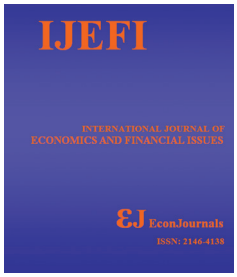

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On the Chinese's Exchange Rate Regime: A Different Approach

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ABSTRACT

This paper will prove, through a financial and econometric model, a different estimation approach on the Chinese' basket peg. In particular, this study proposes a new system for calculating the numeraire in exchange rates of the major currencies present in Chinese basket-peg. We will analyze the values of exchange rates in the financial markets, particularly in the Forex market and Binary options. Then, after choosing the three currencies that have characteristics of low volatility, we will find our numeraire that will be determined by average every 30 min. Finally, we will do an econometric estimation.

Keywords: Exchange Rate Regime, Chinese Basket Peg, Forex Market, Binary Options
JEL Classifications: F22, F42, F44`

1. INTRODUCTION

The Chinese' exchange rate policy has been, especially in recent years, a theme of deep interest and debate. In particular, the monetary policy carried out by the Chinese authorities was definitely one of the most important economic tools used to allow the extraordinary economic growth that China has experienced and is experiencing. Now, to analyze the management of the exchange rate in China must start necessarily from 1979, the year in which the new political course gives rise to a gradual reform work based on the enhancement of private initiative and openness to foreign countries. This has led to a new and greater importance about the role of the exchange rate and, so, also of international trade.

Before 1979 the foreign trade system had performed three aspects predominant: Monopoly, centralized planning and accounting national. These three institutional aspects were responsible for the higher inefficiencies in the existing system in the pre-reform and so they were the main objectives of the reforms on foreign trade. It was a system in which a limited number of state-owned corporations supported China's foreign trade. This monopoly system was set up to encourage insulation against external shocks and to ensure that the central government could use the foreign exchange resources of the nation for its programs industrialization. With the centralized planning of all activities, import and export of the country were controlled by the state. The rule was: It was thought that exports could generate enough foreign exchange to sustain imports, while policymakers thought that imports would fill the gaps in the productive capacity of the country, as specified in the national economic plan. The last aspect that constituted the financial basis of the system prior to the period of market reform with foreign countries was the system of centralized accounts. Under this system, all foreign currency earnings were to be delivered to the government by means of centralized planning will meet the demand. If the foreign trade sector suffered a loss of domestic money in its operations, the government automatically used to cover it with the central budget. In addition, importers and domestic exporters have surrendered all their profits in domestic currency to the central state budget. Due to this automatic mechanism of tax subsidy, the exchange rates could be set at an arbitrary level, misaligned by other variables economic.

These three institutional aspects, when they were initially designed, were considered as the advantages of an economy planned. Later it

turned out that they were the main causes of the inefficiency of the pre-reform system. In fact, in this system, the exchange rate was primarily a function of accounting to find the profits or benefits in the event of losses. Therefore, the official exchange rate was fixed only one element in the constellation based on other non-market prices. The exchange rate did not have a significant role in foreign trade, because with the state monopoly and the central budget losses in exports, resulting from the overvalued exchange rate, were offset by profits from imports, and vice versa if an undervalued exchange.

The reform started in 1979 has involved, therefore three related issues: The breaking of the monopoly to encourage competition among commercial enterprises; the abandonment of centralized planning to allow the forces of the market to have a greater role in the allocation of resources; financial independence of the firms that operated on foreign trade. The fundamental task of the reform was especially to transform the mechanism for allocation of foreign currency to a new system based on the principles which regulate the market.

In particular, from 1997 to 2005, the Chinese government fixed the exchange rate of the national currency with the U.S. dollar at the rate of 8.3RMB, i.e., adopting a policy of anchor-peg in order to maintain stable levels of inflation. However, the Renminbi was accused several times of being excessively devalued and only on July 21, 2005, China agreed to revalue its currency passing to a system of type crawling peg.

