




## CARF Working Paper

CARF-F-236

### **Japan's Bubble, America's Bubble and China's Bubble**

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November 2010

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**Japan's Bubble, America's Bubble and China's Bubble\***

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Abstract

This paper compares the three recent episodes of boom and bust cycles in asset prices: Japan in the late 1980s to the 1990s; the U.S. since the mid 1990s; and China during the last decade. Although we have not yet seen a collapse of Chinese property prices, the increases so far are comparable to those in the other two episodes and seem to warrant a careful comparative study. I first examine the behavior of asset prices, especially, property prices in the three cases and point out some similarities. I then go on to discuss some backgrounds for the behavior of asset prices. I emphasize the role played by extremely easy monetary policy for generating bubble like asset price behaviors in the three cases. Monetary policy was shown to be easier than standard policy rules like the Taylor rule indicates. The reason for easy monetary policies is investigated. In the U.S. case the monetary authority was concerned over the risk of deflation in the early to mid 2000s. The experiences of Japan and China are quite similar in that the authorities of both countries were seriously concerned with possible deflationary effects of exchange rate appreciation on the economy. Japan let the exchange rate appreciate, while China has resisted a large scale intervention. It is shown, however, that the behavior of real exchange rates has not been that different. Implications of such a finding for the future of the Chinese economy are also discussed.

\* Earlier versions of the paper were presented at the 2010 three country (China, Korea and Japan) conference on the Global Financial Crisis and Asian Financial Markets held in Tokyo on August 20, and the 2010 meetings of the Turkish Economic Association, held in Girne, TRNC on September 1-3.

With China overtaking Japan as the second largest economy in the world, many aspects of the Chinese economy have been attracting worldwide attention, including the behavior of asset prices, especially the recent sharp rise in property prices. Among many backgrounds for the property price inflation, many observers seem to point to the role played by extremely easy monetary environment. The usual story behind easy money is that worldwide monetary easing in response to the economic and financial turmoil since 2007 has been imported to China through the authority's attempt to keep the Renminbi-dollar exchange rate stable. The Chinese authority seems to have been afraid of the deflationary impact of Renminbi appreciation on the Chinese economy. On this view, China's foreign exchange rate policy has been one of the causes of the property price inflation.

Regarding the relationship between exchange rate appreciation and monetary policy, we find an interesting parallel in Japan in the 1980s. Japan's experience was different from that of recent China in the sense that the yen rose sharply in response to the so-called Plaza accord in 1985, that is, unlike the Renminbi today. The Bank of Japan (BOJ), however, out of concern over the deflationary effects of the yen appreciation on the economy, carried out ultra easy monetary policy in the late 1980s, which led to the famous bubble in property and stock prices, its collapse in the 1990s, and serious consequences for the financial system and the economy since then. This experience seems to contain some interesting implications for the future of the Chinese economy.

In this short essay, I will compare more carefully the two episodes, that is asset price increases in recent China and in Japan in the second half of the 1980s, with occasional references to the recent U.S. experience with property price inflation as well.

## 1, Comparison of Data on Asset Price Inflation

Let us begin with a casual examination of the data on asset prices. Figure 1 shows property prices in China, Japan and the U.S. The axes have been adjusted so that the three property price data series reach their peaks at the same point in the chart. Thus, the data starts in 1980 for Japan, in 1996 for the U.S. and in 2000 for China.<sup>1</sup> At the peak the price level is adjusted to equal 100 for each country. Of course, there is no knowing of when Chinese property prices will peak out. Hence, the assumption of the peak year of 2010 for China is only one of convenience and involves no judgment of myself as to

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<sup>1</sup> The corresponding peak years are 1990 for Japan, 2006 for the U.S. and 2010 for China.

the future course of Chinese property prices. For the sake of convenience, however, let me refer to recent movements in Chinese asset prices as a "bubble." There would probably be no objection to calling the other two episodes Japan's bubble and America's bubble. The data sources are Urban land price index for Japan (nationwide), the Case-Shiller index for the U.S. and Commodity Building Selling Price (National Bureau of Statistics) for China.<sup>2</sup>

The figure shows a striking similarity for the three economies. During the decade leading up to the peak, property prices rose 100-150% in the three countries and then they came down sharply in Japan and the U.S., although the downturn has been sharper in the U.S. than in Japan. The U.S. and Japanese property prices look like a typical behavior of asset prices during a bubble. The rise in Chinese property prices so far has been slightly larger than the other two cases and seem to justify the concern over the risk of its collapse.

In order to examine more carefully whether such property price movements were bubbles or not, it is useful to compare property prices with incomes properties generate. For want of better measures, I use nominal GDP for Japan, real GDP for the U.S. (because the Case-Shiller index is already divided by CPI) and Income per Capita for China (National Bureau of Statistics). The result is shown in Figure 2. For China and Japan both nationwide and regional series are shown. For China one series is the Commodity Building Selling Price for 35 Cities divided by the income per capita for 36 city average and the other is the corresponding series for Shanghai. For Japan, the indexes of land prices for the entire nation and for 6 largest cities have been divided by nominal GDP. The result for Japan is not much different even if different income series for the entire nation and large cities are used.

Figure 2 provides a substantially different view of property prices from Figure 1. For the economy wide average, property prices did not rise much more than incomes either in Japan or China. For large cities, however, they seem to have risen much more than incomes they generated. Presumably, the contrast would have been less striking had we had better data on rents by region. Thus, one obtains the impression that property bubbles in Japan and China were mainly an urban phenomenon. There is some evidence that property prices were high relative to incomes nationwide in the U.S. It is also noteworthy that the property price-income ratio for Japan as a whole, despite the absence of a sharp rise around 1990, has kept declining since the early 1990s. This may

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<sup>2</sup> The so-called 70 city property price index shows much milder increases. Here, I have chosen an index that accords better with anecdotal stories about Chinese property markets.

be explained by declines in expected future growth rates of the economy, which partly were a result of declines in asset prices.

Turning to stock prices, Figure 3 presents stock price movements in the three countries before and after the peak of the bubble. In the figure year zero corresponds to the peak of the property price bubble as explained above. The U.S. and Japan look similar, although the downturn has been more mild for the U.S. at least so far. The behavior of Chinese stock prices is quite extraordinary; they almost quadrupled in the first two years (2006-2007) in the figure and then erased most of the gains in the aftermath of the so-called Lehman shock and is now at about half the peak level. The U.S. and Japanese stock prices behaved in exactly ways they would in a bubble, while the Chinese stock prices already passed its peak in 2007. Actually, the peak of the Chinese and U.S. stock prices coincide and was recorded in October 2007.

