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An Analysis of the Appreciation of the Chinese Currency and Influences on China's Economy

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**An Analysis of the Appreciation of the Chinese Currency and Influences on
China's Economy**

A Thesis Presented to
the Faculty of Social Sciences
University of Denver

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

By
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Title: An Analysis of the Appreciation of the Chinese Currency and Influences on China's Economy

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ABSTRACT

In recent years, China's economy development has had more and more impact on the global economy. The Chinese currency continued to appreciate since 2005, which has had both positive and negative results on Chinese's economy. The Chinese government uses the monetary policy to control the inflation pressure, which could work counter to Chinese exchange rate policy. RMB appreciation also has some effects on the Chinese banking system. Through the Global Trade Analysis Project (GTAP), a global computable general equilibrium model, we analyze how, when there is RMB appreciation, the Chinese exports and imports, and Chinese employment and income inequality react. The model suggests that exchange rate appreciation would reduce the effectiveness of monetary policy, and also have a negative relationship with the employment rate and income inequality. RMB appreciation might have a little positive effect on housing price increases; it's good for real estate investment, but needs to be controlled in case the housing bubble bursts. RMB appreciation should help to keep overall inflation lower, the trade balance between the U.S. and China will only have a

small effect by RMB appreciation, and if the currency appreciation is combined with other reforms instead of appreciation alone, that would boost the global economy. If China is able to allow rising real wages in a way that increases domestic consumption, the negative effects of RMB appreciation on employment in China may be offset.

Keywords: China, exchange rate, monetary policy, Renminbi appreciation, economic impacts.

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ACRONYMS AND ABBREVIATIONS

PBC	People's Bank of China
PPP	Purchasing Power Parity
GTAP	Global Trade Analysis Project
GDP	Gross Domestic Product
MME	Money Market Equilibrium
MEC	Marginal Efficiency of Capital
CME	Commodity Market Equilibrium
OME	Open Economy Multiplier
BOP	Balance of Payment
ER	Exchange Rate
RRR	Reserve Requirement Ratio
SHIBOR	Shanghai Interbank Offered Rate
FDI	Foreign Direct Investment
WTO	World Trade Organization
CGE	Computable General Equilibrium
GMM	Generalized Method of Moments
IMF	International Monetary Fund
VAR	Value at Risk

CHAPTER ONE: INTRODUCTION

1.1 Background

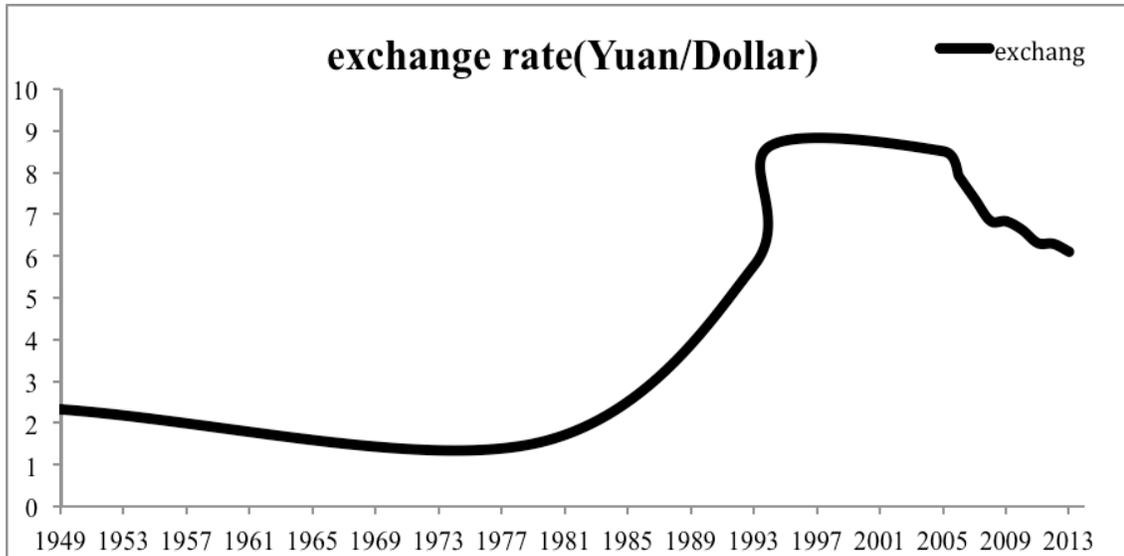
From 1949 until the late 1970s, the Chinese exchange rate was fixed at a highly overvalued level, 1.5 Yuan per US dollar. but Since 1978 as the economic reforms began, reforms of China's exchange rate regime have been a key factor underlying the country's growing participation in global trade. In the following 15 years, the government used several methods like depreciating the exchange rate to boost exports. On January 1, 1994, the government unified the official and swap market rates to RMB 8.7, afterwards the Yuan kept appreciating; it was 8.30 Yuan/dollar in 1995 and 8.28 Yuan/dollar in 1997. Since then, the Chinese government fixed the exchange rate at 8.27 Yuan/dollar to prevent the deterioration of regional exchange rate depreciation competition until 2005. On July 21, 2005, China adopted a new currency regime: RMB's exchange rate would become "adjustable, based on market supply and demand with reference to exchange rate movements of currencies in a basket". In May 2007, the Chinese central bank increased the flexibility of RMB exchange rate by adjusting the daily fluctuation range from +/-0.3% to +/-0.5%. From 2005 to 2008, the Yuan appreciated 21% and the real exchange rate of RMB appreciated 16%. The exchange rate stayed around 6.84 Yuan/dollar for

almost two years because of the global financial crisis, until 2010, the daily fluctuation range increased to +/-1%. (Table 1.1) Since January 2014, Chinese currency starts depreciation. It has gone up and down, but overall, it has depreciated.

Table 1.1 The exchange rate of China

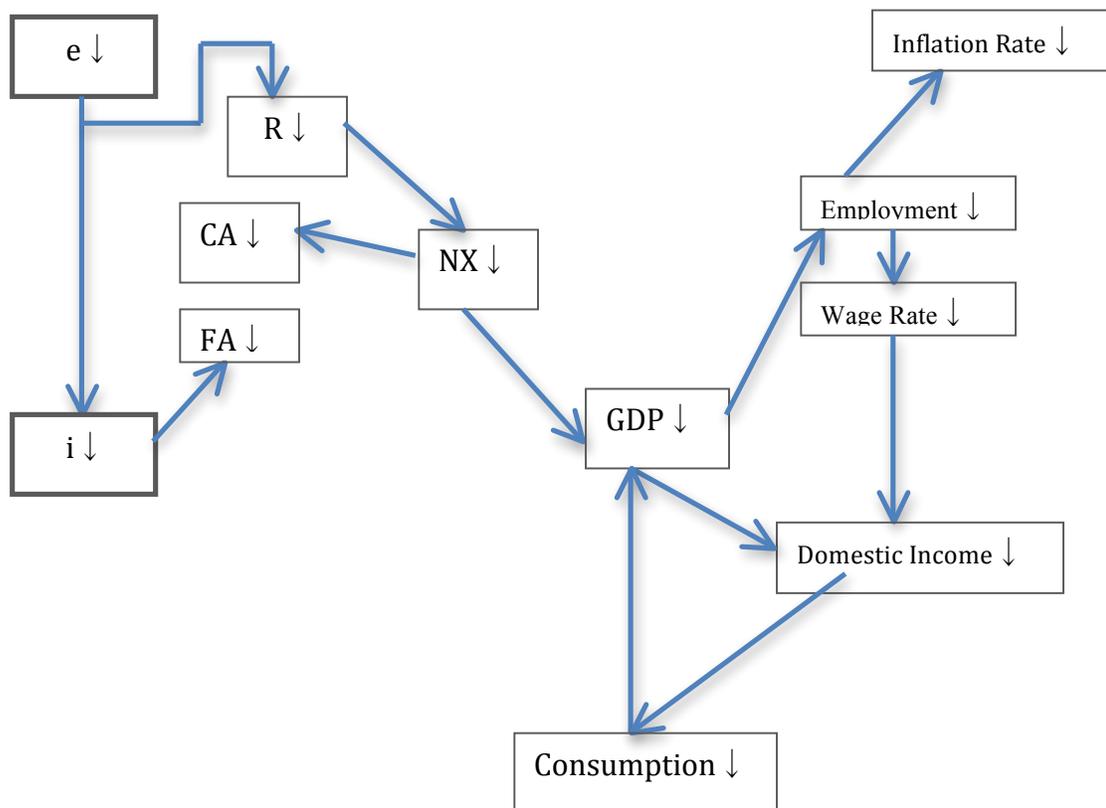
Year	Exchange rate(Yuan/Dollar)
1949	2.3
1979	1.49
1993	5.76
1994	8.62
2005	8.5
2006	7.9
2007	7.36
2008	6.83
2009	6.82
2010	6.62
2011	6.3
2012	6.28
2013	6.09

Figure 1.1 The exchange rate of China



The adjustments of the exchange rate could affect China's macroeconomics. Since 2005 as the Yuan kept appreciating, some economic indicators of China changed as well. In Figure 1.2, if the RMB appreciates, the nominal exchange rate (e) will decrease, so a fall in e represents appreciation, which means as Yuan/dollar falls the Yuan's value is increasing. This chart shows only one possible direction for the linkages to go in.

Figure 1.2 Linkage Mechanism



e —Nominal Exchange Rate

R —Real Exchange Rate

i —Interest Rate

CA—Current Account

FA—Financial Account

NX—Export

1.2 Purposes, Methodology, and Disposition

According to Figure 1.2, RMB appreciation could influence the Chinese economy. The impact of the Chinese currency appreciation is the main research subject of this thesis. Through this paper, we hope that people could understand better the current situation of China's economy, and get a clearer idea of how RMB appreciation affects the China's economy. To meet these objectives, the rest of the paper is organized as follows. First, we discuss the reasons for the Yuan appreciation. Next we look at the macroeconomic framework. Then we examine how RMB appreciation would affect monetary policy, the Chinese banking system, and the real estate market. Then we present macroeconomic impacts of Chinese currency appreciation and examine the effects on trade flows. We also talk about the effects on the U.S. economy, and the world economy. We look at the relation between RMB appreciation and real wages, employment, and income inequality. Finally, we discuss how the Chinese ER change may help or hurt China's and the global economy.

1.3 How to determine if a currency is overvalued or undervalued?

We said that before the 1970s, Chinese currency was at a highly overvalued level, however, by simply looking at trade balance or foreign currency reserves it is hard to determine proper currency exchange levels. Purchasing Power Parity (PPP) is one of the measurements used in economics, and is defined as “a relative price of internationally traded commodity” (Takeuchi). For example, if a laptop that costs 10,000 Yuan in China and costs 1000 dollars in the U.S, the PPP is 1 dollar=10 Yuan. If the actual exchange rate is 1 dollar= 5 Yuan, the export price becomes 2000 dollars, twice the domestic U.S. price and export competitiveness is reduced. “Thus, by looking at the PPP, we can determine if the currency is overvalued or undervalued. If the PPP/exchange rate >1 , it is overvalued. If this figure <1 , it is undervalued. If it equals 1, the currency is at the proper level” (Takeuchi). But because of a lack of price data, it is difficult to collect and the only source is data from the International Comparison Program (ICP). For instance, in 2001 “with a level of 1 being an appropriate exchange rate level, the Yuan was at 0.23, which means the Chinese Yuan was a full 4 times undervalued ($1/0.23=4.34$). This is how we use PPP as a proper way to determine a currency is overvalued or undervalued.

1.4 What’s pushing up China’s Yuan?

The Chinese currency obviously faces pressure from inside depreciation and outside appreciation. China is running a huge current account surplus and in the last decade China’s trade surplus has ballooned increasing inflationary pressure, so an easing of

inflationary pressures has served as a motivating force for the appreciation of the Yuan. Since monetary authorities are keen about inflation concerns, as well as constraints on using interest-rate adjustment as a policy instrument, they found ample reason for letting the Yuan appreciate. An appreciating Yuan will help to keep inflation lower without having to raise interest rates, which hurt domestic spending and attract hot money. China worries about losing GDP with a lower trade surplus, but higher real wages can perhaps raise domestic consumption to replace this. Trade surplus leads deficit countries to complain about an undervalued Yuan. Media reports outside China speculated that political pressure influenced the government's decision to let the Yuan appreciate. Even with the pressure to let the Yuan appreciate as well as a desire to increase consumption through real wage increases, by looking at the PPP we see that the Yuan has been and continues to be undervalued.