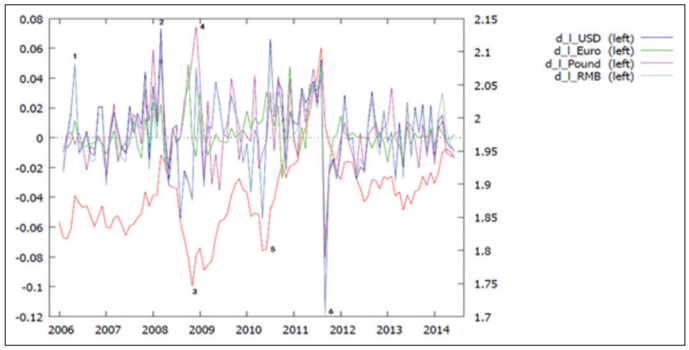
2. CHINESE' EXCHANGE RATE REGIME: TOWARDS A NEW APPROACH

Chinese' exchange rate regime was studied by Frankel and Wei (1994, 1995, 2007), Frankel (2006), Ogawa (2006), Eichengreen (2006), Yamazaki (2006), Goldstein and Lardy (2006), Laurenceson (2008), Levy-Yeyati & Sturzenegger (2003), Ogawa and Yoshimi (2008), Ohno (1999), Zeileis (2009), Evenett (2010), Mele (2010), Mele and Baistrocchi (2012), Yi (2013) and Cui (2014) and these analyzes have been internationally accepted economic literature. However, the consideration of numeracies, especially as a factor necessary to carry out the exchange rate was in our opinion, subject to an error. In particular, although the models used have leveled the problem of volatility through the use of logarithms, the first difference, the use of models in time-series (GARH, AR or the ARIMA), in our opinion, it was always present. In the analysis, therefore, the presence of volatility generates distortion in the results: A higher volatility means that a value can potentially be spread out over a larger range of values. This means that the price change dramatically over a short time period in either direction. The assertion is true not only for financials but also for currencies because the exchange rate in the economy is also a price: The price of one currency in terms of another currency. The analysis, therefore, econometrics or statistics should try to level as possible the presence of volatility.

We tested for this purpose the exchange rates of the main currencies used for the analysis of Chinese basketball-peg in a series post-2005 reform. Were taken as numeraire the Swiss franc, the Canadian dollar and Special Drawing Rights.

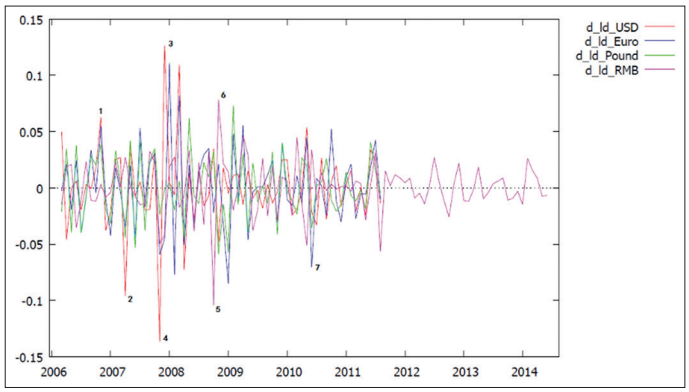
Regarding the exchange rate between the currencies considered (RMB, USD, Euro, Pound) data were taken from Pacific exchange rate service, 2014; for the exchange rate on SDR data are our elaboration on IMF data and statistics. In particular, the analysis is based on the following consideration: we want to check for the presence of peaks of volatility over the range considered stable. We leveled through processes of statistical and mathematical couples exchange rates: first, we have developed the logarithm and then the first difference on the result. Finally, taking a time series from January 2006 to June 2014 we counted the volatility that exceeded the value of the media, considering the possible effects of the rebound in the exchange market (Figures 1-3).