The divergent behavior between Chinese property and stock prices seem to be explained that the latter, stock prices, despite the presence of capital controls, have recently moved in tandem with global stock prices, while the former has been under heavier influence of domestic economic factors.

Figure 4 presents the rate of growth of domestic credit. The U.S. and Japan are similar, although the U.S. bank credit has contracted more sharply since the burst of the bubble than was the case in Japan. Reinhart and Rogoff (2007) argued that prior to the peak of a large bubble, there was almost always a large buildup of private/public debt. Japan's experience accords with this view. Chinese credit growth has been more complicated; it has two peaks in the chart, one in 2007 (year -3) and, the other, in 2009 (year -1). The first peak corresponds to that of stock prices. The second peak seems to reflect the strong fiscal expansion that took place in response to the Lehman shock, but also partially related to the sharp rise in property prices as identified in Figure 1.

## 2, Monetary Policy and Asset Price Inflation

A significant boom and bust cycle in asset prices are usually associated with extremely easy monetary environment.<sup>3</sup> Normally, monetary policy is the major cause of such an environment. Let us thus examine what was going on with monetary policy during the three episodes.

Figure 5 presents Japan's overnight call market rate along with a version of the Taylor rule rate. The parameters necessary for the calculation of the Taylor rule rate are assumed to be (inflation target=2%, potential growth=3%, natural rate of interest=3%). In addition, the weights on the inflation gap and output gap are both assumed to equal

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<sup>3</sup> See, for example, Kindleberger and Aliber (2005).

0.5.<sup>4</sup> It can be seen that the actual short-term rate had been well under the Taylor rule rate for two years beginning in the second half of 1986. This must have been an important factor behind Japan's bubble in stock and land prices.

Figure 6 carries out the same exercise for the U.S. The actual federal funds rate and the Taylor rule rate are plotted. The assumptions for the Taylor rule are: (inflation target=2%, potential growth=2.5%, natural rate of interest=2.5%). The result is quite similar to Japan. During much of 2001-2005, the federal funds rate was much lower than the Taylor rule rate. This seems to correspond very well with the sharp rise in U.S. property prices in the early 2000s.

The exercise is more difficult for China. This is because the Chinese authority does not seem to have used changes in interest rates as the major tool of monetary policy. Instead, it has relied more heavily on moral suasion of banks regarding their lending attitude and/or changes in required reserve ratios for affecting monetary conditions. Nonetheless, the comparison of the actual and Taylor rule rates may be instructive. Figure 7 presents this using the discount rate as the interest rate. The result is striking in that the actual rate has always been lower than the Taylor rule rate, which seems like a recipe for an ever expanding bubble! The gap between the two narrows with the use of the (one year) lending rate, as shown in the figure. The Taylor rule rate, however, has still always been above the lending rate only with exceptions in 2009I and II.

There have certainly been other causes of the three bubbles. In Japan and the U.S. regulatory policies played important roles. In the Japanese case there was liberalization of the bond market regulations in the late 1970s, which prompted large firms to rely more on the bond and equity markets for financing their investment. As a result, banks lost a significant part of their business and went into property related lending activities, where banks thought credit analysis was easy. After all, there had been no episode of a protracted decline in land prices in post war Japan. Thus, banks developed huge exposures to the property market. Neither the banks nor the regulators, however, paid much attention to the risk such bank balance sheets entailed.<sup>5</sup>

The regulatory failure in the recent U.S. case is well known. A significant part of financial intermediation shifted towards the so-called "Shadow Banking System," which

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<sup>4</sup> I used the gap between the potential growth rate and actual growth rate for a proxy for output gap for want of a good estimate of the output gap. This simplification tends to exaggerate the response of the Taylor rule rate to actual output growth. Thus, the argument to follow needs to be discounted for this simplification. There is, however, no shortage of more rigorous estimates of the Taylor rule rates that show similar results. See, for example, Taylor (2009) for the U.S.

<sup>5</sup> See, for example, Ueda (2010).

was not policed very well by the regulators. Regulators did not know much about, and therefore, were not able to contain, excessive risk taking in the shadow banking system. They also did not provide a necessary safety net in the shadow banking system for avoiding systemic risks.

Reinhart and Rogoff (2009) discuss other causes of bubbles, including a wide spread "this time is different" psychology, which blinds people to the risk of the collapse of bubbles. In the recent U.S. case prominent economists, including A. Greenspan, talked about "the U.S. economy conquering business cycles." In Japan in the late 1980s there was a talk about "Japan as No.1." A similar psychology seems to be observed in China today.

Rather than pursuing such diverse causes of the bubble, I would like to return to the discussion of the relationship between monetary policy and the bubble in the next section. Specifically, I will focus on the question of why monetary policy was so easy prior to the formation of the three bubbles.

### 3, Backgrounds for Easy Monetary Policy

To anticipate the conclusion of this section, monetary easing in Japan in the late 1980s and China today are both related to the concern over possible deflationary effects of a stronger currency. That of the U.S. in the early 2000s seems to have been motivated by a more genuine concern over the risk of deflation.

In the U.S. case the intention of the monetary authority behind the easing in the early to mid 2000s as we saw in the last section was most clearly stated by Bernanke (2003) who argued that

"a substantial fall in inflation at this stage has the potential to interfere with the ongoing U.S. recovery, and that in conceivable--though remote--circumstances, a serious deflation could do significant economic harm. Thus, avoiding a further substantial fall in inflation should be a priority of monetary policy."

Here, we see a clear concern over the risk of deflation and the damage it can do for the U.S. economy. Perhaps, the concern was partly motivated by a study of the experience of Japan in the late 1990s and the early 2000s.

In a sense the U.S. carried out monetary policy in a textbook manner. In retrospect, the concern for the risk of deflation was somewhat excessive, and the monetary easing during this period led to the serious housing and credit bubbles in the mid to late 2000s. In other words, the Fed had underestimated the risk of strong monetary stimulus generating serious financial imbalances.<sup>6</sup>

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<sup>6</sup> See, for example, White (2010) for the relationship between monetary policy and

The motivation behind the BOJ's easing in the second half of the 1980s was similar but centered more on the role of a single variable, the exchange rate; the BOJ was worried, perhaps too excessively, about the deflationary effect of stronger yen on the economy.

