

ADB Working Paper Series

**Is It Desirable for Asian Economies
to Hold More Asian Assets in Their
Foreign Exchange Reserves?—The
People's Republic of China's
Answer**

Bin Zhang

No. 306
August 2011

Asian Development Bank Institute

Bin Zhang is senior research fellow at the Institute of World Economics and Politics, Chinese Academy of Social Sciences, Beijing.

The views expressed in this paper are the views of the authors and do not necessarily reflect the views or policies of ADBI, the Asian Development Bank (ADB), its Board of Directors, or the governments they represent. ADBI does not guarantee the accuracy of the data included in this paper and accepts no responsibility for any consequences of their use. Terminology used may not necessarily be consistent with ADB official terms.

The Working Paper series is a continuation of the formerly named Discussion Paper series; the numbering of the papers continued without interruption or change. ADBI's working papers reflect initial ideas on a topic and are posted online for discussion. ADBI encourages readers to post their comments on the main page for each working paper (given in the citation below). Some working papers may develop into other forms of publication.

Suggested citation:

Zhang, B. 2011. Is It Desirable for Asian Economies to Hold More Asian Assets in Their Foreign Exchange Reserves?—The People's Republic of China's Answer. ADBI Working Paper 306. Tokyo: Asian Development Bank Institute. Available: <http://www.adbi.org/working-paper/2011/08/29/4681.foreign.exchange.reserves.prc/>

Please contact the authors for information about this paper.

Email: bjzhangbin@gmail.com

Asian Development Bank Institute
Kasumigaseki Building 8F
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

© 2011 Asian Development Bank Institute

Abstract

We calculate the return on the major Asian currency denominated long-term government bonds in terms of a basket of the People's Republic of China's (PRC) imports of goods and services, namely the real return on those assets from the PRC's perspective. In the sample period of January 2002 to December 2009, the real return on United States (US) treasury bills is lower than that of Japan, India, the Republic of Korea, Singapore, or Thailand's government bonds, and a little higher than that of Malaysia's government bonds. This result shows that it is desirable for the PRC to substitute Asian currency denominated government bonds for US Treasury bills to maintain the purchasing power of its foreign exchange reserves. To some extent, this research supports the proposal by Fan, Wang, and Huang (2010) on the cross holding of regional currencies in foreign exchange reserves.

JEL Classification: F31, F21, G11

Contents

1.	Introduction.....	3
1.1	Global background	3
1.2	Regional background	3
1.3	PRC background	4
1.4	Structure of this paper	4
2.	Real Returns on Foreign Exchange Reserves	5
2.1	Concept	5
2.2	Return on foreign exchange reserve assets in terms of a basket of imported goods and services	6
3.	Nominal and Real Returns on Major Asian Currency Denominated Assets.....	7
3.1	Nominal returns on major Asian currency denominated assets	7
3.2	The purchasing power of major Asian currencies in terms of the PRC's imported goods and services	9
3.3	The real return on Asian assets	9
4.	Conclusion.....	10
	References.....	11

1. INTRODUCTION

1.1 Global background

The global financial crisis in 2008 reminded economists and policymakers once again that the existing United States (US) dollar dominated international monetary system has serious shortcomings. As noted in a report by the United Nations (UN) Commission (2009), “the global imbalances which played an important role in this crisis can only be addressed if there is a better way of dealing with international economic risks facing countries than the current system of accumulating international reserves.”

To prevent disinflation, the US authorities adopt an extremely loose monetary policy and an excessively expansionary fiscal policy. The effects of those policies spill over to emerging economies that as a consequence are confronted with problems of inflation and asset price bubbles, rather than disinflation. Emerging economies, and even a developed economy like Japan, are forced to intervene in the foreign exchange markets or increase restrictions on international capital flows.

In addition, loose monetary policy and excessively expansionary fiscal policy are threatening market confidence in the US dollar, and those policies may result in depreciation of the US dollar and inflation in future. For those economies holding large amounts of US securities in their foreign exchange reserves, a weak US dollar or inflation means a deterioration of the purchasing power of their foreign exchange reserves.

