International Journal of Development and Sustainability
Online ISSN: 2168-8662 – www.isdsnet.com/ijds
Volume 2 Number 3 (2013): Pages 1636-1644
ISDS Article ID: IJDS13042501

Analysis on influencing factors of the exchange rate between Chinese Yuan (CNY) and Mongolian Tögrög (MNT)

Baasankhuu Baljinnyam *, De Hong Lu

College of Economics and Management, Northwest A&F University, Yangling, Shaanxi 712100, People's Republic of China

Abstract

This paper analyzed the macroeconomic factors that influence the exchange rate between CNY and MNT in Mongolia. The monthly data for the period between January, 2006 and December, 2012 was used. The data sourced from Monthly Statistical Bulletin of BOM, Monthly Statistical Bulletin of NSO and Monthly Report of MGCA. The main variables used to check variability there are; inflation, interest rate, exports to and imports from China on the exchange rate between CNY and MNT. In the analysis, we used simple linear regression model with ordinary least method. The results of our study revealed that the inflation and interest rate are the two most influential factors to exchange rate variation, but exports and imports between China and Mongolia had no significant effect on exchange rate. All of result came from co-integration regression test as well as correlation and covariance measurement, that all was analyzed by Eviews 7.

Keywords: Exchange rate, Inflation, Interest rate, Cointegration regression analysis, Export to and import from China, Covariance and correlation measurement, Co-integration regression test

Copyright © 2013 by the Author(s) – Published by ISDS LLC, Japan
International Society for Development and Sustainability (ISDS)

Cite this paper as: Baljinnyam, B. and Lu, D.H. (2013), "Analysis on influencing factors of the exchange rate between Chinese Yuan (CNY) and Mongolian Tögrög (MNT)", *International Journal of Development and Sustainability,* Vol. 2 No. 3, pp. 1636-1644.

* Corresponding author. *E-mail address:* yolanda414@yahoo.com

1. Introduction

The reasons of this study are: Mongolia is a landlocked country between China and Russia and has no coastline. China is playing the leading role in trade turnover, investment, employment (mining and construction building) and services in the Mongolia. Other special reason for research in this paper is that of rapid internationalization of CNY. "The Chinese authorities have focused on encouraging use of the RMB in settling cross-border trade with neighboring countries and on the development of RMB financial services in Hong Kong SAR" (Maziad and Kang, 2012, p.3). China is one of the countries which is influenced most by dollar standard and it needs to increase the international status of RMB and enhance the total level of economic development (Xiang, 2012). Hence, a careful consideration of the determinants of exchange rate of currency between these two countries is essential. This paper deals with this issue and therefore, it will be a very important study for these two countries. The main variables used to check variability are inflation, interest rate, exports to and imports from China on exchange rate between CNY and MNT. The exchange rate provides a key macroeconomic linkage between the domestic economy and the rest of the world that takes place through goods and asset markets (Moosa and Bhatti, 2009). "Volatility in the cross section is related in the first instance to macroeconomic fundamentals -most notably inflation, real GDP growth, the fiscal deficit (in percent of GDP), and the openness of the economy (measured by the sum of exports and imports relative to GDP)" (Canales-Kriljenko and Habermeier, 2004, p. 4).

2. Model and data analysis

2.1. Building of model

In this paper, the determinants of exchange rate between CNY and MNT are examined using simple linear regression model involving monthly data for the period from January, 2006 to December, 2012. This analysis selected macroeconomic factors of the exchange rate between CNY and MNT; inflation, interest rate, exports to and imports from China. The main variables used to check variability are inflation, interest rate, import and export on exchange rate volatility. Simple Linear Regression model with ordinary least method (OLS) is used to analyze the results (Parween et al., 2012).

There are many crucial factors affecting currency exchange rate in Mongolia. The statistical tests revealed that the real effective exchange rate was significant to the exchange rate system choice. We analyzed and discussed most influencing factors of the exchange rate between two currencies for our objectives.