CHAPTER TWO: THE MACROECONOMIC FRAMEWORK

2.1 Introduction

In 1936, John M. Keynes indicated that interest rate was determined by the demand for money, and it couldn't adjust the balance of saving and investment. Investment can determine saving, but saving cannot determine investment. He said monetary policy could affect the interest rate to influence the economy. John R. Hicks invented the IS-LM model to demonstrate the relationship between interest rates and real output in the goods and services' market and money market in 1937. The IS curve shows the locus of combinations of GDP (Y) and interest rate (r) at which the commodity market is always in equilibrium and LM curve is the locus of the combinations of interest rates and GDP at which MME (Money Market Equilibrium) is always established.

There have been three reforms on China's currency policy. Before 1994, China had a double exchange rate system. In 1994, the Chinese government unified those two exchange rate systems at an initial rate of 8.70 Yuan to the dollar. In 2005, Chinese government changed its currency policy: RMB's exchange rate would become

“adjustable, based on market supply and demand with reference to exchange rate movements of currencies in a basket”. China halted its currency appreciation policy around mid-July 2008, mainly because of declining global demand for Chinese's products that resulted from the effects of the global financial crisis (Wayne and Marc, 2011). On June 19, 2010, the People’s Bank of China (PBC) based on current economic conditions stated that they would, “proceed further with reform of the RMB exchange rate regime and to enhance the RMB exchange rate flexibility.” After 2010, RMB keep appreciate, meanwhile, it impact the economy of China.

With the appreciation of the currency, the net exports should decrease. $\text{Net exports} = \text{Saving} - \text{Domestic Investments}$. McKinnon (2013) said that a newly appreciated Renminbi would turn China into a more expensive place for international investors, so that domestic investment would fall. So, according to the previous formula, net exports actually increase from exchange appreciation. Exports fall, but so do imports after RMB appreciation because of the negative investment and consumption effects on income. After the government spending increases the IS curve will shift to the right, both interest rate and income increasing; the capital will flow inside, meaning both the current account and capital account have a surplus, then the BP curve (assumed that there is no free capital mobility) will shift rightwards; if there is a money supply which might be given by the central bank, the LM curve will shift rightwards (Wang, Zhou and Wang, 2012). Monetary policy refers to the central bank’s actions that affect the quantity of money and credit in an economy in order to influence economic activity. Through the IS-LM-BP

model, we can know the relationship between exchange rate and monetary policy of China. If the Chinese central bank enacts expansionary monetary policy it would make Yuan undervalued because Chinese move money out, so in order for them to keep their yield from falling too much, the Chinese central bank must sell foreign assets. If the PBC enacts contractionary monetary policy it will cause the Chinese currency to appreciate too much. So there is a conflict between exchange rate and monetary policy in China. For rebalancing the Chinese economy, stabilizing the RMB exchange rate is quite important.

2.2 The principle of effective demand and liquidity preference

In *The General Theory of Employment, Interest and Money*, John M. Keynes indicated that monetary policy could affect the interest rate to influence the economy. The classical economists mentioned that because of the interest rate, saving was always equal to investment and saving determines investment. Keynes didn't agree with this, and said the interest rate is determined by the demand for money, and it couldn't adjust the balance of saving and investment. Investment can determine saving, but saving cannot determine investment.

There are two rates that can determine the investment. One is the interest rate. It is changed by a bank on their loans. Another one is the rate of expected returns from the use of the machine or expected rate of profit or marginal efficiency of capital (MEC). If the

marginal efficiency of capital is greater than the interest rate, producers know that expected rate of return from the use of the machine is higher than the rate charged by banks on their loans and so producers would invest more. Therefore investment is rising. But if the marginal efficiency of capital less than the interest rate, producers know that expected rate of returns from use of the machine is lower than rate charged by banks on their loans, so producers would invest less. Therefore investment falls.

In The General Theory of Employment, Interest and Money, Keynes wrote that the rate of interest couldn't be a return to saving or waiting as such. The definition of the rate of interest rate is, for a specified period, the reward for parting with liquidity. So the unwillingness of the people who possess money to part with their liquid control over it is measured by the interest rate. If the rate of interest were lower, then the public would wish to hold an aggregate amount of cash that would exceed the available supply. If the rate of interest rate were raised, then there would be a surplus of cash because fewer people would be willing to hold it. Then we could know the quantity of money and the liquidity-preference are both determine the actual rate of interest in given circumstances. Keynes (1936) indicated that liquidity-preference can show as a function formula: $M=L(r)$, where r is the rate of interest, M is the quantity of money and L is the function of liquidity-preference; it fixes the quantity of money which the public will hold when the rate of interest is given.

The individual who believed that future rates of interest would be higher than the rates assumed by the market will keep actual liquid cash. The individual who believed that future rates of interest would be lower than the rates assumed by the market will borrow money for short periods in order to purchase debts of a longer term. There are three divisions of liquidity-preference:

“(i) the transactions-motive, i.e. the need of cash for the current transaction of personal and business exchange; (ii) the precautionary-motive, i.e. the desire for security as to the future cash equivalent of a certain proportion of total resources; and (iii) the speculative-motive, i.e. the object of securing profit from knowing better than the market what the future will bring forth. (Keynes, 1936)”

So we can conclude that the rate of interest falling as the quantity of money is increased. There are two reasons, one is due to the transactions-motive: if the rate of interest falls, then liquidity-preference will absorb more money. Another one is: every fall in the rate of interest may make people feel the future of the rate of interest differs from the market's view so they would wish to hold a larger quantity of cash.

“For whilst an increase in the quantity of money may be expected, to reduce the rate of interest, this will not happen if the liquidity-preferences of the public are increasing more than the quantity of money; and whilst a decline in the rate of interest may be expected, to increase the volume of investment, this will not happen if the schedule of the marginal efficiency of capital is falling more rapidly than the rate of interest. (Keynes, 1936)”

As the rate of interest rises, the quantity of money demanded will go down, because as the rate of interest goes up, the bond price will fall, and so people will buy more bonds and will keep less money in cash.

2.3 Theory about The Mundell-Fleming Model and Monetary Policy

In 1937, John R. Hicks invented the IS-LM model to demonstrate the relationship between interest rates and real output in the goods and services market and money market.

2.3.1 IS curve

In the commodity market, commodity market equilibrium (CME) requires that total expenditure generated equals the total income produced, which is equal to GDP. To understand total expenditure generated, there are four major sectors of the economy: consumer sector, producer sector, government sector and foreign trade sector. ①The consumer sector has expenditures on financial goods and services, and that expenditure of consumers is called consumption(C). It primarily depends upon national income GDP (Y). As GDP is rising, consumption is expected to go up as well. If this positive relationship is assumed to be linear, then its equation can be written as: dependent variable = constant term + coefficient * independent variable ($C=a+bY$). It's called the consumption function.

To derive a saving function from consumption function, define saving (S) as the income (Y) that is not consumed $S=Y-C$, so $S=Y-(a+bY)=(1-b)Y-a$. ②The producer sector has expenditures on (i) purchase of machine, tools and equipment or (ii)

construction activities or (iii) increase in inventories. This is known as investment (I). Financial investment includes the purchase of bonds and stocks, and does not constitute total expenditure. Two rates can determine the investment: (1) interest rates change by a bank on their loan (r). (2) Rate of expected returns from the use of the machine or expected rate of profit or marginal efficiency of capital (MEC). If $MEC > r$, then producers know that expected rate of returns from use of the machine is higher than rate changed by banks on their loans then producers would invest more, and so investment would go up. Optimum level of investment is at the point of $MEC=r$. We recognize that investment is completely independent of GDP (Y). ③The government sector has expenditure on welfare programs, social security payments, unemployment benefit, defense, interest and national debt, transportation, education, national security etc. This is called Government Expenditure (G). Fiscal policy refers to a government use of spending and taxation to meet macroeconomic goals. ④The foreign trade sector expenditure appears in two types. The expenditure of foreign residents on domestic goods and services is called export (X), while the expenditure of domestic residents on foreign goods and services is called import (M).

For commodity market equilibrium, we need total expenditure equal to total income, or $C+I+G+X-M=Y$. IS curve shows the locus of combinations of GDP (Y) and interest rate (r) at which commodity market is always in equilibrium. IS curve slopes downwards because at higher interest rates, we need lower GDP for CME. As higher interest rates (r) are considered, then $r>MEC$ and investment will decline, new total expenditure will be

lower, and new CME moves downward with lower GDP. There are two things to decide the slope of IS curve: (1) value of responsiveness of investment to the change in interest rate or elasticity of I with respect to interest rate. If this elasticity is high, then a small Δr makes a large ΔI . Then this large ΔI will makes even larger ΔY , so a small Δr has to be associated with a large ΔY , then the IS curve is flatter. (2) value of OME, a higher value of OME will create (with any given ΔI) a large ΔY , so any Δr will be associated with a large ΔY , then the IS curve is flatter. A shift of the IS curve is caused by any change that will change GDP at the same interest rate (i), such as a change in export (X), as an increase in exports will make higher GDP for CME, so all points of IS curve shift to the right. (ii) Fiscal policy change, an expansionary fiscal policy ($\Delta G \uparrow$ or $\Delta TX \downarrow$ or both) would make higher total expenditure in CME, then CME GDP needed will be higher (at the same interest rate). Then all points of IS curve will shift to the right. An increase in the tax rate reduces the slope of the aggregate demand curve. t prime will represent the higher tax rate. The flatter aggregate demand curves produce an IS curve that is steeper as a result of the increase tax rate.

The elasticity of investment with respect to interest rate is one of factors to determine the slope of IS curve. If this elasticity is high, then a small change of interest rate makes a large change of investment, then this large change investment will makes even larger change GDP. The elasticity of investment with respect to interest rate of China's economy is small, so the IS curve of Chinese economy is quite steep. Greenwald, Stiglitz

and Weiss (1984) cite empirical evidence and provide a theoretical argument for investment to be inelastic that should apply to China strongly because credit availability seems more important than the level of rates.

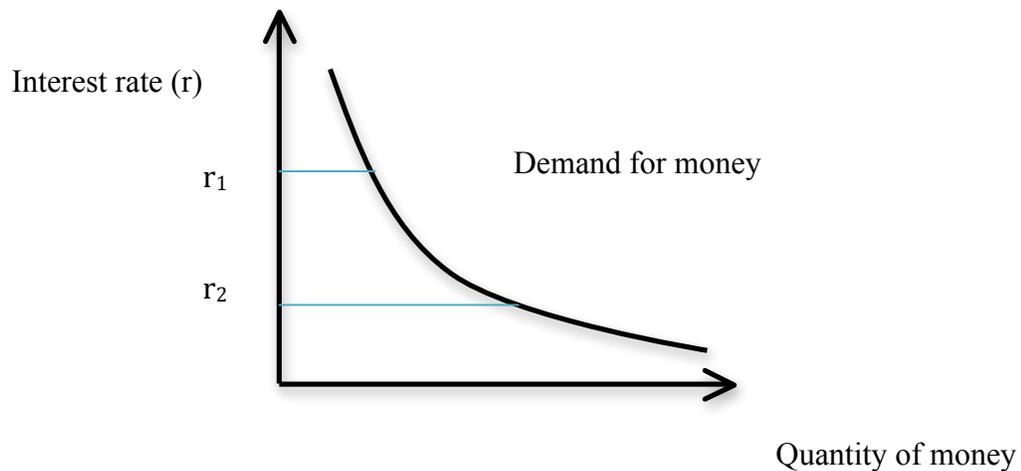
2.3.2 LM curve

In the money market, there are two forces operating: money supply and money demand. As the interest rate decreases, the demand for money increases, which gives us the downward-sloping money demand curve. An increase in the national income results in an upward and outward shift of the money demand curve. The amount of shift depends on the increase in income as well as the income sensitivity of demand for money. An increase in the interest sensitivity for real money reduces the slope of the money demand curve. Small decreases in the interest rate cause a large increase in the demand for money. The amount of money (nominal money supply) is set by the central bank and therefore exogenous. This value is then divided by price level and corrected for inflation.

Money supply in the very short run is fixed. The slope of LM curve is determined by elasticity of money demand with respect to the interest rate. If this elasticity is very high, then a small Δr makes a large change in money demand. This will create a large disequilibrium in money market and we need a large ΔY to correct this disequilibrium. A shift of the LM curve is caused by changes in the money supply. An expansionary

monetary policy (MS going up) would require a lower interest rate for money market equilibrium, and then all points of LM curve will shift to the right.

