

On the Chinese Exchange Rate Regime: An Attempt to Flexibility During 2015

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Abstract: This study will demonstrate, through an econometric and asset allocation approach, if and how the Chinese exchange rate regime was changing during 2015. Particularly, China to improve its exchange rate formation system implemented, during July and August 2015, three depreciation as a step toward a market-oriented exchange rate. This situation, along with the new right of the RMB to be an international currency in SDR should generate a loss of weight about the USD in the Chinese basket peg. For this reason, moving from Frankel-Wei's basic econometric model - but with some appropriate changes - our objective is to verify if the Chinese monetary policy about the exchange rate has affected the inner balance of the Chinese basket-peg leading it towards a flexible exchange rate regime.

JEL Classification: C22,E42, E44;

Keywords: Exchange Rate Regime, China, Econometric model, Asset -allocation.

1. INTRODUCTION

The Renminbi is a young currency and it was introduced in China in 1948 during the economic planning time. This situation didn't help the Chinese exchange rate system because the real value of the currency and its exchange rate was almost illusory. The currency policy, then, had to observe very strict rules that were dictated by the Central Bank. Only at the end of 1978, the Open Door policy brought a transformation in the Chinese economy: openness to foreign trade, attract foreign direct investment, long-term economic plans and also a monetary reform. Specifically, it was created a dual currency system that allowed the use of Renminbi only for domestic transactions and expected exchange certificates for foreign transactions; towards the end of the eighties, Chinese authorities have made the Renminbi convertible thanks to the abolition of the dual currency and with the exchange rate stabilization.

From 1994-1995 the Chinese government fixed the exchange rate of its currency with the US at national rate 8.3RMB per dollar, arousing negative reactions from the US government and of the whole economic world. In fact, the RMB was accused several times of being excessively depreciated and as a result of an ongoing struggle, China agreed to revalue its currency by switching to a system of crawling peg type through an official announcement July 21, 2005. This policy allows the Asian country to take fixed exchange rates advantage. A more depreciated currency, compared to the conditions of a flexible exchange rate, created the conditions for obtaining and maintaining a significant price advantage in exports. Although China has tried, in more recent times, to develop consumption interior, Asian economy, still, remains strongly linked to foreign demand.

For this reason, the Chinese authorities have proven reluctant to move from a model of fixed exchange rates to a more fluctuating, where the currency would be free to appreciate, constantly advocated by the global economy and in particular from the United States. So, on the 21st of July- 2005 as a response to the international debate on the fact that the Chinese currency was excessively undervalued (therefore favoring national exports) the Chinese Central Money Authority declared the re-evaluation of the Renminbi to an exchange of 8.11 RMB (-2.053%) to the American dollar, not to mention the adoption of a new exchange rate regime focused on the abandonment of the dollar, preferring instead an exchange rate based on a basket of international currencies (M. Mele, 2010).

The study about Chinese exchange rate regime began with Frankel' approach (1993). After there were numerous other studies: Frankel&Wei (1994), Devereux (2003), Ogawa (2006), Eichengreen (2006), Yamazaky (2006), Zeleis (2009), Mele (2010), Marzovilla & Mele (2010), Mele (2012,2014,2015) that have proposed other approaches with interesting results. Without going into this study on how Frankel' approach is formulated we can remember that it estimates a linear regression where the dependent variable is the home currency compared with a numeraire (Swizz Franc, SDR, Canadian dollar ecc...) and the independent variables are the currency into the basket peg. So, the value of coefficient (that estimate the elasticity) will be the weight of that currency in a hypothetical basket and the model will be suitable according to standard econometric tests. The contributions mentioned above have been characterized both for the choice about the numeraire, which for the econometric technique applied (OLS, time series, static or dynamic).

2. THE ECONOMIC BACKGROUND

Although it is widely claimed that the three RMB depreciations are the result of China's economic growth below expectations, our idea is that everything has its origin in the financial markets. Therefore, we move already away from the possibility of a transition to flexible exchange rates. For many months, in fact, economists and traders were concerned that a market soared by 110% in one year, in an economic slowdown with corporate profits falling, it was in a state of "bubble" overt.



Figure. 1: Shanghai Composite Index

Source: our elaboration in Futures and Market, 2015.

The ratings, arrive to pass a multiple of 70 times earnings, had lost any link with the fundamental, ending at the mercy of euphoric emotions of investors. Little importance was given to the fact that in China there were only 90 million small investors most of whom had little education and no financial experience. They have entered a phase of so-called "Bull Market" very particular to the point of thinking that never before 2015 it had been known in the Stock Exchange. The profits recorded by traders have held up well even rebound phases out until the end of June 2015. Since then the trend has

reversed sharply, entering, however, a phase “Bear”, or bearish, after accumulating in a few sessions losses, on the whole, higher than 20%.