On the theoretical and empirical concepts, the empirical model for influence factors of exchange rate is chosen as follows,

$$Y = \alpha INF + \beta INT_RATE + \gamma EXP_CH + \lambda IMP_CH + \varepsilon \quad (1)$$

where Y is exchange rate between CNY and MNT and ε is error of the regression.

Table 1 summarizes the factors used in the estimation and their sources.

Table-1. Variables in the estimation

Name of factors	Notation	Coefficient	Source	Time period
Inflation	INF	α	Statistical Monthly Bulletin, BOM	Jan.2006-Dec.2012
Interest rate	INT_RATE	β	Statistical Monthly Bulletin, NSO	Jan.2006-Dec.2012
Export to China	EXP_CH	γ	Monthly Reports of MGCA	Jan.2006-Dec.2012
Import from China	IMP_CH	λ		Jan.2006-Dec.2012

2.2. Data analysis

In order to realize the analysis, we discussed on figures and statistical reports of all influencing factors.

2.2.1. Exchange rate

The exchange rate between CNY and MNT has steadily been increasing since 2006. Before 2008, it averaged at 1 CNY=151 MNT, and after 2008, it increased to 1 CNY=198 MNT. The exchange rate between CNY and MNT rose sharply up by 35 percent, during the economic crisis worldwide in 2008. In last 4 years exchange rate was fluctuating and value was with very high difference. Exchange rate reached an all time low of 146.3MNT per CNY in March, 2006, and a record high of 225 percent in December, 2012. Records of exchange rate are shown in Figure I.

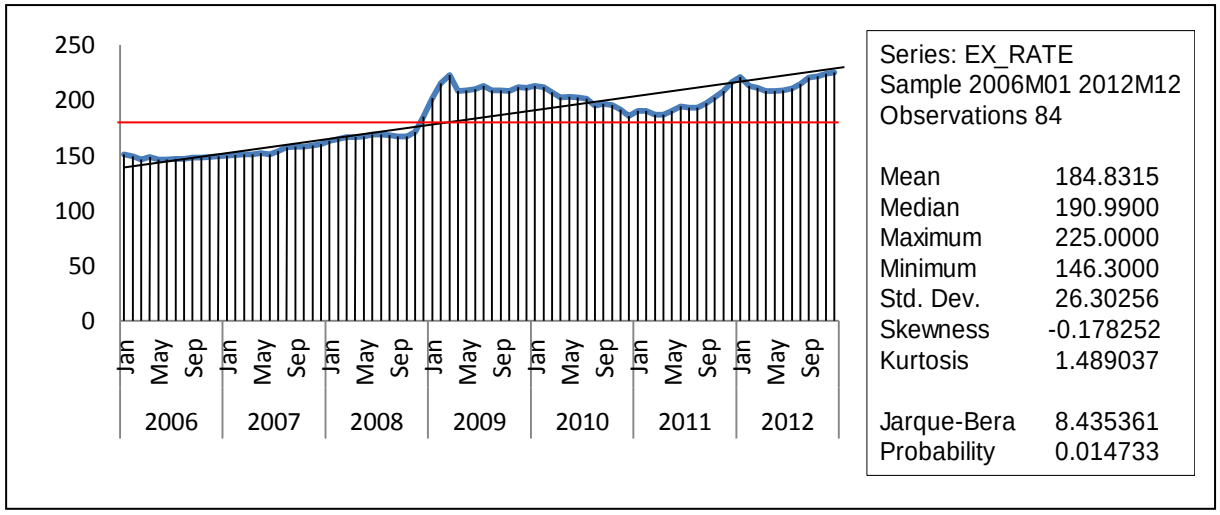


Figure I. Data of exchange rate between CNY and MNT

Source: Statistical Monthly bulletin (2006-2012), BOM

2.2.2. Factor-1. Inflation

Historically, from 2006 until 2012, Mongolia inflation fluctuated and the difference was very high between every month. It reached an all time high of 5.1 percent in April of 2008 and a record low of -2.8 percent in the month of July, 2010. The global economic crisis or rising of Chinese consumer prices and booming of mineral sector of Mongolia also added pressure to inflation. Historical data for inflation rate of Mongolia are shown in Figure II.