Figure 2.1 Relationships Between Interest Rate and Quantity of Money



2.3.3 BP curve

BP Curve is the locus of combination of interest rate and GDP at which balance of payment (BOP) equals to zero; it means foreign trade market equilibrium is established. At a higher interest rate, we need higher GDP for $BOP = 0$, because at a higher interest rate, there is a capital inflow (surplus or capital account) to compensate this, a deficit on current account is achieved by higher GDP. Therefore, BP curve is upward sloping from left to right. The slope of BP curve depends upon the elasticity of imports (M) with respect to GDP (Y) and the capital mobility from the economy. A shift of the BP curve is caused by change in the exchange rate (ER), if the exchange rate increases (the domestic currency depreciates), then at the same GDP, we need lower interest rate for $BOP = 0$. This is because the depreciation of the domestic currency creates higher exports and

lower imports. To compensate for this, we need lower interest rate, there is surplus on current account. BP curve will shift to the right.

Monetary policy refers to the central bank's actions that affect the quantity of money and credit in an economy in order to influence economic activity. If expansionary monetary policy is adopted, money supply increases, so in the money market interest rates would decline, and at an interest rate less than MEC (marginal efficiency of capital), investment will go up. As investment increases, GDP must rise as well. With an increase in the money supply in IS-LM-BP curve model, LM curve will shift to the right; a new CME and MME would have a lower interest rate and higher GDP.

2.4 The Exchange Rate Policy and Monetary Policy of China

2.4.1 Background on China's Currency Policy

Before 1994, China had a double exchange rate system. There was an official fixed exchange rate system and a relatively market-based exchange rate system. The first exchange rate system was used by the government and the second one was used by importers and exporters in a "swap market." The Chinese government unified those two exchange rate systems at an initial rate of 8.70 Yuan to the dollar in 1994. So by 1997, the Renminbi was allowed to rise to 8.28. "The RMB became largely convertible on a

current account (trade) basis, but not on a capital account basis, meaning that Yuan is not regularly obtainable for investment purpose” (Eichengreen, 2005). From 1994 until July 2005, China maintained a policy of pegging the RMB to the U.S. dollar at an exchange rate of roughly 8.28 Yuan to the dollar. The peg appears to have been largely intended to promote a relatively stable environment for foreign trade and investment in China (since such a policy prevents large swings in exchange rates) –a policy utilized by many developing countries in their early development stages. Goldstein (2004) indicated that the Chinese central bank maintained this peg by buying (or selling) as many dollar-denominated assets in exchange for newly printed Yuan as needed to eliminate excess demand (supply) for the Yuan. As a result, the exchange rate between the RMB and the dollar basically stayed the same, despite changing economic factors, which could have otherwise caused the Yuan to appreciate (or depreciate) relative to the dollar.

“Under a floating exchange rate system, the relative demand for the two countries’ good and assets would determine the exchange rate of the RMB to the dollar” (Wayne and Marc, 2011). In 2005, Chinese government changed its currency policy, RMB’s exchange rate would become “adjustable, based on market supply and demand with reference to exchange rate movements of currencies in a basket” (People’s Bank of China), and then the dollar-RMB exchange rate went from 8.28yuan to 8.11, an appreciation of 2.1%. After 2005 to 2008, the exchange rate of the U.S. dollar against the RMB would be adjusted from 8.11 to 6.83, an appreciation of 18.7%. That’s because the Chinese government decided to allow the RMB to appreciate steadily but slowly. In 2008, the global demand for Chinese products declined as a result of the effects of the global

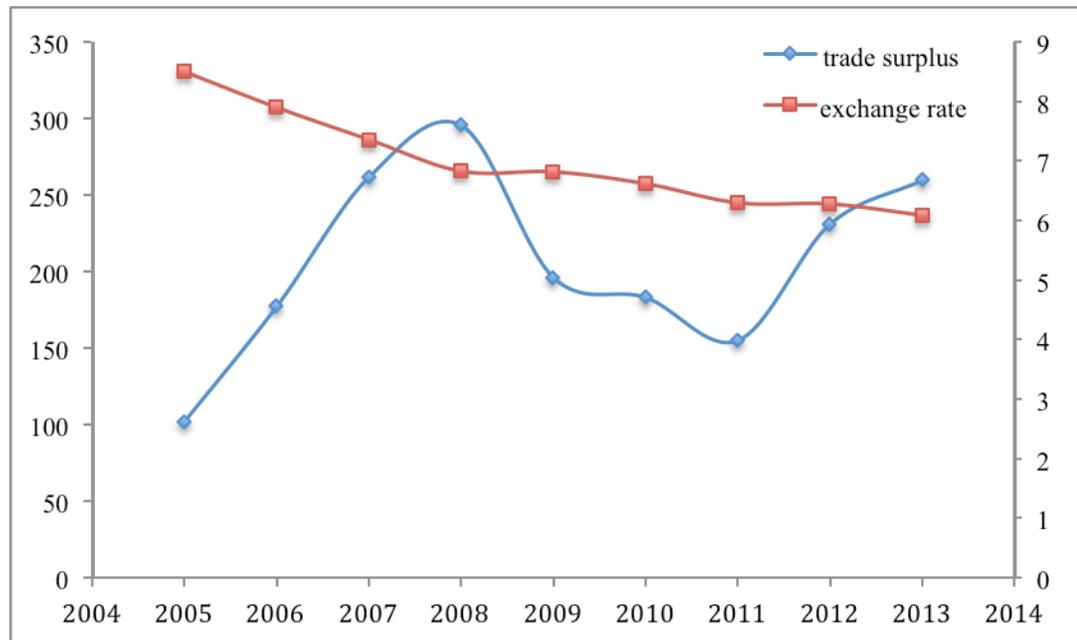
financial crisis, so China stopped its currency appreciation policy. Then, the RMB/dollar exchange rate was maintained at 6.83 through around mid-June 2010.

On June 19, 2010, China’s central bank, the People’s Bank of China (PBC), stated that, based on current economic condition, it had decided to “proceed further with reform of the RMB exchange rate regime and to enhance the RMB exchange rate flexibility (People’s Bank of China).

Table 2.1, China’s Exchange Rate and Trade Surplus

year	2005	2006	2007	2008	2009	2010	2011	2012	2013
trade surplus of China (US \$bilions)	101.9	177.5	261.8	295.5	196.1	183.1	155.1	231.1	259.8
exchange rate(yuan to dollar)	8.5	7.9	7.36	6.83	6.82	6.62	6.3	6.28	6.09

Figure 2.2, China's Exchange Rate and Trade Surplus



Source: <http://www.customs.gov.cn/tabid/44604/Default.aspx>

<http://www.pbc.gov.cn/publish/zhengcehuobisi/637/index.html>

From June 19, 2010 to November 30, 2011, the yuan/dollar exchange rate rose from 6.83 to 6.35, an appreciation of 7.6%. Since the RMB appreciation was resumed, the exchange rate has gone up and down, but overall, it has appreciated.

2.4.2 The Exchange Rate Policy and Monetary Policy of China

Mackel (2013) indicated about the impact of current monetary policy on RMB that:

“Regulatory changes this year offer further support to RMB internationalization and clarify the broader regulatory environment for the currency across its different jurisdictions. Although the central bank acted as the lender of last resort during the squeeze, it maintains that monetary expansion can support economic growth.

However, policymakers have subsequently put more focus on a ‘prudent monetary policy.’ That means banks deleveraging, an end of easy money for sectors with overcapacity, support for GDP growth, and keeping credit lines open for smaller companies. A prudent money and credit policy should be positive for the RMB in the long term, because it ensures the health of the banking system and makes growth more sustainable. However, at the moment, prudent policy also means slower growth and easing inflation.”

Renminbi targeting greatly limits the ability of the central government to use monetary policy to control inflation. If central banks raised interest rates to control inflation, then investors from other countries might want to shift funds to China to take advantage of the higher Chinese rates. We call that “hot money” inflow. In theory, capital control could stop the large inflow or outflow when domestic interest rates are higher or lower than foreign rates, but for an economy that is very open to trade, it is difficult to maintain effective capital controls over time. There are two reasons for the capital inflow “(1) the relative interest rates in China and the United States; and (2) expectations of the future appreciation in the value of China’s currency, the renminbi (RMB)”(Wayne and Marc, 2011) The inflows force the government to boost the money supply to buy up the foreign currency necessary to maintain the targeted peg.

“Expanding the money supply contributes to easy credit policies by the banks, which has contributed to overcapacity in a number of sectors, such as steel, and speculative asset bubbles, such as in real estate. In the past, the Chinese government has tried to use administrative controls, with limited results, to limit bank loans to sectors where overcapacity is believed to exist. In effect, a pegged currency induces the Chinese government to utilize inefficient and non-market financial policies for credit allocation, rather than a market-based system that would promote an efficient allocation of capital. (Wayne and Marc, 2011)

Hot money flows can destabilize domestic asset prices, so when the central banks making monetary policy, it should account for hot money flows. Hot money flows on when the interest rate is set too high.

“Recent China aggressively has used policy alternatives to benchmark short-term interest rate changes to attempt to promote domestic price stability without affecting hot money flows. In particular, China has utilized reserve requirement ratio (RRR) adjustments to control loan growth and to target inflation. Unlike changes in the short-term benchmark interest rate, RRR adjustments directly affect the behavior of only domestic banks, and have relatively little impact on the decisions of speculators and on hot money flows. From 2010 through mid-2011, the PBC raised its benchmark short-term interest rate five times, and hiked its RRR twelve times. Since monetary easing began in the middle of last year, China has not changed its benchmark short-term interest rate, and has cut its RRR twice (Trading Economics, 2012). The PBC’s reliance on RRR is a prudent approach to conducting monetary policy and to mitigating the problems associated with hot money flows. Nonetheless, when targeting benchmark short-term interest rates and exchange rate trading bands, Chinese policymakers should heed the lessons of the JPY appreciation via the Plaza Accord and Japan’s subsequent deflationary experience. (Jackson, 2013)

If the Chinese central bank pursued expansionary monetary policy, that would make Yuan undervalued because Chinese begin moving money out, and so to keep their yield from falling too much the Chinese central bank must sell foreign assets. If the PBC pursues contractionary monetary policy, it will cause the Chinese currency to appreciate too much.

2.5 Conclusion

According to IS-LM model, we can conclude that there is a conflict between currency policy and the monetary policy of China. When Chinese's bank adopts expansionary monetary policy, then money supply would go up and interest rate will

decline, LM curve shift to right. So it creates a large of foreign assets inflow, to maintain the currency, government have to buy domestic money back and sell foreign assets, then LM curve would shift back to original level. Thus monetary policy effectiveness will be quite lower.

Although a rebalancing of China's economy, including the adoption of a market-based currency, would likely entail significant adjustment costs, it also would likely produce long-term benefits to the Chinese economy. Li (2007) gives the example that it could: (1) increase the level of imports to boost China's terms of trade, (2) stabilize the RMB exchange rate, which will help China to continue to be a strong position in international trading negotiation; (3) improve Chinese living standards by lowering prices for imported goods and services exposing more of the domestic economy to greater global competition; (4) enhance the efficiency and competitiveness of Chinese domestic firms to boost their output; (5) the Chinese government should more efficiently to use monetary policies to control inflation through a market-based credit system to allocate capital; (6) have a better relationship with their trading partners to promote economic development in China at the expense of growth in other countries.

CHAPTER THREE: 'HOT MONEY' INFLOW ALSO WOULD AFFECT CHINESE BANKING SYSTEM AND HOUSING PRICE

In Chapter Two, we found that RMB appreciation would cause the 'hot money' inflow, which is the reason for reduced effectiveness of monetary policy, but it also has impacts on the Chinese banking system and real estate market. There is a potential effect of RMB appreciation on China's banking system. Going much beyond the existing gradualist approach to currency reform probably will be dangerous for the banking system because it's still fragile. In the fast-growing economy, if the growth rate of net domestic assets of the PBC is kept too low, then the excess demand for money will induce the expenditure patterns and balance of payments inflows. For the real estate market, in recent years Chinese housing prices kept rising and there probably is a relationship between housing price and Yuan appreciation. Exchange rate appreciation would cause hot money inflows, and most hot money flowed into the Chinese real estate market. An investment into Chinese property market can yield high growth, and the appreciation of RMB can help obtain additional revenue.

3.1 The banking system and RMB appreciation

The People's Bank of China was founded in 1948 through the consolidation of Bihai Bank, Huabei Bank, and Xibei Farmer Bank. In September 1983, the state Council decided to have the PBC function as the central bank of China. The major duty of the PBC is to perform the functions stipulated by the State council, such as: mitigate systemic financial risks and implement and formulate monetary policies to control inflation.