Figure 8 shows movements in the yen-dollar rate and the BOJ's official discount rate which had been the BOJ's major policy variable until the early 1990s. There is a strong correlation between the two variables. Each time the yen appreciated sharply the BOJ eased policy quite aggressively.<sup>7</sup> Specifically, the relationship may be seen quite clearly in the early 1970s, the late 1970s, the late 1980s and the mid 1990s. Of these four monetary easing, two led to serious negative consequences for the economy; the easing in the early 1970s generated serious inflation and that of the late 1980s, the asset price bubble.<sup>8</sup>

The BOJ's worry about the deflationary effect of yen appreciation on the economy by itself was nothing wrong, but it may have been somewhat excessive judging from the comparison of the actual policy rate with the Taylor rule rate. We have to be careful here because usual analyses of the Taylor rule are done in a closed economy context and hence do not address fully the question of how monetary policy should respond to the exchange rate.<sup>9</sup> The subsequent events in the Japanese economy, however, still indicate that the monetary easing was somewhat excessive.<sup>10</sup>

China in the recent period seems to be following a similar pattern. It surely has resisted sharp appreciation of the Renminbi. The attempt at this, however, has resulted in a very strong domestic monetary easing. Figure 9 shows increases in base money and in foreign exchange reserves. There has been a mild correlation between the two, but with the correlation becoming more salient since 2007. This is perhaps explained by

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financial imbalances..

<sup>7</sup> Although not shown in the figure, this also was a time of large current account surpluses.

<sup>8</sup> For a more careful analysis of this correlation and its effect on Japan's bad loan problem in the 1990s, see Ueda (2000).

<sup>9</sup> The analysis of optimal monetary policy in an open economy context would still indicate that the policy interest rate should respond to the expected inflation and output. To the extent, however, expected output is affected by current exchange rate appreciation, the response of the BOJ to the yen movement by itself may not have been incorrect. The question then boils down to whether the degree of the response was adequate.

<sup>10</sup> It would be unfair to place all the blame for the mismanagement of monetary policy on the BOJ. There were significant political pressures on the BOJ to ease at times of large yen appreciation. It has to be recalled that the BOJ had not been as independent as it is now until the late 1990s. In addition to the domestic political pressure, the U.S. had reportedly put pressure on Japan to ease monetary policy in the late 1980s. On this point, see, for example, Funabashi (1988).



attempts at sterilization becoming increasingly difficult as the PBOC has continued to sell domestic asset it holds to extract funds from the system. Or else, in the aftermath of the Lehman shock the Chinese authority may have decided not to withdraw the funds supplied through foreign exchange market intervention. Compared with late 2006 the increases in both base money and foreign exchange reserves almost doubled in 2007 and 2009. Figure 10 shows the ratio of foreign assets in the total assets of the Chinese monetary authority. After a pause in 2005 and early 2006, the ratio has been rising again as in the early 2000s and is now more than 80%. The increase in base money must have been the fundamental cause of asset price inflation and the inflation of the general price level which was, although moderate, more elevated than in most developed countries. In addition, the more general tendency for the maintenance of low interest rates throughout the 2000s as we saw in the last section may have been partially motivated by a concern over the value of Renminbi.

Let us now examine what has been happening to the exchange rate. Figure 11 shows the nominal effective exchange rate calculated by BIS for Japan and China. It is again drawn in such a way that China today corresponds with Japan in 1990. The Renminbi has appreciated somewhat since 5-6 years ago, but the size of the appreciation is nothing compared with that of the yen in the 1980s. This is exactly why the BOJ eased monetary policy aggressively during the period. The direct negative effect of the sharp appreciation of the yen on the economy, the subsequent volatility in asset prices and the financial system, and the ultimate stagnation of the Japanese economy must have been a major reason for the denial of a large Renminbi appreciation by the Chinese authority. The figure shows clearly that China has avoided a Renminbi appreciation on the scale we saw for Japan in the late 1980s.

Figure 12 presents the behavior of real effective yen and Renminbi. It can now be seen that Renminbi has recently appreciated in real terms on the order of magnitude comparable to, although still smaller than, Japan in the late 1980s. The reason for the divergent behavior between nominal and real Renminbi is straightforward. The Chinese monetary easing as discussed in the previous section raised inflation by more than her competitors. Chinese inflation has been moderate during the recent period, but still higher than many of her G7 competitors.

Implications of the above finding for the Chinese economy are not straightforward. Although China has succeeded in avoiding a large scale Renminbi appreciation in nominal terms, but the very attempt to avoid it has led to very easy monetary environment, some inflation of the general price level and thus real appreciation of the exchange rate. Monetary easing has also generated bubble like

behaviors in stock and property prices. Real appreciation of the exchange rate and asset price inflation are the two major macroeconomic phenomenon Japan experienced in the late 1980s. In this sense, the attempt by the Chinese authority has been only partially successful. It has not been able to avoid the workings of basic economic forces.

Whether China is going to repeat the Japan style stagnation of the economy seems to hinge on the management of economic policy going forward. For one thing, further attempts seem necessary to contain the volatility of asset prices. This would require more dynamic use of the interest rate policy channel. To the extent that some volatility is experienced, its effects on the stability of the financial system and ultimately on the economy will have to be monitored carefully. Japan failed in this respect and allowed the vicious cycle of asset price deflation and stagnant economy to take hold.

For another, real appreciation through nominal appreciation and that through domestic inflation may not mean the same thing for the real economy. For example, the yen has not appreciated in real terms by as much as in nominal terms. The difference is explained by low domestic inflation or deflation since the late 1990s. The maintenance of a low real yen by way of deflation has been associated with a very stagnant economy. The causality here is difficult to pin down. One can, however, at least point to serious problems for monetary policy the zero lower bound on nominal interest rates (ZLB) has created. Needless to say, the ZLB is more likely under lower rates of inflation. If such problems are serious, one can say that the same level of real exchange rate is associated with better economic performance if it is achieved by a combination of a weaker currency and higher domestic inflation.<sup>11</sup>