Figure 1: Exchange rate USD/CHF, monthly data



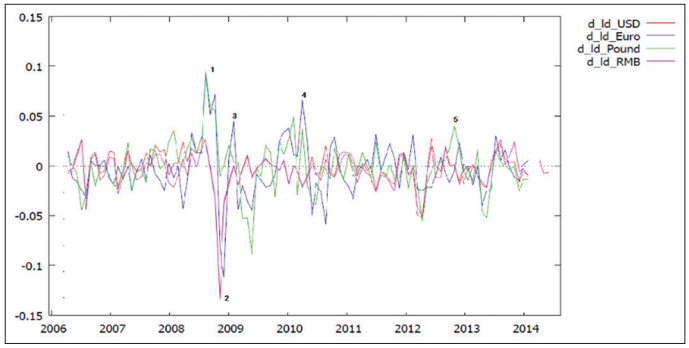
Source: Our elaboration in GRETL

Figure 2: Exchange rate USD/CAD, monthly data



Source: Our elaboration in GRETL

Figure 3: Exchange rate USD/SDR, monthly data



Source: Our elaboration in GRETL

As we can see from the previous figures, the currency pairs considered in the further work on the system for the estimation of the Chinese' exchange rate regime have all volatility peaks. The combinations of Figure 1 on the exchange rates USD, RMB, EURO POND against the Swiss Franc show 6 abnormal volatility peaks: In an econometric analysis that observation would recommend the use of a model series of the GARCH. However, in our view, even if the D-W test is less than the value of 4, nothing forbids us to think that the outcome will eventually find distorted by the anomaly of the volatility itself. As for the combination of the Canadian dollar compared to the currencies that it is clear how it would be extremely unstable in the analysis. In fact, we counted no <7 types of abnormal volatility that only decrease from 2011. The greater volatility is recorded between the end of 2007 and beginning of 2011, i.e., the period of the U.S. financial crisis. Again we thought we estimate these empirical values become distorted even by eliminating outlier. Finally, we can see Figures 4-6 where we instead used as numeraire the special drawing rights. This choice in an econometric study could certainly prove to be the most efficient. In fact, the observation graphic shows a more stable development of exchange rates even if we count 5 abnormal volatility.

Now, we ask ourselves whether it is possible to perform an econometric analysis in the presence of so much volatility. It has become apparent that the use of logarithms and first differences did not reduce the volatility. The first explanation for this phenomenon is that, most likely, the exchange rates used against the CHF, CAD,

Figure 4: Exchange rate USD/CHF in Forex market

Source: Our processing Forex Trading Signal, FXCM 2015

Figure 5: Exchange rate USD/CAD in Forex market

Source: Our processing Forex Trading Signal, FXCM 2015

Figure 6: Exchange rate USD/PLN in Forex market

Source: our processing Forex Trading Signal, FXCM 2015

or SDR affected much of the changes in financial markets. In particular, we are aware that exchange rates fluctuate every second day, and purchases and sales are made in many markets. We can think at the market Forex or binary options: In these markets are trading with leverage up to a value of 400, with the possibility to bet on up or down every 60 s. Therefore we think it is necessary to choose the numeraire of an exchange rate based on its stability in the financial markets. This stability must be observed in a time range of 5 min for at least a month. The exchange rate will be stable and break the points of maximum and minimum rarely. Finally, profits and/or losses will be contained throughout the period considered.

3. A NEW METHOD OF ANALYSIS

Referring to several works on the estimation of Chinese's exchange rate regime algebraically the RMB is pegged to currencies $X_1, X_2,\ldots$ and X_n, with weights equal to $w_1, w_2,\ldots$ and w_n, then $\log RMB(t+s)$-$\log RMB(t) = c + \sum w(j)[\log X(j, t+s)$-$\log X(j,t)]$. Faced with such a mathematical representation the problem is to define the "value" of the currency. We are talking about, then, the numeraire. In particular, if the true regime is more variable than a rigid basket peg, then the choice of numeraire does make some difference to the estimation. Some authors in the past have used a remote currency, such as the Swiss franc. More specifically Frankel and Wei (1995) used the SDR; Frankel and Wei (1994), Frankel and Wei (1999) and Eichengreen (2006), Mele (2010) used the Swiss franc; Bénassy- Quéré (1999), the dollar; Yamazaki (2006), the Canadian dollar.