China is running a huge current account surplus. For example, in the last decade, China's trade surplus has ballooned and it increased inflationary pressures and caused abundant liquidity. In 2013, China's trade surplus jumped to \$259.8 billion, so the PBC has to conduct sterilization operations, mainly by issuing central bank bills, raising the reserve requirement ratio, and hiking the interest rate to prevent the growing liquidity in China's financial system from yielding severe inflation. The PBC has taken some measures to deal with the inflationary pressure and soak up the excess liquidity.

3.1.1 The potential effect of RMB appreciation on China's banking system

China's banking system has some serious deficiencies and faces a lot of challenges going forward. Li (2008) said that in China, the small and medium-scale enterprises are reliant on the informal credit market where they pay higher interest rates because those enterprises are underserved by the formal banking system. Although there is a ceiling on loan interest rates, pricing of bank loans remains largely undifferentiated, and when the

banks making lending decisions the state-owned banks do not take enterprise profitability into account. Since the state-owned banks of China have a lot of pressure from the government, they have to charge a high interest rate for the small and medium-scale enterprises for bank loans. If the government charged high interest rates to the banks, their profitability would be low and that's why the state-owned banks are highly dependent on the gap between lending rates and rates set by the government for loaning the banks funds, and probably the interest rate gap will narrow markedly in the period ahead as financial liberalization and globalization proceed.

Doing much currency reform would hurt the banking system because it is still fragile. The Renminbi appreciation could cause a sharp reduction in growth, the trend decline in bank's nonperforming loans is much harder to maintain. So some serious currency mismatches for banks could be generated by a large Renminbi appreciation.

In 2007, Yu (2007) stated "In summary, to achieve simultaneously the objectives of the maintenance of a stable exchange rate, a tight monetary policy, and a good performance of the commercial banks is impossible." The Chinese monetary authorities have to sterilize the large increase in international reserves to prevent the bank credit and monetary aggregates explosion and decrease the risk to the banking system. Indeed, even with the ambitious sterilization efforts of the past five years, there were costly bank credit booms in 2003, in the first quarter of 2004, and in the first half of 2006. In 2004, consumer price inflation also hit nearly 5 percent, while producer prices rose by 8 percent

(Goldstein and Lardy, 2009). As inflation increased, the real interest rate decreased, and also the return of the saving deposits from the banks are very limited, so people began to choose to invest in other fields like real estate or the stock market, which will cause slow or negative growth in the people's holdings of bank deposits. We call this disintermediation.

An increase in inflation would appreciate the real exchange rate. If the authorities take the high sterilization route, the increase in inflation is cut off. In a fast-growing economy, if the growth rate of net domestic assets of the PBC is kept too low, the very expenditure patterns and balance of payments inflows caused by the excess demand of money. There is a "tax" as the "cost of sterilization" caused by placing the amount of low-yielding sterilization bills with the banks and rising bank reserve requirements. Since the banks' profitability is already low by international standards, the banks cannot absorb this tax themselves. But if the banks pass on the tax to depositors, they probably will put their money elsewhere. Bank loan growth will not increase without enough bank deposits.

Low exchange rate flexibility means that interest rate decisions will be delayed which will trigger large capital flows and is not good for banks. Taking preemptive interest rate action to avoid both sharp growth slowdowns and inflation excesses can make the central banking more effective.

Prasad (2007) indicated that capital account convertibility should await further strengthening of the banking system, not currency appreciation and flexibility. The authorities will have plenty of room for maneuver in countering issues such as an unexpected large fall in China's growth rate or unanticipated setback on bank reform as long as restrictions on capital outflows are reduced step by step instead of steeply. If Chinese households and firms decided to suddenly increase the share of their assets invested abroad, capital outflow could quickly grow to as much as \$500 billion, with very unpleasant consequences for the Chinese economy (Yu, 2007).

To sum up, the authorities wish to “expand the role of commercial paper bond, and equity markets to diversify (away from banks) the sources of external financing available to firms,” and also, they have “expressed an understandable intention to gradually lift restriction on capital outflows, in part to offer savers a higher rate of return and in part, given China's large global current account surplus, to reduce upward pressure on the renminbi” (Goldstein and Lardy, 2009). However,

“Such moves in the direction of further financial liberalization and globalization are likely to have the competitive effect of reducing the 350 to 400 basis point spread between deposit and loan interest rates (even a 100 basis-point decline could have wiped out all the profits of state-owned banks), since both Chinese investor and savers will then have more alternatives to domestic banks” (Goldstein and Lardy, 2009).

3.1.2 Interest rate liberalization

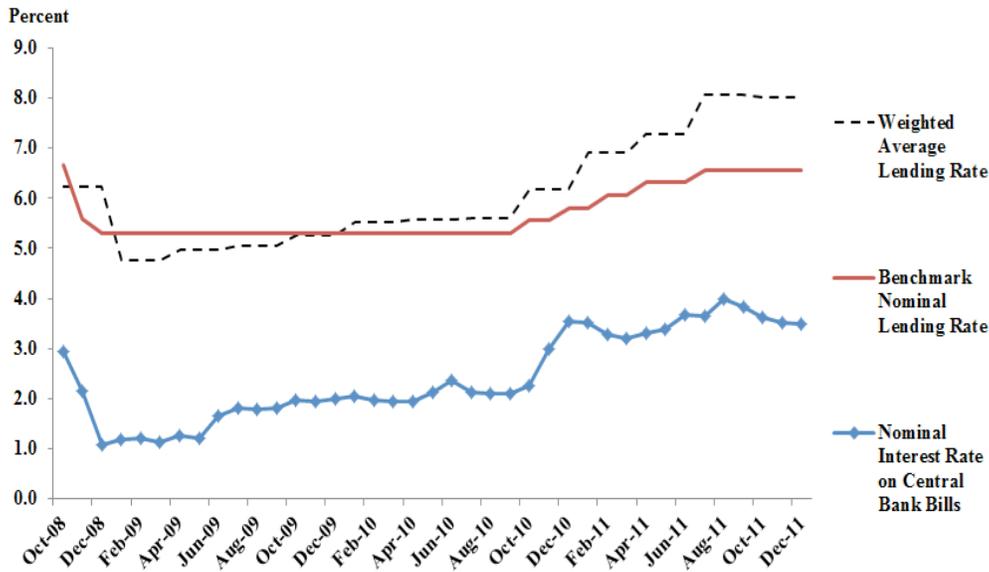
If Chinese banks raised interest rates in an effort to control inflation, the rate of capital return in China might become higher than the rate of capital return in the U.S., overseas investors would shift funds to China to take advantage of the higher Chinese rates. The government of China has had difficulty blocking such inflows of “hot money.” China is suffering from “hot money inflow” in its capital account; the PBC therefore has to take some measures to prevent the growing liquidity in China’s financial system from yielding severe inflation. In 2004, the central bank adopted a low interest rate policy to earn more profits for the banks.

The central bank decided to use financial repression to hold down the cost of sterilization. There are three elements for this policy. First, the central bank pays a very low interest rate on three-month and one-year central bank bills. Zhang (2012) showed that Shanghai Interbank Offered Rate (SHIBOR), the most market-driven interest rate in China is higher than the bill rates. And when banks are required to purchase central bank bills, the cost incurred is the difference between the bill rates and SHIBOR rates. There’s another way to measure the earn on central bank bills for the low interest rate banks is the gap between the bill rates and the central bank’s benchmark one-year lending rate. In figure 3.1, from 2008 to 2011, this gap has ranged between 3 and 4 percentage points. In the beginning in 2010, the actual weighted average lending rate started increasing.

The second element of the low interest rate policy of the central bank is the central bank pays a really low interest rate on required reserves. There also a large gap between

the central bank’s benchmark one-year lending and the rate the central bank pays on required reserves, even larger than the gap between the rate on one-year central bank bills and the benchmark lending rate.

Figure 3.1: Interest Rates on Central Bank Bills and Commercial Bank loans, 2008-2011



Sources: Nicholas Lardy, Interest Rate Liberalization and the International Role of the RMB (2012).

China’s banks have been quite profitable. In 2011, “net profits of China’s banks soared by 36 percent to exceed RMB 1 trillion” and “the return on assets was 1.3 percent in Q4, far and away the highest of any national banking system” (Lardy, 2012). These profits are the direct result of financial repression, as reflected in the negative deposit rates received by savers in the banking system of China.

The government has set a ceiling on rates banks could pay on deposits and a floor that the banks could charge on loans to make sure that the banks earned very high profits,

which is the third element of the central bank's low interest rate policy. This low interest rate policy shifted the cost of sterilization away from the central bank, and ultimately largely to the household sector.

In conclusion, renminbi appreciation is one of the reasons why China has excess liquidity. To block the inflows of "hot money," and create more profit for the banks, the Chinese banks had to take the low interest rate policy. Interest rate controls create a cossetted environment for banks. To develop a fully commercialized banking system, interest rate controls could undermine the incentive to develop the risk assessment skills. "For the internationalization of the renminbi, detrimental to broader financial market development is an important condition and interest rate controls could do that" (Prasad and Ye, 2012). Eventually, if interest rates in China are not largely market-determined, it will be difficult to ease controls on flows of portfolio capital.

3.2 Relationship between RMB appreciation and real estate price in China

3.2.1 Background Knowledge

Since 2003, the real estate industry of China is booming and it has become an important factor of promoting China's economy growth. In table 3.1, from 2003 to 2010, the housing price of Beijing appreciated 285%, the housing price of Shanghai appreciated

186%, and according to the economy data from National Bureau of Statistics of China, the real estate investment in 2010 is RMB 4.8267 trillion, the commercial housing investment is RMB 559.9 billion, which all increased by over 30% than the previous year (Liu and Hu, 2012).

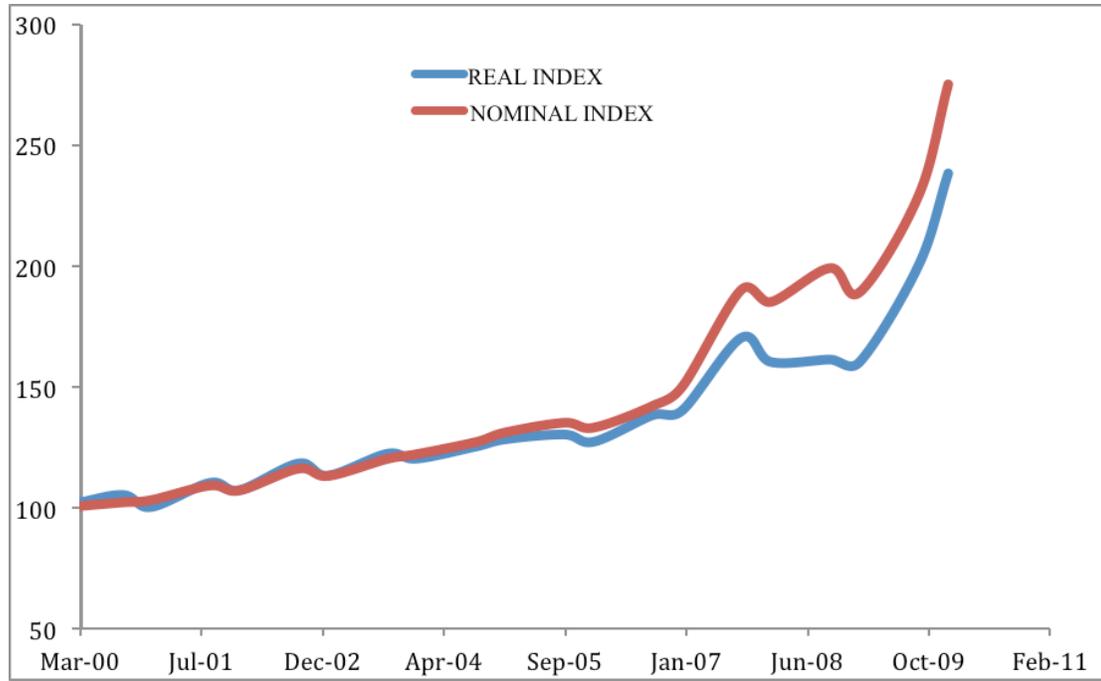
Table 3.1, Average Residential Unit Price of Selected Cities in China (Unit: RMB/Square Meter)

Year	Beijing	Shanghai	Guangzhou	Shenzhen	Tianjin	Hangzhou
2003	4,456	4,989	3,999	5,793	2,393	3,657
2004	4,747	5,761	4,356	6,385	2,950	3,884
2005	6,162	6,698	5,041	6,996	3,987	5,454
2006	7,375	7,039	6,152	8,848	4,649	5,967
2007	10,661	8,253	8,439	13,370	5,576	7,432
2008	11,648	8,115	8,781	12,823	5,598	8,211
2009	13,224	12,364	8,989	14,389	6,605	10,561
2010	17,151	14,290	10,615	18,954	7,940	14,259
Appreciation	285%	186%	165%	227%	232%	290%

Source: the China Real Estate Statistics Yearbook. (2003-2010)

Figure 3.2: Constant Quality Price Index for Newly Built Private Housing in 35 Major Chinese Cities, 2000-2011

2000Q1=100



Source: Institute of Real Estate Studies, Tsinghua University.