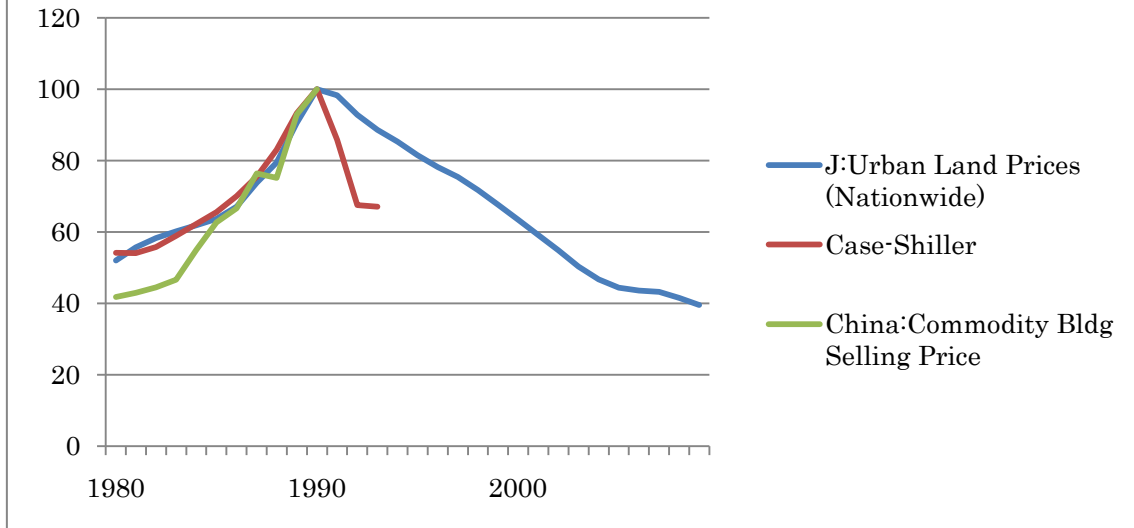
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<sup>11</sup> Of course, carrying out this line of argument too far is dangerous because beyond a certain level high inflation obviously creates its own costs for the economy.

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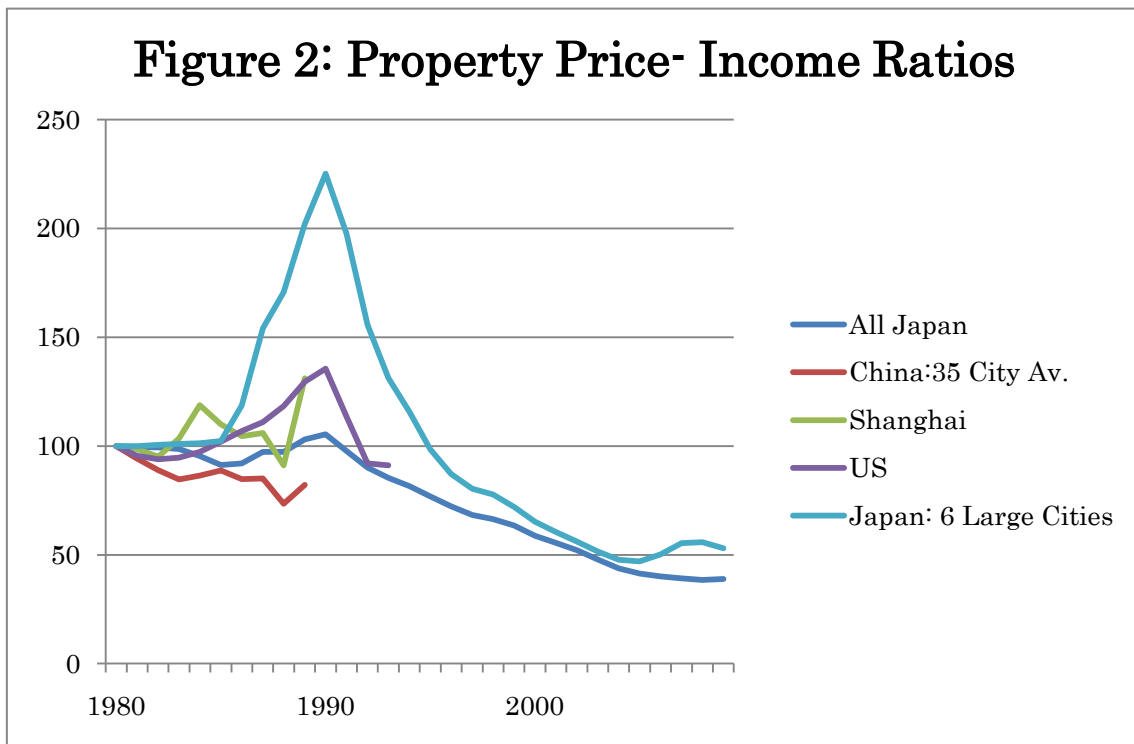
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**Figure 1: Index of Property Prices  
Japan(1980-2009), China (2000-2010) &  
US (1996-2009)**

