

**WOULD RMB APPRECIATION LEAD TO THE LIQUIDITYTRAP IN CHINA?
: LESSONS FROM COMPARATIVE STUDIES OF JAPAN AND GERMANY**

By

Shi Ziguo

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
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MASTER OF PUBLIC POLICY

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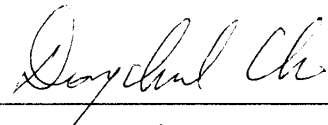
THESIS

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for the degree of

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Committee in charge:

Professor Cho, Dongchul, Supervisor



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Approval as of May, 2012

ABSTRACT

WOULD RMB APPRECIATION LEAD TO THE LIQUIDITY TRAP IN CHINA? LESSONS FROM COMPARATIVE STUDIES OF JAPAN AND GERMANY

By

Shi Ziguó

With 30 years worth of high-speed development, currently the huge trade surplus generated the pressure of Chinese Yuan (RMB) appreciation. Many researchers worry about the economic outlook of China because Japan's liquidity trap happened right after the appreciation of the Japanese Yen, and this concern has been a popular argument against RMB appreciation as well as the option of a floating exchange rate regime.

However, even though Japan and Germany experienced the same currency appreciation, only Japan fell into the liquidity trap. This comparative study shows that currency appreciation was not the reason for Japan's liquidity trap. Actually, the difference of interest rate between Japan and Germany took place right after the asset price bubbles burst in Japan, which undermined the effect of easy monetary policy in 1990s.

Currently, China is facing the same conditions as what Japan and Germany experienced from the late 1980s to the early 90s. Ever since the appreciation of RMB in July 2005, China's asset prices, like those of Japan, have rapidly increased. But China undertook monetary policies and administrative measures to prevent the rise of bubbles. Just like what was witnessed in Germany, China's interest rate and inflation rate will correlate positively with the growth rate of monetary aggregate.

In the future, if the Chinese authorities intervene in the foreign exchange market to delay the appreciation, then the market power would expect further appreciation. The continual expectation of appreciation would cause the inflow of abundant liquidity, which would increase interest and inflation rates in the long term. If no government intervention is involved in the foreign exchange rate, the capital inflow will lead the exchange rate to an equilibrium level as the market expects. Since the domestic liquidity is independent of the foreign exchange rate market, the inflation and interest rates will be immune to any fluctuations derived from the exchange rate.

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ACKNOWLEDGEMENT

This thesis was accomplished with support of many people. They contributed through stimulating ideas, sacrificing time, and giving proper motivation. I am grateful to Professor Cho, Dongchul for his time and kind help.

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List of Symbols or Abbreviations

USD: United States dollar

RMB: Renminbi the official currency of China (People's Republic of China)

GDP: Gross domestic product

CPI: Consumer price index

BOJ: Bank of Japan

IMF: International Monetary Fund

BIS: Bank for International Settlement

FDI: Foreign direct investment

1 INTRODUCTION

Ever since the elimination of the exchange control on current account transactions by the Central Bank of China in 1994, the nominal exchange rate has remained stable. Moreover, there has been a steady expansion of China's export and import during the 1990s and an accelerated growth after 2000. China's current account as well as capital and financial account have begun to post a "twin surplus" since the 1990s. In 2004, the surplus under the current account reached USD 70 billion. Meanwhile, China's surplus under the capital and financial account, including net errors and omissions, totaled USD 132 billion (People's Bank of China 2004). On July 21, 2005, the People's Bank of China announced the reform of the exchange rate regime. After a 2 percent of immediate appreciation, RMB has undergone a gradual appreciation. Up to August 2011, the RMB had appreciated to 6.3867 per dollar, which was an appreciation of about 22.87%.

The current economic situations in China are similar to those of the Japan in the late 1980s. Right after the remarkable appreciation of yen, Japan's economy slipped into the liquidity trap and the deflation slump. Some researchers (McKinnon and Ohno 2000; McKinnon and Goyal 2004) attribute the low interest rate liquidity trap to the Yen appreciation. At present, there are many similar characteristics of China's situation to that of Japan in the late 1980s, such as the huge current account surplus, high saving ratio and excessive dependence on export. So McKinnon (2005, 2006) predicts that China would follow Japan into the liquidity trap if the authorities let RMB appreciate.

However, the Deutsche Mark also appreciated in a similar proportion during the same

period of Japanese Yen appreciation. If the appreciation were the reason for liquidity trap, Germany should have gone into the liquidity trap as well. On the contrary, we have witnessed a different case in Germany.

The comparative study shows that the reason for low interest and inflation rate is not the appreciation but the monetary supply in the long run. In Germany, the easy monetary policy successfully induced the increase of the inflation rate, while Japan experienced a long period deflation. Actually the divergence of interest rate between Japan and Germany took place right after the bubble burst in Japan, which undermined the effect of easy monetary policy in 1990.

In China, since the gradual appreciation started in July 2005, the asset prices has gone up like Japan. But China's authorities took administrative measures to prevent bubbles from forming. Without the bubble forming and busting, China's easy monetary policy would increase money supply and further bid up the interest rate like what happened in Germany.

McKinnon (2006) argues that had China broadened the control on the international capital flow and interest rate, RMB appreciation would lead to capital inflow which was an impetus to reduce interest rate. In that case, the liquidity trap in Japan would recur in China. In fact, there is no direct relation between currency appreciation and interest rate in the long run. The nominal interest rate is determined by the inflation rate which is subject to the change of money supply. In the 1990s, Japan's easy monetary policies failed to increase the monetary aggregation (M2) because of the bubble burst. However, in China, the capital appreciation was stopped by administrative measures and the easy monetary policy would not fail. So the interest rate would be determined by monetary policy.

Without the weakened effect of bubble burst on monetary policies, China's interest rate and inflation rate would correlate positively with monetary policies like Germany's experience. On one hand, if the Chinese authorities intervene into the foreign exchange market to delay the appreciation, investors would expect further appreciation. Furthermore, the continued appreciation expectation would cause capital inflow and abundant liquidity. In the long run, the abundant liquidity will increase the inflation and interest rates. On the other hand, if there is no government intervention involved in the foreign exchange rate, the capital inflow would keep the exchange rate on an equilibrium level as the market expects. Since domestic liquidity is independent of the foreign exchange market, the inflation and interest rates will be immune to the fluctuation derived from the exchange rate.

This paper is intended to be organized as follows. Section 2 will review the previous studies on China's exchange rate regime and comparative studies on the appreciation of Yen and RMB. Section 3 will compare the appreciation experiences of Japan and Germany in the late 1980s as well as the aftermath of economic performances in the early 1990s. Section 4 will discuss the interest rate and determinants of inflation rate in the long run. Section 5 will review China's RMB appreciation since 2005 and analyze the trend of interest and inflation rates. Section 6 is the summary and conclusion.

2 LITERATURE REVIEW

This section summarizes the existing debates on Japan's liquidity trap, China's exchange rate regime and comparative studies on Japanese and Chinese currency appreciations.

2.1 Liquidity Trap in Japan

The concept of liquidity trap is coined by Keynes (1936), referring to a situation that the injection of money by central bank is unable to lower the interest rate when the interest rate is close to zero. When the *General Theory of Employment, Interest and Money* was first published, there were heated disputes on the concept of liquidity trap. Concerning the zero interest period of over a decade, it is generally accepted that Japan has been reduced to the liquidity trap since 1995. Nevertheless, Weberpals' study (1997) has found that although there was no evidence for the liquidity trap in Japan between 1991 and 1995, the monetary policies had less effect on the interest rate than those in other periods. In other words, Japan had been on the way to the liquidity trap from 1991 to 1995.

2.2 Debates on China's Exchange Rate Regime

Ever since 2003, China's exchange rate regime has remained a hot macroeconomic topic worldwide. Because of the accumulation of surplus in both current and capital accounts, most economists argue that the Chinese RMB has been significantly undervalued (Funk and Rahn 2005; Garton and Chang 2005). Especially the reports of the United States Congressional Research Service (Morrison and Labonte 2008, 2011; Lim, et al. 2006) claim if the Chinese authorities let the RMB exchange rate float, at the disposal of the market supply and the demand of Chinese goods, the current surplus would reduce, which would in turn alleviate the trade deficit of the United States.

However, the calculation of equilibrium level of exchange rate is still controversial. Many studies have produced different results by applying different methodologies or variables to calculate. By applying the behavioral equilibrium exchange rate model and the

permanent equilibrium exchange rate model to estimate RMB equilibrium exchange rate, Funke and Rahn (2004) have found that RMB has not been significantly undervalued.

However, some studies hold different views from those of the United States Congressional Research Service. They insist that RMB appreciation alone can not substantially change the conditions of international trade positions and reduce the trade deficit of United States, because the other emerging Asian countries will substitute for China's export (Isabelle et al.2011; McKinnon 2007; Zhou 2006). Cui (2007) states that the prices of Chinese products have been so much dominated by the prices of imports that the exchange rate appreciation can not change the prices of Chinese export products too much.