In the meantime, as indicated before, the exchange rate of China kept appreciating since the exchange reform in 2005. From 2005 to 2013, RMB has appreciated against U.S dollar by 39.57%. RMB exchange rate plays an important role in China's economic development, it connects the domestic and international markets and exchange rate movement can influence the price level of entire real economy by changing the prices of import and export commodities. Martin and Morrison (2008) indicated that due to the impact of expected appreciation of RMB, more and more foreign capital flowed into Chinese market, since the stock market is mostly manage and controlled by the Chinese

government, most foreign capital has flowed into China's real estate market, which led to increases in real estate prices.

3.2.2 Capital inflow vs. Real estate price

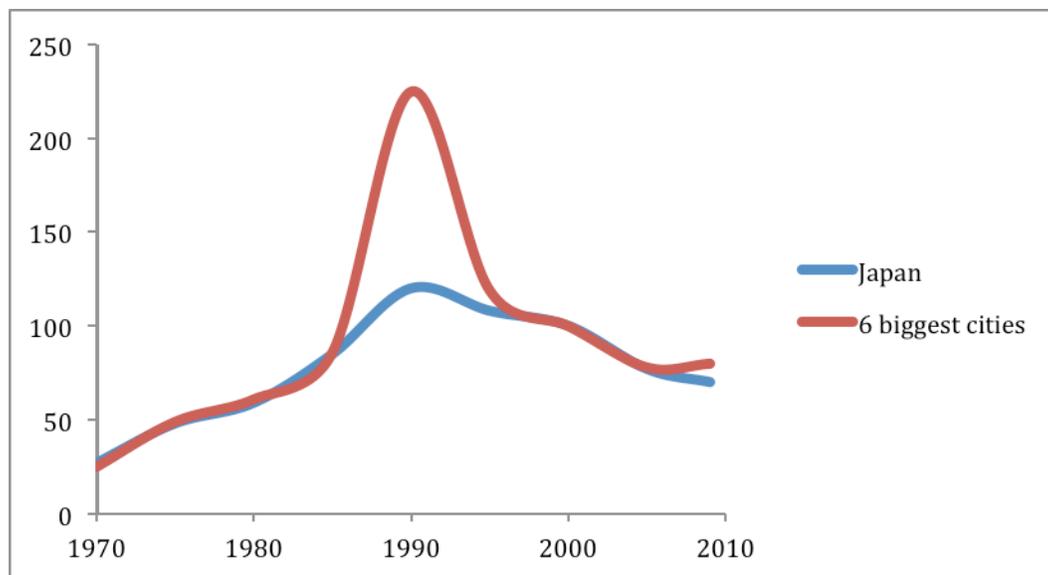
Joseph B. Lipscomb, John T. Harvey and Harold Hunt (2003) said that “the rise of real estate prices will lead to the rise of exchange rate, however, with the rise of exchange rate, real estate prices rise further” based on the experience of real estate prices in Mexico. In the 1980s, Japan had a similar economic environment. From 1985 to 1988, the yen appreciated 86% and the land price of Tokyo doubled. Clearly, there is a relationship between the appreciation of the domestic currency and capital flows. How do capital flows respond to change in exchange rates? McKinnon (2012) believed that the capital flows most responsive to exchange rate movements are hot money flows. “Carry traders profits by borrowing in economics where expected returns are relatively low and lending or investing where expected returns are relatively high” (Jackson, 2013). Since an appreciation of the purchased currency increases profits, when the PBC let the RMB crawl upward, a dollar-based investor would have a high expected returns if he purchase RMB, that is a big incentive for carry traders to bring hot money into China.

The International Fisher Effect – $[i_s = i_d + E(\Delta e)]$ – shows that the expected appreciation of an economy's currency $E(\Delta e)$ increases foreign demand for domestic fixed income assets, which can cause higher fixed income prices and lower domestic

nominal interest rate (id). In 1985, the Japanese currency started appreciating; carry traders saw the profits from borrowing USD-denominated assets and investing in JPY-denominated ones. The fixed income prices got higher and interest rate got lower in Japan. However, because of the hot money inflow, the nominal interest rates didn't decrease until 1990. After the currency of Japan appreciated, domestic stock markets rose dramatically, as international speculators purchased Japanese assets to profit from JPY strength. From 1985 to 1991, Japanese urban property prices more than doubled.

Figure 3.3, Urban Property Prices in Japan

2000=100



Source: Japan Real Estate Institute

Similar to Japan, the Chinese currency appreciated significantly since 2005, and recently China has experienced similar symptoms of hot money inflows. The primary main land benchmark for Chinese stock market performance roughly tripled, and China

also experienced a real estate boom like Japan. McVey (2011) in his research shows that the real estate prices throughout major Chinese cities about doubled between 1998 and 2011.

3.2.3 The influence between exchange rate and housing prices

The impact of exchange rate on real estate prices

The appreciation of RMB can attract more foreign capital inflows and enhance the speculation in the real estate market. RMB appreciation will also drive domestic investment. As we discussed before, the appreciation of RMB would decrease the imports of China because of the lower Chinese domestic prices, which also decrease the price of imported goods. The lower prices and higher income will increase public wealth, which lead to an increase of demand for real estate.

As we know, continued RMB appreciation would cause excess liquidity. According to the European Central Bank, excess liquidity is defined as that the real currency stock deviate from expected equilibrium level (Guang, 2006). The excess currency liquidity might bring inflation. Li (2007) said that normal consumptions prices including housing prices are all consistently increasing in a wide range. The inflation may encourage the increase of real estate prices. To sum up, in the long run, the RMB appreciation promotes the increase of China's housing prices.

Besides the RMB appreciation, there are other reasons which can cause the housing price increase. 1) Chinese traditional attitude, Chinese people like to buy their own houses instead of renting. 2) People's income is increasing rapidly. 3) There is huge potential demand because of the speedy urbanization process. 4) Limited investment opportunities: China stock market and futures market are not very stable or profitable, and also the stock market is mostly controlled by the government, so the excess capital rushes into real estate to seek high profits. 5) Family structure is changing: the Chinese family used to all live together, but in recent years, after the young people get married, they will buy their own house, which increases housing demand.

The impact of real estate on exchange rate

Yang Liu and Zhiqiang Hu (2011) use the Granger causality test to show that “changes in housing price is the cause of exchange rate movements, however the RMB exchange rate movements is not the cause of housing price change” (Liu and Hu, 2012). Then they got the result through the VAR model that in the long run, the increase of housing price will have an effect on RMB appreciation because the increasing demand for real estate investment and more hot money inflow to China would lead to further appreciation of the RMB exchange rate.

3.2.4 Real estate bubble in China and how to prevent the bubble from bursting

We all know that if there are extremely high profits in one field, then more capital and investment will be absorbed by this field. Over the last few years, there have been high profits in real estate market of China, more and more money will be moving into the real estate, which will cause other enterprises in their own fields to have low profits. This adverse effect happened in Japan and Hong Kong several years ago, we call it a housing bubble.

Joseph E. Stiglitz in 1990 defined that “if the reason for the price is high today is only because investors believe that the selling price will be high tomorrow – when ‘fundamental’ factors do not seem to justify such a price – then a bubble exists.” Because the speculative demand for real estate expanded so much, real estate bubbles might happen in China. There are four types of bubble: safe bubble, precautions bubble, dangerous bubble and very dangerous bubble. If the bubble is one of the last two kinds of bubble, then it will definitely burst and cause huge damage to the economy. See

Appendix A.

Tao, Li and Jianping, Wu (2004) concluded that the real estate bubble might develop for five reasons: low transaction costs; easily getting bank loan support; banks can provide enough capital; people’s optimistic expectations; short time to use speculation

capital. These reasons caused the speculation demand to buy houses to increase. Some people were buying houses because of their self-use and investment demand, but mostly for speculation, as they were waiting for a good selling point to sell the houses to gain profits. In last few years, the rate of vacant houses in China kept increasing and became very high, so a precaution bubbles might already exist, and probably develop at a fast pace to turn into dangerous bubbles.

To sum up, it is important to control the high real estate prices to stabilize the RMB exchange rate. First, the Chinese banking capital should enact a strict credit policy. From 2001 to 2003, the U.S. federal funds rate was cut to 1%, people had more investments choice. Then the banks issued more loans and led to the real estate bubble. After the bubble burst, the whole credit system collapsed instantly. Three ways to tighten credit policy are: first, strengthen the management of bank credit funds and the credit qualification assessment of the borrowers to reduce risk. Secondly, improve the supply structure of the real estate market to meet different consumer needs, which improves the ability of real estate market to resist risk. Thirdly, actions to “reduce the foreign capital inflow to China and strengthen supervision on local government and enterprises are very necessary” (Liu and Hu, 2012).

CHAPTER FOUR: OTHER MACROECONOMIC IMPACTS OF CHINESE CURRENCY APPRECIATION ON CHINA

As discussed before, Chinese currency appreciation also has effects on some other macroeconomic aspects, like net exports, unemployment and income inequality. In figure 1.2 we can see that when Yuan appreciation would decrease, the net export would also decrease. According to the data using Global Trade Analysis Project (GTAP) model, the export and import of China would all decrease. The United States may or may not benefit from China's large surplus, on one hand, the U.S. could use funds provided by China to help fund the large external deficit and U.S. borrowers would benefit from low interest rates, while on the other hand, if the demand for imports from China did not decline at the same rate that prices increased, an appreciation of the RMB could actually worsen the U.S. trade deficit in the short-run (the J-Curve Effect). The employment rate and income inequality also would decline with the appreciation of the Yuan. Due to the continued appreciation of the RMB, export enterprise is facing a serious crisis. And as the wealth gap between rural and urban areas would get worse, the adjustment of RMB exchange rate will not only affect the income gap, but also the wages gap, as the high Gini coefficient of China in last decade shows.

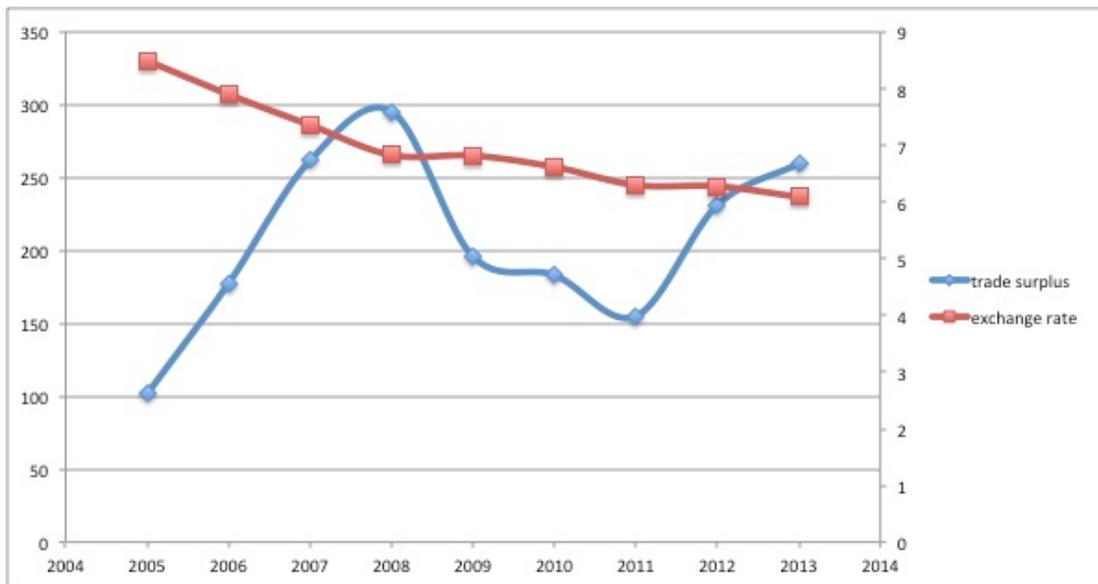
4.1 The effects of RMB appreciation on China's external trade Flows

In January 2014, China's trade surplus jumped to \$31.9bn. Imports rose by 10% from a year earlier to \$175.27bn and exports increased by 10.6% from a year earlier, far faster than analysts' forecasts, to \$207.13bn. China is running a huge trade surplus, there are some of factors influence the China's trade balance. How does RMB appreciation affect China's external trade? In the late 1970s, China adopted the open-door policy, since then China has experienced spectacular economic growth. China has some advantages in cheaper labor and policy measures, along with the deepened globalization China utilized those advantages to attract foreign direct investment (FDI). In 2001, China joined the WTO, and as it became "the world's factory," it further was able to fully capitalize its abundant labor force and integrate into the world system. Bahmani-Oskooee and Wang (2008) indicated that in 1994, China implemented a weak RMB exchange rate policy at the rate of 8.7 RMB/dollar. In world trade, the exchange rate policy enables China to induce an extraordinary upsurge in trade surplus; its trade balance grew from 3.3% of GDP in 1990 to 10.6% in 2007. "China changed its currency policy in 2005 to make RMB exchange rate more flexible, but the trade surplus continued to increase substantially (Zheng, Guo, Jiang, Zhang and Wang, 2006)." According the figure 4.1, the RMB appreciation seems has a little effect on reducing China's trade surplus.

