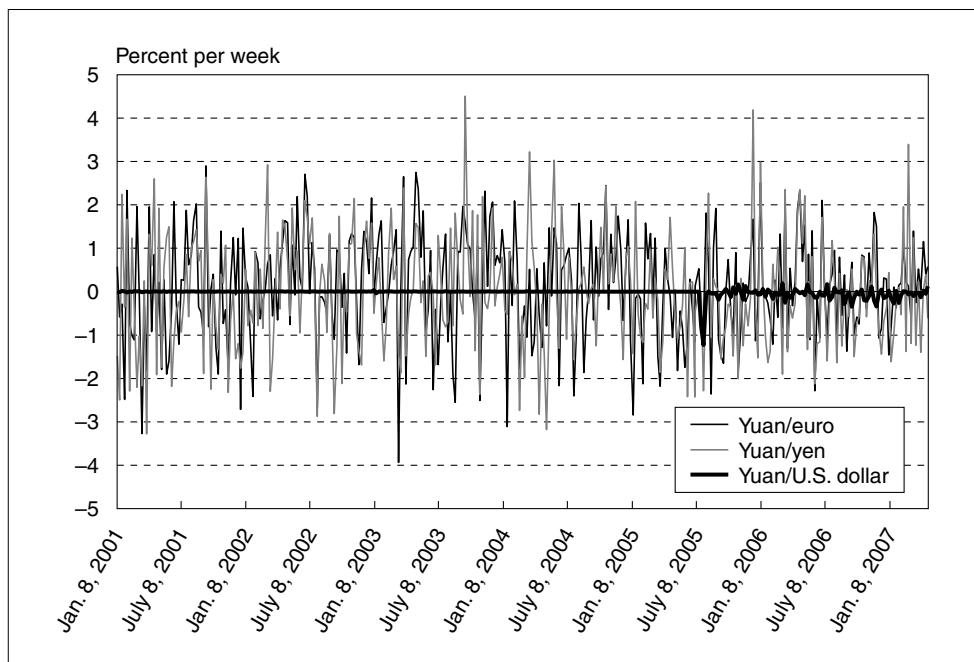
The strategy I describe for China has two components. First is the adoption of a target zone for the exchange rate between the RMB and a basket of main trading partner currencies. This step was already taken by China in July 2005, although as indicated above, so far the system seems to operate as a *de facto* U.S. dollar peg, the bands of fluctuation for the yuan/dollar rate remain quite narrow, and the "basket" provision seems meaningless in light of the apparent commitment to hold the yuan/dollar bilateral rate fairly steady. Under the first component of the strategy, the basket target

zone would gradually expand over time until a full float was achieved. In the interim, the influence of the basket would be to deter large fluctuations in the effective exchange rate. The second component of my blueprint calls for the retention of extant financial account controls, especially inflow controls, until a high degree of exchange rate flexibility and a domestic financial reform have been attained. As noted, similar strategy packages were pursued successfully by Chile and Israel. The Japanese and especially Korean experiences follow related lines while illustrating potential pitfalls.

A first point to make is that the RMB-dollar link has not brought overall exchange rate stability in any relevant sense. Although the RMB has been reasonably stable *against the U.S. dollar*, movements in the dollar itself have implied sharp change in the RMB's exchange rate against third currencies, notably the euro and the yen. Figure 9 shows the week-to-week fluctuations of the RMB against the yen and euro in recent data. Volatility in nondollar exchange rates is considerable, not infrequently entailing a ± 2 percent change (or more) in the space of a single week. Because China has substantial trade with Europe and Japan, the RMB peg against the dollar cannot be justified on the basis of trade-enhancing effects that supposedly work through real exchange rate stabilization—at best, we have trade creation with the United States (and countries that peg to the dollar) but trade diversion with respect to Europe and Japan.

The unbalanced volatility suggests that for China a basket peg such as has been officially announced (but not yet implemented) might indeed offer a better trade-off between the benefits and costs of an exchange target. In principle, the relevant basket

Figure 9 Changes in the Yuan's Bilateral Exchange Rates



would include the currencies of all China's principal trading partners, those from which it imports intermediate products and consumption goods as well as those to which it exports.