Without using and recall the last approach in Frankel (2009), because he does not take a currency to calculate the exchange rate, we wonder why it has been taken as the numeraire own the Swiss Franc, the Canadian dollar or the SDR. The answer lies in the fact that such currencies (index for SDR) should be less present in the financial markets, which is less affected by the influences of the markets. If we compare these with other currencies in the financial market, then the answer is true. However, as we noted in the previous section, both the Swiss Franc, Canadian dollar and SDR have volatility spikes.

So we ask, is it possible to cut this volatility? To answer this question, we observed the behavior of 63 currency pairs traded in financial markets more volatile, Forex market and binary options. We then tracked the performance of these currencies running time of step: 1 min, 5 min, 10 min, 30 min, 1 h, 3 h, 1 day, 1 week and the 1 month. For every trend of the exchange rates we have used a number of financial indicators, in order to understand if and how a change in the exchange rate was really predictable: Average True Range, Bollinger's band, MACD/OsMA, Momentum and Williams Percent Range. The use of such analysis is appropriate in our opinion. This is because if the exchange rate is predictable to say that always keeps the same trend over time. In short, the trend is repeated by becoming the exchange rate suitable for analysis in time series. We have accepted the terms of error as follows: only once within a 30-min exchange rate can break the point of maximum or minimum in a whole day. The results have been impressive. On three different Forex currency markets (major, minor and major 2) really the Swiss Franc and the Canadian dollar appeared the currencies to be less subject to unexpected trends. However, we realized the presence of another currency that met our requirements: The Polish Zloty.

We observe from the figures underlying the trend of the currencies in the Forex market choices (Figures 4-6).

As we can see from the figures on the October 16 2015, all currencies in the exchange rate with the U.S. dollar, meet our requirements. The trend is very smooth and losses and gains are minimal traders from 12.00, however, the trend disappears almost flat for about 6 h, then resume from 18.00. For those who are studying the financial markets, especially that of Forex, this result does not worry much. In fact, it is normal that from 14.00, especially, markets begin a phase of preparation for the opening of the U.S. market. From 14.30, in fact, begin the pre-market trading between Europe and the USA. At 15.30 the two markets match in the world increasing trading and volatility of currencies: This is the most important time to make a gain. But this situation is always considered for each currency. So we decided to consider the periods prior to that time. In fact, we wanted to test this view looking at a quiet time for the financial markets an exchange rate which is USD/EUR from 19.30 to 22.00 on the same day.

From Figure 7 we can clearly see the presence of an unstable exchange rate and high volatility even during the most "quiet" in the markets. We can see that in just 2 h have come to be created

Figure 7: Exchange rate USD/Eur in Forex market

Source: Our processing Forex Trading Signal, FXCM 2014

inside the graph Elliot's wave with the exchange rate that fluctuates from 1.8342 to 1.8360. This result this result thus shows how the exchange rate of the Swiss franc, the Canadian dollar, and Polish Zloty are preferable to other currencies.