Reforms of the global monetary system would help to solve global imbalances, reduce spillover from US economic policies, and maintain the value of foreign exchange assets held by emerging economies. The US dollar’s role as the major global reserve currency, especially its role as a medium of exchange and a unit of account, will not collapse in the near future. However, marginal changes in the global monetary system are needed. The key aim of marginal changes to the global monetary system would be to reduce demand for US dollar denominated assets, at least for those economies that continue to accumulate large amounts of their official foreign exchange reserves in the form of US dollar denominated assets.

1.2 Regional background

Since the Asian financial crisis of 1997, academics and policymakers in Asia have advocated that Asian economies should strengthen financial and monetary cooperation in the region. Economists are in consensus about numerous aspects of such cooperation, such as short-term liquidity support, development of regional bond markets, regional exchange rate policy cooperation, and so on. The essential aim of such cooperation would be to reduce the over-dependence of the region on the US dollar, thereby improving regional financial stability and promoting regional trade and investment development (ASEAN+3 Research Group, 2004). Up until now, the Chiang Mai Initiative, which is a network of bilateral swap arrangements (BSAs) among ASEAN+3 countries¹ aimed at addressing short-term liquidity difficulties in the region and supplementing existing international financial arrangements, has been the major achievement of ASEAN+3 financial cooperation.

¹ The ASEAN+3 countries are Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei Darussalam, Myanmar, Cambodia, Lao PDR, Viet Nam, the People’s Republic of China, Japan, and the Republic of Korea.

Despite calls by economists to promote Asian financial and monetary cooperation, real progress has remained limited in practice. Regional bond markets have developed slowly, exchange rate policy cooperation has made no progress at all, and even the usefulness of the Chiang Mai Initiative has been called into question. During the global financial crisis, the Republic of Korea was confronted with large swings in capital flows and a volatile exchange rate. When the Republic of Korea sought help from outside, it called on the US rather than utilizing swap agreements provided for by the Chiang Mai Initiative. It is understandable that the Republic of Korea made this choice. On the one hand, the credit conditionality of the swap agreements as part of the Chiang Mai Initiative is linked with International Monetary Fund (IMF) credit conditionality, and is rather strict; on the other hand, publicly asking for liquidity support from the regional swap agreements may have weakened market confidence in the Republic of Korea's economy.

Given the limited progress in Asian financial and monetary cooperation, economists need to review the lessons of the past and come up with new suggestions that serve the interest of all countries in the region and that are more practical. Fan, Wang, and Huang (2010) propose that ASEAN+3 economies cross hold regional currencies as part of their Foreign Exchange Reserve. We think this would be attractive for ASEAN+3 economies and we will consider this proposal below.

1.3 PRC background

The monetary authority of the People's Republic of China (henceforth, PRC) is confronted with big challenges in managing the PRC's foreign exchange reserves. On the one hand, the US monetary authority continues with its loose monetary policy which may bring about further losses in the value of the PRC's foreign exchange reserves in terms of purchasing power (Yu, 2010); on the other hand, the PRC is forced to increase its holdings of US dollar denominated assets since the PRC's current account and financial account surplus will not disappear in the near future and the PRC's monetary authority does not have sufficient alternative investment instruments. The PRC needs to reform the management of its foreign exchange reserves. The key element of such reform would be to reduce the share of US dollar denominated assets in the PRC's foreign exchange reserves, thereby diversifying its foreign exchange reserve portfolio.

1.4 Structure of this paper

The key issue, which is an indispensable part of the needed reform of the global monetary system, East Asia regional financial and monetary cooperation, and protecting the real value of the PRC's foreign exchange reserves, is how to reduce over-dependence on the US dollar. This is important for the PRC, the East Asian region, and the world. Without large incremental changes in foreign exchange reserves, the question that presents itself is what are the desirable substitutes for US dollar denominated assets? In this paper, we assess whether nominal and real returns on Asian currency denominated assets outperform those of US dollar denominated assets. Nominal returns on assets using the US dollar as a reference currency are easy to obtain and can be applied to all economies. However, nominal returns on assets using the US dollar as reference currency do not reflect purchasing power changes in those assets. Real returns on assets, which uses a basket of imported goods and services rather than the US dollar as reference unit, are preferable for measuring the changes in the real value of foreign exchange reserves.