As we can see from Figure 1, the Shanghai index from March 2015 until that June recorded an uptrend. The losses in this period are counted in 11 main units which, however, have always been compensated by profits rebound effects. Trading volumes, in addition, have remained high strengthening the basic hypothesis according to which the growth prospects, also in the Chinese economy, kept the financial market supports. However, as we can see from the figure, from mid-June began a phase of a negative trend that triggers the disorder in the choice of investors. All this would seem to be the result of attempts by the authorities to restore order in the explosive growth of credit, for the purchase of shares by operators “shadow” unregulated such as structured funds, “umbrella trusts” and other exotic channels. The response of the market, as a result of movements bearish and that, showed no signs of change in position, surprised and even scared the authorities.



Figure. 2: Shanghai Composite Index, Evidence of Loss

Source: our elaboration in Futures and Market, 2015.

As we can see from the graph above, from mid-June until 17 August, the index recorded about 23 losses, some of them in particular 10- they persisted for a long time.

This situation has led the policymakers to intervene with important reforms:

- (1) China’s central bank has devalued the yuan by nearly 2% against the US dollar for the first time in five days;
- (2) PBOC cuts interest rate by 0.25% and reserve requirement by 0.5% in an effort to improve the country’s struggling economy;
- (3) China’s central bank lowered the reserve requirement ratio (RRR) for all banks;
- (4) The People’s Bank of China injected a net 150 billion yuan in open-market operations, according to data compiled by Bloomberg;

In this context, with a global economic slowdown, low levels of output and prices, austerity measure in EMU that penalizes economic growth, it is not surprising that Chinese exports have collapsed over time. In addition, the collapse global commodity prices have produced the deflation that has led Beijing to react with the yuan devaluation. Devaluation would, all else being equal, let Chinese exporters regain some lost competitiveness. By raising the cost of imports, it would also help China stave off deflation.

3. WAS CHINESE EXCHANGE RATE REGIME MORE FLEXIBLE? EMPIRICAL ANALYSIS

In this part, we want to estimate the Chinese exchange rate regime to verify the flexibility. However, this analysis is not simple. In fact, we have to verify a short period dataset, with daily data. Obviously, there will be no problems in the number of observations for econometric estimation but, for the technical analysis in the financial markets, will need to measure the width of Bollinger' band.

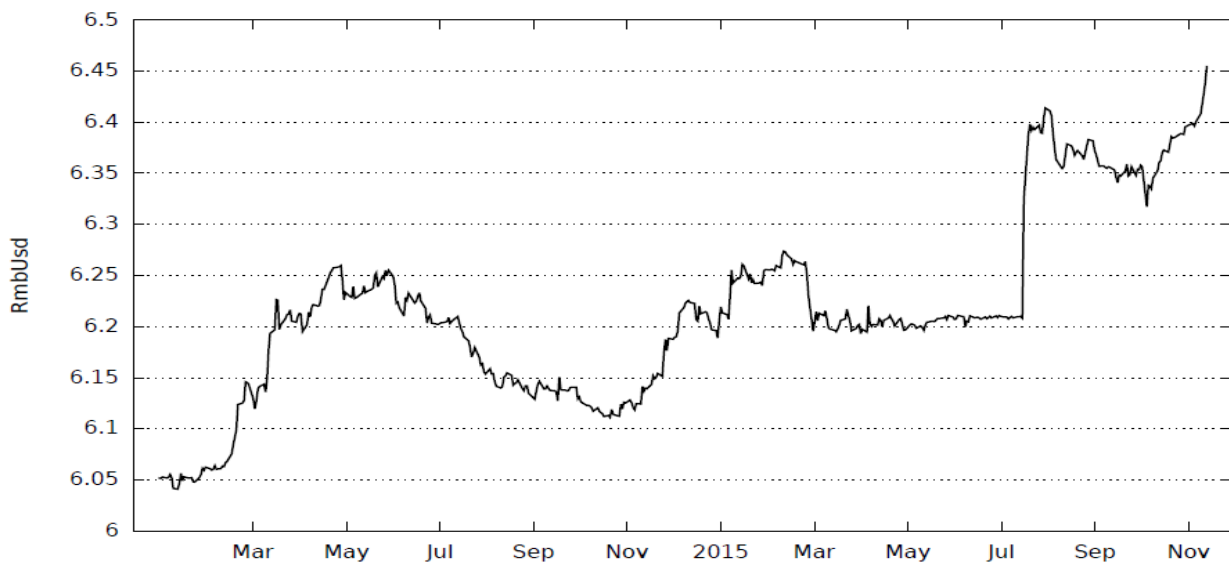


Figure 3: Shanghai Composite Index, Evidence of Loss During 2015

Source: our econometric processing with Gretl. Ver. 1.8.4 software on RBA data

As we can see from Figure 3 RMB with the policies of devaluation it has, in fact, widened the crawling peg of its exchange rate regime.