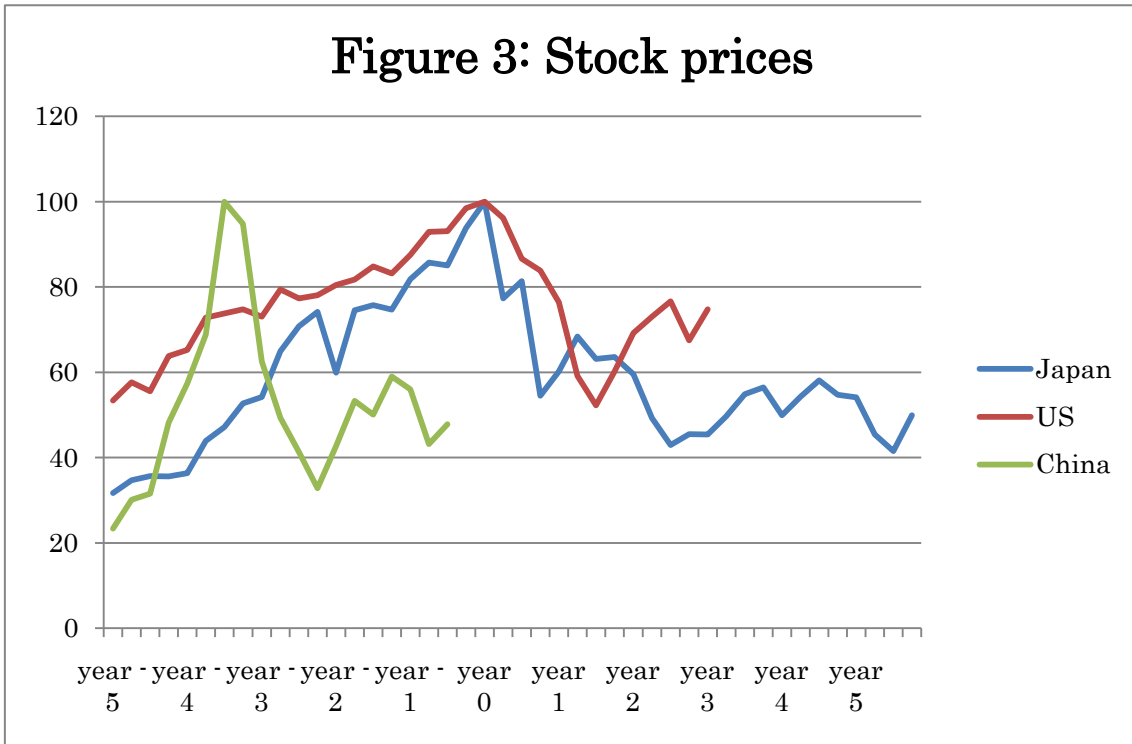


Source: Nikkei data base, Case-Shiller HP, CEIC data.

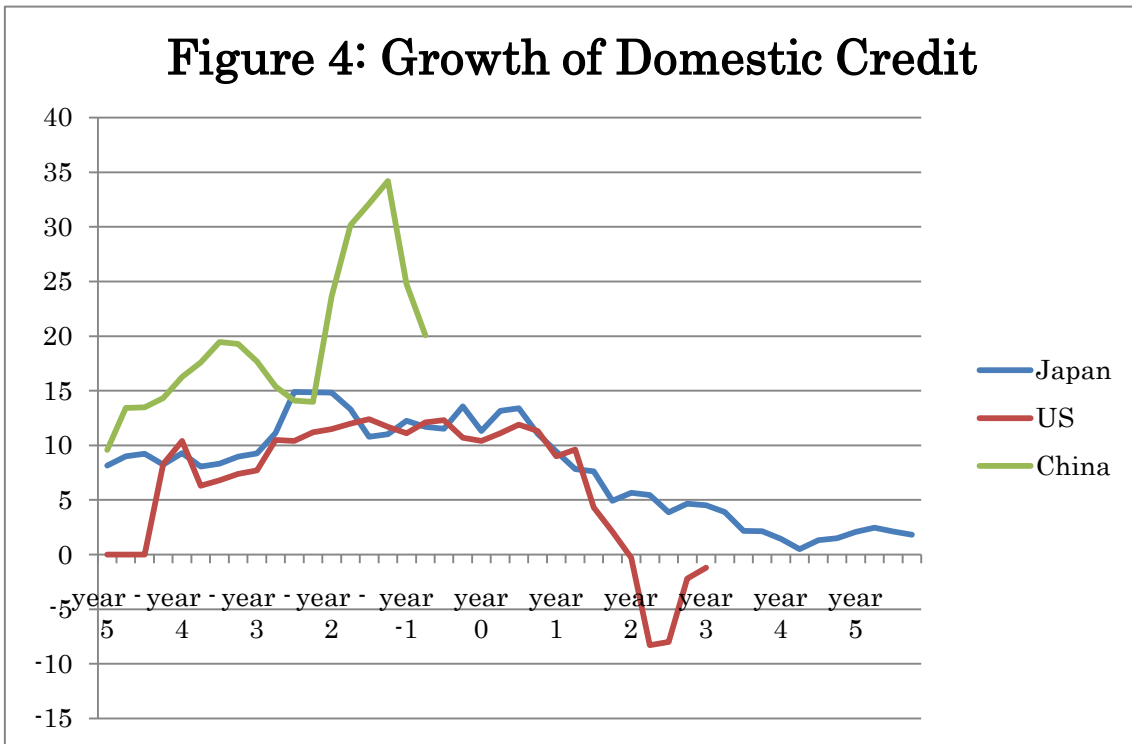
**Figure 2: Property Price- Income Ratios**



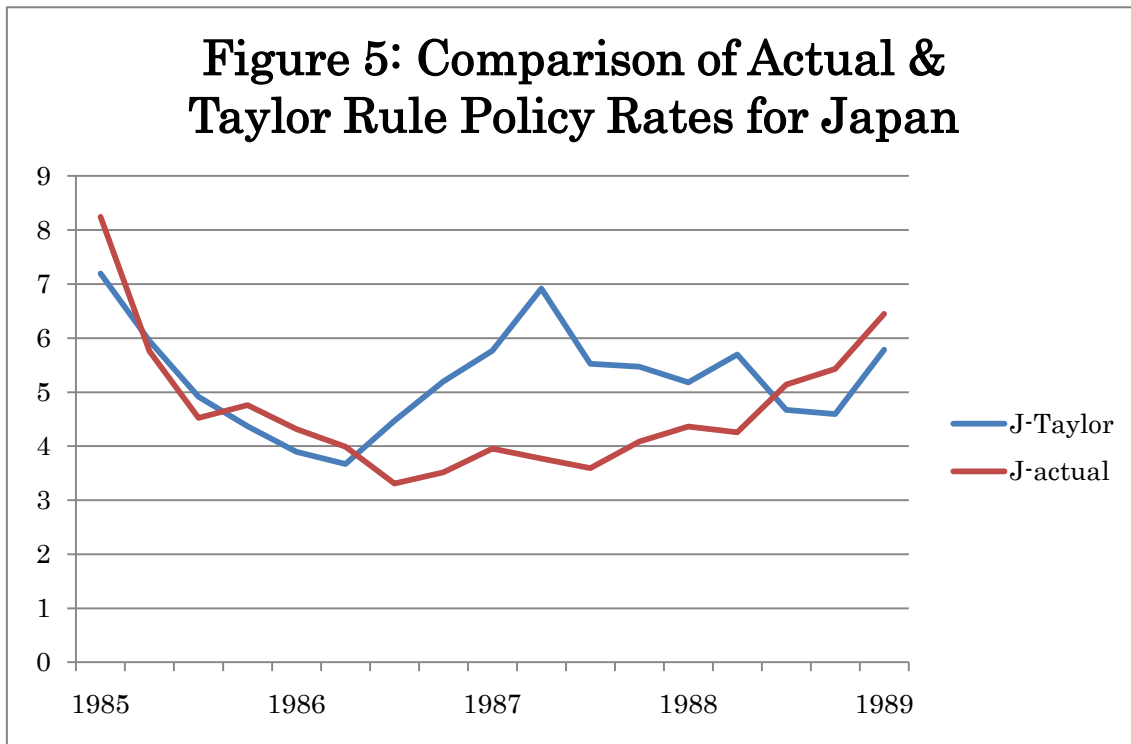
Source: the same as Figure 1.