The remainder of this paper is organized as follows. Chapter 2 introduces different concepts of returns on foreign exchange reserve assets, and shows how to calculate the real returns on assets. Chapter 3 gives our calculations of nominal and real returns on Asian currency denominated assets, and compares them with US dollar denominated assets. Chapter 4 concludes.

2. REAL RETURNS ON FOREIGN EXCHANGE RESERVES

2.1 Concept

For the management of foreign exchange reserves it is of key importance to have a comprehensive and objective understanding of returns on foreign exchange reserves. In the process of calculating returns on foreign exchange reserves, the first problem is the selection of an appropriate reference currency or the unit of account. The choice of a reference currency is determined by the particular objectives aiming to be achieved by foreign exchange reserve management. Three choices appear in the literature as the most typical ones (Xu and Zhang, 2010). The first is using the local currency as the reference currency, a choice that is justified if the central government's objective is to maximize national wealth or domestic consumption (Dallas and Yoo, 1991; Beck and Rahbari, 2008). The second choice is using foreign currency as the reference currency, a choice to be made when the objective is to hold the reserves, for example to intervene in the foreign exchange market or to finance the capital account deficit. If such is the case, the unit of account should be the US dollar (Ben-Bassat, 1980), or a basket of currencies with their respective weights determined by an exchange rate peg target, or by the composition of imports (Rikkonen, 1989). The third choice is defining an appropriate currency index which is constructed based on the real purchasing power of a currency. As foreign exchange reserves are needed to be able to cope with possible future current account deficits, the composite index is usually constructed based on the proportion of total imports from different countries or the proportion of payment in currencies used to import, and deflated by foreign price indices. See Kouri and de Macedo (1978), Ben-Bassat (1980), Healy (1981), Ben-Bassat (1984), Horii (1986), and Dellas (1989) for more details.

In practice, the US dollar is widely used as the reference currency, not only because it is the most liquid and widely accepted in international accounting and payments, but also because it is able to meet the needs of central banks to intervene in foreign exchange markets or to finance their capital accounts. Another important motivation lies in the fact that it offers a yardstick for assessing the relative performances of central banks as institutional investors, since employing the dollar as the unit of account is highly accepted amongst global institutional investors.

Based on a comprehensive literature review of both theoretical and empirical studies, Roger (1993) identified three motives for the holding of foreign exchange reserves by central banks: (1) transactions needs, namely to finance readily foreseeable foreign exchange demands of either the public or the private sector; (2) intervention needs, namely for the purpose of foreign exchange market intervention and meeting macroeconomic policy targets, which is considered to be the most important source of demand for reserves; (3) wealth diversification or portfolio considerations, namely for the purpose of maintaining or enhancing the value of foreign exchange reserves. Since the PRC's current foreign exchange reserves are much larger than necessary to meet regular reserve demands for debt repayment, current account deficit payments, and intervening in the foreign exchange market to stabilize yuan exchanges, maintaining their long-term value and realizing high investment yields in real purchasing power terms have become the primary targets² of the PRC's foreign exchange reserve management.

² Based on a survey conducted by the authors in 2009, most experts in the PRC Finance 40 Forum think that the most prominent problem of foreign exchange reserve management at present is to maintain and increase its long-term value.

Given the PRC's prime objective is to increase the value of its foreign exchange reserves in real purchasing power terms, the PRC should assess the desirability of the assets based on real return rather than nominal return. Taking the PRC as an example, if the US dollar depreciates against other reserve currencies, the overall nominal value of foreign exchange reserves in US dollar terms will increase, whereas the real purchasing power of foreign exchange reserves will decrease. It is obvious that there is a sharp contrast between the increase of nominal returns of foreign exchange reserve assets in US dollar terms and a decrease of real returns in purchasing power terms. If returns in US dollar terms is chosen as the operating target in foreign exchange reserve management, the results may be a lower ability to meet international payments, a reduced capacity for foreign exchange market intervention, and a loss of national wealth. This would go against the aforementioned three original motivations for holding foreign exchange reserves, especially against the major motivation, which is to maintain and increase the real value of foreign exchange reserves.