Before estimating the model, it is preferred to carry out the Dickey-Fuller test prefixed to seven delays necessary to test if the historic series relative to the three currency explicatives, to the dependent currency (Renminbi), and the numerai-re being proposed as dummy variable being little present or less stationery.

Now, we can make an estimate of the dependent variable through a general econometric model "OLS". The results advise the need for an alternative model only if: Durbin-Watson test will be > 2 ; the measure of the relative quality of statistical models for a given set of data (Akaike criterion, Hannan-Quinn and Schwarz criterion) will be different between them; the model shows heteroskedasticity; there are omitted variables; residues are not distributed according to a normal Gaussian.

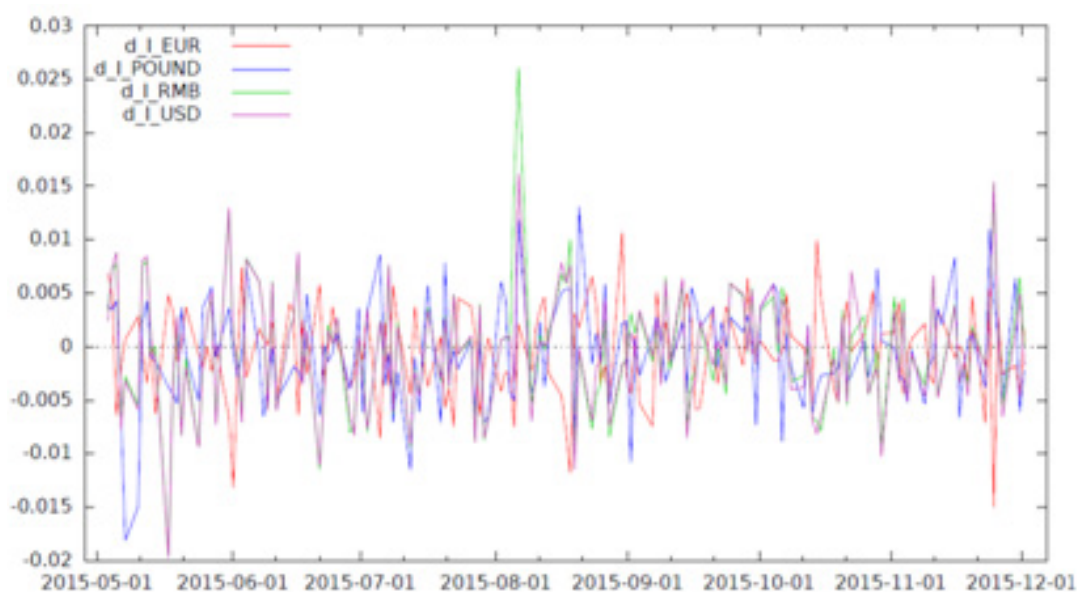


Figure. 4: Analyses of the Stationary Movements in Prime Logarithmic Difference

Source: our econometric processing with Gretl. Ver. 1.8.4 software, Pacific Exchange Rate.

Model: OLS, using observations 2015-05-04:2015-12-02 (T = 153) Dependent variable: d_1_RMB

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
d_1_USD	0.980573	0.0352259	27.8367	<0.00001	***
d_1_EUR	-0.0550068	0.0390815	-1.4075	0.16135	
d_1_POUND	-0.00874365	0.0376893	-0.2320	0.81686	

R-squared	0.884699	Adjusted R-squared	0.883162
Log-likelihood	737.7974	Akaike criterion	-1469.595
Schwarz criterion	-1460.503	Hannan-Quinn	-1465.902
rho	0.342283	Durbin-Watson	1.310204

The results obtained through the elaboration of data using STATA version 11 and Gretl 1.84 - with a dataset constructed at intervals of 5 days- clearly demonstrate, how the role of the dollar in the Chinese basket is dominant. In fact, there is a sort of dollar-peg because other currencies considered in the model are not significant. The value of the coefficient of the dollar, in addition, is very high. Its comparison with previous studies [Frankel and Wei's (1994), Levy-Yeyati and Sturzenegger (2003), Ogawa (2006), Eichengreen (2006), Yamazaky (2006), Cobham (2007), Zeleis (2009), Mele (2010, 2012, 2014)] shows that there has not been lightening of dollar-peg "de facto".