China's authorities are prudential in choosing the flexible exchange regime. After the Asian crisis, the pegged exchange rate of RMB has become the anchor of Asian economy which has not only contributed to the stability of China's financial system but also stabilized that of other Asian countries (Zhou 2003). McKinnon and Schnabl (2009) provide their advices that Chinese RMB exchange rate appreciate gradually under the conventional narrow band.

2.3 Previous Comparative Studies on Yen and RMB Appreciations

A conclusion of the comparative studies on Japan and China's experiences is that China should be careful of the possibility of liquidity trap due to currency appreciation (McKinnon and Schnabl 2003; McKinnon and Goyal 2004; McKinnon 2005, 2006; Papa 2010; Danne and Schnabl 2008) though the causes of Japan's liquidity trap are still unclear. Various studies provide different causes of the liquidity trap in Japan, such as Japanese Yen appreciation (McKinnon and Ohno 2000; McKinnon and Goyal 2004), the government

intervention on the appreciation of Japanese yen (Danne and Schnabl 2007), the collapse of asset price bubbles (Weberpals 1997; Shiratsuka 2003), and the financial deregulation (IMF 2011).

McKinnon has published a series of papers to argue that China would follow Japan into the liquidity trap. McKinnon uses the interest parity theory to analyze the impact of RMB appreciation on interest rate. The formulation is as follows:

$$i = i^* + E(\hat{\epsilon}) + \phi$$

The domestic nominal interest rate (i) is determined by the foreign nominal interest rate (i^*), the expectation of exchange rate ($E(\hat{\epsilon})$) and risk premium (ϕ). If the foreign interest rates decline and the domestic currency appreciation expectation is positive, the domestic interest rate will be bid down by the capital inflow. The long-term low interest rate policies in U.S. will involve China into the liquidity trap. The more liberalized China's financial system is, the more salient the impact of appreciation on the interest rate will become. The liberalization includes: (1) the abolishment of domestic interest rate restrictions on bank deposits and loans; (2) the removal of controls on international financial flows.

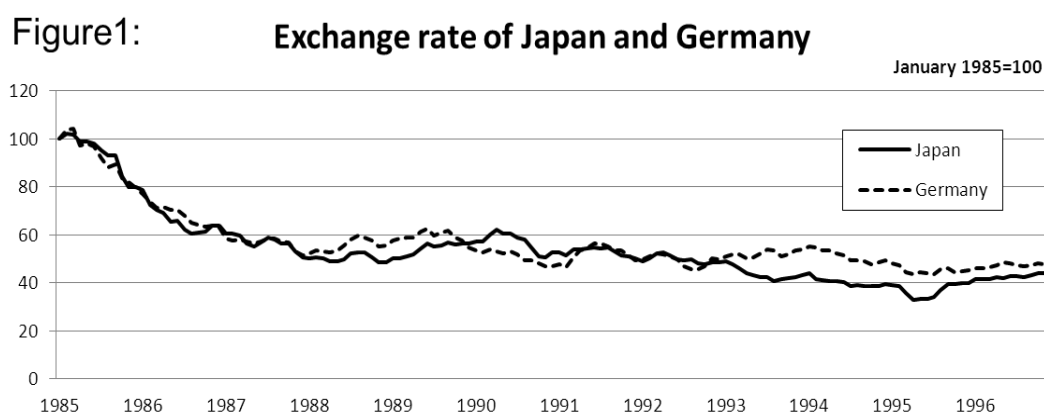
If there is unsterilized intervention on foreign exchange market, the domestic monetary base will increase and the short-term rates will go down. Otherwise, if the government intervention and capital account control are removed, the pressure from free international financial arbitrage between dollar bonds and RMB bonds will also nudge down interest rate at longer maturities (McKinnon 2006).

3 COMPARISON BETWEEN THE CASES OF JAPAN AND GERMANY

China's current conditions are similar with those of Japan and Germany in the 1980s. Some researchers believe that Yen appreciation led Japan to the liquidity trap and China would repeat Japan's liquidity trap. However, Japan and Germany experienced the same currency appreciations but only Japan went into the liquidity trap, suggesting that currency appreciation was not the cause of Japan's liquidity trap.

3.1 Similar Appreciation and Monetary Policy Responses

Japanese and German currency appreciations occurred between 1985 and 1988. After the famous Plaza Accord, the Japanese Yen appreciated by 90% from 254 per dollar to 134, and the Deutsche Mark appreciated by 68% from 3.17 per dollar to 1.89 until December 1988 (Figure 1). The GDP growth rates in both countries were battered by the downturn of exports. The authorities of both countries repeatedly tried to stem the trend and smooth the fluctuation by intervening in the US dollar market and accommodating money growth (Manfred J.M. Neumann. 1996).

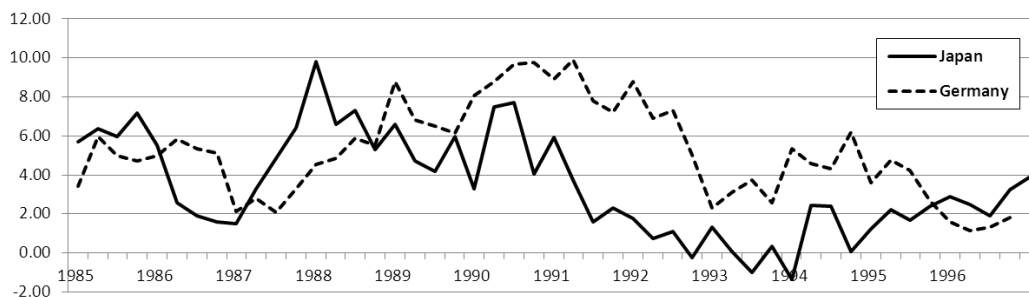


Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 1: Exchange rate of Japan and Germany

In April 1985, the growth rate of Japanese export ended its expansion and began to decline from 2.85 percent to minus 19.46 percent, which was really a big shock to the Japan's economy. The GDP growth rate of Japan collapsed from 7.16 percent in 1985Q4 to 1.86 percent in 1986Q3. Likewise, Germany experienced a similar episode to what happened in Japan. The Germany's export growth rate went down from 6.59 percent in June 1985 to minus 4.54 percent in August 1986, and the GDP growth rate decreased from 5.98 percent in 1985Q2 to 2.14 percent in 1987Q1. (Figure 2 and Figure 3)

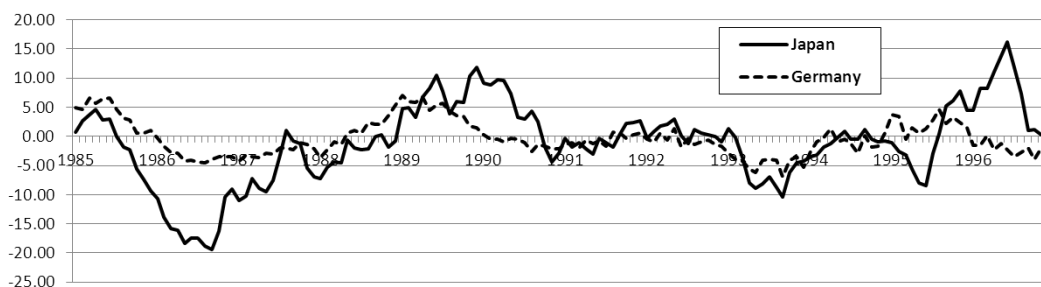
Figure2: Nominal GDP growth rate of Japan and Germany



Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 2: Nominal GDP growth rate of Japan and Germany

Figure3: Japan and Germany export growth rate

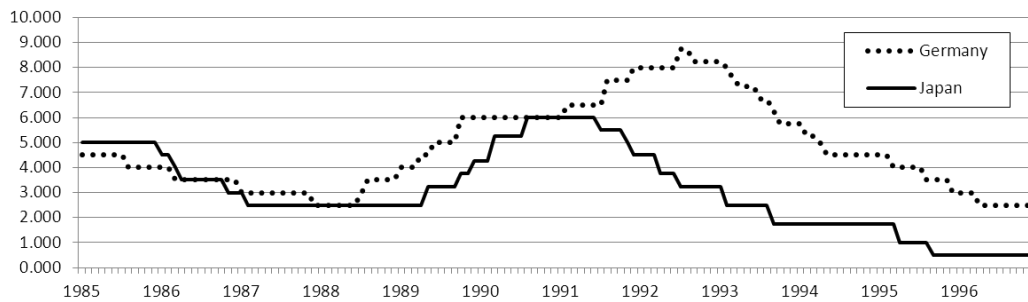


Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 3: Japan and Germany export growth rate

