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# Introduction to the International Monetary Institute (IMI)

Established on December 20, 2009, IMI is a non-profit academic institution affiliated to China Financial Policy Research Center and the School of Finance of Renmin University.

Following the "general theory of macro-finance", IMI aims to become a world-class think tank, focusing on the studies of international finance, in particular the international monetary system and RMB internationalization. Despite its relatively short history so far, IMI has established itself as a leading research institution and important forum, where industry leaders, policy makers and academic experts from home and abroad share their insights and expertise.



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# RONALD I. MCKINNON

Former Member of IMI Advisory Board

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Ronald McKinnon was the William D. Eberle Professor of Economics, Emeritus. He was born in Edmonton, Canada, on July 10, 1935. He joined the Stanford economics faculty in 1961 as an assistant professor. He received tenure in 1966, was promoted to full professor in 1969 and eventually became a chaired professor. He earned his bachelor's degree in economics from the University of Alberta in 1956 and his doctorate in economics from the University of Minnesota in 1961.

His primary interests were international economics and economic development including trade and financial policy in less-developed countries, the transition from socialism in Asia and Eastern Europe, the foreign exchange market and U.S.-Japan trade disputes, European monetary unification and international monetary reform, and the economics of market-preserving federalism. A prolific writer, he wrote or co-authored nine books and penned numerous articles and commentary pieces for economic journals and publications such as *The Economist*, the *Financial Times* and the *Wall Street Journal*. His works include *The Order of Economic Liberalization: Financial Control on the Transition to a Market Economy*, 2nd edition (1993); *The Rules of the Game: International Money and Exchange Rates* (1996); and *Dollar and Yen: Resolving Economic Conflict between the United States and Japan* (with K. Ohno, 1997). Recent (1997) articles include "Credible Liberalizations and International Capital Flows: The Overborrowing Syndrome" (with H. Pill); "The East Asian Dollar Standard, Life after Death?" (1999); and "The Syndrome of the Ever-Higher Yen: American Mercantile Pressure on Japanese Monetary Policy" (with K. Ohno and K. Shirono, 1999).



After Professor Ronald I. McKinnon passed away in October 2014, his family generously contributed 1897 books from his personal collection to IMI. In memory of him, this issue is proud to present Ronald I. McKinnon.



RONALD I. MCKINNON

Former Member of IMI Advisory Board

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# **China, SDR and the World Reserves System**

## **China Has Been Strengthening Currency to Get into Exclusive Group**

*By* DAVID MARSH\*

A grand bargain between China, the U.S. and the International Monetary Fund seems to be shaping up under which Beijing may be about to enter the heart of global finance in exchange for turning the renminbi into a strong currency.

The People's Bank of China has been drawing on its \$3.8 trillion of currency reserves in intervention to keep the renminbi reasonably stable against the strong dollar, propelling the Chinese currency USDCNY, to a real (inflation-adjusted) trade-weighted appreciation of 11% during the past 12 months. This exceeds the 9% real appreciation of the dollar.

The intervention reinforces the Chinese authorities' attempts to maintain favor with important foreign holders of renminbi, including many international central banks, even though Beijing is vulnerable to the resulting loss of export competitiveness.

The Chinese actions appear linked to an attempt to underline the currency's fitness to join the special drawing right, the IMF's composite currency used in official financing and reserves. Although nothing has been confirmed, and final outcomes could become embroiled in international politics, China appears broadly on track to become part of the IMF's official currency unit in a review process due to be completed later this year.

This would represent a landmark move for an emerging-market currency to join a monetary unit hitherto encompassing solely industrialized nations.

The IMF seems to be taking a pragmatic line on the contentious issue of a new structure for the SDR, which could involve bringing in the renminbi despite its formal lack of full convertibility. All of this is a potential challenge for the dollar and its pivotal position in world money. It adds up to an element of weakness for the euro, which has been losing ground as a reserve unit following action by the European Central Bank to weaken the single European currency as part of efforts to revive the eurozone economy.

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In a fundamental departure for central-bank governors, who normally refrain from giving guidance on foreign-exchange rates or commenting on other central banks' actions, Mario Draghi, the ECB president, said last August: "The fundamentals for a weaker exchange rate are today much better than they were two or three months ago. ....Other central banks have been reducing their exposure to the euro."

Over the past 12 months, eurozone countries have recorded a real trade-weighted devaluation of 12%, according to data from the Bank for International Settlements. The movement has accelerated since the ECB started large purchases of government bonds earlier this month, much of which involves encouraging foreign official holders to sell their euro reserves, often being exchanged for dollar assets.

China has not mounted an open campaign to enter the SDR, established in 1969, which at present groups the main reserve currencies — the dollar, euro, yen and sterling — and is valued at around \$1.36. This is well down from \$1.50 towards the end of last year, a result of U.S. currency strength.

Beijing may be calculating that, if it can maintain currency stability, it could advocate the renminbi's adhesion to the SDR as a means of strengthening the otherwise weakening composite unit. China is also garnering potential support from the U.S. Treasury and Congress, which otherwise in recent years have been quick to condemn Beijing for alleged manipulation in weakening its currency to raise export competitiveness — the opposite of what has been happening in the last few months.

An additional factor building momentum towards revitalizing the SDR is China's action to galvanize leading emerging-market economies towards reforming world monetary arrangements. This includes the five-nation BRICS group's decision to set up the New Development Bank in Shanghai, partly as a challenge to the IMF and the World Bank. China has achieved significant success this month in persuading leading European countries to join its planned Beijing-based Asian Infrastructure Investment Bank in spite of U.S. opposition.

The IMF's review of the options for widening the SDR examines as important conditions the renminbi's much-increased use in trade invoicing as well as whether it is "freely usable" in international payments and asset management. Other indicators under the spotlight include use of the renminbi in international debt securities and bank liabilities, and foreign-exchange spot market turnover.

In all these areas the renminbi, although affected by residual capital-account restrictions, has made impressive strides in the last two years.



## **Prospects for the Inclusion of Renminbi in the SDR Basket**

*By* WANDA TSENG\*

The upcoming review of the Special Drawing Rights (SDR) basket by the International Monetary Fund (IMF)'s Executive Board is receiving widespread interest. Past reviews, conducted every five years, have been rather technical exercises. The 2015 review, however, is attracting much attention because of the possible inclusion of the renminbi (RMB) in the SDR basket. The inclusion of the RMB in the SDR basket would mark an important milestone in China's efforts to internationalize its currency and, more broadly, in China's decades-long economic reform process. It would also mark an important step in efforts to reform the international monetary system.

Consideration of the inclusion of the RMB in the SDR basket has gained momentum since the 2008 global financial crisis. The crisis prompted a renewed debate about the functioning of the international monetary system and the role of reserve currencies. Questions were raised about whether the current system, dominated by the U.S. dollar as the main reserve currency, has outlived its usefulness and entailed systemic risks, and what reforms were needed to improve the current system. At the same time, China became the world's second largest economy and the world's largest trading country. In the history of the international monetary system, the currencies of countries that play an important role in global trade have tended to become reserve currencies. Against this background, the potential for the RMB to become another reserve currency and be included in the SDR basket gained widespread consideration.

This paper is organized as follows. Section I examines the driving force for the inclusion of the RMB in the SDR basket. Section II considers the progress with RMB internationalization. Section III considers how the RMB measures against the criteria set by the IMF for including a currency in the SDR basket. Section IV offers some conclusions.

### **1. Impetus for RMB inclusion in the SDR basket**

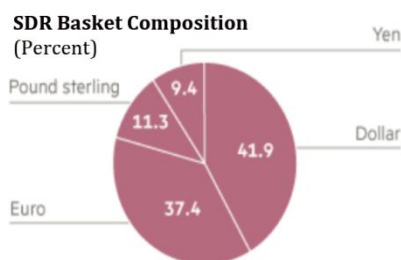
The bid for the RMB to be included in the SDR basket can be traced to the 2008 global financial crisis. Notably, in March 2009, Governor Zhou of the People's Bank of China called for a reform of the current international monetary system (Zhou,

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2009). He argued that the outbreak of the crisis and its spillover to the entire world revealed the vulnerabilities of the current system, which relied on the holding sovereign currency reserves (i.e., the U.S. dollar). He pointed out that policy decisions taken in reserve currency countries might not be appropriate for the rest of the world, leading to systemic risks. Furthermore, the global financial crisis and increasing worries about the large and possibly unsustainable public debt burdens of the main reserve currencies raised questions about whether these currencies could maintain their store of value properties over the long term. Additional reserve currencies could help central banks around the world to diversify the risks of their reserve holdings. Governor Zhou called for an expanded use of a “super sovereign reserve currency” such as the IMF’s Special Drawing Rights and proposed a stronger international role for the currencies of “major emerging economies” (such as the RMB) in the SDR basket.

In October 2011, as part of its work program on reforming the international monetary system, the IMF Executive Board discussed possible reform options for broadening the SDR currency basket (IMF, 2011b). The Board concluded that the current “freely usable” criteria (that is, widely used internationally and widely traded in the principal exchange markets) for inclusion in the SDR basket remained appropriate. Indicators of “freely usable” include: the currency composition of official reserve holdings; the currency denomination of international banking liabilities; the currency denomination of international debt securities; and the volume of transactions in foreign exchange markets. At present IMF currently recognizes only four currencies as “freely usable” globally. These are the U.S. dollar, euro, Japanese yen, and the British pound and they constitute the currency basket for the IMF’s (IMF, 2011a). These currencies all share the characteristics of having market- - determined exchange rates and capital account convertibility.



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<http://www.ft.com/intl/cms/s/2/2b72e622-f2cb-11e4-b914-00144feab7de.html#axzz3e8M66zHVIMF>.

Figure 1. SDR Basket Composition

## **2. Progress with RMB internationalization**

In the aftermath of the global financial crisis, the Chinese authorities took systematic steps to promote the international use of the RMB. The speed of change has been remarkable in just a few years. The main initiatives taken include:

- Facilitating international trade denominated and settled in RMB;
- Expanding both offshore and onshore RMB- -- denominated investment opportunities for global investors;
- Signing currency swap arrangements with other central banks and encouraging them to hold RMB as part of their foreign reserves.
- Promoting the use of the RMB for regional infrastructure projects and official development assistance.

Building on China's central role in global trade, the initial focus was on expanding the use of RMB in cross- -- border trade settlements. Since beginning a pilot program in 2009, cross border trade settlement in RMB has expanded to cover all companies in China in 2012, allowing the RMB to flow back and forth from mainland China without restrictions as long as it is for trade settlement. Trade settlement in RMB surged from nothing in 2009 to account for over 20 percent of China's merchandise trade.

In late 2013, the Society for Worldwide Interbank Financial Telecommunication (SWIFT) reported that the RMB vaulted ahead of the euro and the yen to become the second most widely used currency in global trade finance (measured by letters of credit). By this measure, the RMB accounted for 8.7 percent of global trade finance transactions in October 2013, compared with 6.6 percent for the euro, 1.4 percent for the yen; the dollar remains dominant at 81 percent.

The expansion of trade settlement in RMB contributed to a buildup of RMB deposits offshore, mainly in Hong Kong (which accounted for more than 80 percent of RMB trade settlement). Although personal RMB business was launched in Hong Kong SAR in 2004, when residents there were allowed to open deposit accounts denominated in RMB, RMB deposits really took off only after the introduction and expansion of the RMB trade settlement in 2009. From RMB9.2 billion at end- -- 2009, RMB deposits in Hong Kong rose to over RMB 900 billion by end 2014. Globally, RMB deposits rose to RMB 1.6 trillion (mainly in Singapore and Taiwan, in addition to Hong Kong).

In view of the constraints presented by its relatively closed capital account and underdeveloped domestic financial markets, China has relied on Hong Kong as a platform for expanding the range of RMB denominated financial instruments to promote the RMB as an investment currency. There is now a wide range of offshore

RMB- -- denominated financial products available in Hong Kong, including interbank lending, mutual funds, certificates of deposit, active spot and forward foreign exchange markets, RMB cross currency swaps, insurance policies, and some structured products. Issuance of RMB- -- denominated bonds (dim sum bonds) in Hong Kong has increased sharply, from \$0.9 billion in 2010 to \$9.7 billion in the first eleven months of 2013. While companies in China or Hong Kong issued most of the bonds, a number of multinational corporations have also issued dim sum bonds.

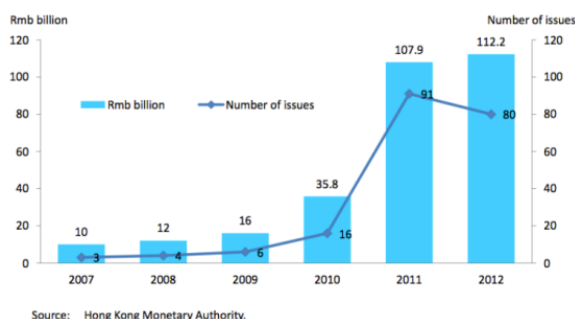


Figure 2. Dim Sum Bonds Issuance in Hong Kong

Onshore RMB- denominated investment opportunities have been expanded as well. In August 2010, the channels, through which offshore RMB could flow back to the mainland was expanded with the RMB Qualified Foreign Institutional Investor (RQFII) program. The RQFII allow central banks and qualified financial institutions to invest RMB directly in the onshore interbank bond market and equity market, subject to individual quotas. In addition, the RMB Outward Direct Investment (ODI) scheme was created in January 2011, allowing companies in China to conduct overseas FDI in RMB; the RMB FDI scheme was created in October 2011, allowing foreign companies to conduct FDI in China in RMB. Since then, through the third quarter of 2013, RMB- denominated and settled FDI has, on average, accounted for about a third of China's total FDI flows.



FDI = foreign direct investment, PRC = People's Republic of China, RMB = renminbi.  
Sources: People's Bank of China, *China Monetary Policy Report*; CEIC, PRC Premium Database; Bloomberg.

Figure 3. RMB Outward and Inward Direct Investment (Reproduced from Eichengreen, 2014)

More recently, the Chinese authorities have further expanded RMB investment opportunities both offshore and onshore. These include the Hong Kong- Shanghai Stock Connect program, which allows global investors to buy Shanghai- listed shares through Hong Kong and domestic investors to buy Hong Kong- listed shares through Shanghai. While this program is subject to quota and other restrictions and trading has been slow, it nevertheless represents an important liberalization for portfolio investment. “Two- way cash sweeping” was another key reform introduced in 2013 with the creation of the Shanghai Free Trade Zone (SFTZ). This allowed companies registered in the SFTZ to remit working funds across the border and extend RMB intercompany loans to their offshore parent companies, subsidiaries, or affiliates.

Since 2009, China has signed RMB- denominated currency swap arrangements with 29 countries plus the euro zone, totaling over RMB 3 trillion. These agreements are intended to provide foreign central banks with access to RMB liquidity and to encourage partner countries to allow RMB use by their banks and corporations. China has also joined in the regional Chiang Mai Initiative Multilateralization—a series of swap lines backed by foreign exchange pools amounting to \$240 billion and the Initiative is working to diversify swap lines to include the RMB.

In 2014, China launched several initiatives to promote the use of the RMB in regional infrastructure projects and for development assistance. China established the New Development Bank with the BRIC countries with \$50 billion in capital with the aim to invest in infrastructure and other development projects in member countries using local currencies. Also, China established a \$100 billion Asian Infrastructure Investment Bank to help finance Asian infrastructure projects.

Since 2008, China has made substantial progress with RMB internationalization. The IMF's Managing Director recognized this progress in a March 2015 press statement.<sup>1</sup> While the RMB is not convertible on the capital account, progress with RMB internationalization has resulted in a gradual and cautious opening of the capital account. Furthermore, while the RMB exchange rate is not market determined, the IMF assessed in May 2015 that the RMB is "no longer undervalued," suggesting that the RMB exchange rate has reached an equilibrium level consistent with market forces.<sup>2</sup>

### 3. How does the RMB measure against SDR inclusion criteria?

To assess prospects for the inclusion of the RMB in the SDR basket, it is useful to consider the indicators for the "freely usable" criteria (that is "widely used" and "widely traded") used by the IMF for a currency's inclusion in the SDR basket:

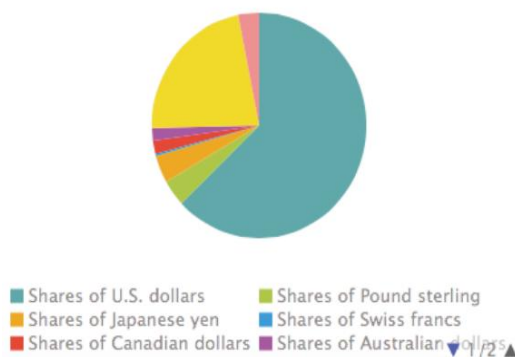
Currency composition of official reserve holdings: While an increasing number of central banks around the world reportedly have added RMB to their foreign exchange reserve holdings, data on the use of the RMB in global foreign exchange reserves are not readily available. According to the most recent IMF<sup>3</sup>

data, the share of reserves denominated in "other currencies," which includes the RMB, in total "allocated reserves"<sup>4</sup> is about 3 percent at end- -- Q4, 2014; the U.S. dollar remains dominant at 63 percent, followed by the euro at 22 percent, and the Japanese yen and British pound at 4 percent each.

It would be useful for the IMF to release data on RMB holdings in total "allocated reserves."

A supplemental indicator of RMB use as a reserve currency is the number of central banks holding the currency. A survey of reserve managers shows that the RMB was held by 15 percent of the respondents (RBS, 2013). While the RMB appealed to some reserve managers, its lack of convertibility was often cited as an

World - Allocated Reserves by Currency (in Percent)  
2014Q4



<sup>1</sup> <http://www.imf.org/external/np/sec/pr/2015/pr15131.htm>

<sup>2</sup> <https://www.imf.org/external/np/sec/pr/2015/pr15237.htm>

<sup>3</sup> Source: <http://data.imf.org/?sk=E6A5F467--C14B--4AA8-5A09EC4E62A4>

<sup>4</sup> Allocated reserves refer to foreign exchange reserves of entities reporting currency

obstacle to investment. Within the next five to ten years, however, 37 percent of the composition of their foreign exchange reserves to the IMF (accounting for 53 percent of the world's foreign exchange reserves at end-Q4, 2014). Respondents indicated that they would consider investing in the RMB.

Currency denomination of international banking liabilities and international debt securities: BIS data on amounts outstanding of international liabilities show the continued dominance of the U.S. dollar and the euro in international financial transactions. The share of each of these two currencies has remained broadly stable with a combined share in the 75 to 80 percent range. The Japanese yen and the British pound follow far behind in the third and fourth ranking at less than 10 percent each. The share of the RMB is not separately reported, but included in "other currencies" which accounted for 7 percent at end September 2013.

Volume of transactions in foreign exchange markets: According to the Bank for International Settlements' Triennial Central Bank Survey, the RMB became the ninth most actively traded currency in 2013. The Survey noted that the role of the RMB in global FX trading surged, mostly driven by a significant expansion of offshore RMB trading. RMB turnover soared from \$34 billion in 2010 to \$120 billion in 2013. Nevertheless, RMB's share in global FX volume was 2.2 percent, compared with 87 percent for the U.S. dollar, 33 percent for the euro, 23 percent for the Japanese yen, and 12 percent for the British pound.

In sum, assessing the "freely usable" criteria for the RMB yields a mixed picture. The RMB has gained ground as a "widely used" currency for global trade settlement, but it still has a long way to go to achieve the "widely used" and "widely traded" criteria in global financial transactions on par with the dollar or euro. Data on the RMB is not separately published for the indicators used by the IMF to assess the "freely usable" criteria and it would be useful to have the RMB data separately published to properly assess how the RMB compares with the currencies presently included in the SDR basket.

#### **4. Conclusion**

China's growing weight in global output and trade, together with policy measures taken by the Chinese authorities, has led to an increasing use of the RMB in international trade settlement. However, use of the RMB for international financial transactions remains limited, notwithstanding the rapid expansion of offshore and onshore RMB investment opportunities. More recently, China has promoted the use of the RMB for regional infrastructure projects, although the effects on the use of the RMB remain to be seen.

Assessing RMB against the “freely usable” criteria for the SDR basket yields a mixed picture. This suggests that a decision about including the RMB in the SDR requires not only objective judgment of measurable criteria, but also subjective judgment by the IMF’s Executive Board about the benefits/costs for the international monetary system.

Including the RMB in the SDR basket will be beneficial for the global economy. Such a move will catalyze further financial sector reforms in China. An efficient, stable, and competitive financial sector in China contributes to the ongoing efforts to reform China’s economy, which is important for the global economy. Beyond that, the emergence of RMB as an international currency can provide an additional source of liquidity and facilitate a diversification of risks in the global financial system from reliance on a few reserve currencies. These risks are illustrated by the recent bouts of financial market volatility in anticipation of interest rate increases by the U.S. Federal Reserve. The U.S. Federal Reserve is mandated to take into account only domestic considerations about growth and employment, regardless of the impact of its actions on the global economy. The emergence of additional reserve currencies, notably the RMB, can help shape the international monetary system more in line with the changes in the global economy and help promote global financial stability.

