Research on the Interaction between RMB Interest Rate, Exchange Rate Fluctuations and Chinese Capital Market

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Abstract: - The interest rate and exchange rate fluctuations have very significant impacts on the domestic economy and capital market development. Adopted from the traditional theory such as the interest rate parity, capital flow theory and the classical theory of IS-LM model, the paper does an in-depth theoretical and empirical research and analysis on the interaction and complex relationship among the three aspects of RMB interest rates, RMB appreciation and securities prices when they change. Research shows that there are strong correlations between Chinese foreign exchange market, money market and stock market; with the RMB appreciation and interest rate increase, the capital accumulation effect and stock assets revaluation effect will promote the overall price level of Chinese Capital market rising. At the same time, in view of the less flexibility in current RMB interest rate and exchange rate, and the reverse impacts between currency appreciation and interest rates, we expect that the effect from RMB appreciation on the capital market will be weakened compared to the past situation of yen appreciation. However, due to the effect that the RMB appreciation is expected to form some international hot money flows, which maybe form a Chinese economic bubble, this trends can not be neglected, it should be did to maintain a high vigilance and to cautiously deal with the relationship between the RMB appreciation and interest rates rise particularly.

Key-Words: - Currency revaluation, Interest rates, Capital flows

1 Introduction
Interest rate and exchange rate are the two most important variables of prices in market economy, and they are very important for national economic and capital market development. Interest rate and exchange rate fluctuations will have an effect on the respective domestic capital markets through their own path and various mechanisms. In open economy, a country's money market and foreign exchange market have gradually been integrated. As two powerful tools of the money market and foreign exchange market regulation, interest rates and exchange rates have a strong relationship between the constraints linked. Because of interaction and mutual influence of the two powerful tools in the process of transmission, interest rates and exchange rates will have an effect of complex and diverse on the capital market. Therefore, for the capital markets in which there is the existence of the exchange rate revaluation pressure and rate hike at the same time, not only we will study on the potential impact of rate hike and exchange rate fluctuations to the capital markets, but also must give full attention to research the interaction between interest rates and exchange rate fluctuations and its complex impact on the market. Based on this basic idea, this article will focus on the theoretical study and practical analysis on this tripartite relationship.

2 Problem Formulation
Many progresses have been made in study on the relationship such as Capital markets and interest rates, exchange rates and capital markets, interest rates and exchange rates, but there are not many studies on the impact China's capital market that the interest rate, exchange rate fluctuations at the same time will have.

In the capital markets, how interest rate affects exchange rate and how exchange rate affects securities prices will eventually be achieved by the cross-border capital flows. Arbitrage capital depends primarily on the price comparison of the risk arbitrage and the cost of time to pay. In our country, the risk reward of someone who engages in arbitrage is made up of two parts, first, differences between the level of domestic interest rates and international interest rates, that is, the rd-rf,
secondly, expected changes in the rate of RMB, that is $\triangle e$. Arbitrage costs is made of the credibility of policy and the transaction costs caused by foreign exchange and capital controls. At present, we have a very favorable international trade balance, the supply of foreign exchange is increasing, it is market expectations that RMB will continue to maintain a slight appreciation trend ($\triangle e<0$). So the reward for the risk of arbitrage capital inflows is $(r_d-r_f) - \triangle e$ in the domestic financial market. With regard to RMB appreciation, interest rates and capital flows, its impact to capital market on the potential effect, we would like to discuss and analyze.

First of all, when the continued appreciation of RMB is expected, the international arbitrage capital will try to enter the domestic market through various channels. According to the classic IS-LM model (Figure 1), the inflow of hot money will make money supply increase in China's currency market, so that the LM curve is shifted to right from LM0 to LM1. When the IS curve maintain unchanged, intersection points of the LM1 curve and the IS curve is in the E1. So that the domestic real interest rates is dropped from r0 to r1, and lead to the proportion of domestic commodity prices rise in a short period of time. With economic overheating and inflation pressures, the People's Bank of China is to raise its interest[1].

At the same time, in accordance with the theory of capital flows related to international economics:

$$F = f (r +, r * -)$$

The international flow of capital is mainly determined by the difference in interest rates. The net inflow of capital $F$ correlates closely to domestic interest rates $r$ and negatively to foreign interest rates. When domestic interest rates $R$ rise, it is bound to attract more international involvement in speculative capital. According to the IRP's well-known law and decision theory of equilibrium exchange rates, when domestic interest rates $r$ rise in a short period of time, it is bound to expand the demand for local currency on international financial market. So that the local currency exchange rates $e$ will increase, and lead to local currency appreciation. That is, domestic interest rates $r$ correlates closely to exchange rate $e$.