Both of the two countries undertook easy monetary policies in order to mitigate the downward tendency of export. The Bank of Japan executed a series of discount rate reductions, cutting the rate from 4.5 percent to 2.5 percent. Bundesbank also reduced the discount rate from 5 percent to 2.5 percent. (Figure 4)

Figure4: Japan and Germany's discount rate



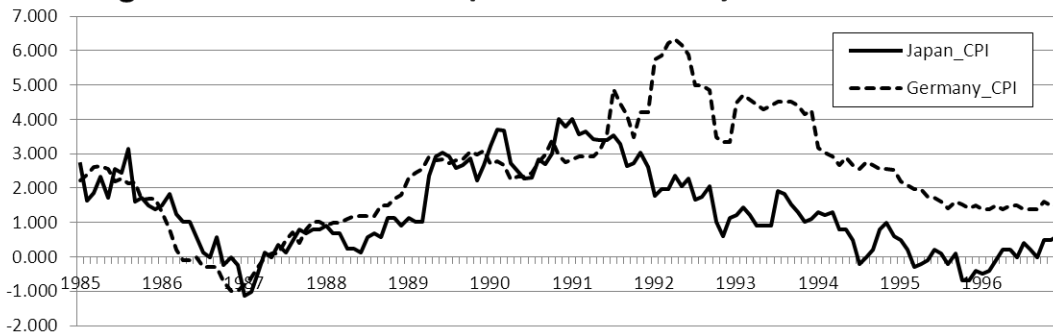
Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 4: Japan and Germany's discount rate

As a result of easy monetary policies, export and output recovered strongly. In Japan, the export growth rate increased from minus 19.46 percent in September 1986 to 11.89 in December 1989 and GDP growth rate recovered from 1.49 percent in 1987Q1 to 7.69 percent in 1990Q3. In Germany, the export growth rate rose from minus 4.54 percent in August 1996 to 6.78 percent in April 1989 and the GDP growth rate increased from 2.14 percent in 1987Q1 to 9.66 percent in 1990Q3.

During the currency appreciation period, the fluctuations in inflation and interest rates were similar in two countries (Figure 2 and Figure 3). From 1985 to 1990, their interest rates were almost the same, which fluctuated between 3 percent and 8 percent. The interest rates in both countries went down gradually after the Plaza Accord in 1985, and rebounded from 1988. The inflation rates also declined from 1985 and rebounded back from 1987. There was no sign of deflation and liquidity trap in Japan.

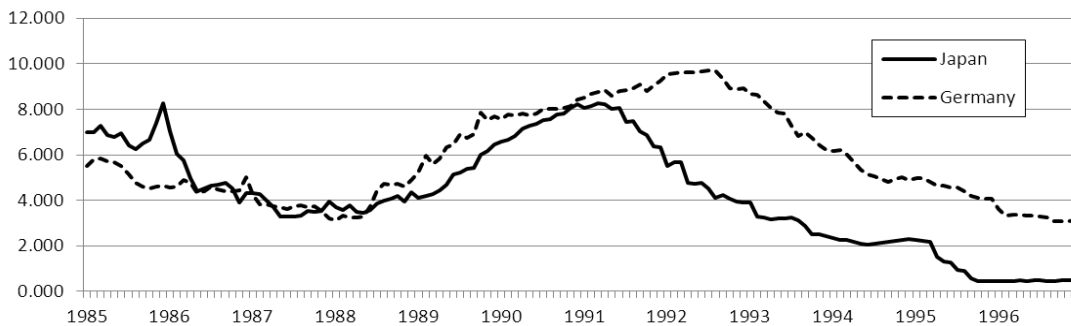
Figure5: CPI of Japan and Germany



Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 5: CPI of Japan and Germany

Figure6: Interest rate of Japan and Germany



Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 6: Interest rate of Japan and Germany

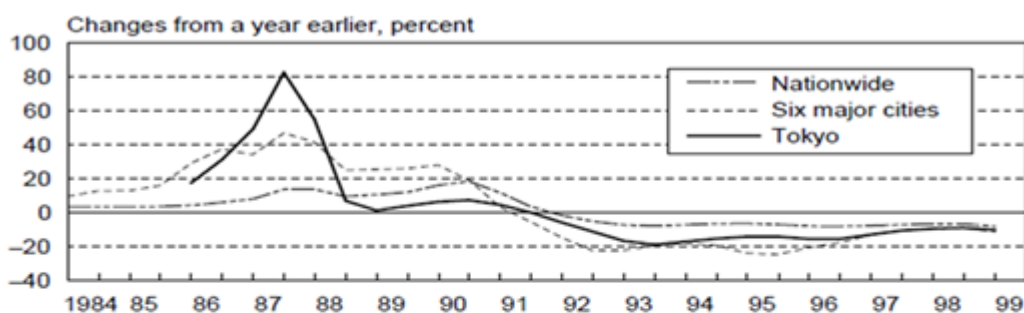
3.2 Different Capital Market Performances

3.2.1 Asset Price Bubbles in Japan

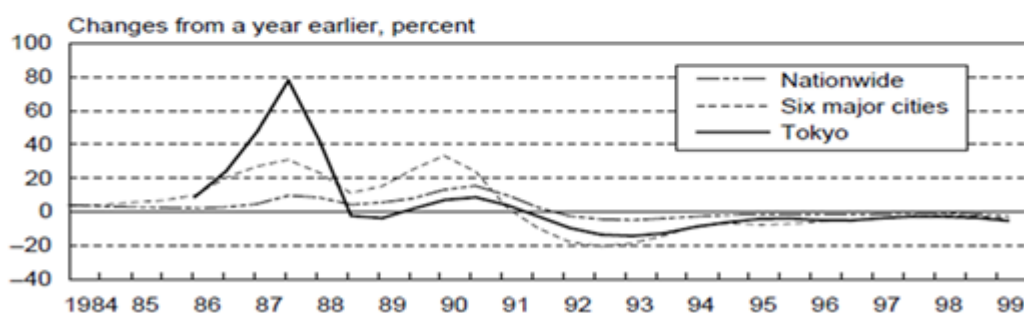
From the late 1980s to the early 1990s, Japan's asset markets experienced significant fluctuations. The prices of real estate, especially in the large cities such as Tokyo, Osaka and Nagoya, increased rapidly since 1986. Land prices went up to its peak in September 1990, nearly five times of the prices of 1985 (Figure 7). In late 1990, the total land value in Japan was estimated to be nearly \$20 trillion, which was more than 20 percent of the world's total wealth. The stock price also increased sharply, and the Nikkei 225 rose from ¥12,598 to ¥38,915 between 1985 and 1989. Then it collapsed to ¥14,309 in August 1992, more than 60 percent below the peak (Kunio et al. 2001).

Figure7: Japan's land price

[1] Commercial Land



[2] Residential Land



Source: Japan Real Estate Institute, *Urban Land Price Index*.

Citation: Kunio Okina, Masaaki Shirakawa, and Shigenori Shiratsuka 2001 *The Asset Price Bubble and Monetary Policy: Japan's Experience in the Late 1980s and the Lessons*

Figure 7: Japan's land price

In the late 1980s, both of the asset prices and the money supply increased. The economy overheated, but the consumer price, remained quite stable. From 1985 to 1990, the asset prices, including stock and land prices, increased rapidly with the money supply climbing up (Figure8). However, it was very difficult for the Bank of Japan to distinguish whether the economy was overheating. The study of the Bank of Japan (Okina et al. 2001) provided the evidence that when the bubble formed, the Bank of Japan was concerned with the inflationary pressure and adverse effects of excessively easy monetary policy at a quite early stage. Yet at that time, the inflation rate and other related indicators were stable. There seemed no sufficient reason to take tight monetary policy to slow down the increase of asset prices. Furthermore, there was no common understanding about the results of the increase in asset prices. For instance, in 1987 when asset prices increased sharply, the Bank of Japan discussed

the possibility of monetary tightening in view of concern with inflation and excessive monetary easing, but they were unable to present a sufficiently convincing argument for tightening (Okina et al. 2001). Immediately after the bubble burst, many scholars argued that the Bank of Japan should have taken tight monetary policy in an earlier stage.