2.2 Return on foreign exchange reserve assets in terms of a basket of imported goods and services

We construct the return on foreign exchange reserve assets in terms of a basket of imported goods and services, namely the real return on foreign exchange reserve assets (Real Return on Foreign Exchange Reserve, RRFER). This measure reflects the purchasing power changes of the foreign exchange assets.

The formula of RRFER is:

$$RRFER_x = (1 + i_x) \left(1 + \frac{\Delta reer_x}{reer_x} \right) \quad (1)$$

In which, "i" represents the nominal return on the asset in local currency terms; "reer" represents the local currency's purchasing power of a basket of goods and services; we call it the real effective exchange rate (reer) of the currency.

The construction of the "reer" formula is as follows:

$$reer_x = \sum_{i=1}^{20} \theta_i RE_{i/x} \quad (2)$$

in which, RE represent the real exchange rate, $RE_{i/x} = \frac{E_{i/x}}{P_i}$. The price indices, P , used here are

fixed-base export price indices from the corresponding trade partners or the producer price indices if export price indices are not available.

θ represents the weight of each currency. Currency weight can be chosen according to research objectives. In this study, the weight of an individual currency is determined by its weight in the PRC's imports. The aim of employing this method is to assess the relative importance of a currency from the perspective of the purchasing power of a basket of the PRC's imported goods and services. As we mentioned, the primary current objective of foreign exchange reserve management for the PRC is to maintain and enhance the real value of the foreign exchange reserves, namely to maintain their purchasing power in terms of imported goods and services. In

this study the PRC's twenty largest importing countries³ are considered and their weights are readjusted to make the readjusted sum equal to 1.

$reer_x$ represents the real effective exchange rate of a currency x in terms of a basket of imported goods and services. Taking $x = US$ as an example, an increase in $reer_{US}$ indicates a one unit US dollar increase in purchasing power of a basket of the PRC's import goods and services. There are two important differences between the " $reer_{US}$ " used here and the " $reer_{US}$ " generally referred to. The first is that the weights of various currencies in the basket for the former are determined by the PRC's import structure, while those of the latter depend on the foreign trade structure of the US. The second is that the " $reer_{US}$ " generally referred to represents the relative price changes of a basket of US goods and services relative to a basket of goods of trade partners, while the $reer_{US}$ defined here reflects the relative price changes of one unit of US dollar relative to a basket of goods and services. We do not adjust the exchange rate for US prices levels, but for the price levels of the PRC's trading partners.

3. NOMINAL AND REAL RETURNS ON MAJOR ASIAN CURRENCY DENOMINATED ASSETS

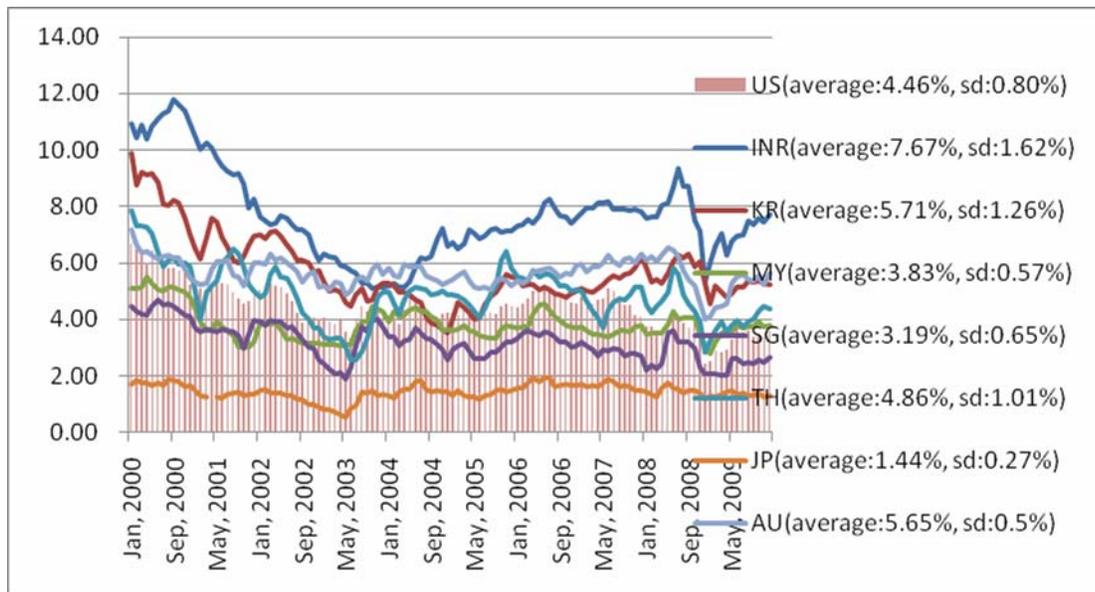
3.1 Nominal returns on major Asian currency denominated assets