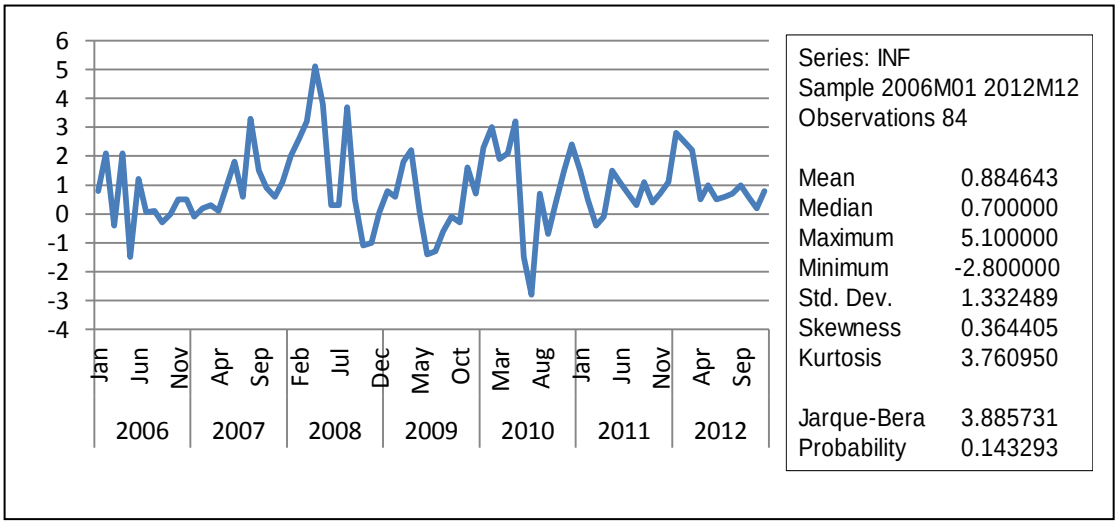


Figure II. Data of Inflation (monthly changes)

Source: Statistical Monthly bulletin (2006-2012), NSO

2.2.3. Factor 2. Interest rate

The interest rate in Mongolia averaged 10 percent, reaching an all time high of 14 percent in the month of April, 2009 and a record low of 6.40 percent in the month of July, 2007. In this data, interest rates decisions are taken by the Bank of Mongolia. The official interest rate is the Policy Rate. Figure III presented historical data for interest rate in Mongolia.

2.2.4. Factor 3. Exports to China

From 2006 until 2012, Mongolian exports increased from 25 percent to 50 percent in each year. At the beginning of this time period, export to China reached to 27.64 mill.USD however, it was reached an all time high of 4404.56 mill.USD in the month of December, 2011. Mongolia mining is open for foreign investors because the top export products are minerals (coal, copper, molybdenum, tin, tungsten, and gold) other than cashmere, animal origin products, hides, skins and natural or cultured stones etc. All time Mongolian chief external trade partner is China (92 percent of total exports in 2012) and very limited share for Canada (2.7

percent), Russia (1.8 percent) and others (3.5 percent). Figure IV shows more clear history of Mongolian exports.