Table 4.1, China's Exchange Rate and Trade Surplus

year	2005	2006	2007	2008	2009	2010	2011	2012	2013
trade surplus of China (US \$bilions)	101.9	177.5	261.8	295.5	196.1	183.1	155.1	231.1	259.8
exchange rate(yuan to dollar)	8.5	7.9	7.36	6.83	6.82	6.62	6.3	6.28	6.09

Figure 4.1 China's exchange rate and trade surplus



Source: <http://www.customs.gov.cn/tabid/44604/Default.aspx>

<http://www.pbc.gov.cn/publish/zhengcehuobisi/637/index.html>

Some prior studies have focused on the relationship between the Chinese currency and trade surplus of China. Zhang and Fung (2006) use the Global Trade Analysis Project (GTAP) model to examine the effect of Chinese RMB revaluation by introducing various shocks to the real exchange rate of China. Hertel (1997) said that GTAP is a well-known computable general equilibrium (CGE) model that has been used widely for international

trade analysis. To analyze one country's interactions with other countries in the GTAP model, there are three distinct channels: (1) usage of service provided by the international transportation sector; (2) trade of commodities and service; (3) investments. Yang, Zhang and Tokgoz (2012) simulated the implementation of a one-time shock to the nominal ER of Chinese RMB for 2010 and examine the associated short-term effects. They adopted the recursive dynamic method for the period of 2004-2010 to update the database of the GTAP model. Chinese officials showed that the Chinese government likes gradual, small-step changes to the exchange rate instead of a drastic revaluation of Chinese currency in the short-run. Therefore, Yang, Zhang and Tokgoz (2012) discussed the effect of exchange rate appreciation under three alternative scenarios that correspond to 5, 10 and 15 percent increase from the existing level of nominal exchange rate appreciation. Table 4.2 shows the short-term effects of Chinese currency appreciation on key Chinese macroeconomic indicators. In this table, the real wage of labor and GDP deflator respond positively to the currency appreciation, other macroeconomic indicators react negatively to the currency appreciation. As the degree of exchange rate change is rising, the impacts grow stronger. The Chinese macroeconomic performance is quite sensitive to currency appreciation. When the nominal exchange rate increased by 5 percent, total exports and real GDP declined by 3.5 percent and 3.1 percent respectively. Zhang (2010) concluded, "Scenario results on changes in employment confirm the concerns raised by the Chinese government with the consideration of nominal wage rigidity." The GTAP model claims that as the real wage rose, the demand for labor declined, so employment fell when the nominal exchange rate increased. Overall, all factors prices (capital, land and natural

resources) will decline except real labor prices. The results show that the Chinese economy will shrink significantly as a result of RMB appreciation, the only winners are people who remain employed, as their real wages go up.

As shown in Table 4.2, as the nominal exchange rate increased by 5 percent, the total exports declined by 3.5 percent. The currency appreciation would make Chinese exported commodities more expensive and less competitive in the global market, so the total exports of China would decline with a shrinking economy. However, if the world economy is still blooming, the foreign demand on China's exports will still be solid, despite the RMB appreciates. The results show that the total imports also decline if the exchange rate were to rise. That's because Chinese domestic prices became lower than the prices of imported commodities (as seen in the decline in GDP deflator), and another reason is the total demand will decline with the sharp fall of GDP and income. But only if the fall in exports lowers GDP greatly, would imports actually decrease.

Table 4.2—The impacts of Chinese currency appreciation on Chinese macroeconomic indicators, assuming fixed nominal wage (percentage change relative to baseline).

	Increasing by 5%	Increasing by 10%	Increasing by 15%
Real gross domestic product	-3.1	-6.1	-8.8
Gross domestic product deflator	-3.4	-6.4	-9.3
Total exports	-3.5	-6.7	-9.6
Total Imports	-2.2	-4.3	-6.2
Trade balance	-5.7	-10.5	-14.6
Trade balance(billion US\$)	-9.7	-17.9	-25
Current rate of return on capital	-2.4	-4.8	-7.2
Investment	-2	-4	-6
Real wage of labor	4.4	8.8	13

Employment	-6.3	-12.1	-17.4
Land rents	-11.6	-21.5	-30
Return to capital	-5.5	-10.5	-15.2
Return to natural resources	-15.4	-28.1	-38.7

Source: Jun, Y., Wei, Z., and Simla, T. (2012), The Macroeconomic Impacts of Chinese Currency Appreciation on China and the Rest of World. Simulation results from the Global Trade Analysis Project (GTAP) model.

Finally, as shown in Table 4.2, when the nominal exchange rate increase by 5, 10 and 15 percent, the trade balance would fall by 5.7, 10.5 and 14.6 percent. China's trade surplus and the movement of the RMB have an opposite trend. In the past few years, the Chinese trade surplus declined significantly.

Liou, Peng and Yang (2012) used the dynamic panel generalized method of moments (GMM) to estimate the effects of exchange rate change on exports and imports. GMM was developed by Lars Peter Hansen in 1982 as a generalization of the method of moments. They also concluded that the RMB appreciation would significantly affect the volume of China's exports and imports in general. The Sargan test shows that a 10% RMB appreciation will have 9% decrease in imports on the trade balance.

All the studies show that most of the Chinese macroeconomic indicators like real GDP, exports, investment, and employment would be affected negatively by the appreciation of RMB in the short term. So the Chinese economy would shrink significantly in the short-run. The imports of China would decline as the RMB appreciation because the lower Chinese domestic prices and lower total demand with the contracting Chinese economy. According to the model, the currency appreciation has

positive effect on the real wage of labor, but this model is based on the only change being a decline in Chinese net exports; there would be a rise in real wages due to the fall in imports prices, but in China, also there are some other reasons could cause the increase of real wage and we see that real wages are already starting to rise in China as money wages are rising relative to prices. In 2010, the IMF showed that policy-induced shifts in demand from external to domestic sources increased. Rising consumption and investment typically offset the fall in net exports and employment gains in non-tradable sectors more than they offset losses in tradable sectors. So a higher real wage can induce higher domestic consumption, which could offset the fall in the exports surplus and so prevent a fall in GDP and employment and a rise in inequality. Furthermore, the RMB appreciation has limited effects on curbing China's trade surplus.

4.1.1 How does Chinese Currency Affect the Trade Balance Between the United States and China.

The strength of the RMB is an important factor for China's external trade balance and it also matters for the bilateral trade balance between China and the United States. Zhang, Fung and Kummer (2006) said that the trade relationship between the United States and China has been contentious during the past several decades since China's economic reforms in 1978. In 1979, total U.S.-China trade was \$2billion. In 2013, total bilateral trade between the U.S. and China (exports plus imports) reached \$562 billion. Over the past ten years, U.S. exports to China have been far less than U.S. imports from

China, so the U.S. trade deficit has become increasingly larger. The deficit rose from \$10 billion in 1990 to \$318 billion in 2013. In the meantime, the RMB appreciated by more than 25% against the US dollar over the last decade, and so are there any effects of RMB appreciation on the trade balance between the US and China? In the short-run, when the RMB appreciated, if the demand of the U.S. imports from China did not decline at the same rate as price increased, the RMB appreciation may worsen the U.S. trade deficit. “The United States might benefited from China’s large surplus since it provided the funds that China in turn lent back to the United States, helping to finance the large US external deficit” (Goldstein and Lardy, 2009). Corden (2009) showed that when the RMB is undervalued, U.S. consumers were benefiting from low-cost imports from China, and U.S. borrowers were benefiting from low interest rates that would be higher if China were not purchasing as many U.S. government and other dollar-denominated securities in its exchange market intervention operations.

Table 4.3. U.S. Merchandise Trade with China: 1980-2013(\$ billions)

year	U.S. Exports	U.S. Imports	U.S. Trade Balance
1980	3.8	1.1	2.7
1985	3.9	3.9	0
1990	4.8	15.2	-10.4
1995	11.7	45.6	-33.8
2000	16.3	100.1	-83.8
2005	41.8	243.5	-201.6
2005	41.8	243.5	-201.6
2006	55.2	287.8	-232.5
2007	65.2	321.5	-256.3
2008	71.5	337.8	-266.3
2009	69.6	296.4	-226.8
2010	91.9	364.9	-273.1
2011	103.9	393.3	-295.5

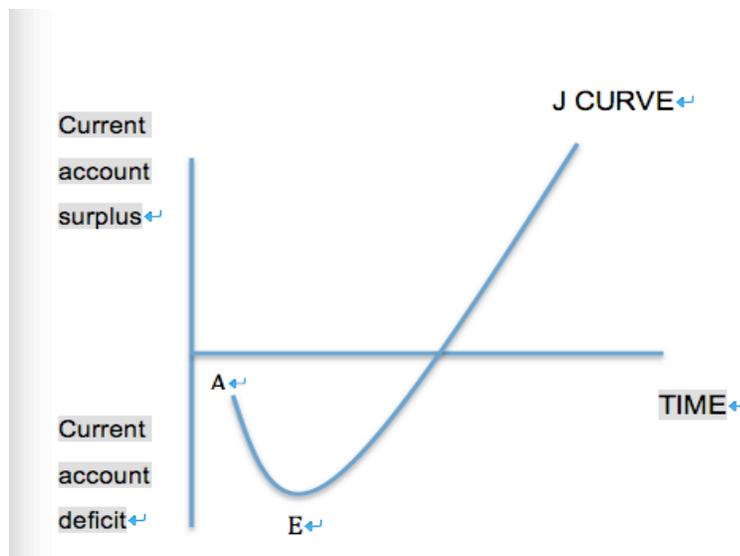
2012	110.6	425.6	-315
2013	122	440.4	-318.4

Source: U.S. International Trade Commission (USITC) DataWeb.

4.1.2 The J Curve Effect

When a country's currency becomes devalued, at first, the country's total value of imports exceeds its total value of exports, resulting in a trade deficit. But eventually, the currency devaluation reduces the price of its exports; consequently the country's level of exports gradually recovers, and the country moves back to a trade surplus. This is called the J-Curve effect (Figure 4.2).

Figure 4.2, The J-curve Effect



The RMB appreciation does cause some effects on the prices of tradable goods and services, imports, exports and trade balance, but the effects can take time (probably a few

years) to appear. In the short run, an appreciation of the RMB would cause prices to increase, but if the demand of imports did not decline at the same rate, the U.S. trade deficit could get worse (Figure 4.2, A-E). The goods of U.S. imports from China are basic-necessity goods; RMB appreciation can barely reduce U.S. consumption of these imports. “The Chinese goods imported to the U.S. are likely to be inelastic, implying that a price increase will have a minimal effect on the quantity demanded” (Zhang, Fung and Kummer, 2006). U.S. consumers need some time to find lower-priced products from other countries instead of the higher-priced Chinese products. And also it would take time for the price of Chinese products increase, the price would stay the same in the short run because of exports contracts with the United States. The size of the overall U.S. trade deficit is determined by a number of factors other than exchange rates, like large fiscal deficit, low saving rate, etc. Those factors might have more effects on U.S. trade deficit than the RMB appreciation. In addition,

“The U.S. relies on foreign countries for its manufactured products, implying that the U.S. might have trade deficit with other countries except China, so the RMB appreciation might not solve the problem of U.S. trade deficit. Chinese currency revaluation is no panacea for the U.S. trade imbalance” (McKibbin and Stoeckel, 2003).