Finally, including the RMB in the SDR basket will be an important step in the ongoing efforts to reform the international monetary system. While the IMF has implemented many reforms since the 2008 global financial crisis, progress on governance reforms has remained elusive. In 2010, the IMF agreed on wide-ranging reforms so that its governance is more reflective of the increasing importance of emerging market countries. Unfortunately, these reforms have been blocked by the United States, the IMF’s major shareholder. Including the RMB in the SDR basket, while not a substitute for the urgently needed governance reforms, would be a step to give a more appropriate role to a key emerging market economy and help to strengthen the legitimacy of the IMF as a global institution.

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- **Headwind? Tailwind! Examining the Direct Impacts of the RMB's Possible Inclusion into the SDR**

By E ZHIHUAN\*

*The International Monetary Fund (IMF) unofficially begins its quintuple review of the SDR basket in recent days, with official result to be expected in October, and implementation at the beginning of 2016. Taking into account of the progress made by the RMB in the past several years including the RMB's use in cross border trade settlement, investment and reserve assets, its approaching the freely usable standard argues strongly for its inclusion into the SDR this time around. The market is generally optimistic about odds of this outcome because it is a matter of when not if. If successful, it will have direct implications to the RMB internationalization in terms of its policy and market drivers.*

**Key words:** RMB internationalization, SDR, offshore market

### **Executive Summary**

- **The RMB meets the basic requirements**

China's real economy, especially trade and investment growth, provides a solid foundation for the RMB to qualify for the SDR. It is not unreasonable to claim that the RMB internationalization is lagging behind China's economic clout.

- **Three scenarios of the RMB's SDR journey**

The RMB's strength lies in exports, trade finance and payment, and it is gaining significantly in terms of offshore deposits and forex trading. Its weakness is in central banks holdings and the RMB international bond market. The RMB makes it into the SDR, and the RMB internationalization's progress in the past several years, the RMB stands a fairly good chance to pass IMF's internal assessment of being freely usable in this year's review.

- **SDR, the new driver for the RMB internationalization**

If the RMB successfully makes it into the SDR, it will certainly help solidify its international reserve currency status, making it a true international currency, driven first by China's financial regulators, then by multinational financial institutions.

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- **SDR inclusion will trigger asset allocation into the RMB in hundreds of billions of Yuan**

The SDR inclusion will trigger demands from reserve asset investment. Based on author's calculation, it is estimated that once the RMB is included into the SDR, the market demands for RMB assets as official reserves holdings would amount to RMB650 billion at least, which far exceeds the current outstanding balance of offshore RMB loan and bonds combined.

- **SDR inclusion will boost growth in offshore financial and trading businesses**

Shortly after the SDR inclusion, asset allocation into the RMB will largely take place in the offshore market, which in turn will boost financial and trading activities.

## **1. Introduction**

The International Monetary Fund (IMF) unofficially begins its quintuple review of the SDR basket in recent days, with official result to be expected in October, and implementation at the beginning of 2016. Although the RMB is not yet convertible, and China still imposes capital controls, taking into account of the progress made in the past several years including the RMB's use in cross border trade settlement, investment and reserve assets, its approaching the freely usable standard argues strongly for its inclusion into the SDR this time around. The market is generally optimistic about odds of this outcome because it is a matter of when not if.

## **2. The RMB meets the basic requirements**

IMF generally conducts review of its SDR currencies basket every five years. During the last review in 2010, the RMB was the only candidate being seriously considered for inclusion.

To qualify for SDR inclusion, a currency has to meet two criteria, the first being that its exports of goods and services during the five-year period ending 12 months before the effective date of the revision have the largest value. China already met this criterion in 2010, as it was the world's third largest exporter of goods and services at that time. Since then, China continues to make headways. Its foreign trade totaled RMB25.42 trillion in 2012, second in the world, and RMB25.83 trillion or USD4.16 trillion in 2013, surpassing that of the US to lead the world. In 2014, China retained the crown with foreign trade totaling RMB26.43 trillion or USD4.30 trillion. Using the five year average, China is also one of the world's leaders. In 2014, the China's economy reached USD10.38 trillion, second only to the US. In the meantime, the foreign direct investment (FDI) China attracts is also second only to

the US, and China's outbound direct investment (ODI) is right behind Japan and the US amongst G20. The dollar amount has been basically at par with that of FDI. China's real economy, especially trade and investment growth, provides a solid foundation for the RMB to qualify for the SDR. It is not unreasonable to claim that the RMB internationalization is lagging behind China's economic clout.

The second criterion is that it has to be determined by the IMF under Article XXX (f) to be a freely usable (FU) currency, which concerns the actual international use and trading of currencies. To determine whether a currency is widely used for international payments or widely traded, the IMF refers to four quantitative indicators.

The first indicator is the Currency Composition of Official Foreign Exchange Reserves (COFER) compiled by the IMF itself. So far, COFER has not been able to single out the RMB in its statistics. Judging from the fact that when COFER began to report the Canadian dollar and Australian dollar individually in 2013, they accounted for about 1.5% each of the world's allocated forex reserves holdings, the RMB has yet to reach such a threshold. It was included in other currencies that accounted for 3.1% of the total in 4Q14.

The second indicator is the international banking liabilities compiled by the Bank of International Settlements (BIS). Again, the RMB is not yet identified individually. According to our own estimates, offshore RMB deposits at the end of 2014 amounted to RMB2.8 trillion or USD440 billion, making it the fifth largest currency right behind the four SDR currencies.

The third indicator is the international debt securities statistics also compiled by BIS. Now that BIS does not list RMB individually, cross comparison using the offshore RMB bond market's size of RMB480 billion at the end of 2014 results in a small share of 0.4% of the total.

The fourth indicator being used is global forex markets turnovers captured by BIS' Triennial Central Bank Survey. It shows that the RMB is ranked the ninth with a market share of 2.2/200. At the end of 2014; it was the sixth most actively traded currency.

Overall, the RMB's strength lies in exports, trade finance and payment, and it is gaining significantly in terms of offshore deposits and forex trading. Its weakness is in central banks holdings and the RMB international bond market. However, those indicators are not meant to be used mechanically. IMF also emphasizes that the Executive Board's judgment is necessary. Combined with Christine Lagarde's latest comment that it is a matter of when, not if, the RMB makes it into the SDR, and the RMB internationalization's progress in the past several years, the RMB stands a

fairly good chance to pass IMF's internal assessment of being freely usable in this year's review.

### **3. Three scenarios of the RMB's SDR journey**

Based on the analysis above, the concept of a freely usable currency concerns the actual international use and trading of currencies, and is distinct from whether a currency is either freely floating or fully convertible. In other words, the facts that the RMB is not yet fully convertible, China still imposes capital controls, and the related RMB exchange rate mechanism shall not be considered obstacles to the RMB's path into the SDR. Recently, volatilities have surged in the offshore market, offshore RMB deposit growth has eased, and trading in offshore RMB bond market has become subdued. Therefore, attention must be turned to facilitate growth in offshore deposit and bond markets due to their important indicative natures.

Currently, the 85% voting threshold applies mainly to the IMF's decisions on the Fund's governance structure such as amending the IMF's Article of Agreement, changing the number of Executive Directors, new membership, quota increase, reallocation of SDR, etc. The US currently has a voting share of 16.75%, meaning it has the veto power on the most important IMF decisions. Other than the freely usable requirement, the RMB's SDR prospects will also hinge upon the US Government and especially the US Congress' stances. Judging from the US Congress' decision to block the 2011 IMF reforms, it is not unreasonable to speculate that the US Congress might block the RMB's inclusion into the SDR even though the US Government gives the green light, which is essentially the same as the US casting its veto.

In view of this, there are three possible scenarios for the RMB's SDR drive.

The first scenario is that the RMB passes the IMF's internal assessment. Then the IMF makes the recommendation to its members, and everybody including the US Government and Congress gives their blessings. The RMB is then officially included into the SDR.

The second scenario is that the US Congress stands in the way, constituting a technical obstacle.

The third scenario is that the IMF cannot reach a conclusion. Under the pressure of the RMB internationalization, it may seek another window before 2020 to finalize the RMB's inclusion into the SDR. This is the worst case scenario as it hinders the RMB internationalization by adding uncertainty to the RMB's reputation and its status as an international reserve currency. Under such a scenario, by 2020 the Chinese economic development and China's financial opening are likely to surpass

the SDR requirements by wide margins. The RMB will have already made large strides as an international reserve currency. The IMF will face an embarrassing situation of long overdue recognition, a disappointment too many.

Judging from the latest developments, the first and second scenarios are more likely to materialize. If so, it will be a formal recognition of the RMB's international reserve currency status, which in turn will expedite its internationalization.

#### **4. SDR, the new driver for the RMB internationalization**

If the RMB successfully makes it into the SDR, it will certainly help solidify its international reserve currency status, making it a true international currency, driven first by China's financial regulators, then by multinational financial institutions.

Based on its development pattern in the past decade, the RMB internationalization has been driven by policy in the early stage. Every milestone of the offshore RMB market development was closely related to the loosening regulatory controls in the Mainland. For example, in January 2007, the PBOC approved of RMB bond issuance in Hong Kong by eligible Mainland financial institutions. The Central Government has been issuing RMB bonds in Hong Kong since 2009, which further developed the offshore dim sum bond market. From 2009 to 2011, RMB cross-border trade settlement has expanded from pilots to all provinces and cities in Mainland, giving rise to Hong Kong's offshore RMB center, and forming the trade basis for the RMB internationalization. In 2011, the Central Government launched the RMB qualified foreign institutional investors (RQFII) program, which extended to more financial institutions. The offshore market thus became the hub for developing RMB products and spreading the use of the RMB in trading and investment. Recently, the Free Trade Zones, Shanghai-Hong Kong Stock Connect and the "One Belt, One Road" strategy are adding new growth impetus to the RMB internationalization in terms of cross border loans and securities trading.

The RMB's inclusion into the SDR will further drive the following developments.

Firstly, it will essentially be an endorsement by the IMF of the RMB's international reserve currency status, which is very significant considering the RMB's convertibility and China's capital controls. It will put the RMB at par to the likes of the US dollar, Euro, Yen and British Pound. With this endorsement, it will remove the obstacles standing in the way of many central banks in their decisions whether to hold the RMB due to its lack of status as an international reserve currency. And global central banks are clear to allocate their funds into RMB assets under proper regulations and risk management, which in turn will trigger a buying spree by central banks and sovereign wealth funds alike.

Secondly, it will further facilitate the use of the RMB in cross border trade, investment, settlement, etc. And China is in the advantage when negotiating pricing commodities such as crude oil and iron ores in the RMB.

Thirdly, it will help lower the borrowing costs by Chinese corporation overseas in their execution of the Go Abroad strategy. And even if China runs into current account deficits, financing it will not be a problem given the RMB being an international reserve currency.

Lastly, it will corroborate the correct path China's reform and opening are on, and will push for further actions such as the RMB's convertibility and China's capital account opening, and help promote further financial reform and opening.

### **5. SDR inclusion will trigger asset allocation into the RMB in hundreds of billions of Yuan**

Besides policies, the key to the RMB internationalization lies in market demands. The RMB internationalization has been driven by policy in the early stage and by market demands for RMB products and transactions later, expanding from offshore markets to the globe. The SDR inclusion will trigger demands from reserve asset investment.

Then how much would such demands likely be? According to IMF's statistics, at the end of 4Q14, global official forex reserves holdings stood at USD11.6 trillion, amongst which USD6.09 trillion were allocated reserves in the US dollar, Euro, Yen, Pound Sterling, Swiss Franc, Canadian dollar, and Australian dollar. In 2013, IMF expanded the coverage of its COFER to list the Canadian dollar and Australian dollar individually. They accounted for 1.4% and 1.5% respectively of the world's allocated forex reserves holdings in 2012. Using 1.5% as a threshold, it amounted to about USD91.3 billion out of the USD6.09 trillion of the total allocated official forex reserves holdings at 4Q14. Using the prevailing exchange rate of 1 US dollar to 6.20 Yuan, it equals to RMB570 billion. And using the Canadian dollar and Australian dollar's average weight at 4Q14 would result in USD110 billion or RMB682 billion. Based on this calculation, it is estimated that once the RMB is included into the SDR, the market demands for RMB assets as official reserves holdings would amount to RMB650 billion at least, which far exceeds the current outstanding balance of offshore RMB deposits and bonds combined.

Currently, there are reportedly more than 40 central banks around the world that have already or planned to hold RMB assets in their forex reserves. They can add to the exposure through offshore markets, QFII, RQFII and China's interbank bond market. With regard to the latter, so far there are more than 20 central banks

including Switzerland, France, Japan, Austria, Australia, and Singapore, etc., who are granted quota for China's interbank bond market investment. And according to public disclosure, central banks holdings of RMB assets currently amount to about RMB140 billion.

## **6. SDR inclusion will boost growth in offshore financial and trading businesses**

Shortly after the SDR inclusion, asset allocation into the RMB will largely take place in the offshore market, which in turn will boost financial and trading activities. Up till now, RMB clearing in the offshore market exceeds RMB trade settlement by a wide margin, suggesting that investment related financial and trading activities dominate the offshore market. In 2014, RMB RTGS clearing reached RMB170.3 trillion for a year-over-year increase of 112.6% compared with RMB80.1 trillion. In the same period, Hong Kong's trade settlement in the RMB totaled RMB6.2583 trillion. Even though its growth was significant and accounting for the majority of trade settlement in the RMB, it was marginal when compared to the RMB RTGS, suggesting faster growth and greater proportion in cross border RMB business under the capital account than under the current account. In 2014, cross-border RMB trade settlement increased 41%, with 18.6% of merchandize trade being settled in RMB. Meanwhile, cross-border direct investment (ODI and FDI combined) rose 97% to RMB1.05 trillion. Therefore, it is estimated that by the year 2020, cross border investment settlement in the RMB will surpass that of trade settlement.

There is no doubt that SDR inclusion will further boost such investment related financial and trading activities. As for foreign exchange transactions, according to Reuters, London has surpassed Hong Kong and accounts for 44% of global RMB transaction volume. Transactions of deliverable futures in London rose 127% to averaging USD42.4 billion per day. Besides Hong Kong Exchanges and Clearing, RMB futures contracts have been launched on the CME, Singapore Exchange, and Brazil's BM&FBOVESPA.

RQFII has become an important channel for RMB asset allocation. Ten jurisdictions outside of Hong Kong have been allotted a total of RMB650 billion for investment. As of the end of February, 2015, institutions in markets such as Singapore, the U.K., France, and Korea had applied for an RQFII quota of RMB41.5 billion. Meanwhile, the NYSE and LSE have listed RQFII-ETF products, providing investors with an important avenue to invest in A shares and the Chinese bond market. Growth in the offshore market forex and derivatives trading further boost related business. As China's capital account liberalization accelerates, hedging



demands continue to soar, and financial derivatives will likely become popular RMB products in the offshore market, and financial derivatives trading in the offshore market will also grow in significance.

The offshore RMB bond market has rapidly expanded from Hong Kong to other jurisdictions. According to the HKMA, Dim Sum bond issuance (excluding CD's) in 2014 amounted to RMB190 billion, nearly double that in 2013. Other markets have also emerged. In 2014, there were 31 Formosa bond issuances totaling RMB20.8 billion in Taiwan. In Singapore, a total of six banks have issued Lion City bonds amounting to RMB11.5 billion. Meanwhile, London witnessed a number of groundbreaking RMB bond issuances. The UK government successfully issued RMB-denominated sovereign bonds and became the first foreign sovereign issuer of RMB bonds. Moreover, IFC of the World Bank has issued a total of RMB3.25 billion of Yuan bonds in London and became the largest RMB bond issuer on the London Stock Exchange. RMB bond issuance has also emerged in Frankfurt, Paris, and Luxemburg, while emerging markets such as Brazil and Dubai have also begun to issue RMB bonds. Offshore RMB bond issuance outside of Hong Kong has reached a cumulative total of RMB150 billion.

Currency swaps have provided a number of jurisdictions with RMB funds for trade settlement purposes. For instance, the Bank of Korea activated the currency swap mechanism to facilitate trade settlement between Korean and Chinese enterprises. In 2014, the Central Bank of Argentina drew down its RMB swap quota to settle trade between Argentine and Chinese companies. Meanwhile, the Monetary Authority of Singapore used currency swaps to provide financial institutions with a comprehensive suite of RMB lending mechanisms, promoting RMB's role in trade and direct investments in Singapore. In addition to official cooperation between governments, policy banks and cross-border investments also boosted offshore RMB business in emerging markets such as Latin America and South Africa. Since 2013, major Chinese policy banks have provided countries including Venezuela and Jamaica with RMB loans to facilitate investments in resources and infrastructure. Meanwhile, major South African insurers have concluded foreign direct investments in China with RMB funds. As bilateral trade between China and emerging markets grows steadily and currency cooperation between governments picks up pace, more and more emerging economies outside of Asia will become new offshore RMB markets.

## **7. Conclusion**

To summarize, if the RMB successfully makes it into the SDR, it will certainly

help solidify its international reserve currency status, making it a true international currency. Moreover, it will push for further actions such as the RMB's convertibility and China's exchange rate reform, and help promote further financial reform and opening.

## Will IMF Inclusion Make World Stash Yuan?

By XIA LE\*

The International Monetary Fund is currently assessing the possibility of including the Chinese yuan into the basket of currencies that underpins special drawing rights -- the supplementary reserves that member states can tap into. China's authorities have been pushing for this since the idea was initially proposed at the 2011 G-20 summit in Nanjing.

At the moment, the SDR basket only includes four currencies: the U.S. dollar, the euro, the British pound and the Japanese yen. From Beijing's perspective, having its currency among this exclusive group would be an important status symbol and could increase overseas interest in holding yuan assets.

The IMF's recent assessment that the yuan is no longer undervalued is widely seen as a signal of openness toward such a move. David Lipton, the IMF's first deputy managing director, said in Beijing in May that adding the yuan to the SDR basket was "not a matter of 'if' but when."

As the likelihood of yuan inclusion increases, many foresee a rosy picture in which other central banks and sovereign wealth funds will scramble to acquire assets denominated in the currency. For example, one optimistic projection states that when the IMF adds the "redback" to the basket, possibly later this year, around \$1 trillion in global reserves will switch to yuan assets.

Take these bold projections with a grain of salt. In our opinion, SDR inclusion might not guarantee the rapid rise of the yuan's share in global reserves, due to a couple of factors that many optimists may have neglected Obstacles

First, the IMF is unlikely to require China to make its currency fully convertible before adding the yuan to the basket. The IMF does not equate an SDR component currency with a global reserve currency. According to the IMF's official definition, reserve assets must be "denominated and settled in convertible foreign currencies that are freely usable for settlements of international transactions."

China would deem it too risky to immediately lift all existing capital controls in the face of weak domestic growth and external uncertainties. As long as China's capital account is not fully liberalized, other central banks will still be unwilling to hold yuan assets, even if the currency is included in the IMF basket. After all, a

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central bank's foreign reserves need to be highly liquid so that they can be easily sold on the market in emergencies.

Second, China has already signed a large number of bilateral swap agreements with other central banks, which reduces the real demand for these central banks to hold yuan assets as part of their foreign reserves.

To put this into context, the People's Bank of China has signed 32 such pacts with other central banks since 2008 in an effort to internationalize the yuan, with an aggregate outstanding amount of 2.9 trillion yuan (\$467 billion). Such an agreement allows a central bank to purchase and repurchase yuan, up to a certain amount, directly from the PBOC. According to news reports, a number of central banks have made use of their swap agreements with China, including Hong Kong, South Korea and Russia. For example, the Hong Kong Monetary Authority did so in October 2010 after stronger-than-expected demand for the yuan in trade settlements led to a shortage of the currency in the Hong Kong market.

These swap deals have facilitated the use of the Chinese currency in trade and financial transactions but, ironically, their efficiency may have reduced the need for countries to hold a large chunk of their foreign reserves in yuan. As a matter of fact, these agreements are expected to play a beneficial role in the global monetary system by limiting the buildup of foreign reserves by central banks, which can carry high costs for citizens and even threaten international financial stability.

All in all, people should not anticipate an exponential growth of the yuan's share in global reserves even if the currency is brought into the SDR fold later this year. Other central banks' interest in the redbank is largely dependent on the pace of China's capital account liberalization.