The precision of the econometric approach utilized is aided by the absence of a correlation between the variables and the adaptability of the independent variables in explaining the dependent variable. Latter is visible through the recorded adjusted R-square value of 0,883. Even the information criteria theorized by Akaike and Schwarz and Hannan-Quinn seem to conform with the model since their readings seem quite similar and there isn't a correlation between the residual ACF test (appendix).

The result obtained through econometric estimation shows that, in reality, there is not, still, flexibility in the exchange rate. However, we believe that an estimate of this type is not sufficient. In fact, the greater or less variability in the exchange rate towards a flexible exchange rate regime needs the study of volatility. In particular, taking the RMB exchange rate against 30 currencies we have estimated the volatility with 1 month, 3 months, 1 year, 3 year and the maximum and minimum values with probability about 95%.

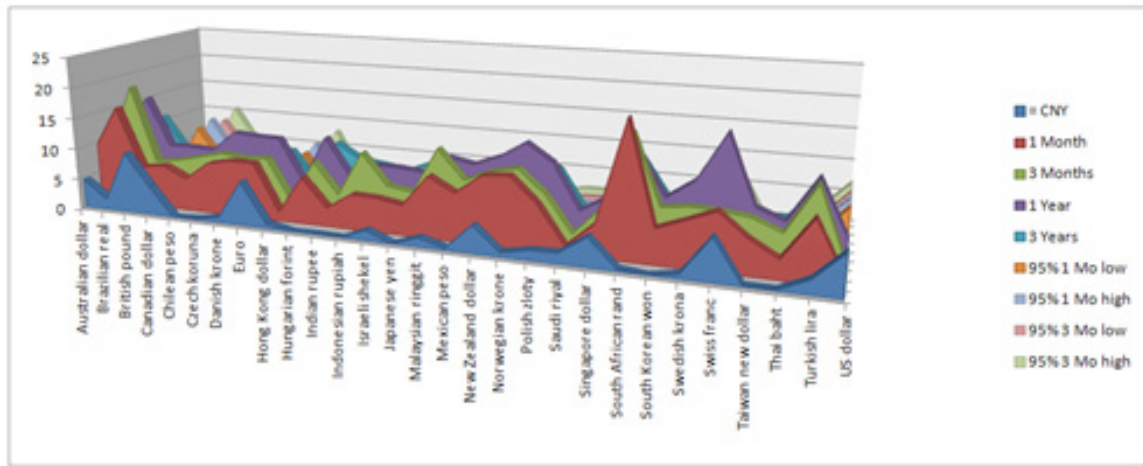
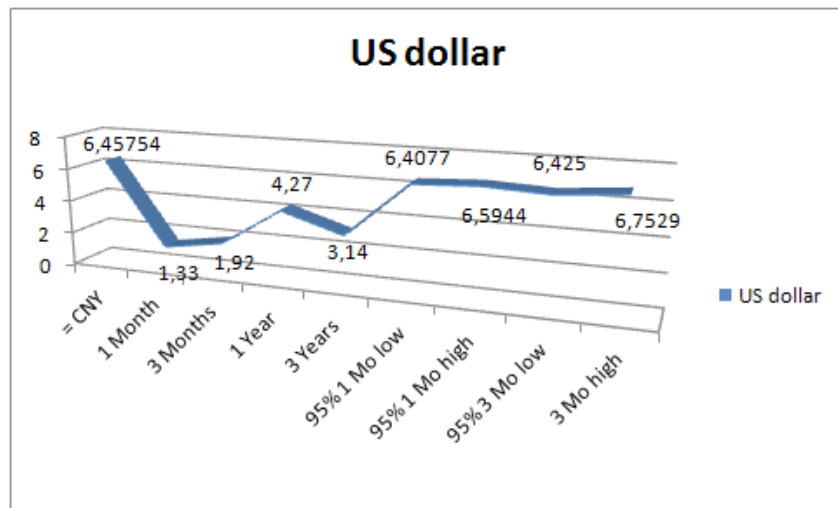


Figure. 5: Volatility Analysis

Source: our statistical processing with Gretl. Ver. 1.8.4 software, Pacific Exchange Rate.