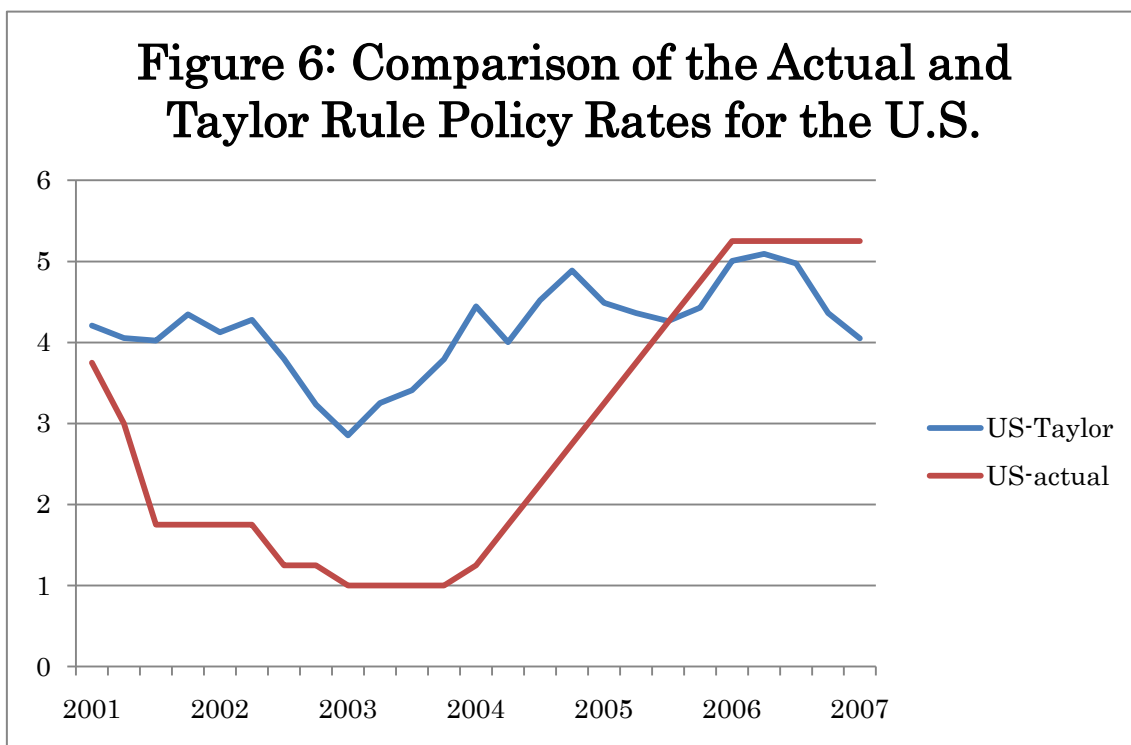
Source: Bloomberg.



Source: Datastream.

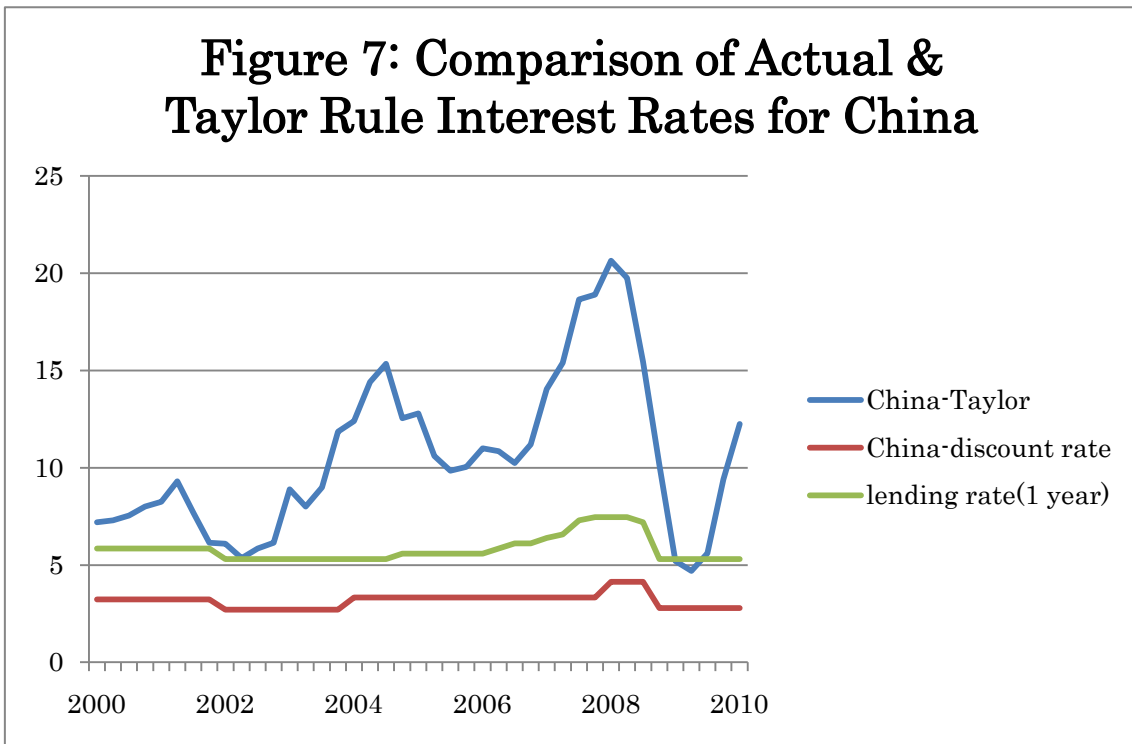


Source: Datastream and author's estimates.