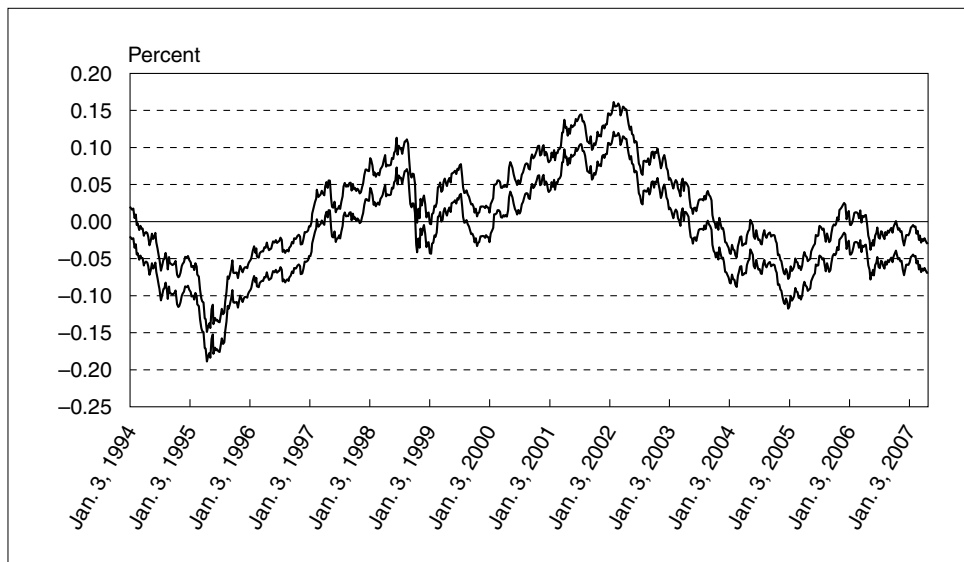
As a simplified example, define the RMB price of a three-currency basket consisting of US\$1, ¥100, and €1 to be $R/B = (R/\$)^{1/3}(R/¥)^{1/3}(R/€)^{1/3}$. (China's actual "reference" basket is much more inclusive.) Because the RMB price index for the basket can also be written as $R/B = (R/\$)^{1/3}(\$/¥)^{1/3}(\$/€)^{1/3}$, the PBOC can stabilize $\log R/B$ such that $c_l \leq \log R/B \leq c_u$ by stabilizing the dollar rate $\log R/\$$, not between unchanging limits as is now the case, but between limits that depend on the bilateral rates of the dollar against the yen and euro:

$$c_l - (1/3)\log \$/¥ - (1/3)\log \$/€ \leq \log R/\$ \leq c_u - (1/3)\log \$/¥ - (1/3)\log \$/€.$$

For example, if the dollar depreciates against the yen, the band for the yuan/dollar rate is moved downward (a revaluation against the dollar) to smooth the resulting shift in the RMB price of the basket.

Figure 10 shows the result of the following thought experiment: suppose that at the start of 1994 China had adopted a 4 percent wide band for the RMB price of an equal-weighted basket of dollars, yen, and euros (that is, 2 percent up or down, and using the European Currency Unit, or ECU, before 1999). How would the implied band for the yuan/dollar bilateral exchange rate have moved over time in response to dollar exchange rate movements against the euro and the yen? That is, what RMB depreciation or appreciation against the dollar would the specified fairly narrow basket peg have allowed?¹⁷

Figure 10 Evolution of the Yuan/U.S. Dollar Range with ±2 Percent Basket Bands



17. McKinnon (2005) has suggested that the current range of fluctuation in the yuan/dollar rate be widened to ± 1 percent, with no revaluation of the central rate. While that step would be useful as a preliminary measure,

The figure displays a considerable range of variation in the yuan/dollar bilateral rate. The RMB would have appreciated significantly against the dollar during the mid-1990s period of dollar weakness, perhaps by more than 15 percent. On the other hand, there would have been a depreciation against the dollar during the height of the Asian crisis, caused by the depreciation of the yen against the dollar. The yen's sharp appreciation against the dollar in the fall of 1998 would have provoked a similar RMB movement, followed by a trend of depreciation as the dollar strengthened toward its 2002 peak (with the price of dollars in terms of RMB potentially rising as much as 15 percent). Interestingly, movements of the dollar against the euro and yen would have allowed a substantial revaluation of the yuan/dollar rate in late 2004, perhaps defusing some of the protectionist sentiment in the U.S. Congress. It is impressive that fairly narrow basket bands (those underlying the figure are narrower than the original European Monetary System bands) allow so much flexibility relative to the dollar.