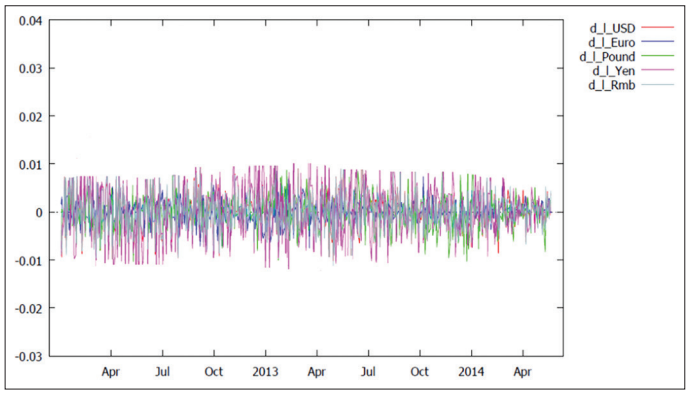
Now, after choosing the three currencies that will be used as the numeraire, there remains the problem of limiting volatility in Figures 1 and 2. We, therefore, decided to solve this problem through various avenues. First, we decided to change the source of our data. We wanted to avoid using data on exchange rates from the IMF, data-stream or the Pacific exchange rate service. The explanation lies in the fact that, we think, these data fail to collect the information in the financial markets but only the closing rate in the market. So, we decided to follow along and complex process to create a dataset used for econometric estimation. In particular, we have taken data every 30 min of the final price traded for each exchange rate considered. So, we decided to follow a long and complex process to create a dataset used for econometric estimation. In particular, we have taken data every 30 min of the final price traded for each exchange rate considered. The data are processed on two markets: Forex and Binary options. Were made of the averages every 30 min in the two markets and then at the end of the day were taken these averages and processed one and the final exchange rate. Finally, this procedure was repeated for 5 days to get a dataset week to 5 days.

Once we have created the dataset to 5 days on the following currency pairs that are present in Chinese's basket-peg: USD/CHF-USD/CAD-USD/PLN, EUR/CHF-EUR/CAD-EUR/PLN, POUND/CHF-PUND/CAD-POUND/PLN, RMB/CHF-RMB/CAD-RMB/PLN we conducted for each period an average of each exchange rate and numeraire chosen for this analysis. Later the results obtained we performed a transformation in logarithmic, then the first difference obtained on logarithms (Appendix).

The result obtained from this complex system is very interesting. We can see it as just stated by analyzing the Figure 8.

We analyze the Figure 8 it is the result of the first log difference about the exchange rates of major currencies in the Chinese basket-peg compared to our numeraire (we can call Fx). The time series plot clearly shows the absence of volatility' peaks.

Figure 8: Time series plot 2009-2014



Source: Our processing in GRETL with elaborations data from FXCM 2014 and 24 option

In particular, it would seem that our computer system about the numeraire generated an effect of stability in every moment of time series, ie we automatically deleted every possible out-liar value in the dataset. A possible explanation of this phenomenon is the following: having chosen a weighted average of the exchange rates that were generated in the financial markets every 5 min, allowed us to gather every bit of information on the behavior of the determinants of exchange rates.

Using, therefore, the new dataset can now make any right econometric analysis to estimate the weight of each currency considered in Chinese' basket-peg.

4. ECONOMETRIC ANALYSIS

In order to empirically estimate the process described above, we apply a model in historical series, with logarithmic differences, for a total of 621 observations. The dependent variable is RMB while the regressors are USD, EUR, Pound, and Yen.

4.1. The Results

Model: AR(1), using observations 2012-01-05:2014-05-22 (t=621)

Dependent variable: d_l_Rmb

Variable	Coefficient	SE	t-ratio	P value
d_l_USD	0.97405	0.01124	86.59	0.000
d_l_Euro	−0.06393	0.01869	−1.104	0.2701
d_l_Pound	0.01138	0.01253	0.908	0.3640
d_l_Yen	0.00391	0.00697	−0.617	0.5745
Adj R-sq.	0.9463			
D-W	1.9956			
P value (f)	0.000			
S.D. regr	0.0009			

The model developed through the construction of the dataset on data extracted from the financial markets, it is econometrically correct. In particular, the independent variables explain perfectly the dependent one. Indeed the value of R^2 is high and it is about 95%. Most probably the remaining 5% belongs to currencies in the famous "basket of 11 currencies," said the official Chinese sources since 2007. The Durbin-Watson statistic used to detect the presence of residual autocorrelation in a regression analysis shows a value lower than 2. Such a value indicates that there is no autocorrelation. Even the standard error of regression, which measures the size of a typical residual regression in units of Y, is minimal: 0.0042.