4.1.3 Net Effect on the U.S. Economy

When RMB remains undervalued, the U.S. consumers benefit from low-cost imports from China. An undervalued RMB would lower the price of imports from China, thus the consumption of the United States could increase, a society’s economic well-being is usually measured by how much it can consume. From a long-term perspective, that an

undervalued RMB increases the purchasing power of U.S. consumers is a lasting effect. China is currently the second-largest U.S. trading partner, the third-largest U.S. export market, and the largest source of U.S. imports. An appreciated RMB could raise U.S. costs for imported products from China implying that the U.S. consumers have less money to buy other goods and services. A study from Yale University estimated that “a 25% appreciation of the RMB would initially decrease U.S. imports from China and lead to greater domestic production in the United States and increased exports to China” (Morrison and Labonte, 2013). But, since the exports of China would decline with the shrinking economy, the benefits to the U.S. would be offset. Fair (2010) estimated the effects of 25% RMB appreciation was estimated to a negative effect on U.S. aggregate demand and output and result in a loss of 5,700 U.S. jobs – less than one-tenth of 1% of total U.S. employment.

As indicated before, China is running a huge trade surplus and the Chinese central bank and private Chinese citizens are invested in U.S. assets. China’s holding of U.S. public and private securities are significant. The greater demand for U.S. assets decreases the U.S. interest rate, which could benefit the U.S. borrowers. The Chinese central bank bought a large proportion of the U.S. Treasury Securities, which helped the federal government finance its budget deficit. As indicated in Table 4.4, in 2004, China was holding \$222.9 billion of U.S. Treasury Securities, and China’s holdings increased to \$1.3 trillion in 2013, 23% of the total foreign holdings. There is a large amount of Treasury securities that had to be sold, because the U.S. federal budget deficit increased

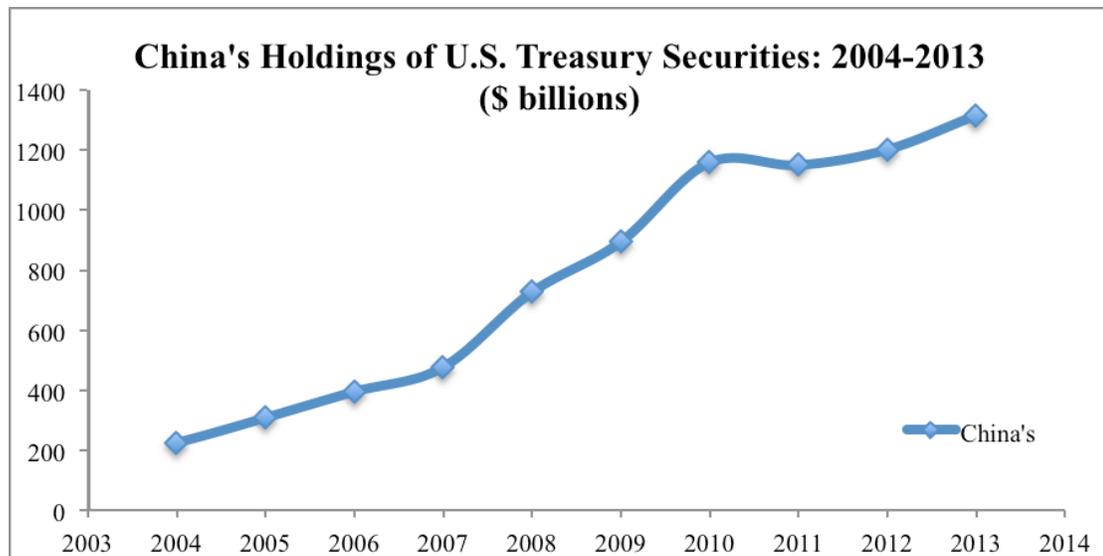
sharply. Morrison and Labonte (2013) indicated that during this period, while the Obama Administration pushed China to appreciate its currency, it also encouraged China to continue to purchase U.S. securities, which China did. However, the currency of China appreciation could lessen China's need to buy U.S. Treasury Securities, which could push up U.S. interest rates. However, the reduced buying of U.S. securities should not in itself raise U.S. interest rates because Federal Reserve policy can keep rates low; if the U.S. inflation rate rises, the Fed may want to raise rates, but the important thing is it may be more affected by how much economic growth there is in the U.S.

Table 4.4. China's Holdings of U.S. Treasury Securities: 2004 – 2013

	2004	2006	2008	2010	2011	2012	2013
China's Holdings (\$ billions)	222.9	396.9	727.4	1151.9	1151.9	1202.8	1317
China's Holding as a Percent of Total Foreign Holdings	12.10%	18.90%	23.60%	23.00%	23.00%	21.70%	23.00%

Source: U.S. Treasury Department.

Figure 4.3, China's Holdings of U.S. Treasury Securities: 2004 – 2013



Source: U.S. Treasury Department.

The exchange rate of China was 8.70 Yuan to the dollar before 2005, from 2001 to 2004 the exchange rate remained constant, U.S. imports from China increased by 92%, and U.S. exports to China increased by 81%. During the 2005-2008 period, the RMB appreciated by 21% of the RMB to the dollar, U.S. imports from China and U.S. exports to China increased by 39% and 71%, and the speed of U.S. imports growth got much slower. From 2005 to 2008, the overall U.S. current account deficit declined by nearly 6%, even though the U.S. trade deficit with China rose by 30.1% (Morrison and Labonte, 2013). The International Monetary Fund (IMF) indicated that if RMB appreciation combined with a greater Chinese consumption and an expansion of the services sector could boost the global economy more than the currency appreciation alone. The IMF estimated that a 20% RMB appreciation would boost U.S. economic growth by 0.05% to 0.07%, and reduce the Chinese economic growth by a range of 2.0% to 8.8%; but after the currency appreciation plus other reforms for rebalancing would boost U.S. growth by over 0.15%, and could range from a boost in China's economic growth by 1% to a reduction of 2%.

To sum up, RMB appreciation does have some effects on the trade balance between the United States and China. An appreciated Chinese currency can reduce China's imports and increase the prices of export goods; this could raise the U.S. inflation rate some amount. However there are other factors that have an influence on the trade balance between the U.S. and China, which probably have more impact than the RMB

appreciation. The International Monetary Fund (IMF) indicated that, if the currency appreciation combined with other reforms, that would boost the global economy, but if the RMB appreciation alone, there's only a small effect on boosting the economy or maybe could actually worsen the global economy.

4.2 Unemployment and income inequality of China vs. RMB appreciation

The adjustment of the RMB exchange rate will affect the amount and structure of China's employment because the currency appreciation alters the prices of import and export goods that could impact the production and employment of the firms highly dependent on trade, in the meantime, exchange rate reform would adjust the industrial structure, so that the employment structure and income distribution structure would change.

4.2.1 Unemployment VS. RMB Appreciation

In Chapter 4.1, we concluded that when RMB appreciation takes place, export and import of China will all decline, which would cause the export enterprise to face a serious unemployment crisis. Most Chinese export enterprises need unskilled labor in large quantities to produce export goods. Chen and Wang (2012) use the GTAP model to conclude that "the RMB appreciation will also have a negative effect, will lower the price

of the unskilled labor and skilled labor” (Table 4.5), that is, “if the growth speed of the RMB appreciation is too great, it will bring certain pressure to the employment.” When the Chinese Yuan appreciates, the price of export products are higher for other countries, so they start choosing lower cost labor from countries like India, Malaysia, Mexico, etc., and so external demand falls. The export enterprise of China would face pressure towards unemployment. Another main dimension by which the RMB exchange rate appreciation can impact Chinese employment is after Chinese money appreciation, the price of import goods will decrease, the pressure for domestic enterprises will increase, while some small domestic enterprises would shut down because of their low competitiveness, causing unemployment to increase.

Table 4.5 The influence of the RMB appreciation to China’s domestic prices

RMB Appreciation	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
Unskilled Labor	2.61	1.52	0.58	-0.66	-1.73	-2.84	-3.93	-5.02	-6.11	-7.2
Skilled Labor	2	0.86	-0.26	-1.41	-2.53	-3.68	-4.82	-5.96	-7.09	-8.23

Source: Zhijian Chen and Zheng Wang, (2012), The Impacts of Renminbi Appreciation on the BRICS’ Economics-A CGE Analysis.

Yang, Zhang and Tokgoz (2012) assumed that the nominal exchange rate increased by 5%, 10% and 15%, and use the Global Trade Analysis Project (GTAP) model to see how the Chinese macroeconomic indicators react in percentage change from the baseline. They conclude that the Chinese economy would shrink as a result of RMB appreciation, and that would cause both imports and exports to drop significantly, as well as falling employment. In table 4.6, we can see the “employment is expected to be hit hard, with a

6.3% reduction as a result of merely a 5% increase in the nominal exchange rate.” This is mainly because of the decline in demand for labor due to the rise of real wage.

Table 4.6 The impacts of Chinese currency appreciation on Chinese macroeconomic indicators, assuming fixed nominal wage (percentage change relative to baseline).

	Increasing by 5%	Increasing by 10%	Increasing by 15%
Real gross domestic product	-3.1	-6.1	-8.8
Gross domestic product deflator	-3.4	-6.4	-9.3
Total exports	-3.5	-6.7	-9.6
Total Imports	-2.2	-4.3	-6.2
Trade balance	-5.7	-10.5	-14.6
Trade balance(billion US\$)	-9.7	-17.9	-25
Current rate of return on capital	-2.4	-4.8	-7.2
Investment	-2	-4	-6
Real wage of labor	4.4	8.8	13
Employment	-6.3	-12.1	-17.4
Land rents	-11.6	-21.5	-30
Return to capital	-5.5	-10.5	-15.2
Return to natural resources	-15.4	-28.1	-38.7

Source: Jun, Y., Wei, Z., and Simla, T. (2012), The Macroeconomic Impacts of Chinese Currency Appreciation on China and the Rest of World. Simulation results from the Global Trade Analysis Project (GTAP) model.

To sum up, the RMB appreciation by itself would have a negative effect on employment in China, but in the short run, exchange rate appreciation would help to control inflation, and raise real wages (Table 4.6), In the long run, these negative effects on China’s growth and investment caused by RMB appreciation would be much smaller.

4.2.2 Income Inequality VS. RMB Appreciation

The adjustment of RMB exchange rate will impact the industry structure and change the price level, then they would cause the income distribution to change. First, the income gap between workers and entrepreneurs would get bigger through international trade. Zhu and Wang (2008) found that “the increase of trade scale promoted both the return of capital and labor, but the extent was bigger on capital, thus raising the income gap between workers and entrepreneurs.” Secondly, the exchange rate reform can also influence wage gaps in different industries. China’s wage rates are determined by the supply and demand in the labor market, but there are several special industries like finance, electricity, real estate, and other energy industry that have strict entry regulations that would also affect China’s wage rates.

“After the exchange reform, the wage growth rate in finance sector rose from 19% in 2005 to 26% in 2007; the wage growth rates of mining, electricity and other monopolistic industries were also very high; and the slowest growth rates were in manufacturing and agriculture service sectors” (Huang, 2011).

Thirdly, the RMB appreciation may widen the income gaps of China’s households between rural and urban areas, and so it may worsen China’s income inequality. In Table 4.7, the Gini coefficient of China and exchange rate are shown from 2005 to 2013. The Gini coefficient was already above the 0.4 in 2000, and reached 0.48 in 2007, this rate deteriorated even further to 0.49 in 2008, and the exchange rate kept appreciation, this income gap increase is conducted mainly through the trade channel.