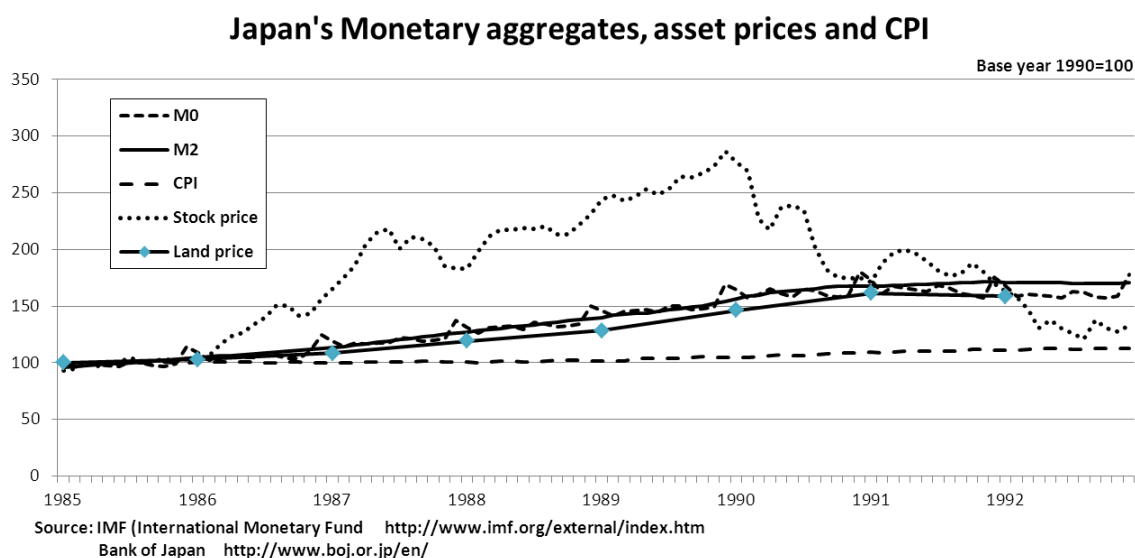
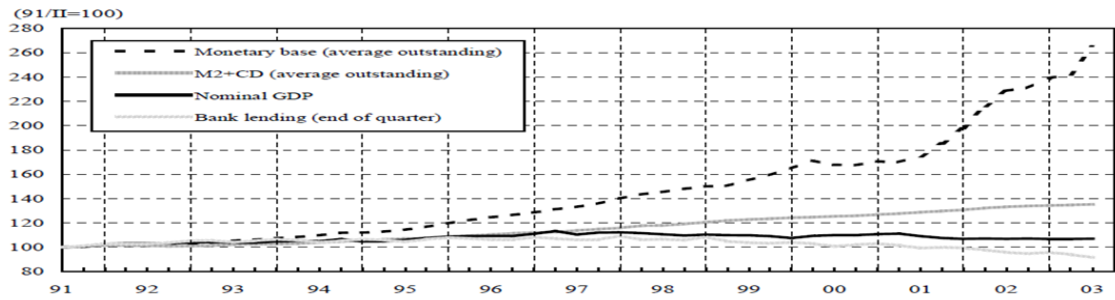


Figure 8: Japan's Monetary aggregates, asset prices and CPI

The early 1990s witnessed a sharp decrease of the asset prices. In the aftermath of the bubble bust, nonperforming loans accumulated in the financial system. The inflation and interest rates declined and the Japanese economy entered the period of deflation and zero interest rate. As the study of Okina et al. (2001) showed, the bubble burst undermined the effect of easy monetary policy. The behaviors of different money aggregates suggested that the effect of monetary easing was different and unusual, compared with that in the past. First, when the liabilities of the BOJ (monetary base) increased significantly, money supply (M2+CDs) growth rate was much lower than that of monetary base. At the same time lending funds of commercial bank were declining (Figure 9). Second, in the aspect of loan allocation, figure 10 shows that loans to manufacturing industries decreased in 1990s while loans to real estate industries rose until 1998.

Figure9: Monetary aggregates in Japan

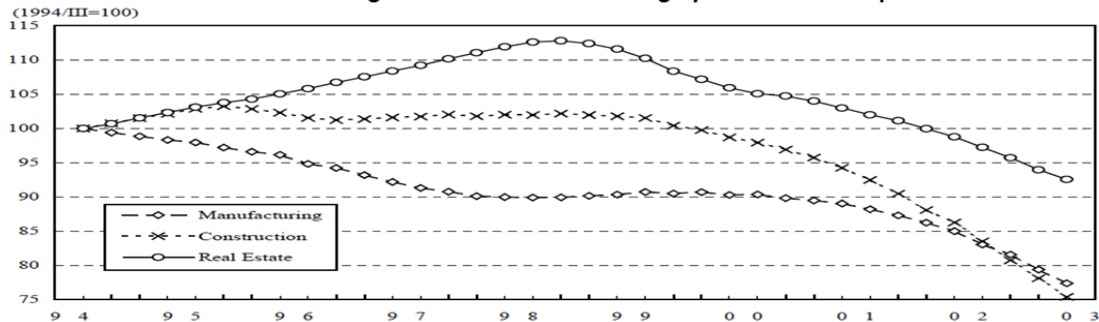


Sources: Bank of Japan, *Financial and Economic Statistics Monthly*; Cabinet Office, *Annual Report on National Accounts*.
 Notes: Figures for monetary base, M2+CD, and nominal GDP are seasonally adjusted. Figures for bank lending are seasonally non-adjusted.

Citation: Kunio Okina, Masaaki Shirakawa, and Shigenori Shiratsuka 2001 *The Asset Price Bubble and Monetary Policy: Japan's Experience In the Late 1980s and the Lessons*

Figure 9: Monetary Aggregates in Japan

Figure10: Loans outstanding by industries in Japan



Sources: Bank of Japan, *Financial and Economic Statistics Monthly*.

Citation: Kunio Okina, Masaaki Shirakawa, and Shigenori Shiratsuka 2001 *The Asset Price Bubble and Monetary Policy: Japan's Experience In the Late 1980s and the Lessons*

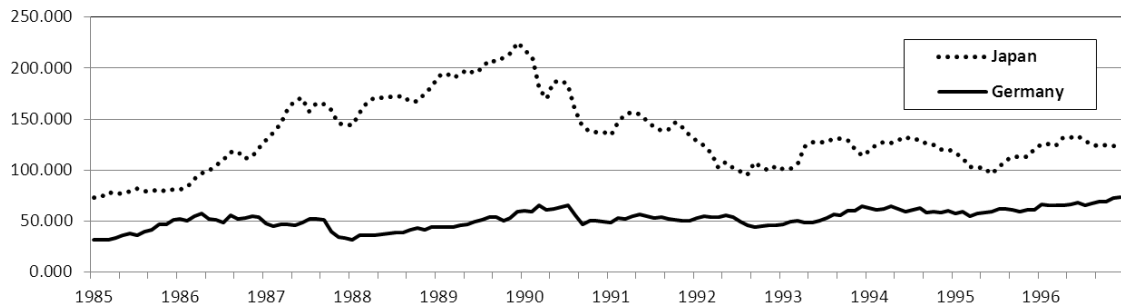
Figure 10: Loans outstanding by industries in Japan

The loans to real estate, which contained implicit risks, eroded the capital bases of financial institutions and reduced their risk-taking capabilities. To avoid realizing the losses from non-performing loans, financial institutions continued to supply credits to unprofitable companies, leaving little resources that could be provided for profitable ones. After the bubble burst, the monetary easing could not effectively counterbalance the downward spiral of the economy. The effects of interest rate cuts on the money supply was reduced, because of the negative impacts of worsened balance sheets of the firms as well as banks.

3.2.2 Capital Market Stability in Germany

During the same period, however, German stock market and real estate markets remained quite stable. According to the data from IMF, the German stock price index rose only 75.31 percent while that of Japan tripled (Figure 11). The real estate price index was also much more stable than that in Japan. As figure 12 and figure 13 shows, the highest annual growth rate of German land and housing prices was smaller than 10 percent.

Figure11: Stock prices of Japan and Germany



Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 11: Stock prices of Japan and Germany

Figure12: The growth rate of Germany's land price

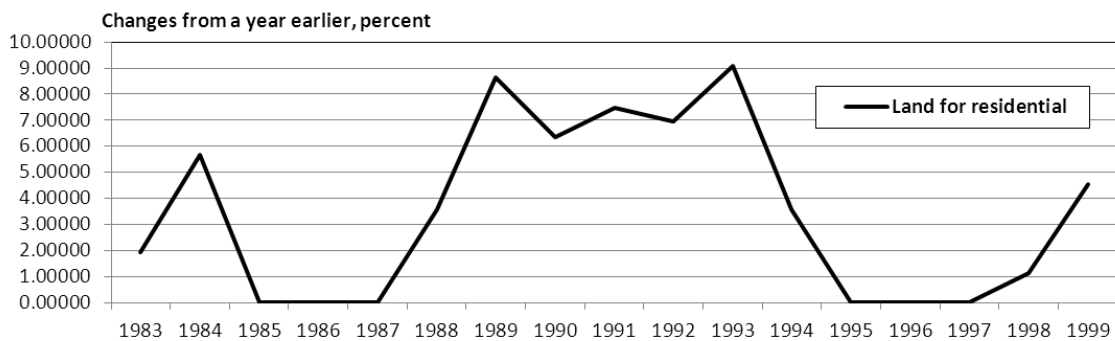
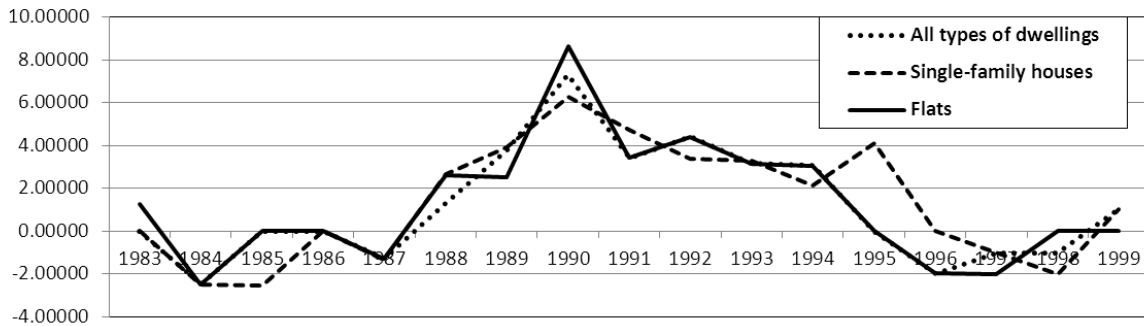