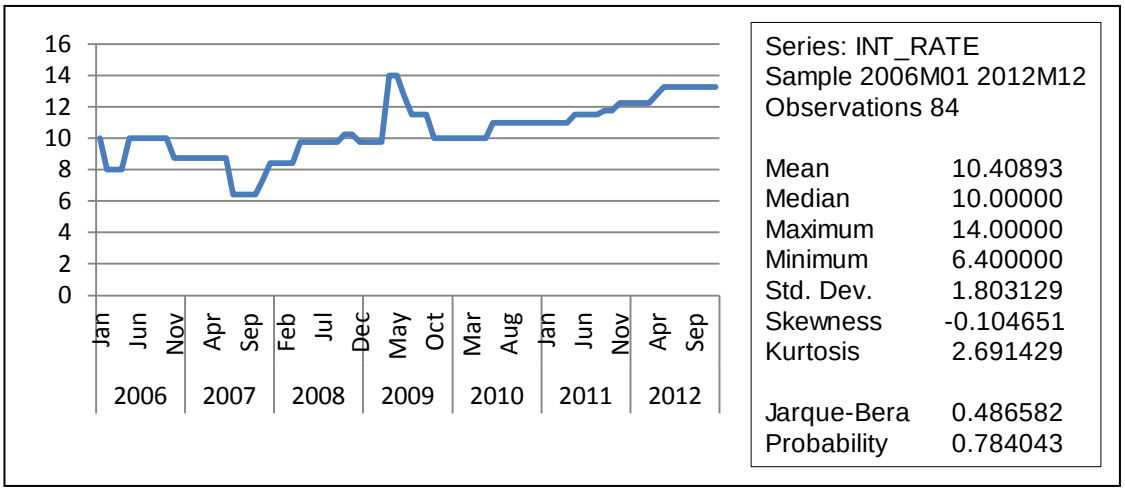


Figure III. Data of Interest rate

Source: Statistical Data (2006-2012), BOM

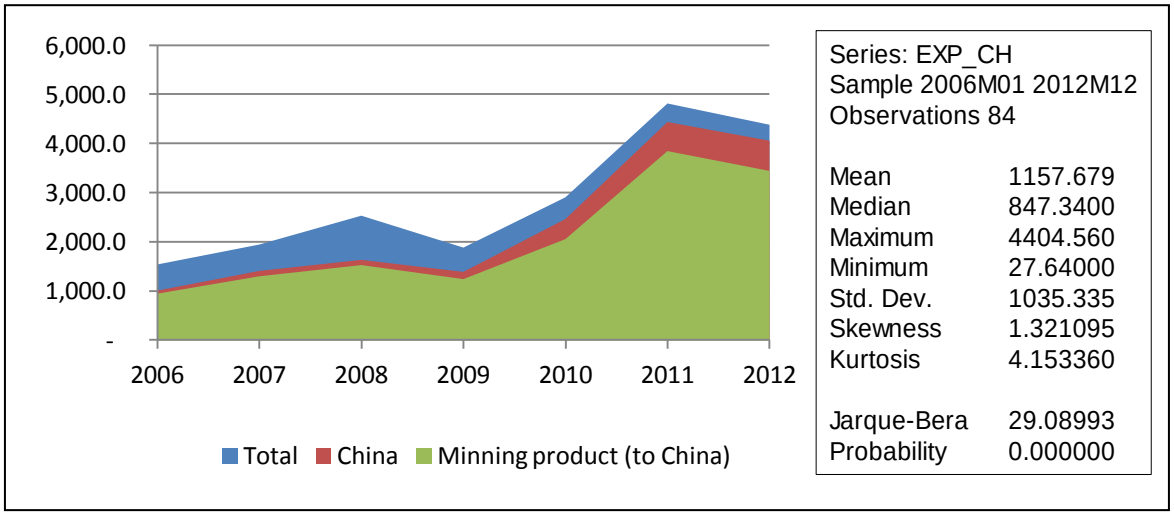


Figure IV. Data of export to China

Source: Reports of Customs General Administration (2006-2012)

2.2.5. Factor 4. Imports from China

Mongolian imports are mineral products, equipments, machineries, vehicles, electric products, foods and base metal products. Over ninety percent of Mongolia's petroleum comes from Russia (27.6 percent of total import) and China (27.4 percent of total import), the major bulk of Mongolian imports, while the next positions is held by Japan, USA, Korea Germany and others. Imports from china are shown in Figure V.