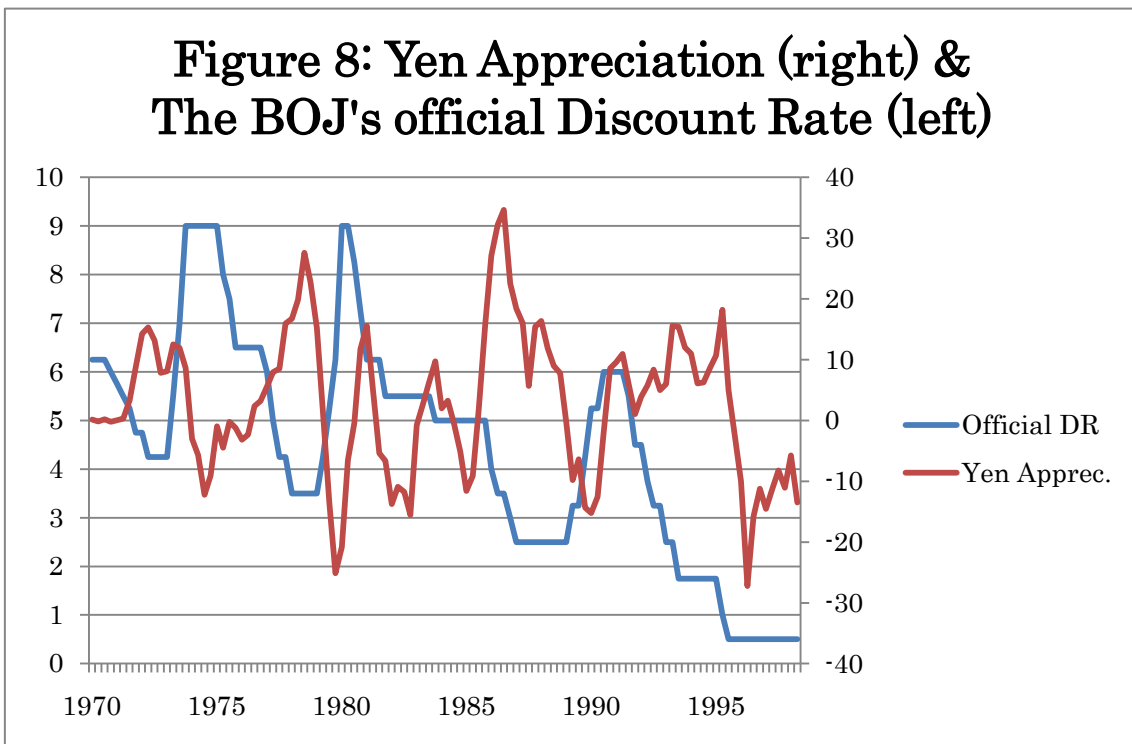
Source: The same as Figure 5.

**Figure 7: Comparison of Actual & Taylor Rule Interest Rates for China**



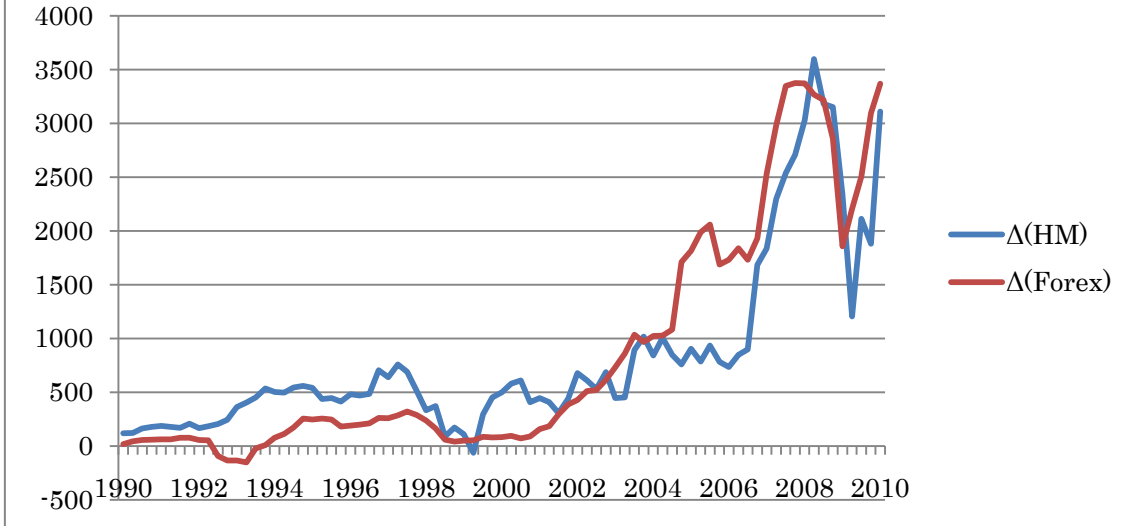
Source: Datastream, CEIC data and author's calculations.

**Figure 8: Yen Appreciation (right) & The BOJ's official Discount Rate (left)**



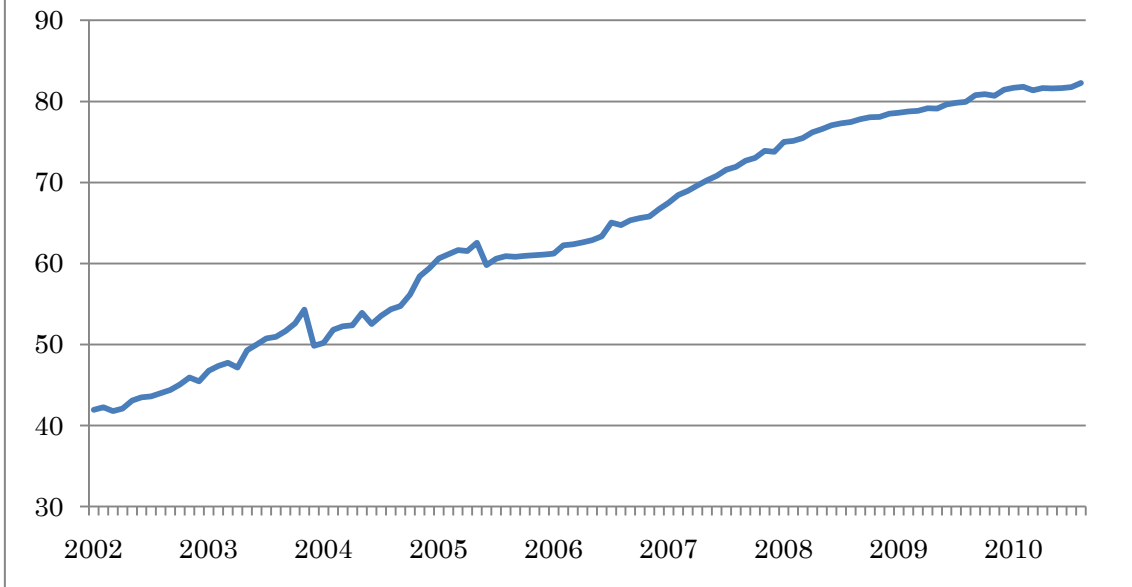
Source: Datastream.