More importantly, the bilateral yuan swap agreements could prove to be a hindrance. In fact, these arrangements could make central banks reluctant to hold yuan assets at comparable levels of other reserve currencies even after China completely opens its capital account.

# **China's Asian Infrastructure Investment Bank (AIIB): Criteria for a Genuine Multilateral Organization: Compare EIB<sup>1</sup> and ADB<sup>2</sup>**

*By* HERBERT POENISCH\*

China's latest project for an international multilateral organization was presented at the APEC November 2014 Conference in Beijing and received the support from 21 Asian countries representing some 18% of world GDP. As there are still great infrastructure needs in Asia which are presently not covered by existing institutions<sup>3</sup>, China's project would go a long way to filling this gap.

If China went ahead with establishing the AIIB with these 21 countries only, this might be perceived as a Chinese undertaking. Among these countries, China is by far the biggest one, representing 66% of the total<sup>4</sup>. A skewed weighting like this would result in an institution dominated by China<sup>5</sup>.

This article lays out the criteria for the AIIB to become a truly multilateral Asian organization, drawing on the experience of the European Investment Bank (EIB) and the Asian Development Bank (ADB)<sup>6</sup>. Part 1 will focus on the composition of shareholders, part 2 will be devoted to the funding of such an organization, part 3 will address the lending structure and the final part 4 will list requirements of corporate governance to ensure global best practices and transparency.

## **1. Composition of shareholders**

While an Asian Infrastructure Investment Bank should, arguably be made up of member countries and territories from Asia only, financing from, and lending to

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<sup>1</sup> Most of the Information is taken from the European Investment Bank public website: [www.eib.org](http://www.eib.org) and the 2013 EIB Activity Report as well as from the 2013 Financial Report.

<sup>2</sup> Most of the Information is taken from the Asian Development Bank public website: [www.adb.org](http://www.adb.org) and the 2013 ADB Financial Report

<sup>3</sup> Some estimates say that infrastructure investment needs could reach USD 750bn annually between 2010-2020. This also depends on how many cross-border projects are included. See Don Rodney OngJunio in The Diplomat, 4 December 2014 ([www.thediplomat.com](http://www.thediplomat.com))

<sup>4</sup> A similar problem exists within the BRICS Bank where the China's share based on GDP would be equal to all other countries' shares.

<sup>5</sup> Australia stated clearly that it was prepared to participate only in a truly multilateral organization.

<sup>6</sup> The World Bank launched the New Global Infrastructure Facility in late 2014. See: IBRD (2014): Press Release 9 October 2014 ([www.worldbank.org](http://www.worldbank.org))

outside the region should not be excluded. In the case of the EIB the shareholders are only members of the European Union (EU), thus it is exclusively European, but some 10% of funds go to non-members which are of interest to the EU. The ADB has non-regional shareholders due to historical reasons but lending is exclusively for developing member countries (DMC).

One of the prime concerns, and indeed a powerful argument for Asian membership only is that the massive savings in Asia should be made available to Asian countries only, thus being recycled in the region.

The present day lenders for infrastructure projects in Asia are the ADB with a subscribed capital of USD 164bn and the World Bank with a subscribed capital of USD 233bn. (For comparison, the EIB is even bigger with subscribed capital of EUR 243bn). Big Asian countries also support regional projects through bilateral lenders such as the China Development Bank (CDB) and the Development Bank of Japan (DBJ).

Table 1: Major shareholders in EIB and ADB

Share of subscribed capital	EIB	Share	ADB	Share
1	Germany	16%	Japan	15.67%
2	France	16%	USA	15.56%
3	Italy	16%	China	6.47%
4	UK	16%	India	6.36%
Biggest 4 total		64%		44%
5+6	Spain & NL	14.4%	AUS&CDN	11.1%
Biggest 6 total		78.4%		55.1%

Source: Annual Reports of EIB and ADB

In the case of the EIB, the major countries were given equal shares independent of the differences in their GDP. In the case of the ADB, the share of the USA was revised downwards to match the share of the biggest country in the region, Japan. In addition, there are 2 non-regional members among the 6 biggest shareholders (see Table 1). Being among the biggest 4 could be a criteria for being eligible to nominate an institution's president or vice-president.

If only 21 countries were to join the AIIB, in a hypothetical case, China would control 66%, thus having the same share as the biggest 4 in the EIB or more than the biggest 6 in the ADB. In order to preserve the multilateral character of the AIIB, while being exclusively Asian, other Asian countries should join this institution, first and foremost Japan, Australia, South Korea and Indonesia. Adding these, the

hypothetical share of the biggest 4 would be 78.3% and of the biggest 6 would be 88%. This is still a high concentration but would warrant the character of a multilateral financial institution.

## 2. Funding of development banks

Such an institution can and should minimize the use of members' contributions by using external resources, while maximizing the disbursements to member countries. The Ordinary Capital Resources (OCR) funds come from three distinct sources: the capital markets and private placements, paid-in-capital provided by shareholders and accumulated retained income (reserves). The main difference between our peers, the EIB and the ADB is that in the case of the EIB nearly all activities are included in the main OCR account whereas the ADB runs an OCR account as well as a number of separate accounts for special funds which are financed in separate ways. These are the Asian Development Fund, the Japan Special Fund, ADB Institute, the Pakistan Earthquake Fund, Regional Cooperation and Development Fund, Climate Change Fund, Asia Pacific Disaster Response Fund, Financial Sector Development Partnership Special Partnership Fund, Trust Funds for Co-Financing. The following comparison gives a partial picture of the ADB as it covers only the main account but not the special funds.

Our peers tap mainly capital markets, with private placements<sup>7</sup> in second place. The proposed World Bank Global Infrastructure Facility (GIF) targets the massive resources of global institutional investors, such as asset managers, private equity funds, pension and insurance funds with assets exceeding USD 100trn under management<sup>8</sup>. These investors are looking for long-term, sustainable and stable investments<sup>9</sup>.

Table 2: Liabilities of EIB and ADB, end of 2013

Liabilities	EIB in mn EUR	Share	ADB in mn USD	Share
Owed to banks	4484	0.9%		
Owed to customers	2487	0.6%		
Debt (after swaps)	426358	83.2%	61630	78.2%
Provisions & accruals	20935	4.0%	1518	2.0%
Subscribed called capital	21699	4.2%	5885	7.4%
Reserves + profit	36240	7.1%	9739	12.4%

<sup>7</sup> The PBoC is the biggest investor in EIB bonds.

<sup>8</sup> Institutional Investors <http://www.oecd.org/finance/financial-markets/42143444.pdf>

<sup>9</sup> See IBRD (2014): *ibid*

Total	512203	100%	78772	100%
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Sources: Statutory Financial Statements of EIB and ADB, own calculations

Funding in table 2 shows that both peers, EIB and ADB work mainly with three OCR, made up of external resources(83.2% vs 78.2%) with a low shares of reserves plus current profit (7% vs 12.4%) and paid-in-capital (4.2% vs 7.4%).

Looking at the peer examples of ADB and EIB we see two completely different financing models. Whereas the ADB's outstanding borrowings of USD 61bn compared with the subscribed capital of USD 164bn result in a gearing ratio of 37%, the EIB is far more leveraged with borrowings of EUR 426bn over a subscribed capital of EUR 243bn, a gearing ratio of 175%. The difference is explained by the higher share of paid-in or called capital which is 9% (EUR 21.7bn over EUR 243bn in EIB and only 5% (USD 8bn over USD 164bn) in ADB.

Although the gearing ratio can be decided later, the major share of funding of the AIIB should be OCR, raised by issuing various types of debt securities in Asian financial markets or private placements to tap Asian savings. Partnership with Asian institutional investors, such as pension funds (eg CPF), insurance funds and sovereign wealth funds (eg Temasek, Khazanah), benefitting the borrower as well as the investor should be added.

Regarding currencies, the ADB borrowed in 10 currencies, the major ones such as USD, JPY, GBP, AUD, NZD, SGD as well as in EME currencies, such as BRR, MXP, TLY and ZAR. Note that it does not issue in borrowers' currencies.

The EIB issued in 15 currencies, the bulk of which are in the core currencies: EUR 49%, USD 30% and GBP 13%. The rest are made up of global currencies, such as the JPY, CHF, CAD, AUD but also of borrowers' currencies, such as TLY, RUB, PLN and CZK.

The maturity profile would depend on market conditions, preferably long-term to match the long-term infrastructure investments.

For the AIIB, issuing currencies should be convertible currencies as well as regional currencies, first and foremost the RMB. The RMB issues could be domestic issues, which would require a permit from the Chinese MoF as well as from SAFE to export the RMB. International RMB issues, such as dim-sum bonds would also require the permit of the Chinese MoF but would be freely disposable.

The mix of borrowing between different currencies would depend primarily on the borrowing costs but would also contain a political element to boost the internationalization of regional currencies, first and foremost the RMB. The securities issued should become part of Asian Bond Fund 1 (in convertible



currencies) and Asian Bond Fund 2 (in RMB). International investors would thus be able to purchase AIIB securities in the Asian capital markets as well as through private placements.

### 3. Investment activities of development banks

Due to the different structures of our peer developments banks, the activities differ as well. Whereas the EIB concentrates all its activities in the main account, loans to customers and credit institutions make up the bulk of assets. In the case of ADB, loans and investments form only part of the overall activities. The special funds are earmarked for special purposes (evident in the names of these special funds) and financed in different ways, including grants from member countries. The EIB on the other hand includes such special funds under off-balance sheet items as “assets held on behalf of third parties”.

The development banks provide resources to member countries (the EIB also extends small amounts to non-member countries). The main instruments are loans, technical assistance (TA), grants, guarantees and equity investments.

Table 3: Assets of EIB and ADB, end of 2013

Assets	EIB in mn EUR	Share	ADB in mn USD	Share
Undisbursed	93343	18.2%	24452	31.0%
Disbursed total	414957	81.0%	53061	67.4%
Of which loans to banks	125444			
Of which loans to customers	289513			
Other assets	3903	0.8%	1259	1.6%
Total assets	512203	100%	78772	100%

Source: Statutory Financial Statements of EIB and ADB, own calculations

The mix between disbursed loans and undisbursed funds varies between the two peer organisations. The share of loans to customers (including loans to credit institutions<sup>10</sup>) is higher in the EIB whereas the share of undisbursed funds is higher in the ADB. A higher share of undisbursed funds could be due to stringent lending criteria. The receivables from swaps and payables on swaps were balanced.

The choices of projects to be financed are mainly those for which private finance

<sup>10</sup> EIB lending to SME is channeled through credit institutions so not to compete with them directly.

would be difficult to find. In recent years infrastructure financing has been surpassed by other priorities, such as SMEs, environmental projects, education.

While one focus of total EIB lending of EUR 74bn in 2013 was still infrastructure projects, the major share EUR 21.9bn (or 30%) went to support SMEs. EUR 17.2bn (or 23%) went to support innovation and skills, EUR 15.9bn (or 22%) was devoted to infrastructure projects in transport, energy and urban renewal, and EUR 19bn (or 25%) was invested into climate support projects.

The activities of the ADB are concentrated in five core operational areas. These should absorb 80% of lending. These areas are: infrastructure, environment, regional cooperation and integration (RCI), finance sector development, and education. Support for other areas of operations, such as health, agriculture, and disaster and emergency assistance, is to be selectively provided.

The AIIB would be well advised to focus on infrastructure projects as its name and its mandated purpose indicates. The other choice to be made will be either domestic projects in member countries or cross-border infrastructure projects which will serve regional cooperation and the integration of Asian economies.

Recipients of AIIB loans can be either various levels of government and government linked entities or the private sector. There can also be joint projects where the government outsources certain activities to the private sector.

The loans can be provided in local currency, RMB or convertible currencies. It is up to the Asset-Liabilities Committee of the development bank to manage the various currency mismatches and to buy hedging operations (such as swaps).

Loans for infrastructure projects are likely to be long-term and should be remunerated above the borrowing rate. The main advantage for the borrowing country is that it can raise funds at the credit spread of the AIIB or the major shareholder, China. Again, the Asset-Liabilities Committee needs to balance the maturity risk.

Loans could be extended as fixed interest loans or variable interest loans. In an uncertain interest environment, long-term loans are likely to be variable interest loans. The Bank needs to purchase hedging instruments to mitigate interest risk. The Bank could also consider extending loans according to Islamic principles for Islamic member states. In this case long-term profit sharing replaces the long-term interest rate calculations.

#### **4. Procedures, transparency and corporate governance**

A reputable multilateral development bank which relies on external borrowing will have to adhere to international best practices, put in place clear mandates,

structures, procedures and accountability. It will have to publish the information in prospectuses for investors as well as publish regular reports on the website as well as to shareholders. Reports will have to be audited by internationally accepted auditors. The following structures are in place in our peer development banks:

#### **4.1 Define mandate**

The ADB's mandate is to help its developing member countries (DMC) to reduce poverty and improve living conditions and quality of life. Whether it be through investment in infrastructure, health care services, financial and public administration systems, or helping nations prepare for the impact of climate change or better manage their natural resources, ADB is committed to helping DMCs evolve into thriving, modern economies that are well integrated with each other and the world.

The EIB supports projects that make a significant contribution to growth and employment in Europe. As part of its counter-cyclical approach, its activities focus on four priority areas: innovation and skills, access to finance for smaller businesses climate action and strategic infrastructure.

The AIIB mandate should focus on the importance of infrastructure projects of DMCs as well as on the importance of cross-border infrastructure development projects to promote Asian integration.

#### **4.2 Headquarters**

The ADB specified Manila, Philippines as its headquarter and the EIB resides in Luxemburg. Both peer banks are not resident in any major shareholder country.

The AIIB would be well advised to set up its headquarter in any Asian country apart from the major ones. A country with a well-developed infrastructure and good access to international financial markets should be chosen.

#### **4.3 Financial management principles**

The ADB stipulates that total borrowing may not exceed the sum of callable capital from non-borrowing members, paid-in-capital and reserves. Total lending may not exceed total subscribed capital plus reserves. Under ADB's lending policy, the total amount of disbursed loans, approved equity investments, and the maximum amount that could be demanded from ADB under its guarantee portfolio may not exceed the total amount of ADB's unimpaired subscribed capital, reserves, and surplus.

The EIB can raise additional capital from shareholders through the callable capital. This is done regularly to underpin the Bank's financial standing and receives support from member countries. The business model is to finance large volumes at low margins. The EIB raises the bulk of its lending resources on the international capital markets through bond issues. Its excellent rating allows it to borrow at advantageous

rates. It is thus able to offer good terms to our clients.

#### **4.4 Due diligence and project selection**

In 2011, ADB introduced policy-based lending, which enhanced the program lending policy by mainstreaming programmatic budget support and enhancing crisis response capacity. ADB has four policy-based lending products, each catering to a different situation in a DMC: stand-alone policy-based lending, programmatic approach, special policy-based lending, and counter cyclical support facility lending.

EIB projects are appraised by a team that comprises, in addition to bankers, economists, engineers and other sector specialists, risk managers and lawyers. The viability of projects is assessed from four angles (economic, technical, environmental and financial) and strict risk policies and guidelines are applied at selection and throughout the lifecycle of the loan.

Post-signature monitoring is performed with a view to intervening early in a transaction where initial conditions may have deteriorated or contractual clauses may have been breached. Strict adherence to screening and ex ante evaluation rules, coupled with systematic ex post reviews, will benefit loan portfolio quality.

#### **4.5 Risk Management**

The ADB constantly scrutinizes the following risks: credit risk, sovereign and non-sovereign, for its OCR as well as the treasury portfolio; market risk, interest and foreign exchange risk on both sides of the balance sheet, liquidity risk, as well as operational risk. ADB maintains an independent risk management group and has various management committees with responsibility to oversee ADB-wide risk issues and endorse related decisions for approval by the Board of Directors and President.

The EIB aligns its risk management systems with best market practices, and adherence to those practices is monitored by the independent Audit Committee. The Bank's lending policies set out minimum credit quality levels for both borrowers and guarantors in lending operations and identify the types of security that are deemed acceptable.

#### **4.6 Asset and Liability management (ALM)**

The ADB has an asset-liability framework that guides all financial policies related to the bank's assets and liabilities.

The EIB Treasury manages the interest rate and foreign exchange rate risk position of the Banks assets and liabilities within prescribed limits. This involves rebalancing the interest rate risk profile and replenishing the Banks liquidity in 14 currencies through the use of standard derivative instruments to achieve a target financial duration. ALM policy aims to ensure self-sustainability of the Bank's

business and growth of own funds.

#### **4.7 Audit and Control Process**

ADB Management has been assessing the effectiveness of its internal controls over financial reporting since 2008. ADB staffs across several departments and offices are responsible for (i) identifying and testing key controls and (ii) assessing and evaluating the design and operating effectiveness of the business processes. Concurrently, the external auditor performed an independent test of selected key controls.

The EIB Audit Committee is an independent statutory body, appointed by and reporting directly to the Board of Governors, in compliance with the formalities and procedures defined in the Bank's Statute and Rules of Procedure. The role of the Audit Committee is to verify that the Bank's operations have been conducted and its books kept in a proper manner and that the activities of the Bank conform to best banking practice. The Audit Committee has overall responsibility for the auditing of the Bank's accounts.

Within the Auditing and Control Process there are also the External Auditors, the Financial Control, the Inspectorate General, the Chief Compliance Officer, and Management Control.

#### **Conclusion**

While the proposal for the Asian Infrastructure Investment Bank fits in well into the overall Chinese strategy "Asia for Asians" the proliferation of new proposals should be narrowed into viable projects. At present the following China-led projects are on the table: the AIIB, the New BRICS Development Bank, the Maritime Silk Road Bank, and in addition, Premier Li has offered USD 20bn to finance infrastructure and development projects in ASEAN countries.

All these announcements need to be followed up by concrete actions within a reasonable time, not to risk being viewed as too ambitious. In the case of AIIB, countries have expressed their interest in becoming members and even signed MoUs. A committee of these interested parties needs to be formed to work out a detailed proposal which would address the issues laid out in this article and study the experience of multilateral peers, such as the EIB and ADB.

This is a golden opportunity for China to gain experience in organizing other countries under its leadership to design a multilateral undertaking, where smaller countries feel respected and integrated into a common sense of purpose and a common strategy. This has been the secret of success of US led multilateral institutions over the past 70 years.

## **Has the US Lost its Role as the Underwriter of the Economic System?**

*By* WILLEM WIDDELKOOP\*

The recent news that Britain aspires to become one of the founding members of the new Asian Infrastructure Investment Bank (AIIB), has shocked many. Larry Summers, who served as a Secretary of the US Treasury between 1999 and 2001, immediately understood the significance of these developments, and wrote in an op-ed for the Washington Post: ‘March 2015 may be remembered as the moment the United States lost its role as the underwriter of the global economic system. I can think of no event since Bretton Woods comparable to the combination of China's effort to establish a major new institution and the failure of the United States to persuade dozens of its traditional allies, starting with Britain, to stay out.’

This British announcement was highly criticized by the US. The Financial Times quoted an unnamed US official: ‘We are wary about a trend toward constant accommodation of China, which is not the best way to engage a rising power. This decision was taken after no consultation with the US.’

Summers were also highly critical of the US’ strategy toward the newly founded AIIB: ‘The U.S. misjudged the situation tremendously, put pressure on allies and developing countries to under no circumstances be part of AIIB. Largely because of resistance from the right, the United States stands alone in the world in failing to approve International Monetary Fund governance reforms that Washington itself pushed for in 2009. By supplementing IMF resources, this change would have bolstered confidence in the global economy. More important, it would come closer to giving countries such as China and India a share of IMF votes commensurate with their increased economic heft.’

With Britain and many more major European countries signing up as founding members of the AIIB, the US economic hegemony has been dealt an enormous blow. For the first time since the end of the Second World War, the US is not in the driving seat during the foundation of a highly significant global institution. Of course, this will not change the world economic system overnight, but when we look back in five, ten or even fifteen years’ time, March 2015 may be remembered as a turning point in economic history.

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\* President/ Founder of Commodity Discovery Fund

It might be remembered as the start of an openly Chinese confrontation with the US over the world's economic leadership. As Summers points out, all of this has taken place because the Chinese leadership has had to wait a full five years for a change in the IMF-voting structure.

The first ideas for an Asian Infrastructure Investment Bank (AIIB) were floated by China in 2013. The Chinese proposed to set-up a multilateral development bank able to provide finance to infrastructure projects in the Asia region. The Chinese wanted the AIIB to work cooperate closely with the IMF, the World Bank and the Asian Development Bank (ADB). But for the US, the BRICS-oriented AIIB is a potential rival for these US-dominated organizations.