Official foreign exchange reserves have high requirements in terms of safety and liquidity, and the lion's share of them are invested in government bonds and agency bonds. Due to data constraints, we only consider the return on long term government bonds—an easily accepted choice for foreign exchange reserve asset managers. We only consider several major Asian economies, such as Japan, India, the Republic of Korea, Thailand, Malaysia, and Singapore—all of them included in the list of the PRC's twenty largest import countries. In addition, we include Australia in our research. Our research period is from January 2001 to December 2009.

In figure 1, the average yield on long-term US treasury bills is 4.46%; the average yield on government bonds for India, the Republic of Korea, and Thailand in term of their local currencies are higher than that of US treasury bills, and the standard error of those bonds are higher than that of US treasury bills too. The average yields on government bonds for Japan, Malaysia, and Singapore in terms of their local currencies are lower than that on US treasury bills, and the standard error of those bonds are lower than that of US treasury bills too. The average yield on Australian government bonds in term of local currency is higher than that of US treasury bills, and the standard error of Australian government bonds is lower than that of US treasury bills.

³ The PRC's trading partners in decreasing order of weights are the US; Japan; the European Union (EU); Hong Kong, China; Taipei,China; the Republic of Korea; Thailand; Malaysia; Singapore; Indonesia; India; Canada; Brazil; Russia; South Africa; the United Kingdom; Australia; Saudi Arabia; Iran; and Argentina.

Figure 1: Yield on Long-Term Government Bonds in Local Currency Terms (%)

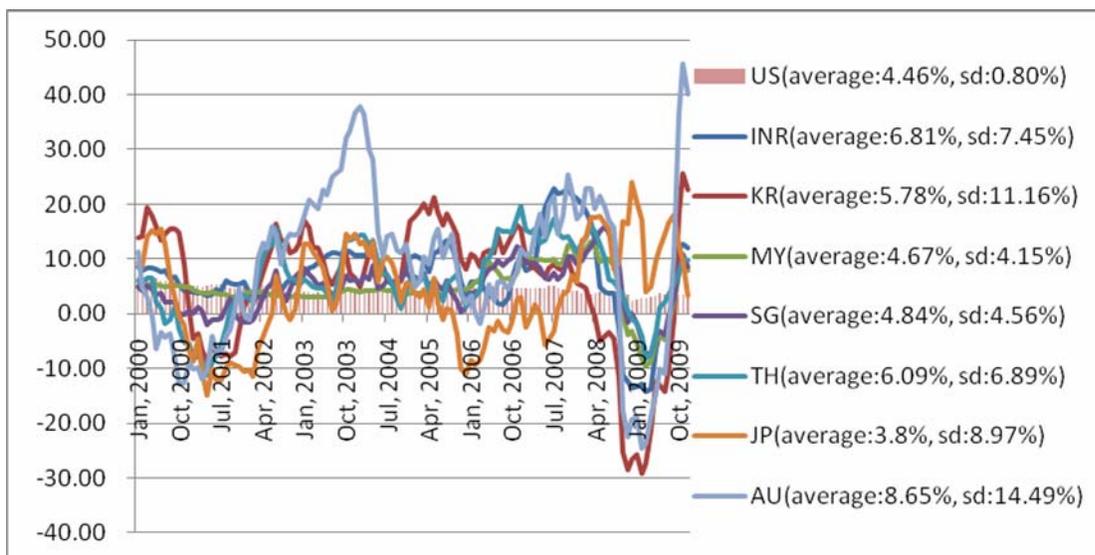


Note: US, INR, KR, MY, SG, TH, JP, AU denote US, India, Republic of Korea, Malaysia, Singapore, Thailand, Japan, and Australia, respectively.