**Figure 9: Increases in Base Money (HM) & Foreign Exchange Reserves (Forex) in China**



Source: Datastream.

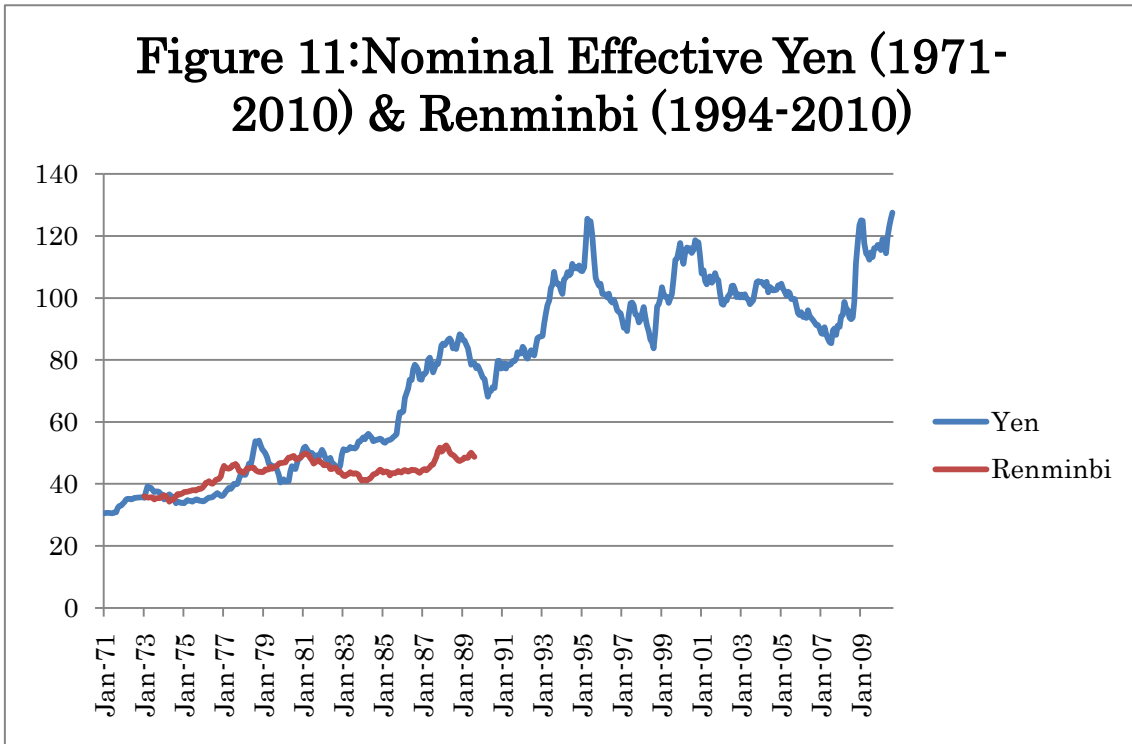
**Figure 10: Foreign Assets/Total Assets, Chinese Monetary Authority**



Source: CEIC data.

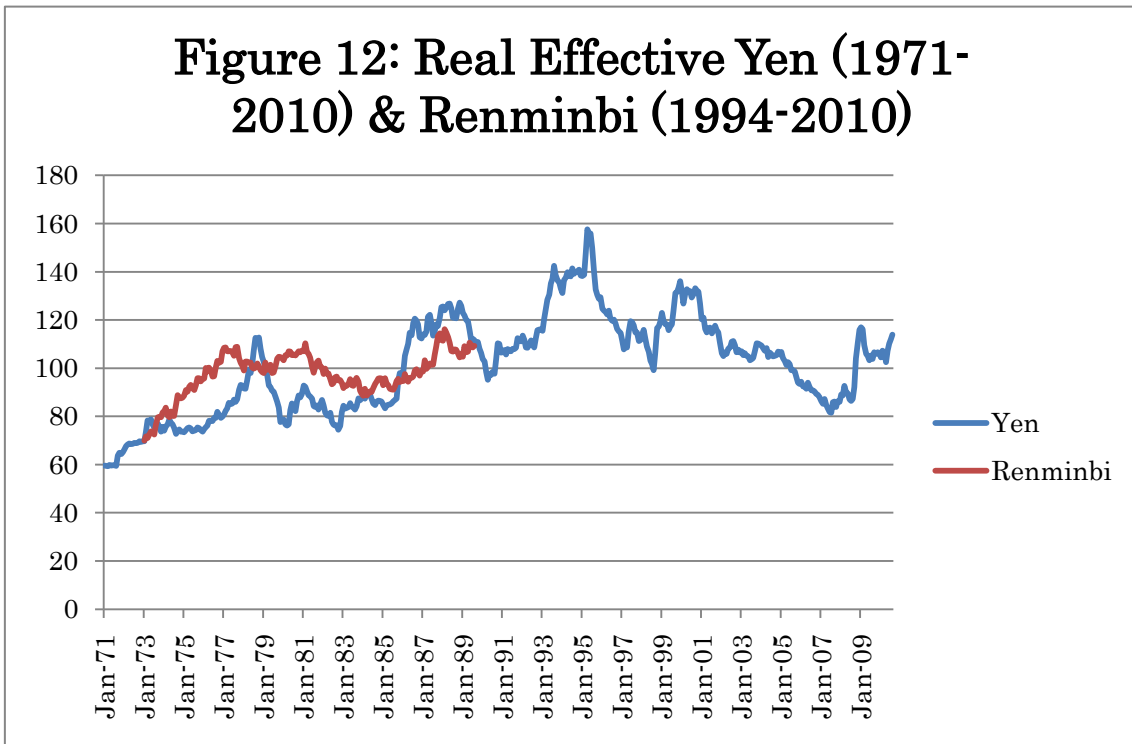


**Figure 11: Nominal Effective Yen (1971-2010) & Renminbi (1994-2010)**



Source: The Bank for International Settlements.

**Figure 12: Real Effective Yen (1971-2010) & Renminbi (1994-2010)**



Source: The same as Figure 11.