In 2014, China invited India to participate in the founding of the AIIB. In October that year, a signing ceremony for the AIIB was held in Beijing, during which 21 mainly Asian countries signed the Memorandum of Understanding. US pressure tried to keep Australia and South Korea from signing up as founding members. In the summer of 2015, almost all Asian countries and most major countries outside of Asia had joined the AIIB, except the US, Japan (which still dominates the ADB, by design of the US) and Canada. North Korea's and Taiwan's applications were rejected. The Chinese want the AIIB to be fully established by the end of 2015. As of May 2015, almost sixty countries, including Russia, have signed up as founding members.

As mentioned, one of the prime reasons for the establishment of the AIIB has been Chinese frustration with, 'the slow pace of reforms and governance in global established institutions like the IMF, World Bank and Asian Development Bank, which it claims are dominated by American, European and Japanese interests.'

The AIIB will be used to finance large infrastructural investments mainly in Asia. The Asian Development Bank (ADB) has published a report stating that the region requires up to \$9 trillion in infrastructural investments in the coming years. Although China is the largest investor in the region, it has merely 5% of the voting rights in the ADB, while Japan and US have a total of 26% of the voting rights (13% each). This can be seen as an attempt to keep the Asia investment developments under Western control.

This same kind of US dominance can be found within the voting structures of the IMF and the World Bank. According to some, international politics play an important role in IMF decision making. The most important decisions within the IMF require a special majority of 85% of the votes, giving the USA, with over 17% of the votes, an effective veto. France, a country with just over 65 million people, currently has more voting rights (4.29%) within the IMF than China (3.99%) with

1.3 billion inhabitants. Belgium, with just over 10 million people, has more voting rights (1.86%) than Brazil (1.72%), a country with a population exceeding 200 million.

Another criticism is that the US move to more neoliberalism and global capitalism since the 1980's, has led to a change in the functions of the IMF. Criticasters claim allies of the US receive 'bigger loans with fewer conditions'. Foreign governments who are non-allies have to sacrifice their political autonomy in exchange for IMF-funds and often have to sell assets crucial for their economy to foreign (often US) companies.

The former Tanzanian President Julius Nyerere, who was angered that debt-ridden African states were forced to hand over their sovereignty to the IMF (and World Bank), once asked: 'Who elected the IMF to be the ministry of finance for every country in the world?' And now the Chinese have openly asked for a 'new world wide central bank'.

Joseph Stiglitz, a former chief economist at the World Bank, has also agreed that the IMF 'was reflecting the interests and ideology of the Western financial community'. The 'helpful hand' by the IMF and World Bank towards military dictatorships friendly to the West' has been criticized as well.

Reforms to give more powers to emerging economies were agreed upon by the G20 in 2010. However, until now, the US Congress has failed to pass these reforms, to the disgust of countries like China. But recent reports indicate that China has chosen to take more initiative to accomplish more structural changes within the institution. The highest ranking Chinese banker at the IMF, deputy managing director Zhu Min, has recently said the IMF has already adopted, 'Plan B, since it can no longer wait for US congressional approval for its proposed reforms.' We could well witness the start of a totally new era. An era in which the West will lose and the East will gain power.



# RMB internationalization

## Pegging to RMB

By HERBERT POENISCH

As China has become the major trading partner for some 30 countries as diverse as Iran, Australia, South Africa, Pakistan, Malaysia, Indonesia, Sudan (see list below<sup>1</sup>) these countries may need to adjust their exchange rate policy to reflect these new realities.

This article will explore the possible exchange rate regimes, ranging from pegging their currencies to the RMB to a full currency board. This will impact the composition of their foreign currency reserves, ranging from a small percentage to 100% held in RMB.

These foreign exchange reserves will need to be held in RMB denominated securities, either offshore RMB or onshore RMB. This article will explore the availability and liquidity of such investments in RMB denominated debt securities.

The challenge for China will be to create a deep and liquid RMB debt securities market and open access to foreign central banks.

Table 1. Share of China in import of the 12 countries, %

NN	Countries	Years		
		2005	2010	2014
1	Australia	13.68	18,75	20.54
2	Brazil	7.28	14.09	16.3
3	India	7.1	11.78	12.66
4	Indonesia	10.13	15.06	17.19
5	Iran, Islamic Republic of	6.2	8.63	27.78
6	Kazakhstan	7.2	16.75	29.04

<sup>1</sup> IMF DOT statistics [www.imf.org/statistics](http://www.imf.org/statistics)

7	Malaysia	11.6	12.55	16.92
8	Pakistan	9.24	17.51	24.72
9	Russian Federation	5.57	5.82	5.94
10	South Africa	9.09	13.91	15.52
11	Sudan	20.67	n/a	21.81
12	United States	15	19.46	19.9

Source: Direction of Trade Statistics (DOTS). IMF. 2005-2014.

Table 2. Share of China in export of the 12 countries, %

NN	Countries	Years		
		2005	2010	2014
1	Australia	11.49	25.09	33.68
2	Brazil	5.77	15.25	18.04
3	India	6.59	7.86	4.17
4	Indonesia	7.78	9.95	9.99
5	Iran, Islamic Republic of	11.2	16.8	28.91
6	Kazakhstan	8.7	17.77	15.89
7	Malaysia	6.6	12.53	12.04
8	Pakistan	2.71	7.39	9.28
9	Russian Federation	0.58	2.17	1.75
10	South Africa	2.67	8.89	9.54
11	Sudan	71.04	n/a	26.36
12	United States	4.63	7.19	7.64

Source: Direction of Trade Statistics (DOTS). IMF. 2005-2014.

### 1. Functions of an international currency

The main four functions of an international currency are<sup>2</sup>: 1) trade invoicing and payment, 2) foreign exchange trading, 3) issue of domestic portfolio liabilities and 4) investment by non-residents in domestic portfolio liabilities. China's RMB is

<sup>2</sup> Ma Guonan and Villar, Agustin (2014): Internationalisation of emerging market currencies. In: BIS Papers 78. [www.bis.org/publications](http://www.bis.org/publications)

progressing well on the first function<sup>3</sup>, slowly on the second function<sup>4</sup> but hardly at all on the third and fourth functions. China is a giant in trade but a dwarf in finance.

As more countries record a rising share of trade with China, China will need to look at fulfilling these functions before long. The advantages for trading partners of China by using RMB are that the number of exchange rates involved in settling trade will be reduced and the clearing of trade will be simplified by direct settlement between the local currency (such as Rand) and RMB. In addition, pegging to the RMB will reduce the impact of volatility of the USD/RMB exchange rate.

## **2. Countries' foreign exchange reserves and composition at present**

Total world foreign exchange reserves amounted close to USD 12trn at the end of 2014. If we subtract the Chinese foreign exchange reserves of close to USD 4trn, there remain some USD 8trn to be allocated among the major currencies (USD, EUR, JPY, GBP, AUD, CAD, CHF) and possibly RMB. An increasing share, some two thirds are owned by central banks in emerging markets (see table 1).

Nearly all foreign exchange reserves are held in the major currencies. The USD share has been fairly stable at some 60%, much larger than the US share in world trade<sup>5</sup>. The EUR share is also larger than the EU share in world trade (see table 1). This can be explained by a currency zone, ie countries using a certain currency for trade with third countries, eg Saudi Arabia selling oil to countries other than the US, denominated in USD.

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<sup>3</sup> IMI Report 2015 on Internationalisation of the RMB

<sup>4</sup> BIS (2013): Triennial Foreign Exchange Survey. Foreign exchange turnover in April 2013, [www.bis.org/statistics](http://www.bis.org/statistics)

<sup>5</sup> McCauley, Robert and Chan, Tracy (2014): Currency movements drive reserve composition. In: BIS Quarterly Review, December [www.bis.org/publications](http://www.bis.org/publications)

Table 3. Currency composition of foreign exchange reserves at current exchange rates (as a percentage of allocated reserves)

Currency composition of foreign exchange reserves at current exchange rates									
As a percentage of allocated reserves <sup>1</sup>									Table 1
	1976	1988	1995	2000	2005	2010	2011	2012	2013 <sup>2</sup>
US dollar	76.50	54.60	58.96	71.13	66.52	61.84	62.36	61.05	61.44
Japanese yen	2.00	6.90	6.77	6.06	3.96	3.66	3.61	4.08	3.86
Pound sterling	1.80	2.30	2.11	2.75	3.75	3.94	3.83	4.03	3.92
Euro	...	...	...	18.29	23.89	26.00	24.66	24.28	24.16
Deutsche mark	9.00	14.20	15.75	...	...	...	...	...	...
Australian dollar	...	...	...	...	...	...	...	1.47	1.65
Canadian dollar	...	...	...	...	...	...	...	1.50	1.82
Other	10.70	22.10	16.41	1.76	1.89	4.57	5.53	3.60	3.14
<i>Memo: Share of global foreign exchange reserves</i>									
<i>Developing countries</i>	<i>53.50</i>	<i>36.10</i>	<i>32.92</i>	<i>37.13</i>	<i>51.89</i>	<i>66.62</i>	<i>66.70</i>	<i>66.30</i>	<i>67.08</i>

<sup>1</sup> Reserves whose currency composition has been identified. Allocated reserves accounted for 78% of global reserves in 1998 and 54% in 2013. "..." = not available. <sup>2</sup> As of Q3.

Sources: IMF (1984, 1998); IMF, *COFER*; Roger (1993).

Source: BIS Paper 78

The share of RMB estimated less than 2% of world's foreign exchange reserves is much lower than China's share in world trade, amounting to some 12% at the end of 2014.

### 3. Possible exchange rate regimes for countries with big China trade

Starting from the theoretical possibilities, countries can either float or peg their currency to another (major trading partner) currency. Under the present international financial architecture based on the Bretton Woods system, most trades were denominated and settled in USD. When the EUR was introduced in 1999, it replaced the shares of various Eurozone currencies but did not encroach on the USD share.

Now, however, countries with strong trade links with China would benefit from seeking an exchange arrangement with RMB. This could range from pegging to RMB, either with an adjustable peg or a fixed peg, to a currency board where all foreign assets would be RMB denominated assets.

Once RMB will be accepted as component of the SDR basket<sup>6</sup>, a major hurdle to pegging to RMB will have been removed. Foreign exchange reserves held in RMB

<sup>6</sup> The IMF is expected to decide on this issue by the end of 2015.

will from then onwards be eligible as official foreign exchange reserves under the IMF definition<sup>7</sup>. Even before that decision, countries are now holding RMB reserves.

China can either take a laissez faire attitude to these unilateral decisions, such as the US has done so far or take a pro-active approach, even including a reform of the international monetary systems towards a multi-polar currency standard by design rather than by default. Short of this major task, China will have to provide adequate investment opportunities in RMB for countries' foreign exchange reserves.

#### **4. Investment possibilities in RMB denominated securities**

According to BIS securities statistics, total outstanding debt consists of 2 components, domestic securities and international securities. International debt securities are issued outside the country either in local currency or foreign currencies. At the end of 2014 international debt securities amounted to USD 22 tr, domestic debt securities USD 59 tr, totaling USD 81tr<sup>8</sup>. For the world as a whole there are ample international and domestic debt securities to invest the current total foreign exchange reserves of USD 12 tr.

At present central banks from some 50 countries hold and invest small amounts of their foreign exchange reserves in RMB<sup>9</sup>. Assuming that countries round the world (except China) would be investing an initial average of 3% of their foreign exchange reserves (total USD 8tr) amounting to USD 240bn in RMB the following picture would emerge.

Adequate investment vehicles can be supplied either as international debt securities, such as off-shore RMB dim sum bonds or domestic debt securities, either issued by the Chinese government or by quasi government agencies, such as the policy banks. The present foreign holdings of RMB are invested in these securities and can be liquidated and exchanged into other currencies any time.

The current largest available pool of off-shore RMB bonds are issued and traded in Hong Kong. At the end of 2014 they amounted close to RMB400, or USD 61bn, thus not enough to accommodate even 3% of world's foreign exchange reserves.

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<sup>7</sup> Under the IMF definition a currency is eligible for inclusion in the SDR basket if it is issued by a major exporting country and if its currency is freely usable.

<sup>8</sup> BIS Securities statistics: [www.bis.org/statistics](http://www.bis.org/statistics)

<sup>9</sup> Strictly speaking these do not count as foreign exchange reserves under the IMF definition.

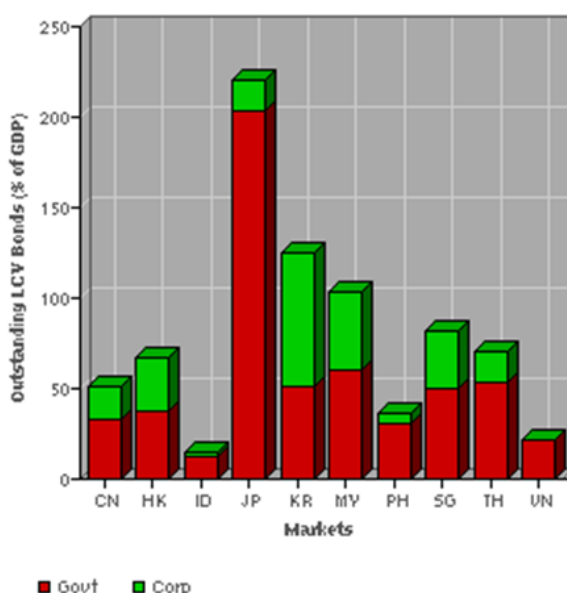
Graph 1: Offshore RMB bonds outstanding in Hong Kong (end 2014)



Source: HKMA<sup>10</sup>

Although the size of China's domestic bond market denominated in RMB is still small in terms of GDP, however, in absolute terms it is already the 5<sup>th</sup> largest one after the USD, EUR, JPY and GBP denominated domestic bonds<sup>11</sup>.

Graph 2: Size (in % of GDP) and composition of LCY bonds in Asia (end 2014)



Source: [www.asianbondsonline.org](http://www.asianbondsonline.org)

The total outstanding domestic RMB debt securities at the end of 2014 were RMB 28 tr or USD 4.5tr (see table 2 below). Chinese Government Bonds make up 30% of

<sup>10</sup> HKMA (2015): The Premier Offshore RMB Business Centre, April [www.hkma.gov.hk](http://www.hkma.gov.hk)

<sup>11</sup> BIS Securities statistics: [www.bis.org/statistics](http://www.bis.org/statistics)

this total. Municipal bonds are expected to increase as a result of the loan to debt swap proposed by the Chinese government. On the contrary, PBOC bills have declined as less intervention in the foreign exchange market has lowered the need for sterilization bonds<sup>12</sup>. Overall, the domestic RMB bond market will be sufficiently large in absolute terms to accommodate more investment by foreign central banks.

Table 4. Chinese domestic bond market, by issuer (RMB bn, year-end)  
RMB bn, Year-end

	2010	Percent of Total	2014	Percent of Total	2014-20 CAGR Percent	2020 <sup>e</sup>
<b>Treasury (CGB)</b>	5,963	29.6	8,553	29.8	10	15,152
<b>PBOC bills</b>	4,091	20.3	428	1.5	n.a.	0
<b>Municipals</b>	400	2.0	1,162	4.0	35	7,034
<b>Financials</b>	5,827	28.9	11,256	39.2	11	21,420
- Policy Banks	5,160	25.6	9,957	34.7	12	19,653
- CDB Bonds	3,680	18.2	6,266	21.8	12	12,368
<b>Gov-supported</b>	109	0.5	1,103	3.8	10	1,954
<b>Non-financials</b>	2,810	13.9	5,005	17.4	8	7,942
<b>Asset-backed</b>	18	0.0	269	0.9	35	1,628
<b>Others</b>	975	4.8	954	3.3	9	1,600
<b>Total</b>	<b>20,175</b>	<b>100</b>	<b>28,730</b>	<b>100</b>	<b>12</b>	<b>56,731</b>

*Notes: "n.a." stands for not applicable. Saving Bonds (electronic) issued by Ministry of Finance are not included as CGBs here, but in the category of Others, as Saving Bonds are different from the Book-entry Treasury Bonds in that they are much smaller in scale, not liquid, and only for retail investors. CDB= China Development Bank.*

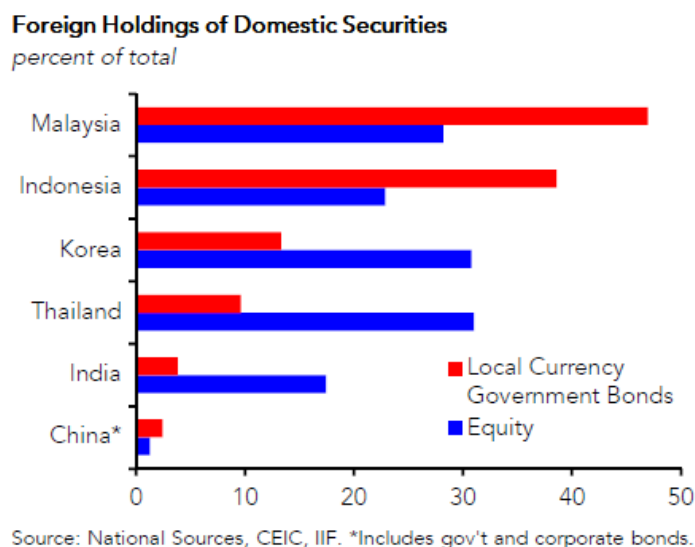
Source: Guonan Ma and Wang Yao, FGI Working Paper 2015<sup>13</sup>

The share of foreign holdings of CBG is very small at present, some 1.5% of total. This compares with 40% of US Treasuries held by foreigners. Other foreign holding as share of total government bonds are contained in graph 3.

<sup>12</sup> The sterilization bonds in emerging markets have been a major element of issuance of local currency bonds. Miyijima, Ken, Mohanty M S and Chan Tracy (2012): Emerging market local currency bonds: diversification and stability. In: BIS Working Papers Nr 391, November [www.bis.org/publications](http://www.bis.org/publications)

<sup>13</sup> Ma Guonan and Wang Yao (2015): Can the Chinese bond market facilitate a globalizing RMB? In: Fung Global Institute Working Paper 2015. [www.fgi.org](http://www.fgi.org)

Graph 3: Foreign holdings of domestic securities



Source: IIF Capital Flows May 2015<sup>14</sup>

The main problems with the Chinese bond market at present are the fragmentation of regulations and trading platforms. For instance, the yield curve up to one year is under PBOC supervision, whereas the longer maturities are under MoF supervision. This fragmentation results in market segmentation which hampers market liquidity. As the indicators in table 4 and graph 4 show, liquidity measures such as the turnover ratio of major government bond markets is very low in China, compared with the most liquid government bonds, the US Treasuries, Japanese JGB and UK gilts.

<sup>14</sup> Institute for International Finance (2015): Capital flows to emerging markets, 28 May, [www.iif.org](http://www.iif.org)



Table 5. Turnover ratio of major government bond markets (annual turnover over average outstanding)

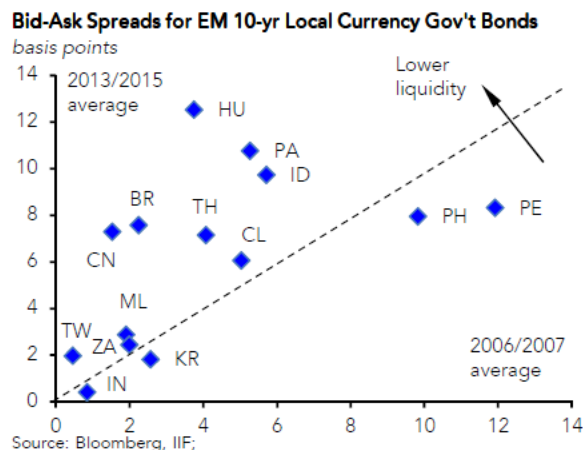
Annual Turnover over Average Outstanding								
	UST	Gilt	JGB	CGB	CGB incl. Futures	China's Policy Banks	CDB Bond	PBOC Bills
2004	29.7	9.1	5.4	0.2	0.2	0.9	0.9	1.5
2005	30.2	9.1	5.1	0.4	0.4	1.0	1.0	1.8
2006	26.7	8.5	6.6	0.5	0.5	1.3	1.2	1.7
2007	28.5	8.1	8.8	0.6	0.6	1.2	1.0	2.7
2008	24.4	7.6	8.2	0.8	0.8	2.3	1.6	5.9
2009	14.6	6.0	6.1	0.8	0.8	4.4	3.0	3.2
2010	15.3	5.3	5.1	1.4	1.4	4.6	3.9	4.3
2011	14.3	6.5	5.1	1.4	1.4	3.4	2.9	4.0
2012	11.8	5.2	5.5	1.4	1.4	3.2	2.6	4.8
2013	11.4	n.a.	5.4	0.7	0.8	1.6	1.5	1.1
2014	10.0	n.a.	5.9	0.7	0.8	1.7	1.9	0.3

Notes: "n.a." stands for not applicable. JGB = Japanese government bonds; Gilt = UK government bonds; UST = U.S. treasury bonds; CGB = Chinese government bonds, CDB = China Development Bank.