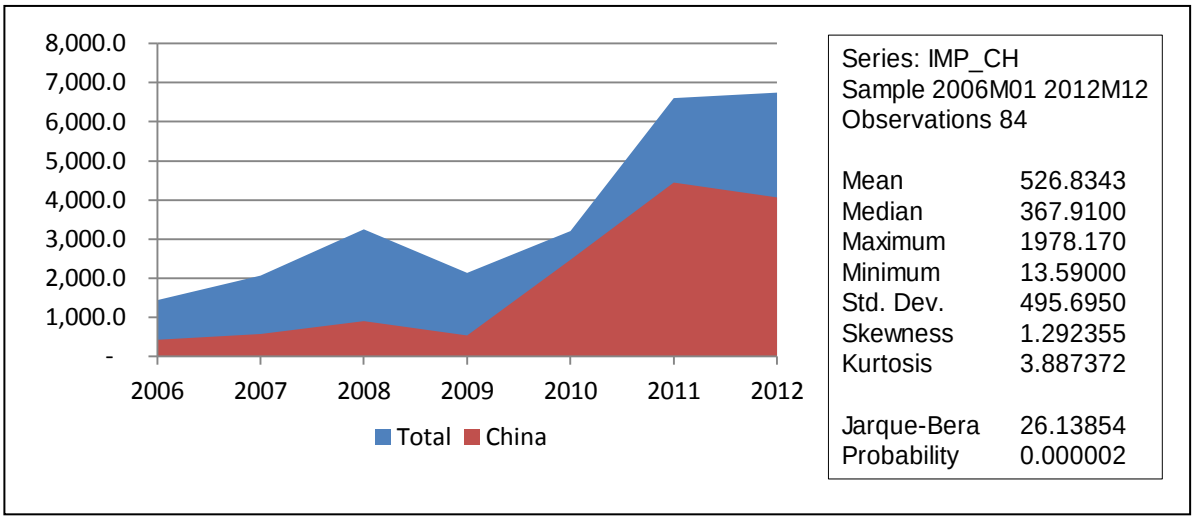


Figure V. Data of import from China

Source: Reports of Customs General Administration (2006-2012)

3. Discussion

In this paper, data analysis included 84 observations for monthly value of exchange rate, inflation, interest rate, export to and import from China in the period between 2006 and 2012. We analyzed two different measurements on all data by EViews 7, which is an econometrics and statistical program for Windows.

3.1. Data analysis I: Covariance and correlation measurement

Ordinary covariance and correlation analysis showed how much related between each factor and our focus was on between exchange rate and four factors, which is shown in the first column of Table 2. According to the ordinary covariance analysis, the exchange rate is negatively correlated with inflation while it is positively correlated with interest rate, export to and import from China. The strongest positive correlation was observed between interest rate and exchange rate at 75 percent with a coefficient of 35.2 percent while mild correlation was observed with rest of the variables. A detailed description is available in Table 2.

3.2. Data analysis II: Co-integration regression test

This analysis was estimated using simple regression model (Eq. 1), and obtained detailed results of econometrics analysis for all data. As shown in Table 3, inflation, interest rate and constant (c) are significant at 90 percent, 99percent and 99 percent respectively, and are positively correlated to exchange rate. Based on the coefficient 1 percent increase in inflation leads to 4.26 percent of increase in exchange rate. Similarly, 1 percent increase in interest rate can cause to 11.75 percent of increase in exchange rate. However, exports and imports between China and Mongolia have no significant effect on exchange rate. These all variables together describe about 56 percent variation on exchange rate. Other variables that influence exchange rate are included government policy and foreign direct investment. The government of Mongolia highly manipulates the exchange rate. But it was difficult to get data on the policy aspects.