Analyzing the results, it is clear that the RMB, in fact, presents an exchange rate regime to "false-basket-peg." In fact, only the U.S. dollar appears to be significant in the model, with a value of 0.974, while the other currencies that are not significant. Such a result shows that China actually has a system of "quasi anchor-peg" to the dollar, which appears to have returned to a system of the type-dollar peg. The explanation of this result may be two. Thinking in terms of pure economics, the dollar would be preferable in all its functions as an international currency, in particular as regards the invoicing currency. The economic instability of the euro has in fact destabilized the role of the euro as an international currency,

that of the English at a time when Britain is still involved in the residue of the international crisis.

A second explanation concerns the financial market. This explanation is motion important for us, as we took the data from calculations on the financial markets also unregulated. In the face of financial instability large investors and traders, which we know many hedge funds and investment funds, are preferring to close contracts of futures arbitrage detained in China's currency, with the United States. Is forming, therefore, a sort of preference disclosures in the financial markets for the U.S. currency at the point of totally affect the Chinese.

5. CONCLUSION

In this work we wanted to analyze the Chinese's exchange rate regime through an innovative approach. The awareness of the role of financial markets in the world economic system, has led us to consider the determination of exchange rates in a different way. We wondered if the only consideration in a dataset of exchange rate taken from normal sources were correct in terms of volatility. This is because the data that are currently available from various sources allow you to use data to 4-5 days, a week, a month. However, these data are an average of trends in exchange rates whose determinants are dependent on many factors. In fact, numerous factors determine exchange rates, and all are related to the trading relationship between two countries: Differentials in inflation, differentials in interest rates, current-account deficits, public debt and political stability and economic performance. However, between these determinants, there is a subset of determinants belonging to the financial markets that has major influence on the evolution of exchange rates.

In particular, we cannot consider factors such as: Hedge funds as speculators, investment management firms, retail foreign exchange traders and non-bank foreign exchange companies. In other words, this subset of the determinants of exchange rates significantly affect the trend of exchange rates: In fact, every change is recorded every second, the result of choices almost always speculative. Therefore, in this work, we constructed a dataset based on the financial fluctuations of exchange rates in Chinese basket-peg. The result was to be able to act on the observations every 30 min, choose the cash in the financial markets and develop an econometric model devoid of irregular fluctuations.

REFERENCES

Bénassy-Quéré, A. (1999), Exchange rate regimes and policies: An empirical analysis. In: Collignon, S., Pisani-Ferry, J., Park, Y.C., editors. Exchange Rate Policies in Emerging Asian Countries. London: Routledge. p40-64.

Cui, Y. (2014), China's exchange rate regime reform: Implications from the experiences of Japan, Korea and Taiwan. China Economic Journal, 8(2), 1-17.

Eichengreen, B. (2006), China's Exchange Rate Regime: The Long and Short of It. Paper for Conference on Chinese Money and Finance; 2-3. New York: Columbia University.

Evenett, S. (2010), The US-Sino Currency Dispute: New Insights from Economics, Politics and Law. Available from: http://www.VoxEU.org eBook.

Frankel, J. (2006), On the yuan: The choice between adjustment under a fixed exchange rate and adjustment under a flexible rate. In Illing, G., editor. Understanding the Chinese Economy. CESifo Economic Studies. Oxford: Oxford University Press.

Frankel, J., Wei, S. (1994), Yen Bloc or Dollar Bloc? Exchange Rate Policies of the East Asian Economies. In: Ito, T., Krueger, A.O., editors. Macroeconomic Linkages: Savings, Exchange Rates and Capital Flows. Chicago: University of Chicago Press.