Source: Guonan Ma and Wang Yao, FGI Working Paper 2015

Measured by bid-ask spreads in the local currency government bond markets, the liquidity situation in the CGB market has deteriorated between 2007 and 2013. It seems that government securities are held to maturity with little secondary market trading.

Graph 4: Bid-ask spreads for various government bond markets: changes between 2006/2007 and 2013/2015



Source: IIF Capital flows, May 2015

## **5. Conclusion**

Once the RMB will have been accepted as component of the SDR, many foreign central banks, notably those with significant trade links with China will search for investment vehicles in RMB. The CGB market needs to be further deepened and liquidity enhanced for reserve managers in foreign central banks to feel comfortable in investing in RMB vehicles. Once this will be achieved, pegging to the RMB will become a technicality. This can be done unilaterally, even without a major reform of the international financial system. This would be a major step forward in the process of internationalization of RMB.

## **PBoC Should Practice Simple Central Banking to Help Renminbi Internationalization\***

By YUKSEL GORMEZ\* and BEN SHENGLIN<sup>Δ</sup>

*There has been recent hype on the rise of the Chinese yuan or Renminbi, since the Chinese membership of the World Trade Organization. After the crises that have been dominating the global financial architecture since 2008, whenever there is a funding shortage anywhere around the world, Chinese cash injection or financial aid seems like an alternative. From Greece to Iceland to Argentina, many countries expect further investment from China. A similar trend surrounds so-called Belt countries around ancient and modern silk roads from maritime to desert lines. This paper argues that there are three reasons for this unique phenomenon. First, China is an emerging country that managed to develop without an external program assisted by the IMF or the like. This is not a debt, but reserve accumulating growth. Second, China managed this growth without any energy or resource bottleneck. Just the opposite, there is now a massive capacity surplus. Third, China is in a very unique position to export capital even it is still an emerging country. This comes from the advantage of huge reserve accumulation in addition to massive direct or indirect RMB liquidity creation opportunities in the form of credits to capital exporting Chinese companies. In this paper, we argue that such a potential may only be realized through simplification of central banking by respecting what backs a fiat currency and how simple it may be possible to manage Renminbi liquidity transmission without either creating domestic inflation or leading to global liquidity bottlenecks.*

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## **1. Introduction**

Opposite to strong misperceptions, central banking is much younger than many assumes, especially compared to the emergence of money, banking or finance. Just over three hundred years since the first central bank emerged in Scandinavia, central banking is primarily a twentieth century phenomenon as more than eighty percent of all central banks known today were established in the last hundred years.

Again contrary to many misassumptions, central banking as a profession only became popular after the collapse of the Bretton-Woods agreement in 1972 when the USD gold-peg arrangement was first de facto and then de jure eliminated, and ever since central banks' ability to fight inflation has become more critical because we entered the era of fiat monies without gold backing, as opposite to the period of Bretton Woods system. In this connection 1980s might be considered as the beginning of an era whereas the focus on the ability and capacity of central banking has increased.

Current literature on central banking may be blamed as not paying enough attention to the recent fiat-money-based global financial architecture. None of the major currencies of the world from American dollar (USD) or Euro to British Pound Sterlings (GBP), Japanese Yen (JPY) and Chinese Renminbi (RMB) is backed with gold or silver. We are all enjoying the benefits of `just printing money with purchasing power` without any boundaries and without any structural risks including inflation because of an excessive supply capacity that we have never witnessed since the industrial revolution.

This is absolutely new to many economic historians. In order to understand their decay, we do not need to go back to the famous German hyperinflation where cigarette was serving Germans better than so-called paper money of that period of 1930s. The lessons of destructive price increases, which led to the collapse of financial system and simple transmission mechanism, might be observed live even in our recent times. There are some countries in Africa with more than five currencies trying to serve as money, with at least one of them coming in banknotes of quadrillions. In Latin America, some countries have already stopped trying to have a stable national currency and instead have simply dollarized their whole financial system. In Asia, we have observed similar "dollarization" as USD and other hard currencies are used alongside national currencies. All of these examples remind us once again that the real cost of having un-reliable money is much higher than many have assumed. Unsustainable central banking, with too much printed money, would destroy welfare enhancement in one way or another. Excessive central banking would lead to the collapse of simple transmission with extremely high cost

to the national and international economic activities.

Against this backdrop, central banks seem to have been fighting hard to earn their credibility. Markets can misperceive and exaggerate the capacity and powers of central banking. This may be due to why central banking began in the first place: the need for a liquidity pool to manage so-called systemic collapse of financial transmission and the need to manage the risk of “too big to fail” that arises from, again, the systemic nature of money and finance, which is sometimes called herd instinct. This is what we call liquidity management under modern central banking principles with fiat money. In contrast, under the gold or silver or parallel or double commodity standard capacity comes with the so called ‘Lombard Consensus’ where you first have the gold or silver in the vault and second you make the gold and silver ‘visible’ to manage herd behavior so that the risk of bank run disappears.

There is almost a consensus on two successes of central banking. The first is so-called Volcker style central banking, where you increase interest rates to double digits if the economy is producing close to maximum capacity and consumers should delay their current consumption for the sake of future welfare. That strategy seemed to have worked perfectly, having cemented the global dominance of USD and prevented the collapse of world trade that might have led to a massive loss of welfare globally. The second success story may be called as Deutsche mark (DEM) miracle, which ended with the creation of Euro (EUR). Though the Euro may be looking fragile at the moment, in the long run Europe will have to be united, started with a single currency, followed by unification including single banking system, single pension system, single social security system, single food security system etc. The third, more controversial, success is the rise of JPY even though it didn’t reach its capacity as an international currency. So, why we single out JPY as the third example? This is because JPY experiences can serve lessons for fiat money. While we do not expect to see much discussions on this tomorrow, we believe that in the next decades many academics will start talking more about what happened in Japan in terms of central banking during Japan’s now famous ‘lost two decades’. As we will discuss in the later sections, *nationalization of yield curve* will most likely be discussed around Japanese handling of central banking issues. The fourth and last example may be RMB. Chinese central banking will be under heightened scrutiny progressively not because of the phenomenal growth over more than three decades. Scholars will find many good reasons to spend more time on this front because, barring a tragic mistake in the following one or two decades, RMB will be a truly global currency, and it will be considered more significant given it is a currency of an emerging country and there is no such precedent in the history of money, banking

and finance.

China can and should utilize this chance by simplifying central banking as opposed many other cases. As a phenomenon of the last century, sustainable fiat money central banking has been characterized with many so-called `black boxes`. It should be as simple as possible and it should be based on basic principles of money, banking and finance. The rest of this article will proceed as follows: Next section will answer the question of what backs RMB? Then, we will investigate the nature of financial stability& sustainability of Chinese economy under the principles of systemic contagion risks with any emergence of “too big to fail” issues. The following part will focus on the simplification of central banking in China including the liquidity management strategies under convertibility and ever deepening financial markets and products. Final section will conclude with internationalized currency management strategies.

## **2. What backs rmb: past, recent and future**

As we have already mentioned, there is no gold or silver backing for so called G20 currencies. All of them are fiat, which means they are extremely simple prints on `special` papers. Since the invention of paper money, we had been following this rule: Your money should not be easily forgeable and fake money should not be in the circulation to compete with the real one. It has always been a serious crime to print unofficial money. Without gold and silver backing, money is just a form of paper, special paper.

This is clear and understandable but we have one question in mind: What backs fiat money, if not gold or silver? Against all black boxes that have been imposed on the design of monetary policy, actually there is an answer to this question and it is not extremely complicated: Backing of a fiat money is anything that is backing the sustainability of a social harmony and well-being. As we learned from Adam Smith, the source of social sustainability is not that complicated: division of labor and the formation of prices will be left to the invisible hand. David Ricardo made a simple addition to that: Specialize on your comparative advantage and trade. Even after so many centuries, these two approaches provide all the answers for the backing of a fiat money as well. Let`s make the point simpler: Under fiat money, division of labor should be progressive based on research and development that leads to innovation. Innovation either leads to new goods or services or leads to more productive processes. Both provide more profit. But profit is not only enough for strong backing. Once profit leads to higher and more sustainable tax earnings for the central management who has also got the central banking power, then management

of money becomes non inflationary and growth friendly. Why? Because central government is the biggest economic unit in any given economy of a single central banking zone. In general, under liberal economic principles, this central so called government does not have `economic activity` especially under the production side. It relies basically on tax earnings. But, taxes should be coming from profits so that future capital structure of real sector should not weaken. Profits should be taken without any harm done to the taxpayers' future health to make future innovations more attractive. We should remember the famous Magna Carta rules in this front as many believes that it was one of the main reasons for industrial revolution to emerge in the United Kingdom.

From this perspective, gold or silver is not needed to back a currency. It is generally possible to design a currency without much reliance on `once and for all` capital accumulation such as land sales in China or commodity currencies such as countries with excessive sovereign wealth funds coming from one or more commodity trade. Sustainable economic activity based on innovation to generate sustainable profits to be taxed comfortably to finance central services such as security, health and education may be enough to design and manage a currency that will go international gradually as strong backing creates international demand as well.

Before getting too far, we should flash forward and remember that when China opened up around the end of 1970s, at least one decision maker was aware of the real backing of China and Chinese currency at that time: Massive size of labor source. Hundreds of millions has been mobilized to fight against hunger and poverty of the times. Foreign direct investment did not miss the opportunity and billions started to get in to create jobs for millions. Simple realization of this mega-sized labor power leads to the creation of a miraculous growth performance without any hyperinflation. By the way, it may be worth mentioning one simple fact here. China has created labor mobility beyond basic imagination. There is no country that has designed such labor flexibility as hundreds of millions went on the run to find better jobs all around the country. Even as of today, the so-called migrant workers represent a high percentage of labor in China supporting production assemblies all around the country. This is the most mobile labor force that has ever been created or designed since the industrial revolution under a single economic zone. On the road to such an ultra super mega labor mobility, China exhibited many unique decisions such as extensive public servant firings and profitable management of public sector enterprises including many restructurings. Many other emerging countries failed to create a central government that can manage to stay away from populist policies that

has been proved destructive in the long run even if it looks like sustainable in the short run.

If excessive labor force was the backing power of RMB in the early stages, what is the backing now? The answer for these questions is anything that helps to strengthen the stance of the economy. We may recall some of them as still lacking populism, excessive reserve accumulation of hard currencies, extremely strong potential growth rate of no lower than five percent to attract massive investment interest from abroad, unprecedented size of scale of all markets from foods to machinery to health products and incomplete urbanization with potential productivity gains. In short, anything that comes from innovation either in the form of new goods and services or from additional value added to processes is the backing of RMB at this stage as it helps sustainable fiscal position of China that may either be used to increase potential growth rate for the future or just be saved as ammunition against the challenges of the future. Both strategies helped keep China strong and make RMB a strong currency even if it is a currency of an emerging economy with fiat standards.

The hard part of this analysis will be to put the argument for the future backing of the RMB. It may look complicated in the first instant but actually the framework we have been utilizing here makes it much simpler: Anything that generates sustainable tax payments to the sustainable provision of central goods and services will be the backing of RMB in the future. For example, so-called ‘four comprehensives’ will support the creation of a credible road map for national and global investors. It is similar to European Union Convergence Rules. Once a country dedicates to the convergence, the risk premium of the country will decrease automatically if convergence rules are still credible. Same will work for China: Once a credible roadmap is shared with the markets, name it as principles or central planning strategies, risk premium will diminish immediately through expectation channels.

More than that, there is another strong backing for RMB in the future: It is the mega size of markets of anything and everything that comes with a massive size of scale and extremely big logistic activities to produce, to distribute and to consume. Once China optimizes economic activity in the country, export of the goods, capital and services become a source of RMB backing as well. We can recently observe this capacity with the creation of One Belt One Road initiatives in addition to Asian Infrastructure Investment Banks. These are the leading examples but surely more to follow. It is our expectation that in the future, China will be looking for opportunities to securitize infrastructural investment and will be ready to create boutique investment banks for all projects either one by one or within a basket. No



other emerging country has ever had such an opportunity before. We may stamp this as engineering capacity of Chinese economy with the help of economies of scale. We should remember that China is a single currency economy with a single market. Anything and everything is produced, distributed and consumed and in the near future China will be the biggest market for all the known goods and services from energy to education from bread and butter to cosmetics, from standard to luxury goods and services. As times passes by, China will be imposing global standards including monetary rules. At this stage we may argue that the strength of the backing of RMB will peak. How long does it take to climb there? It depends on the road accidents that we call structural reforms. Stronger and more and more rational reforms coming with optimal restructuring and recapitalization will shorten the way whereas mistakes that may generate lower growth with more price level fluctuations will lengthen the way. Only time will tell us whether best backing will ever go to the RMB but it is definitely one of the candidate currencies among G20 for such success.

### **3. Systemic risk in China: contagion and too big to fail**

Money in the form of coins have been invented by Lydian's in so-called Minor Asia which is actually Turkey now and money in the form of paper was invented in China. Symbolically, old cultures of both regions may be assumed as masters of money management. But, cycles come and go. Recently, neither region has got the best expertise on money issues. Encouragingly we see the light in the end of the tunnel. First of all, China never gave up money in economic activity compared to Russian experiment with extreme central planning with no role for money and tokens or assignment letters or coupons playing the role of delivery settlement. Also, after the opening up, money-based economic activity became the dominant form of governance for China. During the 1980s, mono bank based banking model was left in favor of dual financial structure based on fractional reserves. This simply means central bank issues money and manages it under the auspices of commercial and investment banks that collect deposits and chooses optimal credit allocation.

Surely, marketization and financial deepening is not complete in China yet. And, there is a problem of too big to fail. Why? With a simple reason: Chinese banking system has not experienced consolidation. It did not develop from small institutions swallowing each other to create gigantic financial service providers. Chinese banks have been too big to fail from the start. They have been designed as big and that was intentional. One may either see good or bad side of this structure. On the good side, there is a massive human resource capacity to manage these banks without chronic

failures to ask for more and more tax-payers money for recapitalization. Secondly, yes the management knows from the beginning that too big to fail banks can't be allowed to go bust because of the systemic nature of their activity. The rest is the optimal management of the so-called moral hazard issues and progress has been made on this front step by step, especially with the fight against corruption. Bad side of the story is crystal clear to many: Fiscal backing is desperately important for the financial stability during the systemic volatility so it is important to fill the tanks during the rainy days. It has been done up until now as Chinese economy managed any risk of bank runs. Unlike other emerging countries, there has been no extensive cost of financial sector restructuring. In some cases this cost went beyond ten percent of GDP during Latin American crises.

Can this be the guarantee for the future stability of Chinese financial system? Maybe not. From the start, Chinese banks have been too big to fail and until the end, they must be managed, supervised and structured accordingly. A fiscal gap should be in the calculations for the future bottlenecks endangering financial stability. This may best be guaranteed as these banks are placed under continuous stress tests regularly and periodically. There has been enormous development on this front not only in China but among global financial institutions as well. China should learn from others' mistake and permanently keep studying the cost of financial crises and develop skills to both prevent the crises including risk management and crises resolution techniques. This will only lower the cost of systemic contagion in China be it national or international contagion. Under capital controls, recent times might be easy going in this front but after convertibility, the financial environment with futures and options markets will complicate things to unprecedented levels. Preparations can only help to minimize the cost to be transferred to the future generations.

#### **4. Designing monetary policy operational framework: yield curve and beyond**

As we discussed in the backing of a currency section, we have already mentioned that Chinese economy has been going over an unprecedented phase that has been supporting an ideal macroeconomic environment to design, develop and operate or manage a strong and reliable global currency with strong backing. This might be a clear breakthrough in the global financial infrastructure that has been dominating the worldwide landscape since the collapse of Bretton-Woods agreement. However, there is a prerequisite: An effective and efficient central banking framework that has got enough instrument independence supported by a rational goal that comes from

executive and legislative powers. Central banking that is independent of politicians are much searched in the west but after the current experience both in Europe and the US, one may easily agree that without the decisions of Congresses in both sides of the Atlantic or without the direct involvement of politicians in many critical monetary decisions around Atlantic, it might have been almost impossible to take many decisions that has been placed to prevent financial collapses in the last seven years.

China is lucky in this perspective because the People's Bank of China is actually part of the Cabinet and has got permanent touch with all Cabinet members. When we go over the close cooperation between the Treasury Secretary and Fed Governor during the 2008 global financial crises management, we may argue that direct membership in the Cabinet may not be rejected as strongly as before. China can benefit from this institutional structure in the future when the tough times come in order to make fast decisions on the sake of the management of the RMB liquidity in the national and global markets.

In a two-tier fractional reserve structure model, central banking has got two critical assignments. The first one is the proper functioning of payment and settlement systems. China has been progressing very rapidly in this front. China National Advanced Payment System has already been developed and just recently China International Payment System has been launched also to support RMB internationalization. Before banking cards has been matured, internet based retail payment systems infrastructures are developing extremely fast. On one hand, national real time gross settlement infrastructure have been developing rapidly with ever easing custody mechanisms and on the second hand, internet companies such as Alipay and Tencent have been developing amazingly cheap and nationwide retail payment systems and modules. Surely, single currency structure of Chinese economy has been helping these initiatives massively by allowing those companies to benefit a lot from massive size of Chinese market. Return on investment in those areas seems quite high even when compared to global standards.

Second critical assignment is the management of liquidity. This part is a little bit more complicated than the first part because it covers all the aspects of central banking as an art. First of all, operational liquidity management needs deep markets. When there are no deep markets in the spot and future markets, surely there is a mission for the central bank to come out and design and develop those markets. At the end of the day, Chinese opening up was a state policy in China and so can be the development of markets by all aspects. We may call this as *do-it-yourself marketization*. Only PBoC can fulfill this gap because only PBoC has got the power

and instruments to function as the lender of last resort to either provide liquidity to the markets or to drain liquidity from the market as the lender of last depositor. It is a two way or double sided market mechanism anyway. Without such a framework, second tier banks will face sudden or unexpected liquidity attacks that can create systemic danger as many Chinese banks are systemically important.

There is one more, small secret of any strong national or international currency. Every efficient and effective currency has got a yield curve for the so-called risk free assets first and then all the securities should have their own yield structure. Yield curve has got a critical role in a well-managed market economy. It creates liquidity for the exchange of purchasing power from one time to another or from one duration to another. It is the ultimate indicator of sustainable economic structure. An economy with a yield curve of only one year maturity is the best sign of macro issues such as dollarization and so called original sin issue. China has got none of them at the moment. However, there might be a risk that monetary policy incompetence or mismanagement may surely bring those destructive issues to China as well. We should remember that especially original sin is a very common problem for many Latin American and Asian or African countries.

Against this backdrop, one may easily argue that there are so much to do with designing, developing and operating a Chinese Government Bond market that will provide an efficient yield curve to help find out the optimal interest rates from one year to thirty or fifty years. In order to support the development of an efficient yield curve, PBoC can and should help the government by all means including designing benchmarking for certain maturities for one, five, ten and thirty years. PBoC liquidity facilities should be assigned to the financial institutions to act as primary dealers. They should be willing to help provide certain benchmark CGBs either to create liquidity or to quote buy and sell rates permanently in order to boost market liquidity. Once benchmarking and market makers mechanism coincides side by side, liquidity will be plenty and all the investors from individual to corporate side and from national to international will be able to buy and sell instantly whenever they need to convert one duration with another. Yield curve will be the most critical price formation for any given economy and China needs to develop one sooner rather than later by using public or central bank resources when deemed necessary.

There is one more advantage for the PBoC: the yield curves of the risk free assets in the major global currencies, be it JPY or USD or EUR are all under government interference recently. Ben Bernanke argued that quantitative easing cycles was necessary to manage the 2008 global financial crises and approved intervention to

yields through central bank balance sheet expansion. On the other hand, John Taylor criticizes this as the biggest intervention to the invisible hand basics of liberal economic structure in the modern US financial history. He may not be wrong to argue that once yield curve derives prices that are imposed by government intervention, then all the relative prices will be suboptimal accordingly. His criticism is much clearer in Japan where there is a unique phenomenon that we call it as the *nationalization of the yield curve*. This is the moment where majority of the risk free assets on the yield curve has been bought by the central banks. As a result, interest rates that has been derived from that yield curve is not a price that is determined by free market forces but it is a price that the government believes fits best to the best interest of the economic units, be it government, corporates or individuals. Consequently, government involvement of communal monetary policy practices is acceptable from all folks of global life now. PBoC may turn this trend into his advantage and relaxingly intervene to shape an 'optimal' structure for CGBs yield curve. In order to do that; instruments such as blind brokerage in the money markets to eliminate liquidity asymmetries may be utilized easily. More than that; a corridor mechanism is already under construction with the elimination of interest rate floors and ceilings and by the creation of repos, reverse repos and other similar liquidity facilities. PBoC has been constantly enriching its operational tool kit and progressing with new instruments as to diversify ammunition to optimize operational framework. There is no ending to this in the near future because of the lack of full liberalization of the financial markets and because of the lack of convertibility. PBoC needs to keep working hard to get prepared to the market volatility and should be developing crises prevention and resolution skills. It is almost inevitable to avoid crises in the long run. PBoC will definitely face national and international challenges. Because of the banking structure in China with gigantic banks, surely the central bank has to work much harder than other central banks. More than that, international competition should be increased. It is common knowledge that when forex market intervention comes jointly by G7 central banks, it is more efficient than individual interventions. PBoC already signed so many swap agreements with other central banks. More swap lines should be built up and more creative alternative or complimentary tool should be constantly investigated.