As we can see from Figure 5 the volatility is constant in time: we can observe higher values relative to 1 month, also with regard the probability at 95%. Dollar and euro, the two currencies considered in the economic literature as international currencies, have peaks of very low volatility and which do not exceed 6,8%. Recalling the results of the econometric model we wanted to isolate the volatility of the exchange rate against the dollar. In particular, faced with the fact that we have carried out an econometric estimation in the short term, we want to see if the volatility increases significantly with the passing of 1 month low to 3 month high.

Fig.6 Volatility Analysis on the Dollar



Source: Our statistical processing with Gretl. Ver. 1.8.4 software, Pacific Exchange Rate.

Also, this analysis confirmed as USD/RMB-RMB/USD volatility in the minimum and maximum values is almost constant: with 95% probability, it changes from 6,40 to 6,75 and so the variation is -0,39. Now, if the volatility estimate confirms the results of the econometric model we just have to analyze what is happening in the financial markets. In particular, we analyze the effect of the devaluations in the Forex market through Bollinger band. In order to calculate the Bollinger bands we use before a G-day moving average (often 20-25) to which is added or subtracted from the value of the standard

deviation multiplied by a factor F (often around 2-3). The upper band is then obtained by adding the moving average F times the standard deviation. The middle band is given by the moving average. The lower band is calculated by subtracting the moving average F times the standard deviation. A smaller amplitude corresponds to a low volatility and vice versa.



Fig.7 Bollinger Band Analysis

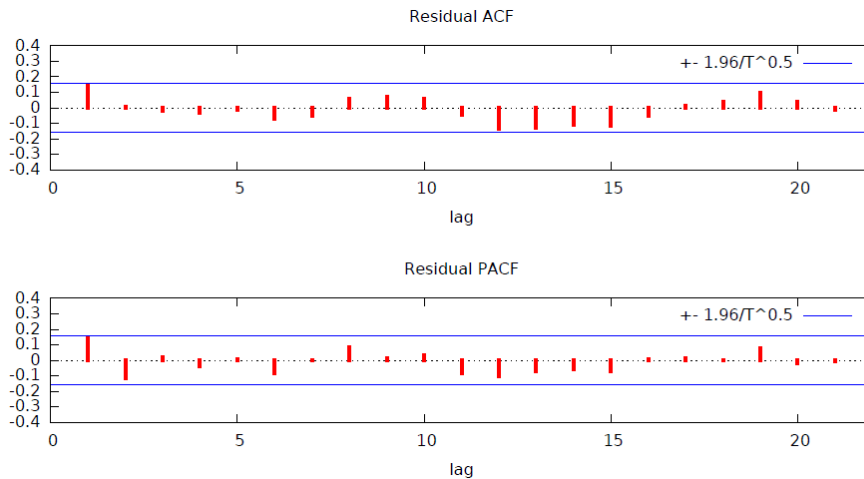
Source: our Asset Allocation processing in Plus 500 trading CFD.

The results of this analysis are very interesting. In fact, during 2014 the Bollinger band remained very compact: the greatest variation is recorded in April with sell rate that passed by 6,000 to 6,2102. However, this situation until August is nearly constant. After we can observe that the Bollinger band increase in volume: the minimum is recorded at a value of 6,0567 and with a maximum point of about 6,4985. This excessive volatility is very interesting and we could not observe it with normal econometric model: volatility breaks the point of maximum resistance recorded in 2015 generating two effects: speculation toward the upside with profits growing (the highest in the currency market in 2015) and an unexpected downtrend that generates losses in the portfolio: this misalignment in Chinese exchange rate has generated the negative effect of a hypothetical change toward the flexibility, as claimed by those who are critical of a flexible exchange rate regime.

4. CONCLUSION

The RMB devaluation operated in recent months by the PBOC against the US dollar has been greeted with cautious optimism by the IMF. This choice, in our opinion, is due to the willingness of China to have an increasingly significant role in defining the exchange rate in the world. The Chinese currency thus seems now destined to travel a road rich in reforms that go from the issue of bonds denominated in the Chinese currency on the London market, the creation of platforms responsible for the exchange of RMB in several European financial centers. Many supporters about flexible exchange rates have mentioned the possibility that China was going to make that choice. However, our study is critical and does not confirm this hypothesis. In particular, econometric analysis shows that there is dollar-peg still (the basket peg is very weak) and the volatility analysis showed that in the 1 month-3 month forecast it is very low against the dollar. Only the Asset Allocation analysis showed that the devaluation has increased the volatility and exchange rates misalignment (typical in that a flexible exchange rate) on the Bollinger band. Nevertheless, our analysis showed all the weaknesses of the flexible exchange rate regime for a country like China: speculation, a possibility about factors of uncertainty, no consideration of beggar- thy-neighbor type.

APPENDIX



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