Figure 12: The growth rate of Germany's land price

Figure13: The growth rate of Germany's house price



Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 13: The growth rate of Germany's house price

From 1991 to 1998, the growth rate of house loans to domestic enterprise and resident individuals was not remarkably higher than those to other industries. The data from BIS (Bank for International Settlement) show that the growth rate of house loan was not as high as that of Japan, though higher than the total loan (figure 14). As figure 15 shows, the growth rate of M3 didn't significantly deviate from that of monetary base.

Figure14: Loan outstanding by industries in Germany

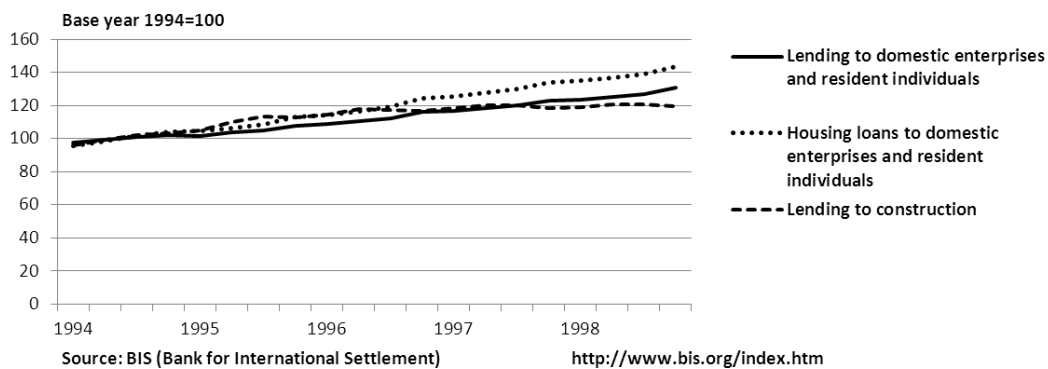


Figure 14: Loan outstanding by industries in Germany

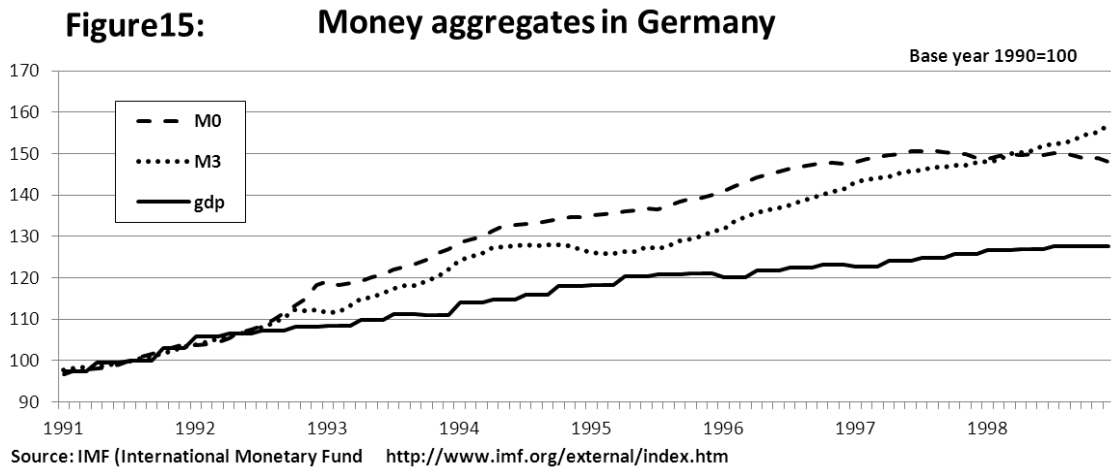


Figure 15: Money aggregates in Germany

3.3 Divergence between Japan's and Germany's Interest and Inflation Rates

The divergences of Japan's and Germany's interest and inflation rates started in 1991 (Figure 5 and Figure 6). Since September 1993, Japan's interest rate had been sustaining lower than 3%, and became even lower than 2% in April 1995 (Figure 6), which was actually the sign of a possible liquidity trap. However, from 1991 to 1996, there was not much appreciation of the exchange rates in Japan and Germany. The Japanese Yen appreciated 17.7% from 134 to 114 per dollar and the Deutsche Mark fluctuated from 1.8 to 1.4 per U.S. dollar (Figure 1).

McKinnon (2003) attributes the liquidity trap to the appreciation of the Yen, which led to the arbitrage behavior of market; however, data from 1985 to 1996 proves that McKinnon's explanation is unreliable. In 1985, the exchange rates of Japan and Germany experienced sharp appreciations and robust appreciation expectations. It can be seen that the interest rates rose from 1987 to 1990 in Japan and Germany. In 1991, both countries' interest rates decreased gradually, but Germany's interest rate was about 2% higher than that of Japan. If it was market arbitrage behavior that bade down Japan's interest rate, then it would be a

short-term effect and the interest rate would fall right after the appreciation appeared. The timespan from 1985 to 1991 was too long to attribute the interest rate decrease to the Yen appreciation expectation.

Faced with similar appreciations, Japan was fell into the liquidity trap, whereas Germany's economic performance was much better. The interest rates of Japan and Germany diverged around 1991. Although both countries' interest rates decreased, the German interest rate was significantly higher than that of Japan since 1991. After the downturn period, Japan entered the era of zero interest rate. From 1985 to 1991, both countries experienced rapid appreciations following the downtrend of exports and GDP growth rates. Then, the easy monetary policies were conducted and a strong recovery was achieved; however, when Japan's famous bubble burst, the difference between the interest rates of Japan and Germany began and continued into the long term.

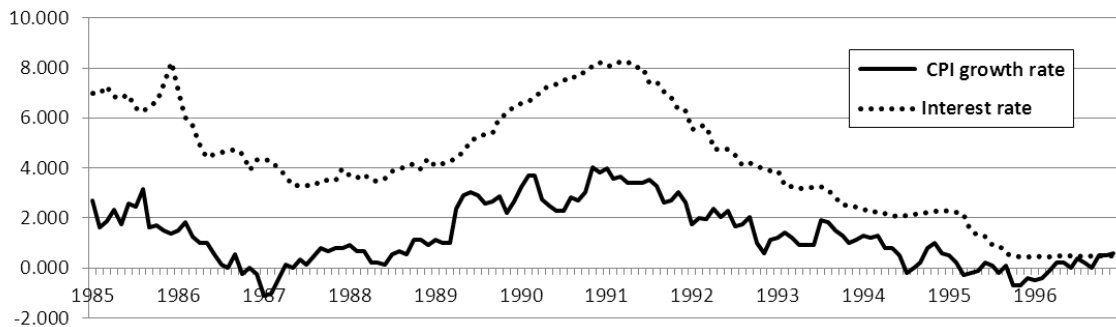
4 LONG-TERM DETERMINANTS OF THE INTEREST RATE

According to the Fisher's (1907) theory, long-term nominal interest rates are determined by two factors: (1) real interest rate, and (2) expected inflation rate. The Fisher equation is:

$$r_r = r_n - \pi_e$$

This means that the nominal interest rate (r_n) minus the expected rate of inflation (π_e) equals the real interest rate (r_r). If r_r is assumed constant, r_n must rise when π_e rises. There is a one-to-one adjustment of the nominal interest rate to the expected inflation rate. The data of Japan and Germany show that the interest rate perfectly correlates with the inflation rate (Figures 16 and 17).