Creative central banking has been crossing over many boundaries that we assumed as China Wall before. Just to provide one example, it was deemed inappropriate for central banks to operate with maturities longer than three months or maximum one year short term money markets. As Bernanke defends for the legitimacy of quantitative easing and managing to reverse those operations, central

banks may even buy thirty year government bonds now. It is surely beyond conventional wisdom. More than that reaching capital markets is taken as legitimate recently even if it is through exchange traded funds. Consequently, PBoC may *manage the change* much comfortably now compared to a decade ago. Most of the interventionist policies turned out to be common practices for all the central banks and it is quite difficult to put any blame on any central bank to prefer illegitimate practices. So, the sky is the limit for the PBoC to develop tools and instruments that will help bring the welfare state position for China in the following decades. RMB has a chance to be a true global currency with strong currency to support global demand. However, RMB needs a very high caliber of central banking competence to manage good and “not so good” days and months with effective and efficient central banking skills supported by global coordination tools. Stakes are high and PBoC has no other option than to win this battle if serving the Nation is the first priority. The Bank will be judged in the following decades whether they deliver the optimal outcome or they make mistakes that brought second best equilibrium for the Chinese Economy. PBoC’s future credibility will be shaping around this judgment.

### **5. Managing international RMB: understanding money supply and demand**

Without a credible central bank, RMB internationalization will face serious bottlenecks all around in the future. If the PBoC can *manage the change* optimally, RMB will be a credible international currency sooner than expected. But if we see many road accidents in terms of uncontrollable volatility in Chinese money and capital markets, then internationalization will be a costly adventure. We will not touch upon the potential failure of the PBoC when the management of RMB becomes second best beyond optimal equilibrium. Such an analysis has got many examples in Latin America or in emerging countries that has experienced high and volatile inflation with extreme foreign exchange rate volatility. Dropping zeros and renaming the national currency are among some of the terrible examples of inefficient central banking.

We will investigate a positive attitude in this part to brainstorm on how RMB internationalization may proceed with optimal central banking by the PBoC. First of all, because of the strong hard currency reserve level of almost forty percent of the GNP, any risk of forex rate volatility is not imminent in China. Against all odds, foreign exchange rate pass-through is not and probably will not be in the radar of PBoC watchers, China macro strategists, academicians and practitioners such as supervisors and regulators. This is such a good sign to celebrate indeed. No energy needs to be vested to estimate implications of multiple currency structure under free

markets with full convertibility. All the energy may be assigned to design a national currency without any systemic foreign exchange rate risk. This has also got a macroeconomic insight: China can finance its own economic restructuring independently without any need from international financial institutions such as IMF. There have been some emerging countries around the world that has never come out of addictive stand-by agreements for a couple of decades. As Chinese growth has been funded by reserve accumulating strategies instead of debt accumulating tactics, now it is time to enjoy independence from external resources on the conduct of monetary management. By the way, this is a great contribution to the global financial stability as well. As China's economy is second biggest now, it might be extremely difficult for the IMF or other international financial institutions to come up with a "stability program" for China in case there comes a sovereign debt issue in Chinese markets. From this perspective, we may argue that China will be alone to design crises management and resolution infrastructure other than a certain level of international cooperation among G20. The societal responsibility of the PBoC from this window looks extremely unprecedented as well.

As the potential growth rate of China is still comparatively much higher than G20 averages, foreign direct investment is still not near to the peak at all. As the factory of the World, China has been proving as massive opportunities to all global companies to capture some slices from the profit capacities. Consequently, China is the biggest exporter of the world, biggest trader of the world and close to be the biggest importer of the world. Surely, it is not surprising that RMB pricing of export and import is explosive in the last four years crossing over almost to a quarter of all trade. RMB is surely becoming de facto international from this perspective and this is helping to reduce forex rate risk for the economy and help further the PBoC to stay independent from any run on RMB from external fragilities.

More than that, RMB sovereign credits are becoming more visible to help ease global financial turbulences. It is not a surprise to see Beijing receiving many visitors from economies facing sovereign issues as a potential funding source. It was only Washington as either for the IMF or for the Fed in cases such as Brady Bonds to ask for help to receive funding to manage stability programs. Surely, Brussel and Frankfurt played a critical role during Eurozone restructuring and Tokyo has been a traditional source of funding for many decades now. But, they are all developed economies. As a developing economy, China has managed to become a source of funding against all odds. We should underline that Chinese help came from the hard currency reserves until now. It is our argument that once RMB becomes a source of funding for sovereign help, then the potential will surely be explosive.

The same potential holds for direct RMB credits for infrastructure investment. This mechanism is actually quite simple. China has got a massive capacity surplus in basic infrastructural investment goods and services and ready to export that capacity. Contemporaneously, the world has got a massive demand for this sort of investment. Asian Development Bank gives the figure more than USD 8 trillion in a decade. Consequently, this is an ideal combination of supply and demand. Just one reminder to keep expectations under control in this front: Unfortunately, we are not living in an ideal world and some of the infrastructural demand fails to come out with a feasible investment plan. There is need to be selective and cautions are advised not to be over excited to jump on government to government credits to cross over the market mechanisms. As we argued in the beginning, invisible hand is historically a well-proven welfare enhancer and markets can evaluate the feasibility of a project much more efficiently than the governments. I am sure corporate China will work hard to help China to do business in private hands around the world. Corporate China can do business in infrastructure development but also to contribute to global health and social security solutions. Surely, they may help individual countries to design development project not only limited to textile industry but to space technologies as well.

However, the role of government in this area is much more than nil or zero: Chinese style “Marshall aid” should be the peak on this progress. China needs that sort of initiatives to be a truly global soft power. RMB help, aid and payless credits to disadvantaged parts of the world will be a sovereign social responsibility for China as soon as now or no later than the country becomes a middle-income country.

## **6. Conclusions and recommendations**

China has been going through an unprecedented economic growth story since 1978. Half a billion citizens have been brought out of hunger first and poverty after. This is a unique story in terms of global comparisons because we never witnessed such a societal welfare creation in such a short period of time providing masses with so many new goods to consume and services to enjoy including the biggest rapid train services that has ever been created in the human history in around ten years.

This economic miracle has been good for Chinese people in particular but it has been good news for the whole world in general. After all, China has got the biggest populationsize. This will bring massive economies of scale for all goods and services, empowering productivity. Against the experience of other emerging economies, China never had any systemic energy bottleneck to distort production, distribution and consumption. China has already benefited most from the



globalization trends but after the World Trade Organization membership, it became an ultimate part of global supply chains by cementing China's role in global logistics. This made sure Chinese globalization irreversible. Surely, China now has got an overcapacity that might be channeled to global welfare enhancement.

Now, it is time to bring this welfare capacity to further boundaries: If PBoC can take the challenge, there is an opportunity to insert and inject much needed resources not inside China but also to anywhere with a need for funding either for economic restructuring, or stability programs or to jump start growth through infrastructural investment. In order to fulfill this societal responsibility, PBoC should design, develop and operate an effective and efficient monetary policy to manage RMB as an international currency. The best way of doing this should be keeping central banking in the simplest form especially during the early stages. Complicated or complex strategies or tactics will put much burden on PBoC watchers to understand what really is going on. Such a risk will shape expectations in the second best equilibrium level beyond optimal balance. Can the PBoC take this challenge? Only time can tell but we take a side on the positive attitude.

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- **Characteristics of the RMB Internationalization and Its Prospects for the SDR**

*By E ZHIHUAN*

The RMB is not yet fully convertible and China still imposes capital controls, but the internationalization of the RMB has made tremendous progress in the past 10 years. The RMB has taken the lead globally in terms of its function in payment, foreign exchange transaction, settlement and reserve holding. This year, the Yuan is on the verge of being included in the SDR basket. The success of the RMB internationalization is an exceptional case and is worth further examining.

**1. The RMB Internationalization is dually driven by policy and markets**

Based on its development pattern in the past decade, the RMB internationalization has been driven by policy in the early stage and by markets in the later. Since the People's Bank of China (PBOC) promoted offshore RMB business in 2003, every milestone of offshore RMB market development was closely related to the loosening regulatory controls in the Mainland. For example, in January 2007, the PBOC approved of RMB bond issuance in Hong Kong by eligible Mainland financial institutions. The Central Government has been issuing RMB bonds in Hong Kong since 2009, which further developed the offshore dim sum bond market. From July 2009 to August 2011, RMB cross-border trade settlement has expanded from pilots to all provinces and cities in Mainland. Hong Kong's RMB businesses have grown from individual services to corporate ones with enterprises and institutions. The market size increased and the RMB internationalization sped up. From 2011 to March 2013, the Central Government launched the RMB qualified foreign institutional investors (RQFII) program, which extended to all the financial institutions that register or mainly operate in Hong Kong. The design concept and mechanism of Hong Kong's offshore RMB market evolved from one-way cash repatriation back to the Mainland to the two-way flows. The offshore market thus became the founder and hub for developing RMB products and spreading the use of the RMB elsewhere in the world. Recently, the Shanghai Free Trade Zone, Shanghai-Hong Kong Stock Connect and even the "One Belt, One Road" strategy are adding new growth impetus to the RMB internationalization.

Apart from policy factors, market demands are the key to the development of offshore RMB businesses. China's real economy, especially trade and investment growth, provides a solid foundation for the RMB internationalization. In 2014, the size of China's economy has reached USD10.38 trillion, second only to the US. In the meantime, China is the largest exporter of goods and the fifth largest exporter of services worldwide. Additionally, in recent years, the foreign direct investment (FDI) China attracts is also second only to the US, and China's outbound direct investment (ODI) countries is right behind Japan and the US amongst G20. The dollar amount has been basically at par with that of FDI. With the support of China's real economy and financial activities, the RMB internationalization goes hand in hand with market demands. In other words, there is tremendous room for the RMB internationalization to grow before it is compatible with China's economic clout.

In the past several years, the market force has been playing a bigger role as demands for RMB products and trading surged, in particular in the financial industry. As the world's largest offshore RMB hub, Hong Kong's first mover advantage is reflected in the depth and breadth of the market. The increasingly active trading activities and an extensive selection of RMB products give birth to a virtuous cycle of demand and supply, meeting market demands and expanding the Hong Kong market itself. The RMB cross-border trade settlement processed by Hong Kong banks grew from RMB369.2 billion in 2010 to RMB6.2583 trillion in 2014, an increase of more than 15 times and accounted for the vast majority of the Mainland's RMB trade settlement. At the end of 2014, Hong Kong's RMB liquidity pool totaled RMB1.1583 trillion (including RMB154.7 billion of certificates of deposit), which accounted for 43% of global offshore RMB deposits. Outstanding Dim Sum bonds in Hong Kong soared from RMB55.8 billion at the end of 2010 to RMB380.5 billion at the end of 2014, a 5.8 times jump and allowed Hong Kong to stand out as the leading offshore RMB bond market.

As cross-border financial integration between pilot free trade zones and offshore markets gradually deepens, more financing needs and opportunities for cooperation have emerged. Since the Shanghai Free Trade Zone (FTZ) came up with innovative financial business solutions, there have been considerable demands for cross-border RMB services from Mainland pilot FTZs. The Qianhai-Shenzhen Hong Kong Modern Service Industry Cooperation Zone kicked off the first cross-border RMB loan program. After the Shanghai FTZ was officially launched, the PBOC started cross-border RMB pilot program in both the Suzhou Industrial Park and the Tianjin Eco-city. Guangdong, Fujian and Tianjin FTZ have also been set up. The pilot areas have strong links to offshore RMB business, generating large demands for cross

border financing, and serving as an important growth engine for investment and financing activities in Hong Kong's offshore market. It is believed that the success of Shanghai FTZ could be replicated and promoted to a greater extent, and reforms be further implemented, creating more financing needs and more room for cooperation.

The connection between capital markets in the Mainland and Hong Kong has been rapidly established. The Shanghai-Hong Kong Connect was the first trial to link the two stock markets. Regulators and market players are now discussing the option of extending the framework to products other than stocks, such as commodities, bonds, fund products, just to name a few major asset classes, and applying the current model to other markets and regions. Besides the Shanghai Stock Exchange, according to the Hong Kong Stock Exchange, it plans to cooperate with Shenzhen Stock Exchange, China Financial Futures Exchange Dalian Commodities Exchange, Shanghai Futures Exchange and the Zhengzhou Mercantile Exchange, etc., in the future. The rapid expansion of this model is conducive to the connection of capital markets in HK and the Mainland on a large scale and will expedite the RMB internationalization.

As the "One Belt, One Road" strategy moves forward, regional cooperation will yield more opportunities for offshore RMB financing. The "One Belt, One Road" is a crucial part of China's opening strategy. China will build a complex investment cooperative network with relevant/neighborhood countries through extensive trade links, promote the circulation and transactions of offshore RMB with international strategic alliances, just like what the US did with the Marshall Plan. These RMB-based cooperative projects will generate large demands for RMB trade settlement and financing. As the world's largest RMB settlement platform, Hong Kong will beat the core to meet settlement needs from the "One Belt, One Road" strategy. Hong Kong's financial institutions could finance infrastructure projects along "One Belt, One Road" through syndicated loans and debt securities. They could also undertake a number of RMB-based ODI projects and promote the circulation and cross-border transactions of the RMB in the offshore market.

## **2. Recent developments of the RMB internationalization**

### **2.1 The RMB internationalization has made headway on the global stage, with an emerging worldwide settlement framework comprised of multiple coexisting markets**

After the PBOC appointed RMB clearing banks in Singapore and Taiwan in 2013, RMB clearing banks in London, Paris, Frankfurt, Qatar, Toronto, Kuala Lumpur,

Bangkok, and Seoul were subsequently appointed in 2014. A 24-hour global offshore RMB market system thus emerged, covering countries and time zones in Asia, Europe, the Americas, and the Middle East. The global RMB settlement system has evolved from being reliant on Hong Kong as a hub to a network of multiple coexisting markets.

In Asia Pacific, a number of offshore RMB centers such as Taiwan and Singapore have grown to a certain scale that allows for differentiation in market structure and positioning. Taiwan now boasts the second largest offshore capital pool after Hong Kong, with RMB310.2 billion of deposits at the end of 2014. Singapore is another important market for offshore RMB businesses in Asia Pacific. As of September, 2014, RMB deposits in Singapore amounted to RMB257 billion, following only Hong Kong and Taiwan. Thanks to its enthusiasm in boosting offshore RMB businesses and its position as a hub of ASEAN, Singapore has made considerable progress in RMB settlement, RMB-denominated commodity transactions, and RMB asset management.

## **2.2 Trading activities outside of Hong Kong in bonds, foreign exchange, and RQFII have become increasingly active**

The offshore RMB bond market has rapidly expanded from Hong Kong to other jurisdictions. According to the HKMA, Dim Sum bond issuance (excluding CD's) in 2014 amounted to RMB190 billion, nearly double that in 2013. Although Hong Kong remains the biggest offshore RMB bond market worldwide, other markets have emerged. In 2014, there were 31 Formosa bond issuances totaling RMB20.8 billion in Taiwan. In Singapore, a total of six banks have issued Lion City bonds amounting to RMB11.5 billion. Meanwhile, London witnessed a number of groundbreaking RMB bond issuances. The U.K. government successfully issued RMB-denominated sovereign bonds and became the first foreign sovereign issuer of RMB bonds. Moreover, IFC of the World Bank has issued a total of RMB3.25 billion of Yuan bonds in London and became the largest RMB bond issuer on the London Stock Exchange. RMB bond issuance has also emerged in Frankfurt, Paris, and Luxemburg, while emerging markets such as Brazil and Dubai have begun to issue RMB bonds. Offshore RMB bond issuance outside of Hong Kong has reached a cumulative total of RMB150 billion.

As for foreign exchange transactions, according to Reuters, London has surpassed Hong Kong and accounts for 44% of global RMB transaction volume. Transactions of deliverable futures in London rose 127% to average USD42.4 billion per day. Besides Hong Kong Exchanges and Clearing, RMB futures contracts have been launched on the CME, Singapore Exchange, and Brazil's BM&FBOVESPA. As for

RQFII products, 10 jurisdictions outside of Hong Kong have been allotted a total of RMB 650 billion for investments. As of the end of February, 2015, institutions in markets such as Singapore, the U.K., France, and Korea had applied for an RQFII quota of RMB41.5 billion. Meanwhile, the NYSE and LSE have listed RQFII-ETF products, providing investors with an important avenue to invest in A shares and the Chinese bond market.

### **2.3 Currency swaps and policy banks have been the main drivers of RMB businesses in emerging markets**

Currency swaps have provided a number of jurisdictions with RMB funds for trade settlement purposes. For instance, the Bank of Korea activated the currency swap mechanism to facilitate trade settlement between Korean and Chinese enterprises. In 2014, the Central Bank of Argentina drew down its RMB swap quota to settle trade between Argentine and Chinese companies. Meanwhile, the Monetary Authority of Singapore used currency swaps to provide financial institutions with a comprehensive suite of RMB lending mechanisms, promoting RMB's role in trade and direct investments in Singapore.

In addition to official cooperation between governments, policy banks and cross-border investments also boosted offshore RMB businesses in emerging markets such as Latin America and South Africa. Since 2013, major Chinese policy banks have provided countries including Venezuela and Jamaica with RMB loans to facilitate investments in resources and infrastructure. Meanwhile, major South African insurers have concluded foreign direct investments in China with RMB funds. As bilateral trade between China and emerging markets grows steadily and currency cooperation between governments picks up pace, more and more emerging economies outside of Asia will become new offshore RMB markets.

In Hong Kong, the largest offshore RMB market worldwide that experienced rapid growth in the past 10 years, there have been a number of new developments.

Firstly, RMB clearing rose considerably and surpassed Hong Kong dollar clearing.

In 2014, RMB RTGS clearing reached RMB170.3 trillion for a year-over-year increase of 112.6% compared with RMB80.1 trillion in 2013. In the same period, Hong Kong dollar RTGS clearing amounted to HKD184.2 trillion \$, or RMB147.7 trillion. Since April 2014, monthly transaction volume of RMB RTGS has surpassed that of Hong Kong dollar and emerged as one of the most prominent currencies in Hong Kong's clearing market.

Secondly, the growth of cross-border RMB transactions under the capital account accelerated and has become a new driving force of Hong Kong's offshore RMB

market development.

Recently, growth of cross-border RMB businesses under the capital account has been noticeably faster than that of the merchandise trade account. In 2014, cross-border RMB trade settlement increased 41% to RMB6.55 trillion, with 18.6% of merchandise trade being settled in RMB. Meanwhile, cross-border direct investment (ODI and FDI combined) rose 97% to RMB1.05 trillion. Obviously, growth of RMB transactions under the capital account outpaced that under the merchandise trade account. In this regard, capital account businesses may become a new driving force of Hong Kong's offshore RMB market.

Furthermore, foreign exchange activities are becoming increasingly important in Hong Kong's offshore RMB market.

In 2013, RMB foreign exchange transactions amounted to USD17.2 trillion, while RMB payments totaled USD11.16 trillion. As the pace of China's capital account opening accelerates, market demand for currency derivative products will strengthen. Therefore, foreign exchange derivative transactions will play a prominent role in promoting offshore RMB products.

In addition, Hong Kong's offshore RMB funds, to some extent, have been allocated worldwide.

Hong Kong is currently the most important center of offshore RMB deposits. RMB deposits in Hong Kong totaled over RMB1 trillion in 2014. Including certificates of deposits, Hong Kong's RMB capital pool has exceeded RMB1.16 trillion, which was mainly used for loans and Dim Sum bonds. According to the HKMA, as of the end of 2014, outstanding RMB loans in Hong Kong amounted to RMB188 billion, while issuance and outstanding value of Dim Sum bonds came in at RMB196.8 billion and RMB380.5 billion, respectively. At RMB568.5 billion, RMB loans and outstanding Dim Sum bonds combined accounts for only 49% of Hong Kong's offshore RMB capital pool. For the time being, obviously, Hong Kong alone cannot fully absorb the stock of RMB funds, some of which are used by overseas financial institutions for interbank liquidity and swaps and thus contribute to the development of other offshore markets. Recently, RMB loans in other offshore markets soared and may have exceeded those in Hong Kong. Therefore, Hong Kong's RMB funds are being allocated globally.