A feature of the basket system is that intervention in support of the basket rate could still be carried out entirely in the RMB-dollar market. The reason is that the basket can be implemented entirely through a (variable) yuan/dollar exchange rate target. As a technical matter, the band could be redefined each morning using the exchange dollar rates prevailing earlier that day in the Tokyo markets. Or it could be updated more frequently. The decision to peg to a basket is also separable in principle from the decision on the denomination of foreign currency reserves. Diversification of official reserves in line with the basket weights would serve to stabilize the value of reserves in terms of RMB, but is not otherwise a necessary adjunct of a basket peg system.

China so far has not implemented a basket peg in the way described above. A genuine basket peg is desirable, however, with the implied margins for yuan/dollar fluctuation being widened over time, and in both directions. Interestingly, there would not necessarily be a one-way bet for speculators against the dollar at the edge of the band, because the band as a whole could move in either direction as a result of movements in the dollar's rates against the yen and euro. Speculators could bet on the value of the basket, however—though some randomization of the basket weights would introduce greater uncertainty into that trade, too. Some countries (e.g., Singapore) attempt to foil speculation by creating uncertainty about the weights on the various basket components.

An alternative basket-like scheme would adjust the yuan/dollar bands, not in response to dollar exchange rates against third currencies, but to the dollar prices of imports from third countries. (Since these prices are not monitored daily, in practice the day-to-day fluctuations would mostly reflect exchange rate changes.) The rationale for this approach would be that, from the viewpoint of welfare, stabilization of import prices seems more relevant than stabilization of currency values. This type of arrangement might fit better with the goal of inflation control, since it would act

it clearly would not suffice and would become unsustainable were China to open its financial account fully. Furthermore, it is hard to see the rationale for a continuing dollar peg in a world where the euro and yen are not pegged to the dollar—there would be no “network externalities” in terms of overall effective exchange rate stability from continuing to peg to the dollar.

to restrain domestic import-price inflation. In practice, however, the differences compared with currency targeting would unfold only gradually.

How much of a revaluation is ultimately necessary for the RMB? There is considerable uncertainty about the answer and a wide range of methodologies and estimates. Frankel (2005) suggests one possible approach, based on the Balassa-Samuelson relationship between per capita real income and the real exchange rate. China's relationship to the cross-section regression of price level on real per capita income within the Penn World Table sample suggests a 36 percent RMB undervaluation for 2000. If Figure 3 is a good guide, the level of undervaluation would be similar now. Goldstein and Lardy (2004) cite a 15 percent undervaluation. As I do, they suggest the adoption of a basket target within a zone, but coupled with an initial 15 percent step revaluation. Eichengreen (2005) takes the view that the RMB's undervaluation is smaller than this. In view of the underlying uncertainties, I would favor a graduated approach such as the one the PBOC seems to have embarked upon, featuring a crawling and widening band, rather than a steep initial revaluation that could be disruptive for the economy and might have to be reversed later. In particular, a gradualist approach would avoid an abrupt redistribution of income away from the relatively poor rural sector, where agricultural output prices are linked to world prices through the nominal exchange rate.¹⁸ Even a narrow band, as McKinnon (2005) has emphasized, would help set the stage for the development of domestic foreign exchange trading. However, it is important that the range of *de facto* flexibility be widened ahead of an acceleration of financial market pressures.

Once market forces are given greater play in determining the day-to-day value of the yuan/dollar rate, the RMB might well move initially to the strong edge of any band that was established. For that reason, it is important that the existing capital flow controls not be dismantled until the exchange rate bands have been widened to the point where a managed float has been achieved. The move to a currency band, a band that could be widened over time, would render superfluous some of the *ad hoc* liberalization measures that have been deployed to ease exchange rate pressures. Many discussions make insufficient distinction between enhanced exchange flexibility, which can be achieved (with less currency volatility) under restricted international financial flows, and openness of the financial account. The two are completely different, and a less risky sequencing would tackle the full gradual relaxation of financial account controls only after the achievement of a good degree of exchange rate flexibility. Eichengreen (2005) and Prasad, Rumbaugh, and Wang (2006) lay out the case for this sequencing in greater detail. The manifest hazards of opening to inflows in the current setting of domestic banking system weakness furnish one of the most compelling arguments for placing further decontrol of the financial account on the back burner.

18. See Blanchard and Giavazzi (2005), who discuss macro measures complementary to revaluation. Of course, an initial step revaluation that inadvertently went too far could spark massive financial outflows through the exit door that now has been opened in response to the current appreciation pressures. Indeed, any revaluation that was not expected to be repeated soon would likely encourage a sharp financial outflow as the speculative positions that have been built up over the past couple of years were unwound. Again, Germany experienced this pattern of inflows, revaluation, and outflows during the last Bretton Woods years (Obstfeld [1993]). This type of uncertainty is another reason for not relaxing financial account controls further in the course of the transition to greater RMB flexibility.