Figure16: CPI growth rate and interest rate in Japan



Source: IMF (International Monetary Fund <http://www.imf.org/external/index.htm>)

Figure 16: CPI growth rate and interest rate in Japan

Figure17: CPI growth rate and interest rate in Germany

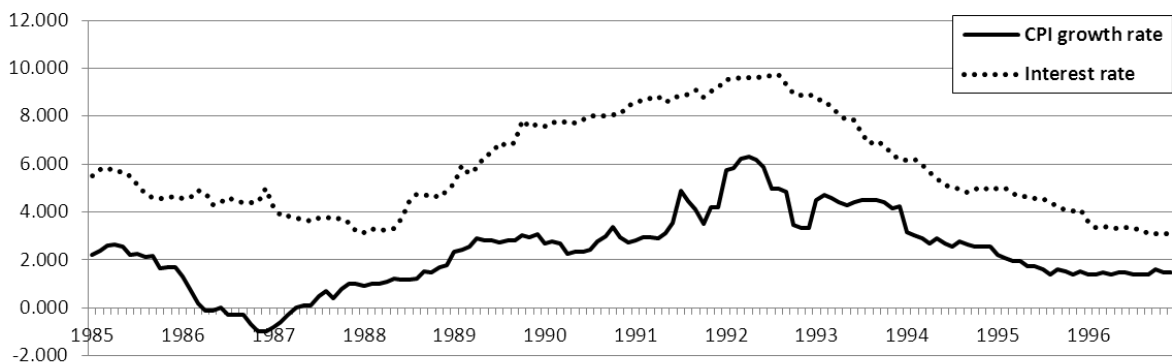


Figure 17: CPI growth rate and interest rate in Germany

Since Friedman (1956) and Lucas (1980) established their “quantity theory”, the one-to-one relationship between long-term inflation and money supply has been generally accepted.

$$\text{Money} \times \text{Velocity} = \text{Price} \times \text{Output}$$

Given an income velocity of money (Velocity) that is constant, the price will be determined by the money aggregate and the amount of output.

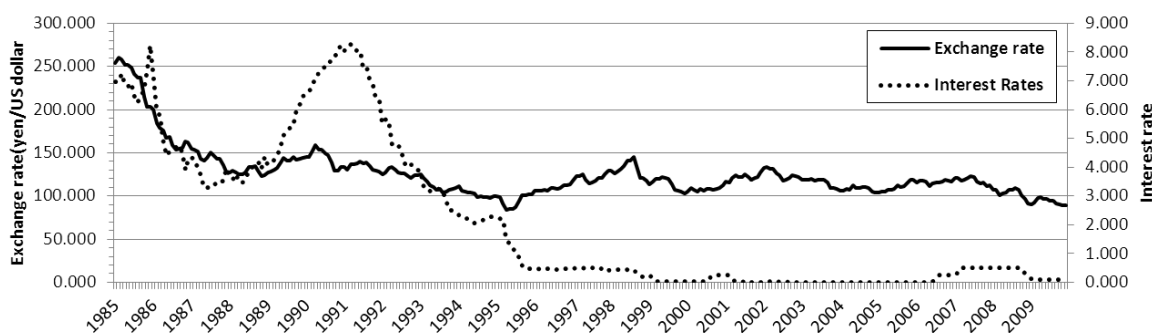
If we let ‘M2’ stand for the money aggregate, ‘consumer price level’ for price level and ‘GDP’ for the output, it can be found that the quantity theory held true in both Japan and Germany at the every period. Japan’s deflation was caused by the failure of expanding money

supply (M2) through easy monetary policy because the commercial banks were unwilling to lend money when the bubble burst.

Based on the principle of interest parity, McKinnon (2003) forms a model of the liquidity trap with international arbitrage. This model was developed through his analysis provided in Section 2. In this model, the Japanese nominal interest rate is determined by the expected appreciation of Yen against the Dollar, as well as the American nominal interest rate. McKinnon applies this model to explain the relationship between Japanese Yen appreciation and the liquidity trap. This model, however, does not explain why Germany did not fall into the liquidity trap with similar appreciation during the same period.

Actually, the interest parity model only holds true in the short run. McKinnon's explanation simply assumes that the continuous appreciation expectation would make the short-term effect appear again and again. According to McKinnon (2003, 2006), the expectation of Japanese Yen appreciation attracted capital inflow from foreign countries, which further bade the domestic interest rate lower than the foreign interest rate. If the expectation was rational, then the appreciation expectation would be stronger when the Japanese Yen appreciated faster, and more capital inflow would widen the gap between the domestic and foreign interest rates. From 1985 to 2000, Japan's exchange rate was not appreciating in a straightforward manner (Figure 18). As the graph shows, if the expectation was rational, there would be several periods of depreciation leading to the depreciation expectation, and more capital inflow would widen the gap between domestic and foreign interest rates; however, Japan's low interest rate remained relatively stable from 1995 to 2009 and was not affected by the exchange rate.

Figure18: Japan's exchange rate and interest rate



Source: IMF (International Monetary Fund) <http://www.imf.org/external/index.htm>

Figure 18: Japan's exchange rate and interest rate

The Deutsche Mark experienced similar appreciation as the Japanese Yen from 1985 to 1998. Germany's interest rate decreased from 9.72% to 3.08% between August 1992 and October 1996; it did not drop below 3.08% until 1998, when the Euro currency system was established.

5 IMPLICATIONS FOR CHINA

The “equilibrium” value of RMB and its alleged undervaluation has been discussed in many papers, but it is very difficult to get a common view. Therefore, this paper will mainly discuss the effect of RMB appreciation rather than its “equilibrium” value. After thirty years of rapid development, huge trade surplus increased economic imbalances in China, and it also increased the risk of financial instability. At present, China pursues a crawling exchange rate regime both at the expense of the autonomy of monetary policy and the effectiveness of financial system.

5.1 Past Appreciation and Monetary Sterilization

5.1.1 From the Hard Peg Regime to the Crawled Pegged Regime

Until 1994, China's authorities controlled both current and capital account transactions.

There were multiple exchange rates in China, including the official exchange rate and market exchange rate. International trade could only be conducted by state-owned enterprises. In that sense, strong capital control separated domestic prices from international markets.

In 1994, China's central bank eliminated exchange controls on current account transactions and unified the exchange rate at 8.7 Yuan per dollar. By 1995, the nominal exchange rate had decreased to about 8.28 and remained stable for the next decade. During the 1990s, China's export and import maintained a steady expansion, and after 2000, experienced accelerated growth.

The rapid increase of current accounts led to the pressure of appreciation from the internal and the external fronts. On the international front, with the United States and Japan as representatives, the developed countries were critical of China's cheap manufacturing products. They argued that the low price of Made in China brought about the continual trade surplus so the RMB should be revalued. On the domestic front, because of the condition of ongoing dual surplus, the People's Bank of China has to issue additional RMB for buying the foreign currency in order to maintain the stable exchange rate, which not only significantly increased monetary base, but also distorted the RMB exchange rate formation mechanism. With the RMB appreciation expectation, lots of hot money flow into China through various channels and posed serious threat to financial system. Therefore, the RMB exchange rate reform is imperative. On July 21, 2005, the People's Bank of China announced the reform of exchange rate regime: an immediate appreciation by 2 percent, moving towards a more flexible regime. Up to August 2011, the exchange rate of RMB had appreciated to 6.3867 per dollar gradually, about 22.87 percent (Figure 19).

Figure19: China's exchange rate

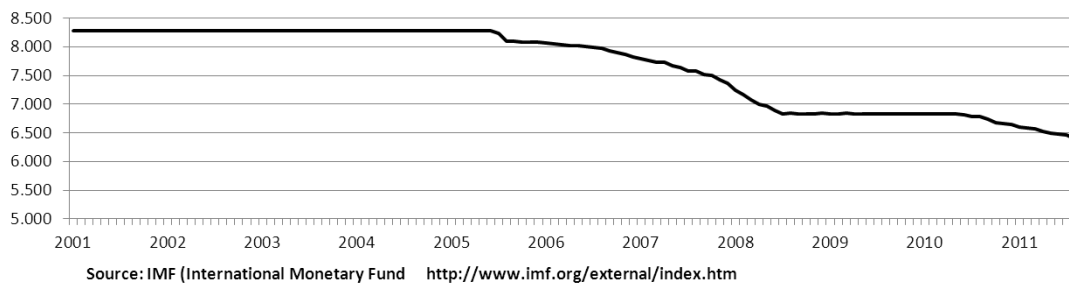


Figure 19: China's exchange rate

5.1.2 Monetary Supporting Measure for the Pegged Regime

China's central bank had to conduct an intervention in the exchange market to maintain the gradual appreciation of RMB. With the increase of current account surplus and capital inflow, China's central bank had to purchase foreign currency by issuing RMB, which has now in turn caused the rapid accumulation of foreign exchange reserve. This measure stirs liquidity growth in the financial system and a credit boom. The liquidity growth will ultimately bid up the inflation rate.

To stabilize the economy, China's central bank has to sterilize the liquidity growth. The monetary policy instruments include open market operation and the placement of reserve requirements on commercial banks.