### **3. SDR, the new building block for the RMB internationalization**

The International Monetary Fund (IMF) will unofficially begin its quintuple review of the SDR basket this May, with official result to be expected in October, and implementation at the beginning of 2016. Taking into account of the progress



made in China's financial reforms and the RMB's internationalization in the past several years, the market is generally optimistic about the RMB's chance to make it into the SDR basket this time around. If successful, the implications are significant. It is essentially an endorsement by the IMF of the RMB's international reserve currency status, putting it at par to the likes of the US dollar, Euro, Yen and British Pound. With this endorsement, global central banks are clear to hold RMB assets. Such an achievement is significant considering the RMB is not yet fully convertible, and China still imposes capital controls. It will corroborate the correct path China's reform and opening are on, and will push for further actions such as the RMB's convertibility and China's capital account opening. However, the RMB will have to qualify as a freely usable currency as defined by the IMF, and overcome the possible veto from the US Government/Congress.

### **3.1 The RMB meets the basic requirements**

To qualify for SDR inclusion, a currency has to meet two criteria, the first being that its exports of goods and services during the five-year period ending 12 months before the effective date of the revision have the largest value. China already met this criterion in 2010, as it was the world's third largest exporter of goods and services at that time. And according to SWIFT, the RMB has become the second most used currency in trade finance, and the fifth largest currency in payments, positioning right behind the four SDR currencies. The second criterion is that it has to be determined by the IMF under Article XXX (f) to be a freely usable (FU) currency. In 2010, the IMF concluded that the RMB had not met this requirement, and thus decided to maintain status quote.

It is worth noticing that the IMF, in its own report, clearly states that the concept of a freely usable currency concerns the actual international use and trading of currencies, and is distinct from whether a currency is either freely floating or fully convertible. In other words, the facts that the RMB is not yet fully convertible, China still imposes capital controls, and the related RMB exchange rate mechanism shall not be considered obstacles to the RMB's path into the SDR. To determine whether a currency is widely used for international payments or widely traded, the IMF refers to four quantitative indicators.

The first indicator is the Currency Composition of Official Foreign Exchange Reserves (COFER) compiled by the IMF itself. So far, COFER has not been able to single out the RMB in its statistics. Judging from the fact that when COFER began to report the Canadian dollar and Australian dollar individually in 2013, they accounted for about 1.5% each of the world's allocated forex reserves holdings, the RMB has yet to reach such a threshold. It was included in other currencies that

accounted for 3.1% of the total in 4Q14. The second indicator is the international banking liabilities compiled by the Bank of International Settlements (BIS). Again, the RMB is not yet identified individually. Since the data series refer to offshore deposits, based on China's own releases, offshore RMB deposits at the end of 2014 amounted to RMB2.8 trillion or USD440 billion, making it the fifth largest currency right behind the four SDR currencies. The third indicator is the international debt securities statistics also compiled by BIS. Now that BIS does not list RMB individually, cross comparison using the offshore RMB bond market's size of RMB480 billion at the end of 2014 results in a small share of 0.4% of the total. The fourth indicator being used is global forex markets turnovers captured by BIS' Triennial Central Bank Survey. It shows that the RMB is ranked the ninth with a market share of 2.2/200.

Overall, the RMB's strength lies in exports, trade finance and payment, and it is gaining significantly in terms of offshore deposits and forex trading. Its weakness is in central banks holdings and the RMB international bond market. Regarding central banks holdings, it is reciprocal with whether the RMB makes it into the SDR, which IMF should take into account. In mid 2013, IMF expanded the coverage of its COFER to list the Canadian dollar and Australian dollar individually, adding to the original five currencies of the US dollar, Euro, Yen, Pound Sterling and Swiss Franc. The statistics were traced back to 4Q12, when the Canadian dollar and Australian dollar accounted for 1.4% and 1.5% respectively of the world's allocated forex reserves holdings. Using 1.5% as a threshold, it amounted to about USD91.3 billion out of the USD6.09 trillion of the total allocated official forex reserves holdings at 4Q14. Using the prevailing exchange rate of 1 US dollar to 6.20 Yuan, it equals to RMB570 billion. There is good reason to believe that such a threshold could be quickly reached considering there are reportedly more than 40 central banks around the world who have already or planned to hold RMB assets in their forex reserves. They can add to the exposure through offshore markets, QFII, RQFII and China's interbank bond market. With regard to the latter, so far there are more than 20 central banks including Switzerland, France, Japan, Austria, Australia, and Singapore, etc., who are granted quota for China's interbank bond market investment.

On the other hand, both the onshore and offshore RMB bond markets have continued to register rapid growth. Moreover, those indicators are not meant to be used mechanically. IMF also emphasizes that the Executive Board's judgment is necessary. Combined with Christine Lagarde's latest comment that it is a matter of when, not if, the RMB makes it into the SDR, and the RMB internationalization's

progress in the past several years, the RMB stands a fairly good chance to pass IMF's internal assessment of being freely usable in this year's review.

### **3.2 It is unclear whether the US will resort to its veto**

Other than the freely usable requirement, the RMB's SDR prospects will also hinge upon the US Government and the US Congress' stances, with the former being more prone to be won over than the latter.

Currently, the IMF's decisions have three thresholds. Decisions requiring a 50% majority of the votes cast include those pertaining to the Fund's daily function such as approval of specific lending programs. Special majorities of 70% of total voting power are required for decisions that fundamentally alter the IMF's operational practices such as the design of IMF facilities, changes to the interest rates on IMF loans/SDR, the budget of the IMF, etc. The 85% threshold applies mainly to decisions on the Fund's governance structure such as amending the IMF's Article of Agreement, changing the number of Executive Directors, new membership, quota increase, reallocation of SDR, etc. The US currently has a voting share of 16.75%, meaning it has the veto power on the most important IMF decisions. As the inclusion of the RMB into the SDR basket will trigger many rules changes of the SDR, it is believed to need 85% of voting shares, making the US decision critical.

Under separation of power, the US President has the authority to appoint the US Governor, Alternate Governor, Executive Director, and Alternate Executive Director to the IMF. The Department of the Treasury has been delegated responsibility to direct US representatives at the IMF and to take a range of actions with respect to the IMF. The Secretary of Treasury, as a matter of practice, is nominated to serve as the US Governor at the IMF, while the Chairman of the Federal Reserve as the Alternate US Governor. According to the US Law, the US Congress is responsible for authorizing and appropriating all US financial commitments to the IMF, including the US quota and voting share, etc. In this year's review, providing the US representatives in the IMF go along with IMF's recommendation to add the RMB to SDR, it may still need the US Congress' approval to be effective. At the time being, this proves to be quite a challenge. In March this year, China's Premier Li urged the US to support the IMF reform initiatives of 2011. They include doubling the IMF quota, transferring 6% of the expanded quota to emerging markets, selecting all Executive Directors by election, not by appointment in some cases, and transferring two Executive Directors posts from Europe to emerging markets. The reforms will make China the third largest shareholders of the IMF, and make all BRIC countries into top ten shareholders. Moreover, China's voting share will increase from 3.81% to 6.0%, while the US' declining slightly from 16.75% to 16.5%, but still

maintaining its veto power. These reforms are also the consensus of G20, which the US Government also supports. However, according to the US Law, it needs the US Congress' authorization, which it has failed to grant in all these years, exposing the rift between the administrative and legislative arms of the US to the dissatisfaction of even the US allies. Judging from this example, it is not unreasonable to speculate that the US Congress might block the RMB's inclusion into the SDR even though the US Government gives the green light, which is essentially the same as the US casting its veto.

### **3.3 It is a matter of time**

Even if the US Congress stands in the way, it will be reduced to technical obstacle given that the IMF, most of its members, and even the US Government give their blessings. It will do little harm to the RMB's international reserve currency status, as China's reform efforts are for all to see. It is thus believed that investment in RMB assets will be little affected. The next IMF review will be five years away in 2020. By then the RMB's internationalization and China's financial opening are likely to surpass the SDR requirements by wide margins. The SDR recognition will be long overdue. Hence, the 2015 review is also a window of opportunity for the IMF, failing to capture which will in turn hurt the SDR's credibility. Furthermore, failure to resolve the issue this year may spur the IMF to find another window before 2020 to finalize the RMB's inclusion into the SDR.

### **3.4 SDR, the new building block for the RMB internationalization**

If the RMB successfully makes it into the SDR, it will certainly help solidify its international reserve currency status, making it a true international currency. Firstly, it will remove the obstacles standing in the way of many central banks in their decisions whether to hold the RMB due to its lack of status as an international reserve currency. This in turn will trigger a buying spree by central banks and sovereign wealth funds alike. As calculated above, 1.5% of disclosed allocated official forex reserves equals about RMB570 billion, which is sizable asset reallocation. Secondly, it will further facilitate the use of the RMB in cross border trade, investment, settlement, etc. And China is in the advantage when negotiating pricing commodities such as crude oil and iron ores in the RMB. Thirdly, it will help lower the borrowing costs by Chinese corporation overseas in their execution of the Go Abroad strategy. And even if China runs into current account deficits, financing it will not be a problem given the RMB being an international reserve currency. Lastly, it will help promote further financial reform and opening such as the exchange rate mechanism reform, and capital account convertibility.

## Reflections of the Internationalization of RMB and China's Power

By JUAN CARLOS MARTINEZ OLIVA \*

The rapid rise of the renminbi reflects a deliberate series of well-engineered actions meant to spread the Chinese currency all over the world. Chinese authorities have initially proceeded with caution, but have soon accelerated the pace towards a growing use of RMB in foreign trade and in financial transactions; new offshore centers outside of Hong Kong have been created, the most relevant being Singapore and London, but also Bangkok, Doha, Frankfurt, Kuala Lumpur, Luxembourg, Paris, Seoul, Sydney, and Toronto. Many more will certainly follow. A fast growing network of swap lines is contributing to intensifying the use of RMB as a trade settlement currency across the world. China's swap lines may be viewed as a cross-section of its geopolitical interests ranging from key Asian partners to oil exporting countries and strategically relevant neighbors. RMB is also present today in the foreign exchange reserves of a large number of central banks across the world.

These steps testify a strong resolve by China to turn the RMB into a broadly accepted currency at the international level. In the face of such unusual developments the question arises on the motivation of China's authorities.

When trying to quantify benefits from currency internationalization, economic literature usually limits the analysis to measurable factors such as the reduction of transaction costs and uncertainty deriving from a third country's currency fluctuations, and the benefits accruing from seignior age, the latter being viewed as an interest-free loan from foreigners holding the national currency (Cohen B.J. (2012), "The Benefits and Costs of an International Currency: Getting the Calculus Right", *Open Economies Review*, 23: 13-31). However, recent literature concludes that a monetary hegemony such as the United States derives little financial benefit from the international role of its currency. Some have even claimed that downsizing such role would be economically beneficial to the U.S. (Bergsten (2009). "The Dollar and the Deficits: How Washington Can Prevent the Next Crisis." *Foreign Affairs* 88, no. 6: 20-38.). Dismissing currency internationalization as a desirable option would nonetheless leave unanswered the question of why China has placed renminbi internationalization at the top of its wish list.

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Geopolitical and power considerations may provide the missing ingredient for a thorough examination of renminbi internationalization; this involves adding to the analysis apparently heterogeneous elements such as China's involvement in regional economic and financial initiatives, and China's exercise of soft and hard power. By adding realism and conceptual sophistication, the analysis of the interaction between dominant currencies and the power of their issuer appears particularly relevant in the explanation of China's desire to internationalize the RMB.

Arguably, if the international use of a currency is pushed far enough, it can trigger a virtuous circle based on cross-feeding effects. A powerful country can create incentives for a more intense use of its currency by its clients and partners; conversely, being the issuer of a powerful currency allows extracting benefits, both economic and strategic, from other countries, thus increasing a country's power. A monetary hegemony may therefore internalize benefits from a widespread use of its currency while network externalities create compelling reasons to perpetuate its monetary dominance across its area of influence.

In line with the above considerations, the process of RMB internationalization can be viewed as an element of a deliberate strategy aimed at creating an East Asian economic community with China at its center. In this mold, the rise of RMB can be viewed as a relevant tool in the diplomatic and strategic effort to achieve the goal of President Xi's Asian Dream of an "Asia for the Asians". Consistently with its regional grand strategy, China is looking to win neighboring countries' support and friendship while keeping a leader's attitude on strategic issues such as territorial sovereignty, and maritime rights and interests. By introducing security implications, China's stated intention to "properly handle territorial and island disputes" adds relevance to the geopolitical aspects of the analysis. Rather than as an autonomous process, RMB internationalization can therefore be viewed as a functional element of China's power strategy to enhance its geopolitical role in East Asian region. Pouring money into the AIIB and the NDB, and pushing ahead the initiative for a Maritime Silk Road Bank can be viewed as part of China's continuing soft-power offensive. More in general, establishing renminbi off-shore centers around the world, creating a network of swap agreements with a large number of central banks, projecting new renminbi-based regional financial institutions, reinforcing its charm offensive and soft power while strengthening its strategic and military capabilities, can be viewed as mutually sustaining elements of China's blueprint.

The late Singaporean Grand Master Lee Kuan Yew had suggested in an interview few years ago that "The Chinese will want to share this century as co-equals with the United States". While the U.S. might find it hard to surrender parts of world

leadership to China, the recent U.S. diplomatic failure in the AIIB confrontation has demonstrated that times have changed, and that many countries, among which historical allies of the U.S., seem today less prone than in the past to adhere to an old-fashioned Cold War model strictly based on American hegemony, and rather inclined to a multilateral approach to global economic issues.

The rapid rise of the RMB as an international currency shows how fast global economic relations may change in the global economy. If that trend is to continue, the Chinese currency might eventually side the U.S. dollar as a world reserve currency. But what matters most in the shorter run is that the RMB has very high chances to become the main regional currency in East Asia, and a powerful vehicle for trade and investment across the area. Rather than as a threat, such an outcome should be viewed as helpful and desirable at the regional level, and a source of stability for the overall international monetary system.

- **The Internationalization of the renminbi with a Focus on Frankfurt**  
**– From the “Middle Kingdom” to the “Middle of Europe”**

*By* ROBERT ELSSEN\*

### **1. Introductory remarks**

While the first three decades of reform and opening up were mainly characterized by the impressive economic growth without focusing much on the Chinese currency we could witness a tremendous expansion of the international use of Renminbi in the last few years. A key driver for the internationalization was the international financial crisis which was triggered by the US Subprime crisis. Another reason for this process is the “going global” of the Chinese economy with lots of investment all over the world. Recent initiatives like “one belt, one road” and also the founding of the Asian Infrastructure Investment Bank (AIIB) have the potential to further accelerate this process.

The Renminbi has started following suit of China’s role as economic powerhouse and leading trading country. Given ongoing restrictions on the usage of Renminbi due to capital account regulations the RMB’s internationalization has not been able to lead to a full convertibility of the currency yet. We currently witness a hybrid constellation of “onshore RMB” in mainland China and “offshore RMB” in Greater China and beyond.

Given the tight relationship and its role of a leading international financial center it was only consequent to start with Hong Kong as the first hub for offshore RMB. China then gradually expanded the concept of RMB hubs to other financial centers while the use of the Yuan in international trade continued to pick up.

Studying international data such as the ones from SWIFT statistics clearly underline the expansion of the RMB as international trade currency. The recognition as international currency also calls for its usage as investment currency on an international scale and as a reserve currency though. Compared to its use in trade, the RMB share in international investment is still comparatively low. China has expanded foreign direct investment rapidly – outgoing investment meanwhile even exceeding the incoming amount of investment. The going global strategy is

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underpinned by government initiatives such as the “one belt, one road” but also private capital to a larger degree. Since China is already the prime trading partner for a variety of countries it may appear as the next step that they get more accustomed to the use of RMB as investment currency instead of using third currencies such as the USD. The third aspect, i.e. acceptance as international reserve currency is widely considered to as the ultimate goal when promoting the internationalization of one’s currency. A clear indicator is the growing usage of the currency by foreign reserve banks. Several reserve banks across the globe have already announced to take the RMB on board as reserve currency or their readiness to do so in the foreseeable future. The introduction of the RMB in the IMF’s currency basket underlying the Special Drawing Rights (SDR) is considered a milestone in this development since it would endow the Renminbi the official touch of an internationally recognized currency. This would send a strong message to financial markets –especially given the fact that the composition of the basket follows rules of predominantly western origin. The official seal would automatically lead to an expansion of the usage as reserve currency and would generally give the internationalization a major boost.

## **2. Expansion of RMB offshore hubs**

The creation of an offshore hub for RMB usually follows a certain sequence. In a first step the People’s Bank of China (PBoC) and respective central bank establish a **currency swap agreement**. Though the agreement usually has the function of a backstop only and it is not expected to be used it enhances market confidence. The PBoC has undertaken stricken such currency deals with a multitude of central banks. The agreement between the European Central Bank (ECB) and the PBoC has a swap line of 350 billion Yuan or 45 billion Euro.

In order to further set up the financial hub bilateral negotiations usually then focus on the establishing a clearing bank in the financial metropolis and granting a Renminbi Qualified Foreign Institutional Investors (RQFII) quota to the respective jurisdiction. There is no specific sequence – some countries concentrated on the clearing bank first (such as Germany) while others received a quota first (such as Great Britain and France).

The clearing bank is designated by the PBoC allowing for access to refinance from the PBoC. Thus the clearing bank is responsible for the RMB payment process. After a general agreement on designating a clearing bank in a particular financial center the PBoC selects a bank that will be entrusted with this role. So far one of the big state-dominated Chinese banks has been selected. The appointed bank varies

from country to country.

The RQFII scheme allows foreign investors to use offshore RMB in order to invest in the capital market and the inter-bank bond market in mainland China. Before investors may make use of this scheme, one has to follow a certain sequence. At first the governments of China and the respective partner country have to agree upon a certain quota. Once the quota is granted prospective investors need to apply individually for the license as such (China Securities Regulatory Commission, CSRC) and thereafter the amount (State Administration of Foreign Reserve, SAFE). If the investor intends to target the inter-bank bond market, the PBoC needs to be involved.

### **3. The RMB hub in the “Middle of Europe”**

#### **3.1 Features of Frankfurt**

Frankfurt is located “at the heart of Europe”. The central position is not only true for the geographical location but also its role of financial hub in the continent. The town hosts more than 200 foreign banks including branches of five major banks from China. The Frankfurt stock exchange is operated by the Deutsche Börse Group – a renowned institution with international exposure offering a broad value chain from trading and clearing to settlement and custody. Moreover Frankfurt is not only the place for the national institutions Bundes bank (central bank of Germany) and BaFin (Federal Financial Supervisory Authority in charge of banking, insurance and securities supervision) but also the European players ECB (European Central Bank with European Systemic Risk Board attached) and EIOPA (European Insurance and Occupational Pensions Authority). The ECB is a key player in the European market as the guardian of the European single currency Euro and also assumed supervisory tasks in November last year (Single Supervisory Mechanism, SSM). The Frankfurt area is also a very attractive region for foreign companies who choose the area for their German and occasionally also European headquarters. They can benefit from a sophisticated infrastructure with high-level education and in terms of transport plenty of railway connections, highways and the huge Frankfurt airport offering direct connections to several Chinese cities. Given these assets the Chinese government decided to set up an office of the China International Investment Promotion Agency (CIPA) that was opened in Frankfurt last year.

#### **3.2 The rise of Frankfurt as RMB hub**

The ECB started the initial stage by signing the currency swap agreement with PBoC in October 2013. The backstop liquidity facility was considered the starting point for the promotion of selected financial centers in the Euro Area to become

offshore RMB hubs since it reassures Euro Area banks with the continuous supply of Yuan.

In the case of Frankfurt the Hessian State government has taken a pro-active role even before the ECB – PBoC agreement in order to further develop Frankfurt as financial center and to cater for the needs and expectations of Chinese financial institutions as well as other companies interested in German / European investment. This was underlined in particular by high-ranking delegations paying visits to China and seminars and other events.

On the federal level the government and the central bank started a fruitful dialogue with the Chinese counterparts in order to take the necessary steps for the RMB hub. During the visit of Chinese President Xi Jinping the two central banks signed a memorandum of understanding to intensify their collaboration in clearing and settlement of RMB payments and to lay the groundwork for establishing a clearing bank on 28<sup>th</sup> March 2013. Thus Frankfurt was the first European financial center designated to get a Renminbi clearing bank. Thereafter the selection process among Chinese banks took place. The Bank of China (BoC) was selected to become the clearing bank on June 19<sup>th</sup>. The clearing bank resumed business operations in November. Since then the BoC can process RMB payments directly with China rendering its services to various banks and other financial institutions.