Table 2. Data analysis I: Covariance and correlation measurement

Covariance Correlation	EX_RATE	INF	INT_RATE	EXP_CH	IMP_CH
EX_RATE	683.5885 1.000000				
INF	-0.034408 -0.000994	1.754389 1.000000			
INT_RATE	35.22466 0.751663	-0.415208 -0.174895	3.212569 1.000000		
EXP_CH	11872.04 0.441213	-194.0909 -0.142384	942.3701 0.510876	1059157. 1.000000	
IMP_CH	5046.224 0.391702	-75.55335 -0.115765	416.1486 0.471203	498437.3 0.982916	242788.3 1.000000

Table 3. Data analysis II: Cointegration regression test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	4.269811	2.342664	1.822630	0.0722
INT_RATE	11.75363	2.016130	5.829799	0.0000
EXP_CH	0.020799	0.016887	1.231634	0.2218
IM_CH	-0.038614	0.034294	-1.125968	0.2636
C	55.54406	19.75021	2.812328	0.0062
R-squared	0.583207	Mean dependent var		185.2392
Adjusted R-squared	0.561833	S.D. dependent var		26.19418
S.E. of regression	17.33902	Sum squared resid		23450.04
Durbin-Watson stat	0.513740	Long-run variance		770.6937

4. Conclusion

Exchange rate plays an important role in the financial and investment market of Mongolia. Therefore, understanding the most important factors which affect to exchange rate is very crucial. In this paper, we tried to analyze the relationship between exchange rate and their determinant variables. Our analysis showed that inflation and interest rate are the most influential factors to exchange rate variation. Stabilizing these variables can indirectly induce the stability of exchange rate. It is recommended that financial managers and government policy makers should probably pay more attention on inflation and interest rate.

4.1. Monetary and exchange rate policy

No policy is needed, as the BOM should not try to appreciate the exchange rate. The flexible exchange rate regime currently in place is the best policy for Mongolia. BOM have to graduate free exchange rate's circumstance. The control inflation is most important responsible of BOM. BOM administrate inflation rate very well, it can appreciate exchange rate and interest rate. And also control inflation is to have a more responsible fiscal policy.

Acknowledgement

I should thank to Chinese Scholarship Council (CSC) for providing a scholarship to do this study successfully. At the same time I would like to gratitude my supervisor Prof. Lu De Hong for his unflinching dedication and direction for the successful end of this research. I would also like to acknowledge sincerely National Statistics Office (NSO), Mongolian General Customs Administration (MGCA) and Bank of Mongolia (BOM) for providing the data for this research.

References

Bank of Mongolia (2006-2012), "Monthly Statistical Bulletin", Exchange rates on foreign exchange market, Interest rate.

Canales-Kriljenko, J. and Habermeier, K. (2004), "Structural factors affecting exchange rate volatility A cross-section study", Monetary and Financial Systems Department, International Monetary Fund, WP/04/147.

Maziad, S. and Kang, J.S. (2012), "RMB Internationalization: Onshore/Offshore Links", Monetary and Capital Markets Department, International Monetary Fund, WP/12/133.

Mongolian General Custom Administration (2006-2012), "Monthly report of Export and Import", National Statistical Office of Mongolia, Monthly Bulletin of Statistics, 2006-2012.

Moosa, I.A. and Bhatti, R.H. (2009), The Theory and Empirics of Exchange Rates, World Scientific Publishing Co. Pte. Ltd., Singapore, SG.

National Statistical Office of Mongolia (2006-2010),"Mongolian Statistical Yearbook", Ulaanbaatar, UB.

National Statistical Office of Mongolia (2006-2012), "Monthly Bulletin of Statistics", Price, Money, loan, stock market and External trade, Ulaanbaatar, UB.

Parween, S., Khan, A.Q. and Ismail, M. (2012), "Analysis of the factors affecting exchange rate variability in Pakistan", Academic Research International, Vol.2, No.3, 670-674.

Xiang, R. (2012), "The key influenced factors of China's international trade based on Rudex Model", 2012 International Conference on Education Technology and Management Engineering, Lecture Notes in Information Technology, Vols.16-17, 19-23.

Abbreviations

BOM	Bank of Mongolia
CNY	Chinese yuan (Currency of China)
MGCA	Mongolian General Custom Administration
MNT	Mongolian tögrög (Currency of Mongolia)
RMB	Renminbi (Currency of China)