China's open market operation is different from that of developed countries. Open market operation concentrates on government bonds and treasury bonds in developed countries. In China, though, the category of government bonds is inadequate and the remaining amount of treasury bills is very small, too. Since 2003, the People's Bank of China has issued central bank paper as a new tool of open market operation. In addition, it has also issued the targeted central bank paper to commercial banks, which has significantly enhanced their loan-making abilities.

The deposit reserve requirement on commercial banks is another important monetary tool for the People's Bank of China to reduce abundant liquidity in money markets. Since June 2006, the People's Bank of China has been raising the deposit requirement reserve ratio to tighten the liquidity that rose from 7.5 to 20 percent from July 2006 to March 2011 (Figure 20). It will freeze 12.5 percent of the total deposit in commercial banks, about 9.6 trillion Yuan (1.46 trillion USD according to average exchange rate in March 2011).

5.2 Unsustainability of China's Current Crawled Pegged Regime

5.2.1 Crawled Pegging Sacrifices Monetary Policy Autonomy

According to Mundell's impossible trinity theory, A country cannot simultaneously achieve the free movement of capital, monetary policy autonomy and exchange rate stability. In order to maintain monetary policy autonomy and exchange rate stability, Chinese monetary authorities have to implement a strict control of capital flows. However, under the conditions of free international trade and increase of foreign direct investment, capital controls become more and more difficult.

It is very hard to distinguish speculative ventures, which can flow in or out of China through the trade of goods and services, direct investment, portfolio investment, foreign debt and other items, from funds that are intended for real trade and investment. Capital control cannot completely prevent the inflow of capital intending to speculate on the appreciation of RMB. A report (2010) from State Administration of Foreign Exchange of China estimates that, due to Asia's financial crisis, the total hot money outflow from 1994 to 2002 was USD 400 billion; since 2003, driven by the expectation of RMB unilateral appreciation, the hot

money inflow had accumulated to 300 billion by 2010. (Calculation: Hot money = increment of foreign reserve – (trade surplus + FDI + gains from overseas investments + domestic companies' total equity capital rising from foreign market)).

For Chinese monetary authorities it is not easy to maintain a fixed exchange rate regime and a sovereign monetary policy simultaneously. China's crawled pegging regime sacrifices the autonomy of its monetary policy both in the short and the long run.

In the short term, Chinese authorities have to concern the uncovered interest parity effects. To pursue an optimal portfolio, the arbitrage money will flow into China if the profit gained from the interest differential between RMB and foreign currencies exceeds the transaction cost. Thus, the only option for the People's Bank of China is to keep the interest rate of RMB lower than that of other currencies, especially the USD.

In the long term, the abundant liquidity caused by the exchange rate intervention would lead to an increase in the inflation rate. Figure 20 shows that China's inflation rate reached 6% in 2011. To deal with the high inflation, the People's Bank of China had to tighten up liquidity by open market operations and increase the deposit reserve requirements on commercial banks, both of which brought about an added cost from the worsened economic efficiency.

5.2.2 Administrative Measures Eroding Economic Efficiency

The People's Bank of China issues the central bank paper to the commercial bank through the inter-bank loan market to offset the abundant liquidity that arose from the intervention with the foreign exchange market. The central bank has to pay the market interest rate for the buyer. The rapid increase of central bank paper may bid up the market

interest rate, which will be the direct cost induced by intervention in the foreign exchange market.

The reserve requirements will freeze commercial banks' loanable money. There are negative impacts on both the profitability of commercial banks and the efficiency of the economy. In China, most of the profits of commercial banks come from the difference between the lending and deposit rates; therefore, a reduction in the lending amount will weaken the capacity for profit. This shortage of loanable money will also result in the commercial banks' preference for lending to big companies, since they will be regarded as less risky. This tendency, in turn, will affect small and medium-sized enterprises, which may have higher growth potential. In that sense, the distortion will finally erode the efficiency of whole economy.

5.3 Which Way for China – German or Japanese?

Currently, China is facing similar conditions to those of Japan and Germany from the late 1980s to the early 1990s. Since the RMB appreciated in July 2005, the economy has experienced rapid asset price increases as in Japan; however, China undertook monetary policies and administrative measures to hamper the accumulation of the asset price bubbles.

5.3.1 Stock Market Fluctuation in China

China's stock price experienced a sharp increase from 2005 to 2007, but the authorities halted the increase through both monetary policies and administrative measures. Ever since the People's Bank of China announced the reform of the exchange rate regime, the RMB has appreciated gradually, and this has given rise to further appreciation expectation. Stock prices began to rapidly increase in 2006. From January 2006 to October 2007, the stock price

increased by 377 percent, and then the bubble began to collapse (Figure 20). The sharp increase of stock prices and the rise of the inflation rate induced tight money policies. The People's Bank of China raised the commercial bank deposit interest rate from 2.25 to 3.87 percent and the lending rate from 5.58 to 7.29 percent. The reserve requirement ratio for the deposit in commercial banks increased from 8 to 13 percent. The People's Bank of China accelerated the frequency of tight monetary policies, especially before the bubble burst; and what's more, both interest rates and reserve requirement ratio increased every month from July to September 2007. Interestingly, the stock price rose almost immediately after the announcement of the tight monetary policy. Finally, the Ministry of Finance increased the stamp duty on stock transaction from 0.1 to 0.3 percent on May, 30th 2007. Then, the stock price fell rapidly. Many Chinese investors believe that it was the increase in stamp duty rather than the monetary policies that actually caused the collapse of stock price.

Figure 20: China's monetary response to the consumer price and stock price

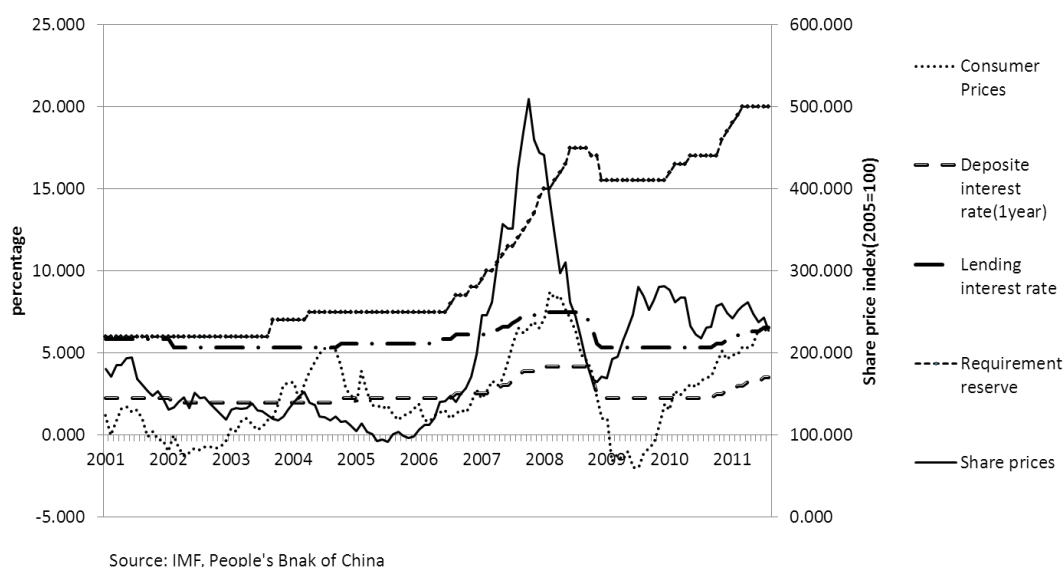


Figure 20: China's monetary response to the consumer price and stock price

It is difficult to clearly ascertain whether the monetary policy or stamp duty adjustment

has hindered stock prices from increasing, but it is generally hypothesized that government intervention is the main reason for the bubble's collapse.

5.3.2 House Price Increase and Strict Real Estate Market Regulations

Facing a rapid increase in housing prices, the authorities used both financial and administrative policies to prevent the bubble from growing. China's real estate market has experienced a rapid price increase since 1998. According to the BBAV Research (2011), housing prices doubled from 2001 to 2010 while the ratio of rents grew only 30% (Figure 21). Compared to the international bubble experiences, China's housing prices did not rise as much as in other countries (Figure 22), but China's authorities considered that the rise in the housing prices was too fast to be sustainable and thus took four kinds of measures to lessen it. The first measure was to increase the mortgage interest rate and down payment ratio. The State Council increased the minimum mortgage interest rate from 70 percent of benchmark interest rate to 1.1 times. Meanwhile, the down payment for buying a second house rose from 30 to 60 percent. The second measure was increasing the transaction tax to limit speculations. The government started to charge 5 percent of the house price for the business tax, provided that the sale took place less than 5 years after the purchase. The third measure was administrative restrictions on the purchase of house. In large and medium-sized cities, if a family had 2 or more houses, they were prohibited from buying any additional ones. The fourth measure was to provide more public houses. The 12th Five-Year Plan of 2011-2015 announced construction of 36 million units of public housing in the next 5 years. The effect of these measurements emerged gradually. Figure 23 shows that there is no more rapid growth in 2011.