Table 4.7 the Gini coefficient and exchange rate of China (2005-2013)

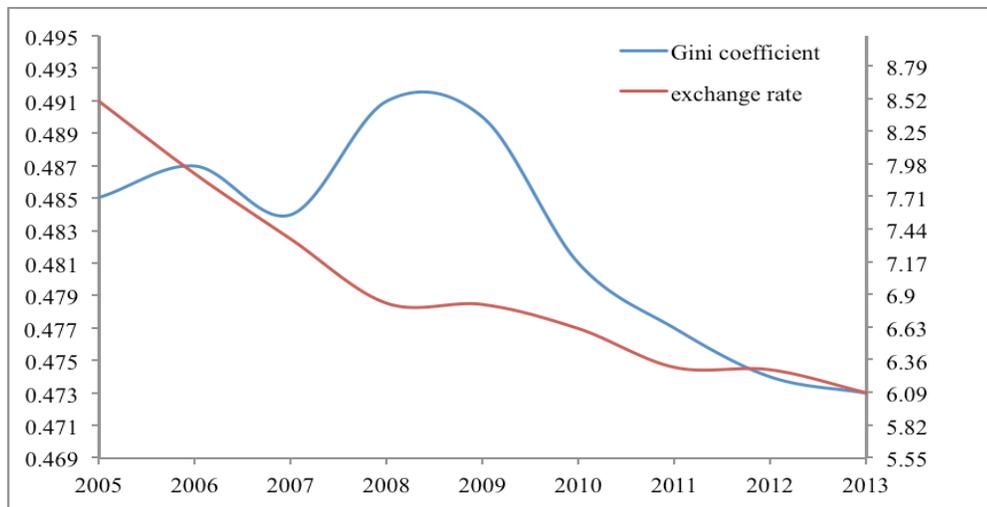
year	Gini coefficient	exchange rate
2005	0.485	8.5
2006	0.487	7.9

2007	0.484	7.36
2008	0.491	6.83
2009	0.49	6.82
2010	0.481	6.62
2011	0.477	6.3
2012	0.474	6.28
2013	0.473	6.09

Source: <http://news.163.com/13/0118/11/8LGH1BBF00014JB6.html>

<http://www.pbc.gov.cn/publish/zhengcehuobisi/637/index.html>

Figure 4.4 the Gini coefficient and exchange rate of China (2005-2013)



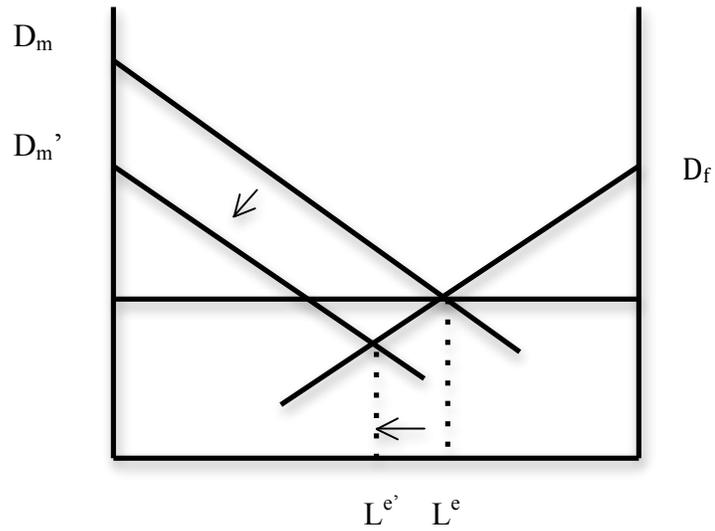
Source: <http://news.163.com/13/0118/11/8LGH1BBF00014JB6.html>

<http://www.pbc.gov.cn/publish/zhengcehuobisi/637/index.html>

When RMB appreciation, the price of manufactured goods increases and the external demand for manufactured goods falls. According to Specific Factor Model, in figure 4.5, the demand curve for manufactured goods will be shifted to the left, D_m' , which will result in a decrease in the nominal wage rate from W^e to $W^{e'}$, and urban manufacturing

employment from L^e to $L^{e'}$, whereas the rural employment increases by the same amount. As a result, the owners of land are more likely to gain while owners of capital lose (Zhang and Ying, 2013).

Figure 4.5, Specific Factor Model



Zhang and Ying (2013) also use the Global Trade Analysis Project (GTAP) model to stimulate the changes in income distribution when RMB appreciates 10%. (Table 4.8)

Table 4.8 Changes in Income Distribution when RMB appreciation by 10%

	China	North America
Land	-2.14	1.1
Unskilled Labor	-0.24	0.02
Skilled Labor	-0.92	0.05
Capital	-0.17	-0.01
Natural Resources	2.98	-1.11

Source: Zhang and Ying (2013). RMB appreciation, Economic Growth and Income Distribution in China and the World.

The table shows that the only winner is the owner of natural resources, the other four factors all decline, while the owners of the land and unskilled labor maybe are in the same entity as famers in the rural sector, this will reinforce the already high income inequality in China.

In conclusion, more rapid Chinese yuan appreciation will adversely affect the income of more vulnerable elements of Chinese society, and it may even exacerbate income inequality more generally.

CHAPTER FIVE: CONCLUSION AND FORECAST

5.1 Conclusion

Since 2005, the Chinese currency kept appreciating and impacted the Chinese economy; some are positive impacts and some are negative ones. In this paper, we talked about how the effectiveness of monetary policy, the banking system, external trade between China and U.S., real estate market, and unemployment all react to RMB appreciation. First, there is a conflict between exchange rate and monetary policy in China. If the Chinese central bank enacts expansionary monetary policy, that would make Yuan undervalued because of Chinese moving money out, so in order to keep their yield from falling too much, Chinese central bank must sell foreign assets. If the PBC pursues contraction monetary policy, then will cause the Chinese money to appreciate too much. So we can conclude that exchange rate appreciation can decrease the effectiveness the monetary policy. Second, the Chinese banking system is still fragile, so doing so much currency reform would hurt the banking system, like some serious currency mismatches for banks that could be generated by a large RMB appreciation. Also low exchange rate flexibility means that interest rate decisions will be delayed, which will trigger large capital flows and is not good for banks. Raising the flexibility of RMB

exchange rate can reduce China's economic imbalance and also guarantee the independence of China's monetary policy. RMB appreciation is one of the reasons that causes China to have excess liquidity and the banking system uses the low interest rate policy to block the inflow of hot money. Third, we found out that in the short run, the real GDP would decrease 3.1% when RMB appreciated by 5%, employment rate would decrease by 6.3% and investment would decline by 2%. But in the short run, RMB appreciation would help control inflation and raise real wages. In the long run, these negative impacts would get much smaller. An appreciated currency can reduce Chinese imports and increase the price of export goods, but RMB appreciation has little effect on the global economy. For the trade balance between the U.S. and China, there are other factors that may have more impact than the RMB appreciation. Four, RMB appreciation can attract more foreign capital inflows and enhance the speculation in real estate market, Yuan appreciation can drive domestic investments, leading to an increase in demand for real estate, but it can also cause a real estate bubble if house prices keep increasing. In the long run, the increasing house prices also have an influence on RMB appreciation; it can lead to further appreciation of the exchange rate. So it is important to control the high real estate prices to stabilize the RMB exchange rate. Last but not least, employment rate would go down when exchange rate appreciates in China, because the price of import goods would decline and the price of export products would go up, the export enterprises and domestic enterprises would face the pressure of competitiveness and unemployment. In the meantime, more rapid RMB appreciation would adversely affect the income of

more vulnerable elements of Chinese society and it could even exacerbate income inequality more generally.

In conclusion, as we talked before, in short run, exchange rate appreciation will help to control inflation and raise real wages. From the GTAP model, we found some negative effects on the macroeconomic indicators like trade flows, trade balance and employment, positive effect on the real wage of labor. However, this model is based on the only change being a decline in Chinese net exports; there would also be a rise in real wages due to the fall in imports prices, but in China, there are some other reasons could cause the increase of the real wage, as we see that real wages are already starting to rise in China, and as money wages are rising relative to prices, a higher real wage can induce higher domestic consumption, which could offset the fall in the exports surplus and so prevent a fall in GDP and employment and a rise in inequality. So the Yuan appreciation need not be bad for China, it would help China keep inflation down while maintaining employment, as domestic consumption replaces exports and a higher value for the Yuan makes imported consumer goods and imported inputs into production cheaper.

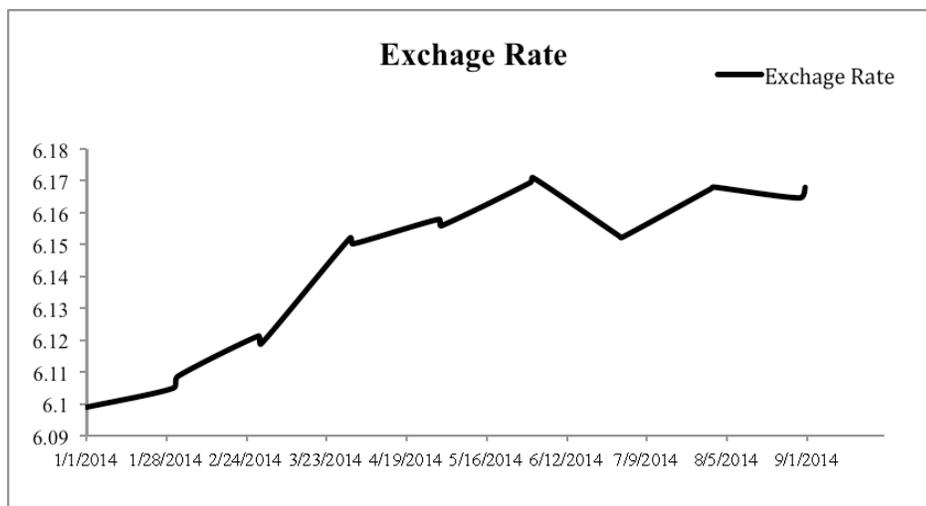
What should be feared is a rapid large appreciation, which would not allow time for an adjustment to higher domestic consumption. Since January 2014, Chinese currency has started a depreciation. (Table 5.1) The exchange rate has gone up and down, but overall, it has depreciated. Maybe this is because of worries that appreciation was moving too fast.

Table 5.1 The Chinese exchange rate (Yuan/dollar) Jan. – Sep. 2014.

Date	Exchange Rate
1/1/2014	6.099
1/30/2014	6.105
2/1/2014	6.1089
2/28/2014	6.1214
3/1/2014	6.119
3/31/2014	6.1521
4/1/2014	6.1503
4/30/2014	6.158
5/1/2014	6.156
5/31/2014	6.1695
6/1/2014	6.171
6/30/2014	6.1528
7/1/2014	6.1523
7/31/2014	6.1675
8/1/2014	6.1681
8/30/2014	6.1647
9/1/2014	6.168

Source: <http://www.pbc.gov.cn/publish/zhengcehuobisi/637/index.html>

Figure 5.1 The Chinese exchange rate (Yuan/dollar) Jan. – Sep. 2014.



The rapid appreciation of the RMB would damage the Chinese economy, but depreciating immediately also would have negative effects. First of all, as the exchange rate depreciates, the inflation rate goes up, which will definitely harm the Chinese economy. Secondly, China's term of trade would increase, and would cause some invisible pressure on the value exchange of the Chinese currency. So in the future, keeping the Yuan stable will help China's economy, such as to continue to be in a strong position in international trading negotiation.

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APPENDICES

Appendix A, Housing supply index

type	Specific Index	Bubble reference standard		China current situation
		Little bubble	Serious Bubble	
Supply index	Proportion of investment	10%<the amount of investment/the whole amount of housing purchased<20% ratio<1:6	the amount of investment/the whole amount of housing purchased>20%	10%<the amount of investment/the whole amount of housing purchased<20%
	Development increase rate	2<development increase rate/GDP<3	Development increase rate/GDP>3 rate>30%	Development increase rate/GDP>3
	Development debt loan increase rate	1<development loan increase rate/total loan in banks increase rate<2	Development loan increase rate/total loan in banks increase rate>2	1<development loan increase rate/total loan in banks increase rate<2
	Housing construction area increase rate	1<Housing construction area increase rate/selling area increase rate<2	Housing construction area increase rate/selling area increase rate>2	1<Housing construction area increase rate/selling area increase rate<2
	Vacancy rate	10-20%	More than 20%	More than 20%

Source: the report from China Academy of Social Sciences in 2006

Housing price index

type	Specific Index	Bubble reference standard		China current situation
		Little bubble	Serious Bubble	
Price index	Selling price	Housing price to income ratio < 1:6	Housing price to income ratio > 1:10	Almost 1:8
	Price increase rate	Housing price increase rate/average income increase rate per capita > 1	Housing price increase rate > 30%	Housing price increase rate/average income increase rate per capita > 1
	Increase range	All kinds of property price increased nationally	All kinds of property price increased nationally	All kinds of property price increased nationally
	Rent level	Rent level index/CPI index < 1	Rent level index < 100	Rent level index/CPI index < 1
	Investors' psychology	Quite optimistic	Very optimistic	Quite optimistic

Source: the report from China Academy of Social Sciences in 2006