Data Source: CEIC

The result could be very different if we substituted the US dollar for local currencies as the reference currency. In figure 2, the average yields on government bonds for major Asian economies except for Japan in US dollar terms are higher than that of US Treasury bills, and the standard error of those bonds are higher than that of US treasury bills too. The average yield on Australian government bonds in US dollar terms is higher than that of US Treasury bills, and the standard error of Australian government bonds is lower than that of US Treasury bills.

Figure 2: Yield on Long-Term Government Bonds in US Dollar Terms (%)



Note: US, INR, KR, MY, SG, TH, JP, AU denote US, India, Republic of Korea, Malaysia, Singapore, Thailand, Japan, and Australia, respectively.

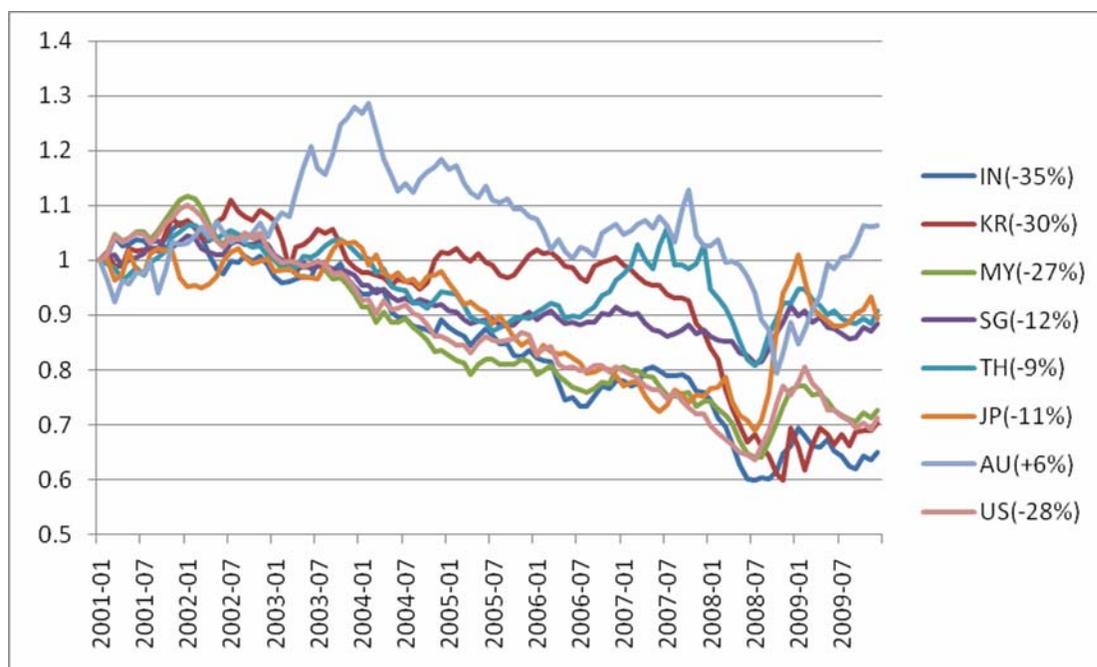
Source: CEIC and author's calculation

3.2 The purchasing power of major Asian currencies in terms of the PRC's imported goods and services

To obtain the real return on different foreign exchange reserve assets, we need (1) the nominal return on assets in local currencies, which is illustrated in figure 1; and (2) the change in purchasing power of the PRC's imported goods and services for each local currency, namely the real effective exchange rate for each local currency. The latter is constructed based on formula (2).