VII. Summary

In the face of huge balance of payments surpluses and internal inflationary pressures, China has been in a classic conflict between internal and external balance under its U.S. dollar currency peg. Over the longer term, China's large, modernizing, and diverse economy will need exchange rate flexibility and, eventually, currency convertibility with open capital markets. A feasible and attractive exit strategy from the essentially fixed RMB exchange rate would be the following two-stage approach, consistent with the steps already taken since July 2005, but going beyond them:

- (1) Establish a limited trading band for the RMB relative to a basket of major trading partner currencies. Set the band so that it allows some initial revaluation of the RMB against the dollar. Manage the basket rate within the band if necessary, and widen the band over time as domestic foreign exchange markets develop. Possibly allow a trend crawl in the band to accommodate long-run real exchange rate changes due to structural changes along Balassa-Samuelson lines. The crawl would allow a flexible response to inflationary pressures. The ultimate goal is a floating yuan/dollar exchange rate, coupled with a monetary regime in the inflation-targeting family.
- (2) Put on hold *ad hoc* measures of financial account liberalization. They will be less helpful for relieving exchange rate pressures once the yuan/basket rate is allowed to move flexibly within a band, and they are best postponed until domestic foreign exchange markets develop further, the exchange rate is fully flexible, and the domestic financial system has been strengthened and placed on a market-oriented basis. Only a resilient financial sector will be able to withstand the occasional sharp interest rate changes that the monetary authorities may find necessary—whether they are responding to incipient unwanted exchange rate movements or to domestic inflationary pressures. Furthermore, financial reform is an essential ingredient in bringing about the changed saving and investment behavior needed to reduce China's unbalanced current account. Currency appreciation alone will not do the job.

References

- Aramaki, Kenji, "Sequencing of Capital Account Liberalization: Japan's Experiences and Their Implications to China," *Public Policy Review*, 2, 2006, pp. 177–232.
- Blanchard, Olivier J., and Francesco Giavazzi, "Rebalancing Growth in China: A Three-Handed Approach," MIT Department of Economics Working Paper No. 32, Massachusetts Institute of Technology, 2005.
- Bufman, Gil, and Leonardo Leiderman, "Surprises on Israel's Road to Exchange Rate Flexibility," mimeo, 2001.
- Cowan, Kevin, and José De Gregorio, "International Borrowing, Capital Controls and the Exchange Rate: Lessons from Chile," in Sebastian Edwards, ed. *Capital Flows and Capital Controls in Emerging Economies*, Chicago: University of Chicago Press, 2007.
- Dooley, Michael, Rudi Dornbusch, and Yung Chul Park, "A Framework for Exchange Rate Policy in Korea," in David T. Coe and Kim Se-Jik, eds. *Korean Crisis and Recovery*, Washington, D.C.: International Monetary Fund and Korea Institute for International Economic Policy, 2002.