Because of the interaction between interest rate and appreciation of the RMB, it makes impact of interest rate and appreciation of the RMB on the capital markets more subtle complicated. On the relationship between them, we can plan for the following analysis. In the coordinate system, the horizontal axis represents the price of securities in $P$, the left vertical axis represents the market interest rate $r$, the right vertical axis represents the RMB exchange rate. The $rp$ curve show that the price of securities $P$ correlates negatively to the market interest rate $r$. The $ep$ curve show that the price of the Securities $P$ correlates closely to Exchange Rate $e$ (indirect price under the law). When $e$ rise, the ep curve will move to ep 1 from left to right. When the interest rate $r$ rises, the rp curve will move to rp 1 from right to left. So the rp curve and the ep1 curve will intersect at E1, the price of securities rise from P0 to P1. However, because there is a positive changes relationship between interest rate and exchange rate, when the interest rate $r$ rises, the international arbitrage capital will make the RMB exchange rate appreciation or more appreciation. So at this time interest rates $r$ would rise in fact, the ep curve will move to the ep2 curve from left to right. The ep2 curve and the rp1 curve will intersect at E2,which offset squeezing effect that interest rate $r$ rise will make on securities prices, and make stock price rise from P1 to P2[3].

3 An empirical study on the correlations among RMB interest rate, exchange rate fluctuation and China capital market

3.1 RMB interest rate fluctuation and the capital market

According to statistics, we generalized the changes in interest rate during 1993 – 2000 and the trend of Shanghai Composite Index, and found that they moved in opposite directions, i.e. if interest rate declined, both Shanghai Comp and the theoretical price of stock market rose, and vise versa. During 2000 – 2002, however, although average interest rate fell down, Shanghai Comp didn’t go up, went down as well. This is because at that time, the average EPS of listed companies (-13.76 YoY) dropped faster than the interest rate (-5.11% YoY), therefore resulting the decline in theoretical price of stocks and hence the descending Shanghai Comp. The fact that the interest rate during 2000 – 2002 kept falling down and Shanghai Comp didn’t increase but decrease, as a result, simply illustrates that the long-term impact of interest rate on the stock market in China coincides with the theoretical analysis, i.e. the long-term trend of stock price is determined by the combination of interest rate and company performance.
3.2 RMB interest rate and exchange rate fluctuation

The empirical study on the impact of RMB interest rate on exchange rate during 1981 – 2003 shows that in the long run, RMB nominal effective interest rate is in coordination with interest rate, and the long-term coefficient of elasticity of RMB relative interest rate to nominal effective interest rate is a minus value. In other words, the interest rate change in China has left a strong influence on RMB nominal effective interest rate and the interest rate changes will change of RMB nominal effective interest rate in a wider range. Interest rate will exert a relatively strong influence on nominal effective interest rate in the long run, but a weaker one for the short term.

Generally speaking, in western countries where the economies are more open, interest rate can directly influence the exchange rate through capital flows. In China, under the current exchange rate and interest rate mechanism and policy orientation, the capital account is not open enough so that interest rate fails to affect exchange rate in full play. Therefore, interest rate can hardly directly influence the exchange rate through capital flows but indirectly affect it by commodity market. The transmission mechanism of interest rate to exchange rate is weakened, and as a result the theory of Interest Rate Parity is of limited application in China, which can be illustrated by the relationship between the changes in RMB exchange rate and interest rate during 1994 – 2006.

4 Conclusion

First, foreign exchange market, money market and securities market are of relevance to each other. The capital effect and revaluation caused by the dual pressure of the interest rate increase and RMB appreciation will become a combined force to drive the general price of China capital market to a new level and thus promote the development of the market.

Second, considering the relatively low elasticity of RMB interest rate and exchange rate, together with the reverse effect caused by interest rate increase and appreciation of the currency, the influence of RMB appreciation on the capital market is expected to be weaker than the previous Yen appreciation in Japan.

Finally, given the considerable trend of international hot money pouring into China driven by the expectation of RMB appreciation, it is necessary to keep high alert to the potential economic bubble in the capital market.

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