In figure 3, major Asian currencies' purchasing power in terms of the PRC's imports of goods and services declined in that each currency's appreciation against the PRC's major trade partners is less than the weighted average inflation of those trading partners. From January 2001 to December 2009, each unit of Indian rupee, Korean won, Malaysian ringgit, Singapore dollar, Thailand baht, and Japanese yen's purchasing power in terms of the PRC's imports of goods and services basket declined by 35%, 30%, 27%, 12%, 9%, and 11%, respectively. In the same period, one unit of US dollar's purchasing power in terms of the PRC's imports of goods and services basket declined by 21%. One unit of Australian dollar's purchasing power in terms of the PRC's imports of goods and services basket increased by 6%.

Figure 3: Purchasing Power Changes in Terms of the PRC's Imports of Goods and Services Basket for One Unit of Currency (%)



Note: US, INR, KR, MY, SG, TH, JP, AU denote US, India, Republic of Korea, Malaysia, Singapore, Thailand, Japan, and Australia, respectively.

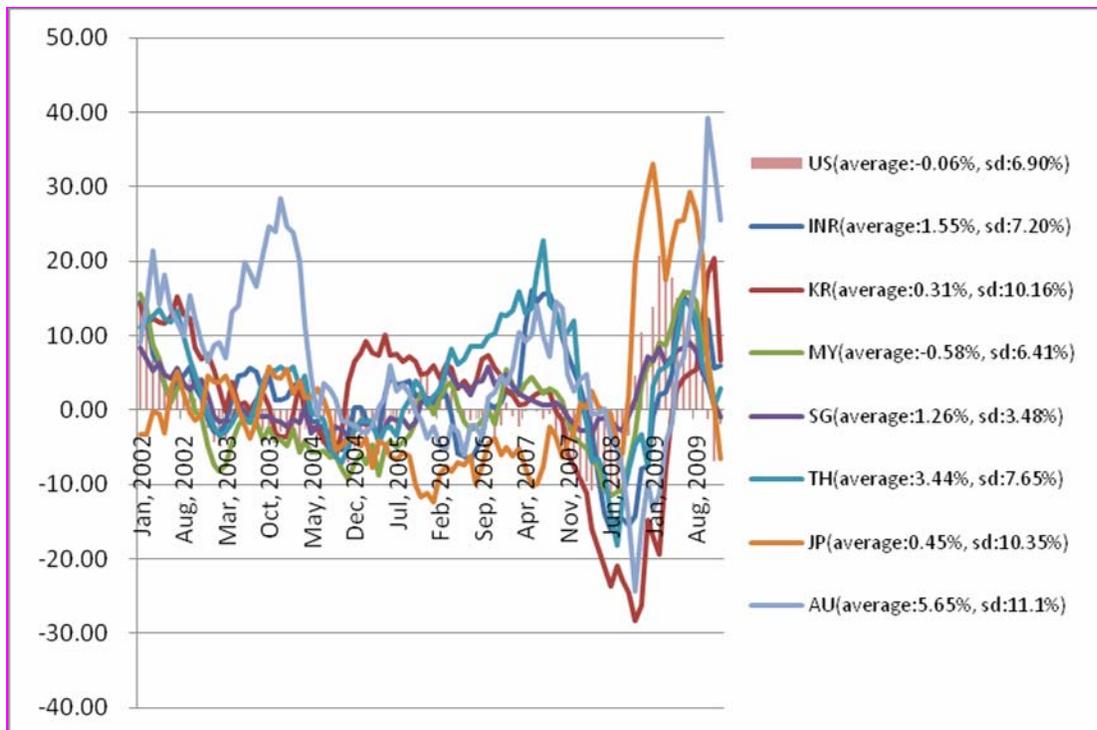
Source: CEIC and author's calculation

3.3 The real return on Asian assets

Combining nominal return and each currency's purchasing power change in terms of the PRC's imports of goods and services basket, we obtained the real return on each asset. As shown in Figure 4, over the period of January 2002 to December 2009, the average real return on long-term government bills of India, the Republic of Korea, Malaysia, Singapore, Thailand, and Japan

was 1.55%, 0.31%, -0.58%, 1.26%, 3.44%, and 0.45%, respectively. The average real return on long-term US Treasury bills over the same period is -0.06%. The average real return on long term Australian government bonds in the same period is 5.65%. The real return on long-term government bills of India, the Republic of Korea, Thailand, Japan, and Australia was more volatile than that of US Treasury bills. The real return on long term government bills of Singapore and Malaysia was less volatile than that of US Treasury bills. This result shows that the average real return on long-term US Treasury bills is poor, underperforming long-term government bonds in all major Asian economies, except Malaysia.