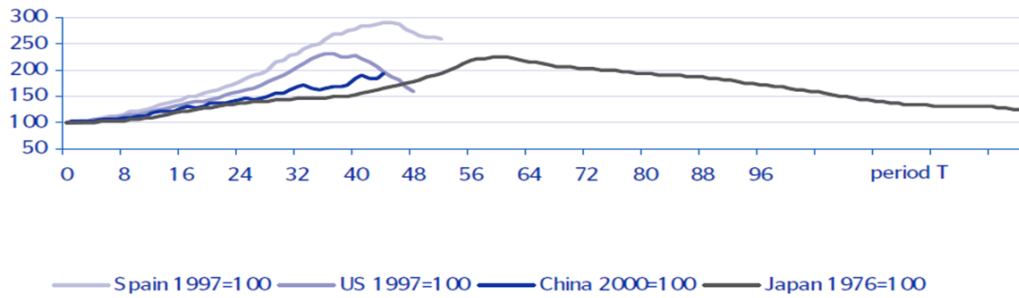
Figure21: Residential property rental index in China



Source: NBS, CEIC and BBVA Research

Figure 21: Residential property rental index in China

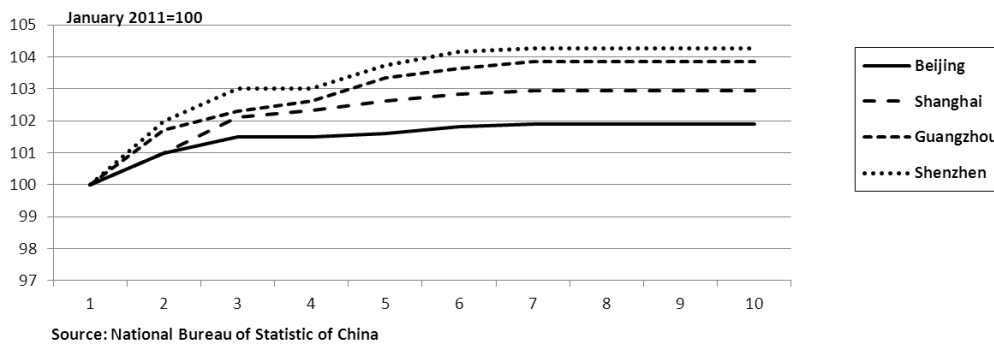
Figure22: International comparison of price bubbles



Source: CEIC and BBVA Research

Figure 22: International comparison of price bubbles

Figure23: China's house price in big cities (2011)



Source: National Bureau of Statistic of China

Figure 23: China's house price in big cities (2011)

Japan's bubble between the late 1980s and the early 1990s had three characteristics: a rapid rise in asset prices, the overheating of economic activities, and a sizable increase in money supply and credit (Okina et al., 2001). China also experienced a rapid rise in asset prices from 2005 to 2010, but Chinese authorities used the monetary policies and administrative measures to puncture the bubble in advance. As a result, the asset price fluctuation did not significantly weaken the effect of monetary policies.

5.3.3 Inflation Rate Increase with Currency Appreciation

The Chinese Yuan appreciated 22.87 percent from July 2005 to August 2011. Like what was witnessed in Japan and Germany, asset prices rose though the trend was disturbed by the global financial crisis in 2008. Unlike Japan's stable inflation rate during the period of asset price appreciation, China's inflation rate shared the same upward trend as asset prices.

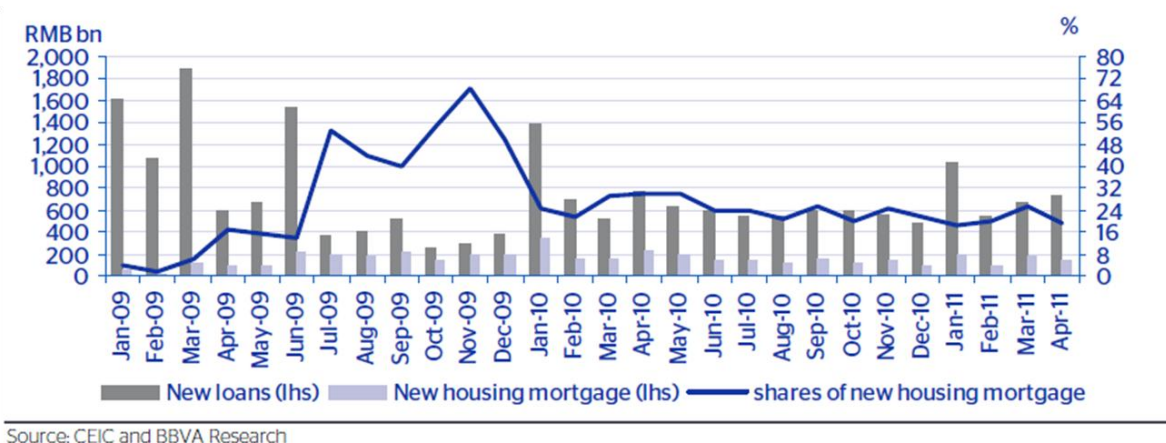
There is no sign that the increase of asset prices has weakened the effect of easy monetary policy. The money supply (M2) did not deviate significantly from the monetary base (M1) (Figure 24). Because of the administrative measure on controlling the housing prices, the amount of new mortgage loans has remained stable since 2010, and the share of new mortgages in the total of new loans has declined since 2009 (Figure 25).



Figure 24: Monetary aggregates in China

Figure25:

New Mortgage Loans in China



Source: CEIC and BBVA Research

Figure 25: New mortgage loans in China

6 SUMMARY AND CONCLUSION

Japan’s liquidity trap happened immediately after the appreciation of the Japanese Yen, which has been referred to as a supporting evidence for the popular argument against RMB appreciation and a floating exchange rate regime. However, the comparison between the experiences of Japan and Germany shows that the appreciation of the Japanese Yen was not the cause of Japan’s liquidity trap. Similar appreciations of domestic currencies led to different economic performances in Japan and Germany.

Right after the burst of Japan’s asset price bubbles between 1990 and 1991, Japan’s inflation and interest rates diverged from those of Germany. The determinant of this divergence was the burst of asset price bubbles. From the late 1980s to the early 90s, Japan’s asset market experienced significant fluctuations. In the late 80s, asset prices surged and the money supply increased as well. The economy overheated, but the consumer price and major indicators of the economy remained quite stable. After the bubble burst in the early 90s, the asset prices decreased sharply. In the aftermath of the bubble burst, nonperforming loans

accumulated in the financial system. Then, the inflation rate and interest rate declined and the Japanese economy entered the era of zero interest rate.

The differences between Japanese and German interest rates stemmed from the different effects of easy monetary policies. In the early 1990s, both countries issued easy monetary policies, but the results differed. Germany successfully increased the money supply, whereas Japan failed due to the bubble's burst in 1990s. According to the Fisher's theory, the long-term interest rate is determined by the inflation rate, and the inflation rate is determined by money supply (M2). Given the income velocity of money being constant, the price will be determined by the money aggregate and the amount of output. The growth rate of output always remains stable, whereas the inflation rate changes with the growth rate of money supply.

For China, indeed, there has been an accumulation of asset prices since the gradual appreciation in 2005, similar to Japan's experience in the late 1980s. Nevertheless, China's authorities implemented monetary policies and administrative measures to puncture the stock price bubble and dampen the increase of real estate prices.

As discussed in previous sections of this paper, China's current crawled peg regime is not sustainable due to the weakening effectiveness of capital control and the sacrifice of autonomy and economic efficiency. Financial liberalization is the ultimate way out for sustainable economic development. In this respect, the paper draws a different conclusion from that of McKinnon (2006) though sharing the same assumption. It is assumed in this paper that the restrictions on commercial bank deposits and lending interest rates as well as the controls on international capital movements are removed. Two different outcomes on the

inflation rate and the interest rate can occur, depending on whether there is government intervention on foreign exchange rate or not. Firstly, if the authorities of China intervene in the foreign exchange market to delay the appreciation, the market will expect further appreciation. The expectation of continuous appreciation will cause capital inflow and will result in abundant liquidity. In the long run, the abundant liquidity will lead to the increase of the inflation rate and the interest rate. Secondly, if there is no government intervention in the foreign exchange rate, then capital inflow will lead the exchange rate to an equilibrium level as the market expects. The domestic liquidity will become independent from the foreign exchange market, so the inflation rate and interest rate will be immune to the fluctuation of the exchange rate. Thus, the liquidity trap is only the case of Japan. Japan's story will not have to be retold in China.

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