- , and Peter Garber, “Is It 1958 or 1968? Three Notes on the Longevity of the Revived Bretton Woods System,” *Brookings Papers on Economic Activity*, 1, 2005, pp. 147–209.
- Eichengreen, Barry, “Is a Change in the Renminbi Exchange Rate in China’s Interest?” mimeo, University of California, Berkeley, 2005.
- , and Mariko Hatase, “Can a Rapidly Growing Export-Oriented Economy Smoothly Exit an Exchange Rate Peg? Lessons for China from Japan’s High-Growth Era,” NBER Working Paper No. 11625, National Bureau of Economic Research, 2005.
- Emminger, Otmar, *The D-Mark in the Conflict between Internal and External Equilibrium*, Essay in International Finance No. 122, International Finance Section, Department of Economics, Princeton University, 1977.
- Frankel, Jeffrey A., “The Yen/Dollar Agreement: Liberalizing Japanese Capital Markets,” Policy Analysis in International Economics No. 9, Peterson Institute for International Economics, 1984.
- , “On the Renminbi: The Choice between Adjustment under a Fixed Exchange Rate and Adjustment under a Flexible Rate,” NBER Working Paper No. 11274, National Bureau of Economic Research, 2005.
- Goldstein, Morris, “A (Lack of) Progress Report on China’s Exchange Rate Policies,” mimeo, Peterson Institute for International Economics, 2007.
- , and Nicholas Lardy, “What Kind of Landing for the Chinese Economy?” Policy Brief in International Economics No. 04-7, Peterson Institute for International Economics, 2004.
- , and ———, “China’s Role in the Revived Bretton Woods System: A Case of Mistaken Identity,” mimeo, Peterson Institute for International Economics, 2005.
- Goodfriend, Marvin, and Eswar Prasad, “A Framework for Independent Monetary Policy in China,” mimeo, Carnegie-Mellon University and International Monetary Fund, 2006.
- Haas, Rick, Natan Epstein, Franziska Ohnsorge, Gil Mehrez, and Allan D. Brunner, “Israel: Selected Issues,” mimeo, International Monetary Fund, 2005.
- Ito, Takatoshi, “A Robust Monetary Framework for China,” in He Fan and Zhang Bin, eds. *In Search of an Internally and Externally Balanced Development Strategy: China and the Global Economy in the Coming Decade*, Shanghai: Shanghai Finance and Economic University Press, 2006 (in Chinese).
- Lane, Philip R., and Sergio L. Schmukler, “The International Financial Integration of China and India,” mimeo, Trinity College, Dublin, and the World Bank, 2006.
- Lardy, Nicholas P., “China: Toward a Consumption-Driven Growth Path,” Policy Brief in International Economics No. 06-6, Peterson Institute for International Economics, 2006.
- Le Fort, Guillermo, “Capital Account Liberalization and the Real Exchange Rate in Chile,” IMF Working Paper No. 132, International Monetary Fund, 2005.
- Ma, Guonan, Corinne Ho, and Robert N. McCauley, “The Markets for Non-Deliverable Forwards in Asian Currencies,” *BIS Quarterly Review*, Bank for International Settlements, 2004, pp. 81–94.
- McKinnon, Ronald I., “Limited Foreign Exchange Flexibility for China: A Two-Percent Solution?” mimeo, Stanford University, 2005.
- Nam, Sang-Woo, and Se-Jong Kim, “Evaluation of Korea’s Exchange Rate Policy,” in Takatoshi Ito and Anne O. Krueger, eds. *Changes in Exchange Rates in Rapidly Developing Countries: Theory, Practice, and Policy Issues*, Chicago: University of Chicago Press, 1999.
- Noland, Marcus, “South Korea’s Experience with International Capital Flows,” in Sebastian Edwards, ed. *Capital Flows and Capital Controls in Emerging Economies*, Chicago: University of Chicago Press, 2007.
- Obstfeld, Maurice, “The Adjustment Mechanism,” in Michael D. Bordo and Barry Eichengreen, eds. *A Retrospective on the Bretton Woods System*, Chicago: University of Chicago Press, 1993.
- , and Alan M. Taylor, *Global Capital Markets: Integration, Crisis, and Growth*, Cambridge: Cambridge University Press, 2004.
- People’s Bank of China, Research Bureau, “The Coordination between Monetary Policy and Exchange Rate Policy in China,” mimeo, 2005.
- , Monetary Policy Analysis Group, *China Monetary Policy Report Quarter Four, 2006*, February 9, 2007.

- Prasad, Eswar, Thomas Rumbaugh, and Qing Wang, "Putting the Cart before the Horse? Capital Account Liberalization and Exchange Rate Flexibility in China," in Jahangir Aziz, Steven Dunaway, and Eswar Prasad, eds. *China and India: Learning from Each Other*, Washington, D.C.: International Monetary Fund, 2006.
- , and Shang-Jin Wei, "The Chinese Approach to Capital Inflows: Patterns and Possible Explanations," in Sebastian Edwards, ed. *Capital Flows and Capital Controls in Emerging Economies*, Chicago: University of Chicago Press, 2007.
- Roubini, Nouriel, "Asia Is Learning the Wrong Lessons from Its 1997–98 Financial Crisis: The Rising Risks of a New and Different Type of Financial Crisis in Asia," mimeo, New York University and Roubini Global Economics, 2007.
- Williamson, John, *The Crawling Band as an Exchange Rate Regime: Lessons from Chile, Colombia, and Israel*, Washington, D.C.: Peterson Institute for International Economics, 1996.
- , "The Case for a Basket, Band and Crawl (BBC) Regime for East Asia," in David Gruen and John Simon, eds. *Future Directions for Monetary Policies in East Asia*, Sydney: Reserve Bank of Australia, 2001.
- Zhao, Min, "External Liberalization and the Evolution of China's Exchange System: An Empirical Approach," mimeo, World Bank 2006.