Figure 4: Real Returns on Asian Long Term Government Bonds, US Treasury Bills, and Australian Government Bonds



Note: US, INR, KR, MY, SG, TH, JP, AU denote US, India, Republic of Korea, Malaysia, Singapore, Thailand, Japan, and Australia, respectively.

Source: CEIC and author's calculation

4. CONCLUSION

Reducing the over-dependence on the US dollar is needed for the reform of the global monetary system, East Asian regional financial and monetary cooperation, and maintaining the real value of the PRC's foreign exchange reserves. To reduce the over-dependence on the US dollar, we need to know the desirable substitutes for US dollar denominated assets. In this paper, we calculated the return on major Asian currency denominated government bonds in term of a basket of the PRC's imports of goods and services, namely the real return on those assets from the PRC's perspective. In the period of January 2002 to December 2009, the real return on US treasury bills is lower than that of Japan, India, the Republic of Korea, Singapore, and Thailand's government bonds, and a little bit higher than that of Malaysia's government bonds. This result shows that it is desirable for the PRC to substitute Asian currency denominated government bonds and Australian government bonds for US Treasury bills to maintain the purchasing power of its foreign exchange reserves.

REFERENCES

- Fan, G., B. Wang, Y. Yiping. 2010. Regional Currency Cross-Holding: A Step Forward to Diversification of Global Reserve System. Conference paper for the “Conference on Diversification of International Foreign Exchange Reserves” held by Asian Development Bank Institute and China Center for International Economic Exchange in Beijing on 26 November 2010.
- Yu Y. 2010. The US Dollar Trap for China. *China Business News*. 31 May 2010.
- Xu Y., and Z. Zhang. 2010. A Literature Survey of the Currency Composition in Foreign Exchange Reserve Management. *Journal of World Economy* (Chinese) (385): 3–27.
- Zhang, B., X. Wang, and X. Hua. 2010. The Nominal and Real Return on China’s Foreign Exchange Reserve. *Economic Research Journal* (10): 115–128.
- ASEAN+3 Research Group. 2004. ASEAN+3 Research Group Studies 2003–2004 http://www.mof.go.jp/english/if/regional_financial_cooperation.htm
- Beck, R., and E. Rahbari. 2008. Optimal reserve composition in the presence of sudden stops: the euro and the dollar as safe haven currencies. ECB working paper series No. 916. European Central Bank.
- Ben-Bassat, A. 1980. The optimal composition of foreign exchange reserves. *Journal of International Economics* 10(2): 285–295.
- Ben-Bassat, A. 1984. Reserve-Currency Diversification and the Substitution Account. Essays in International Finance. Princeton, NJ. No. 53.
- Dellas, H. 1989. International reserve currencies. IMF Working Paper No. WP 8915. International Monetary Fund.
- Dellas, H., and C. Yoo. 1991. Reserve currency preferences of central banks: the case of Korea. *Journal of International Money and Finance* 10(30): 406–419.
- Healy, A. 1981. A simple regression technique for the optimal diversification of foreign exchange reserves. IMF Working Paper No. DM/81/64. International Monetary Fund.
- Horii, A. 1986. The Evolution of Reserve Currency Diversification. BIS Economic Papers No. 18. Bank for International Settlements.
- Kouri, P., and J. de Macedo. 1978. Exchange rates and the international adjustment process. *Brookings Papers on Economic Activity* (1): 111–157.
- Rikkonen, K. 1989. The optimal currency distribution of a central bank’s foreign exchange reserves. Bank of Finland Discussion Paper No. 28/89.
- Roger, S. 1993. The management of foreign exchange reserve. BIS Economic Papers No.38. Bank for International Settlements.
- UN Commission. 2009. Report of the Commission of Experts of the President of the United Nations General Assembly on Reforms of the International Monetary and Financial System. United Nations Conference on the World Financial and Economic Crisis and Its Impact on Development. New York. 24–26 June.