Frankel, J., Wei, S. (1995), Emerging currency blocs. In: Genberg, H., editor. The International Monetary System: Its Institutions and its Future. Berlin: Springer.

Frankel, J., Wei, S. (2007), Assessing China's exchange rate regime. Economic Policy, 51, 575-614.

Frankel, J. (2009), New estimation of China's exchange rate regime. Pacific Economic Review, 14(3), 346-360.

Goldstein, M., Lardy, N. (2006), China's exchange rate policy dilemma. American Economic Review, 96(2), 422-426.

Laurenceson, J. (2008), China's Exchange Rate Policy: The Case Against Abandoning The Dollar Peg. EAERG Discussion Paper; 0105.

Levy-Yeyati, E., Sturzenegger, F. (2003), To float or to trail: Evidence on the impact of exchange rate regimes on growth. American Economic Review, 93, 1173-1193.

Mele, M. (2010), A "time series" approach on the Chinese exchange rate regime. Hrack Economic Research, 23(3), 1-13.

Mele, M., Baistrocchi, A. (2012), Still on China' exchange rate regime: The euro and its role as an anchor currency. Asian Journal of Finance and Accounting, 4, 205-215.

Ogawa, E. (2006), The Chinese yuan after the Chinese exchange rate system reform. China and World Economy, 14, 39-57.

Ogawa, E., Yoshimi, T. (2008), Widening Deviation among East Asian Currencies, Research Institute of Economy, Trade and Industry Discussion Paper No. 08010.

Ohno, K. (1999), Exchange Rate Management in Developing Asia. Working Paper No. 1, Asian Development Bank. Available from: http://www.adbi.org/research%20paper/1999/01/01/183.exchange.rate.

Yamazaki, K. (2006), Inside the Currency Basket. Columbia University and Mitsubishi UFJ Trust and Banking Corporation Working Paper.

Yi, G. (2013), Exchange Rate Arrangement: Flexible and Fixed Exchange Rate Debate Revisited. IMF Rethinking Macro Policy II Paper; p1-8.

Zeileis, A. (2009), Exchange Rate Regime Analysis for the Chinese. Department of Statistics and Mathematics, WU Wirtschaftsuniversität Wien, Research Report Series.

APPENDIX

1. Model for creating of the numeraire in exchange rate system:

   a. $\{[(USD/CHF^{Forex}+USD/CHF^{24option})/2] + [(USD/CAD^{Forex}+UDS/CAD^{24option})/2] + [(USD/PLN^{Forex}+USD/PLN^{24option})/2]\} = \phi$ $t_{30min}; T_{5\ days}$

   b. $\{[(Euro/CHF^{Forex}+Euro/CHF^{24option})/2] + [(Euro/CAD^{Forex}+Euro/CAD^{24option})/2] + [(Euro/PLN^{Forex}+Euro/PLN^{24option})/2]\} = \gamma$ $t_{30min}; T_{5\ days}$

   c. $\{[(Pound/CHF^{Forex}+Pound/CHF^{24option})/2] + [(Pound/CAD^{Forex}+Pound/CAD^{24option})/2] + [(Pound/PLN^{Forex}+Pound/PLN^{24option})/2]\} = \Gamma$ $t_{30min}; T_{5\ days}$

   d. $\{[(RMB/CHF^{Forex}+RMB/CHF^{24option})/2] + [(RMB/CAD^{Forex}+RMB/CAD^{24option})/2] + [(RMB/PLN^{Forex}+RMB/PLN^{24option})/2]\} = б$ $t_{30min}; T_{5\ days}$

   e. $[(\phi_1+\phi_2+\phi_3+\ldots+\phi_n) + (\gamma_1+\gamma_2+\gamma_3+\ldots+\gamma_n) + (\Gamma_1+\Gamma_2+\Gamma_3+\ldots\Gamma_n) + (б_1+б_2+б_3+\ldots+б_n)]/N_i =$ *Fx numeraire*

RESIDUAL TEST