The next step was the granting of the RQFII quota in July 2014. The quota allows registered qualified investors to invest up to 80 billion Yuan in the Chinese capital markets and inter-bank bond market. The tool is considered major gateway to gain market access in the Chinese mainland. As also pointed out by PBoC Governor Zhou Xiaochuan in spring the RQFII regime is the right concept but implementation could be facilitated in order to attract more investors. Envisaged reforms in this area will probably boost this investment channel in future.

The High-Level Financial Dialogue between China and Germany which started in March 2015 will further enhance mutual understanding and co-operation and is also designed to further promote market access and to support the RMB offshore market.

More interaction between the capital markets has the potential to further accelerate the usage of RMB. The opening up of the Chinese capital market has taken a new step by introducing the Shanghai Hong Kong stock connect last November. The Shenzhen Hong Kong stock connect is expected to follow later this year. The Deutsche Boerse Group has engaged in a strategic alliance with Bank of China – the RMB clearing bank in Germany –and is also preparing a joint venture with the Chinese exchanges China Futures Exchange and Shanghai Stock Exchange. The joint venture (“China Europe International Exchange”) will provide German

and other international investors with Chinese financial instruments denominated in RMB. Business operations are likely to start in the fourth quarter of 2015. Thus Deutsche Boerse is the pioneer of the internationalization of the Chinese capital markets outside Greater China.

The German development bank KfW (Kreditanstalt für Wiederaufbau) issued the first RMB-denominated bonds (Goethe bond) in Frankfurt in May 2014. The Agricultural Bank of China issued the first RMB-denominated bonded loan for the Deutsche Leasing group in April 2015. A recent press release (dated 8<sup>th</sup> of June) of the German central bank indicates “strong growth” in the RMB business. Accordingly German-issued RMB-denominated securities have jumped from 5 billion in spring last year to currently over 21 billion RMB. RMB-denominated deposits in Germany amount to 12 billion RMB. Turnover figures for foreign exchange transactions varied from 300 billion to 1.4 trillion RMB per quarter. Some tools such as the RQFII is still at an infant stage but once bureaucratic hurdles are taken they will fuel further growth. The biggest driving force though will be the intense bilateral trade relations between Germany and China (about 154 billion € in 2014). The connectivity between the financial center and real economy in Germany is and will remain the backbone of our bilateral economic relationship and distinguishes Frankfurt from other financial centers around the globe.

## • Transmission Effects of International Media Sentiment to RMB International Level

By DAI WENSHENG\*

*RMB internationalization is an important phenomenon of the international monetary system reform since the global financial crisis, 2008. It is important for the macro policy-makers and the enterprises to grasp and predict the RMB internationalization level timely and accurately. The intention of microscopic decision-making body to use RMB can be reflected by the international media's attention, and thus the RMB internationalization media sentiment of RMB international may transmit and reflect the level of the RMB internationalization related information in advance. The paper mine the international media sentiment and conduct the RMB internationalization index to study the forecast ability of the index for the RMB international and discuss the transmission effects of the international media sentiment on the level of RMB international. The research shows that international media sentiment can be helpful to improve the prediction accuracy of RMB internationalization index RII and verify the transmission effects of the international media sentiment on the level of RMB international.*

**Keywords:** Public opinion, Media mood, RMB international, Transmission effects

### 1. Introduction

The global financial crisis in 2008 has shown that there were flaws in the dollar-core unipolar international monetary system. It has become a global sense to promote the international currency diversification and strengthen the financial macro-prudential supervision. The voice for the international monetary system reform is growing louder and louder. All of these have become a driving force for the RMB internationalization. Because of the extremely complex and volatile international economic environment, RMB internationalization is undoubtedly a very important and protectable system for China to achieve new urbanization, maintain steady economic growth and defend the core interests of the country. It will be helpful for the macro policy makers to grasp the latest changes in the

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international monetary situation and avoid walking detours in the process of RMB internationalization, as long as they can grasp the process of internationalization of the RMB accurately and predict the degree of internationalization of the RMB timely. As for the microscopic decision-making body, it is also helpful for them to choose a favorable currency in international economic contacts. The RMB international is bound to attack the original economic order and the international monetary system, which also will attract the attention of the international media. Once the international public media pay a lot attention to the situation of the RMB internationalization, it may become an important benchmark to grasp the process of the RMB internationalization in advance. This article is commenced based on this hypothetical.

## **2. Literature Review**

### **2.1 RMB internationalization and its degree**

The discussion of international currency and RMB internationalization defines the way to measure the degree of RMB internationalization, and the concept of the international public media about "internationalization" and its extension. But the research on the level of RMB internationalization depends on the definition of international currency and RMB internationalization. Concerned that Dai etc (2013) has comprehensively summarized the existing research, we will not go further research here.

### **2.2 Public sentiment and its effects on the RMB internationalization**

The economists represented by Varian and other experts presented the application of big data in economic management issues and made a series of studies at the dawn of the age of big data. For example, Tumarkin (2002) studied the relationship between internet information and market efficiency, Choi and Varian (2009A,b), Askitas and Zimmermann (2010), D'Amuri and Marcucci (2010), Guzman (2011), Radinsky et al. (2009), Huang and Penna (2009) and Preis (2010) presented that using Google search data to predict the unemployment rate, inflation, demand, economic indicators such as consumer sensitivity, housing index and so on. Google engineers use Google Search data to predict the 2009 H1N1 flu a month earlier than the government than public health authorities. The article wrote by McLaren and Shanbhoge (2011) also summarized the practices that some countries' central bank forecast the economic index through a network of data. Zhang Chengsi (2014) and other experts analyzed the relationship between public opinions and inflation with financial econometrics. But the studies on the relationship between public opinion and RMB internationalization have not been conducted. 'RMB Internationalization

Report 2014 'contained a chapter that devoted to study the international attention and concern about international public opinion. Dai.&Mou (2014) devoted to the international attention about RMB internationalization. Data of these two studies came from there ports that conducted by 103 major global economic mainstream media. And the results are groundbreaking research about the RMB internationalization public opinions.

### **3. The media sentiment of RMB internationalization and the measurement of the level on the RMB internationalization**

#### **3.1 Measure the degree of RMB internationalization**

The research based on the "RII internationalization index" launched by International Monetary Institute, Renmin University, as the benchmark to measure the degree of RMB internationalization. Since the beginning of RMB internationalization was five years ago, RII values only has data since the beginning year of 2010, and the value is small. In order to correspond with the media sentiment index data, the article based on the dynamic normalization index. The first step, using the RII average data of the 4 quarters in 2010 as the benchmark, every quarter's RII index values in 2010 compares with the benchmark and thus get the RII relative values since the first quarter of 2010 and multiplied by 100, which can be referred to as RII10 index; The second step, after first quarter in 2011, every quarter needs to calculate the RII10 index during the previous period and sum the RII10index. Then use the quarter RII10 values to divide the sum value and multiplied by 100, therefore get the C index value of RIIN.

Since the first quarter of 2010 to the fourth quarter of 2013, every period RII, RII10 and RIIN values are shown in table 1.

Table 1 the quarter value of RII、 RII10 and RIIN

Time	2011Q3	2011Q4	2012Q1	2012Q2	2012Q3	2012Q4	2013Q1	2013Q2	2013Q3	2013Q4
RII	0.44	0.56	0.56	0.70	0.79	0.92	0.95	1.14	1.14	1.69
RII10	447	574	572	712	808	939	968	1157	1162	1725
RIIN	2.77	3.56	3.54	4.41	5.01	5.82	5.99	7.17	7.20	10.69

Space limitations, only listes data since the 2011 3rd quarter

#### **3.2 Measurement of international media mood on RMB internationalization**

There are thousands of international media, involved different motivation and contents to report the RMB, not necessarily associated with the RMB internationalization. However, the RMB internationalization is influenced by

financial institutions which are affected by international mainstream media. Thus the article is spreaded according to the following three-steps to measure the mood of relevant international media.

The first step, select the mainstream media. Use the method of Delphi to seek for the global continents experts on monetary issues, invite them to recommend screening major news media around the world. According to the advice of these experts, we finally confirmed the list including 101 English media (as shown in Schedule 1) summed by the G20 countries. The research object is based on these English media coverage. These media distributes evenly and has enough representation in the print media to represent the international mainstream public opinion about RMB internationalization.

The second step, calculate the degree of international media attention. Search for news about "RENMINBI", RMB, CNY, and the report about "Internationalization" and "International use" on the English website in the mainstream media. The result shows that there are few reports or news contain "Internationalization" or "International use", though there were many international media reports were about the RMB in recent years. Due to that the phrase "RMB internationalization" is an academia phrase in China and 'RMB cross-border use' is only adopted by Chinese official policy language, the rate of the two terms used in the national press were not very high. But the international media coverage itself is actually the direct embodiment of internationalization of the currency of media sentiment, While the number of the international media coverage about RMB is actually the directly emotional reflects of the media opinion, the analysis of public opinion amend the technical path. The article will search for an object identified as the Renminbi (RMB). Directly search news reports with "RENMINBI", RMB, CNY news, and the indicator of international media attention is the number of news and articles containing the keywords. The technology which is used to analysis the media sentiment during this period includes "Regular Expression", "LDA model" and general text-mining technologies.

The third step, calculate the international media normalized index of RMB internationalization. The results show that the promotion of the concerns about the Renminbi began since 2008. While there was no RII date before 2010, concerned about the comparability; we will use the data of 2010 as the benchmark to analyze the data for 2010 and beyond. Using the number of reports and news related to the RMB in media around the world as the basis of index, we take one-fourth of the total reported in 2010as 100, convert each quarterly report number for "international media index IMMI". Also, due to the large gap between index values range, in order



to analyze, we will use the same approach as the RIIN normalization to form IMMIN. Data is shown in table 2.

Tabel 2 ATT international media attention, international sentiment index IMMI and media sentiment index IMMIN

Time	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2013 Q4
ATT	439	292	309	377	383	302	249	374	367	408
IMMI	129	86	91	112	113	89	74	111	109	121
IMMIN	5.49	3.65	3.86	4.71	4.79	3.77	3.11	4.67	4.59	5.10

Notes: ATT represents the international media attention, international sentiment index IMMI and media sentiment index IMMIN

### 3.3 The relationship between international media and the degree of RMB internationalization

According to process of how to get the data, you can get the RMB internationalization level and the number of the coverage from international mainstream media about RMB. As shown in Figure 1.

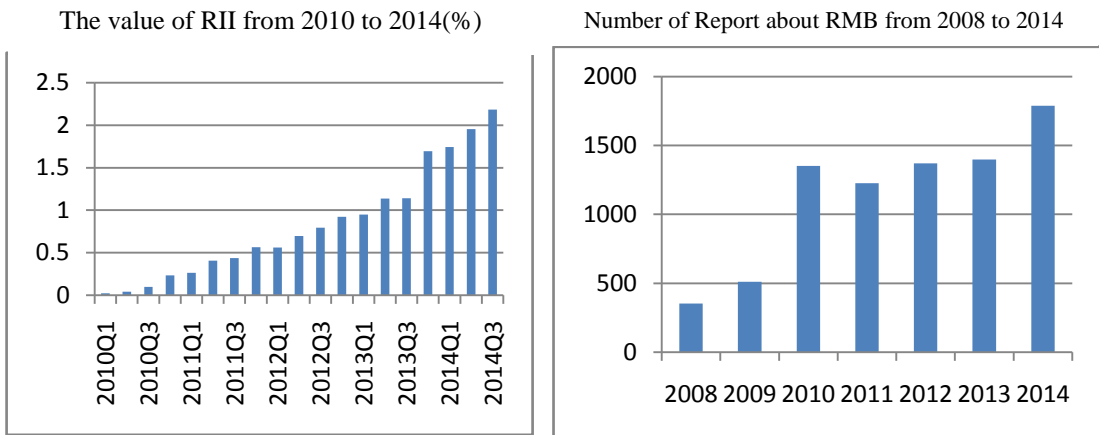


Fig1. The values of RMB internationalization index RII and the number of report about RMB in international mainstream media

RMB internationalization normalized index and international media normalized index, based on RII and the number of international media coverage about the RMB internationalization, as shown in Figure 2.

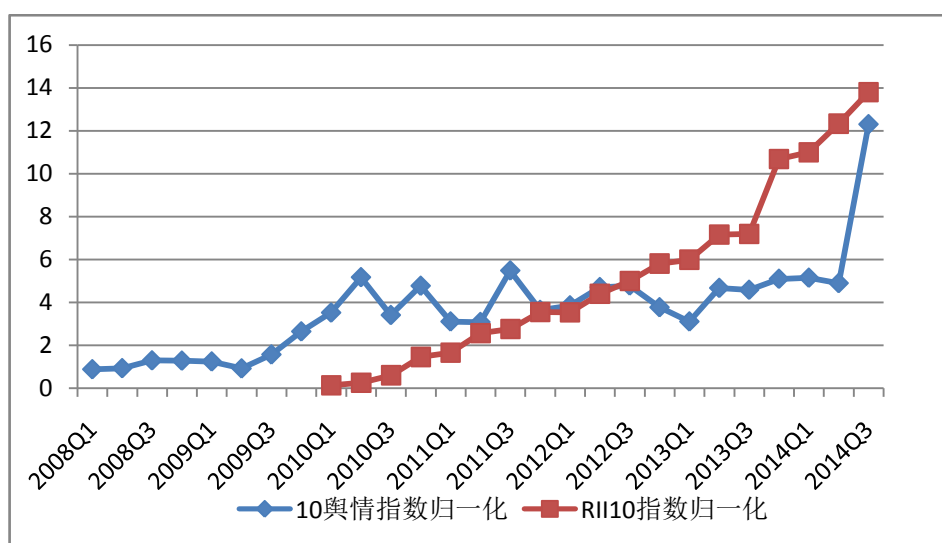


Fig 2.Sentiment indicator and the RMB internationalization RII normalized index

## 4. Research thoughts about Transmission effects sand model results

### 4.1Research thoughts

This paper argues that if the international media does not have the pass-effect of RMB internationalization, international media sentiment indexes do not help to predict the level of the internationalization of RMB; On the contrary, if the international media really has pass-effect on RMB internationalization, media sentiment index will help to enhance the accurateness to forecast the RMB internationalization level. The idea is shown as follows.

First of all, use the ARIMA model as the benchmark model to establish the RIIN model which is based on the RMB internationalization normalized index and release the RII forecast values in reverse. To protect the ARIMA modeling data base, we select the data that begin from the first quarter of 2013, and the training data set contains 12 quarters' data from 2010 to 2012, thus we can construct the ARIMA model to forecast the RIIN values of first quarter in 2013. Then we add the actual values of first quarter in 2013, a training data set training model to forecast the values of the second quarter in 2013, and so on. Because of the absence of the data that RMB direct investment accounted for the proportion of the global investment, we use the forecast values to calculate the RII values as the actual values.

Secondly, substitute the international media normalized index values of RMB internationalization and its hysteresis values over different periods into the model. Use the same training model to forecast the values of RIIN and RII.

Third, calculate the predictive accuracy of the basic model and the sentiment index model to compare the gaps. If the prediction accuracy of the sentiment index model is higher, we can believe that the international media about the RMB internationalization has a transmission effects on the level of the RMB internationalization. When we compare the prediction accuracy, we use root-mean-square error RMSE and the average of the absolute percentage error MAPE for evaluation as the indicator. The formulas are as follows:

$$RMSE = \sqrt{\frac{\sum_{i=1}^N (T_i - A_i)^2}{N}} ; \quad MAPE = \frac{\sum_{i=1}^N \left| \frac{T_i - A_i}{T_i} \right|}{N}$$

## 4.2 Model results

Based on the training data set by the third quarter in 2014, the model results are as follows.

### 4.2.1 Selection of the benchmark ARIMA model

The test results of RIIN unit root show that the RIIN is the process of I (1). There are full ARIMA (2,1,0), sparse ARIMA (2), 1,0), ARIMA (3,1,0) process in competitive model.

Table 3TheARIMA model competition results of RIIN indicators

Model	Variable	coefficient	P values	AIC	SC	HQ
ARIMA(2,1,0)	AR(1)	-0.247901	0.1069	2.56	2.70	2.57
	AR(2)	0.307899	0.0494			
ARIMA((2),1,0)	AR(2)	0.411014	0.0095	2.50	2.60	2.51
ARIMA (3,1, 0)	AR(1)	-0.333232	0.1802	2.71	2.90	2.71
	AR(2)	0.382328	0.0494			
	AR(3)	0.253922	0.0207			
ARIMA((3), 1,0)	AR(3)	-0.035871	0.0571	2.771	2.865	2.770

Table 3 shows that considered the perspective of guidelines and other information functions, the best model should be sparse models: ARIMA (2), 1,0) model.

#### 4.2.2 Including international media sentiment index of model selection

This research selects the RIIN as the dependent variable to build 8 models, while the independent variables are the international media sentiment index IMMIN values and the values including hysteresis<sup>4</sup> in the models, such as IMMIN, ... IMMIN+IMMIN ( -1) +IMMIN ( -2) +IMMI (-3), plus the RIIN (-1), RIIN (-2), we will report only three results in table 4 .

Table 4 Model results with international media, including sentiment index

Model	Variable	Coefficient	P Values	AIC	SC	HQ
Model 1	IMMIN	1.239958	0.0072	5.415	5.515	5.432
Model 2	IMMIN	1.091718	0.0129	5.337	5.485	5.357
	IMMIN(-1)	1.673125	0.0501			
.....	.....	.....	.....	.....	.....	.....
Model 1 Referred to asIMMIN8	IMMIN	0.732226	0.0454	2.734	3.111	2.730
	IMMIN(-1)	1.701479	0.0719			
	IMMIN(-2)	1.908439	0.0800			
	IMMIN(-3)	0.739481	0.0502			
	RIIN(-1)	0.422401	0.0716			
	RIIN(-2)	0.744859	0.0503			

As measured by information criterion and predictive accuracy, finally we choose the model 8 as the forecast model. The values of model 8 variable coefficient can't pass the tests at 5% levels, but can pass the tests under the 10% levels. Concerned the goal of building the model is the predictability, we can relax the standard to 10% so that the model eight is acceptable.

#### 4.2.3 The forecast results of benchmark model and sentiment indicator model

Through efforts above, we get the two best models, the ARIMA model using the benchmark model (with RIIN) itself to forecast RII (model 1), and the limited distribution lag model, adding the public opinion index in (model II). According to the RIIN values forecasted by the two models, we calculate the RII reverse and then calculate the RMSE and MA PE forecasted by RII. Its results are shown as table 5.

Table 5 Predict performance of the model 1 and model 2

	RMSE	MAPE
Model 1	0.745761	9.183173
Model 2	0.490008	8.895402

## 5. Conclusions and Future study

According to the results of the fourth part, we can obtain the follows:

1. RMB is on the rising level in the process of RMB internationalization. The intention for the microscopic decision-making body to use RMB in international trade settlement, international investment in the international currency, can be reflected by the international media's attention, and thus the RMB internationalization media sentiment of RMB international may transmit and reflect the level of RMB internationalization in advance, so that reflect there are transmission effects on the international media mood to RMB international level;

2. From the performance of the forecast, whether the value of RMSE or MAP in model 1 is smaller than in model 2, which illustrates that model 2 is more stable in predicting RII than model 1. It shows that the international media sentiment index really has the function to help predict the RII and international media has transmission effects on the level of RMB internationalization.

3. Seeing from the structure of model 2, we can get the values not only in the current period through the international media sentiment index by using the RMB internationalization index to response the level of the RMB internationalization, but also can get the reflect of the level about the RMB internationalization earlier up to three periods through the values of internationalization media mood;

4. Actually, even if the international media mood can only reflect the current level of internationalization, it is also helpful to introduce the international media mood to grasp the degree of RMB internationalization timely, thus contributing to the macro management and micro-decisions to make judgment. The media sentiment can mine the current media on time, while the value of RMB internationalization index RII reflects the historical level of internationalization.

The paper will go further discussions on the follows in the future, including:

1. Achieve automation calculation on international media sentiment index, so that we can quickly track the RMB internationalization and related changes to forecast the future trends in the RMB internationalization timely.

2. The current discussion from the international media, whether praise or criticism, reflects the international concerns about the RMB internationalization, and thus can be a predictor of the level of the RMB internationalization. With the improvement of

the RMB internationalization, we should strengthen the ability to judge positive or negative emotions from the international media. It will provide support for the relevant departments to make accurate decisions;

3. There search only mined the English-language media sentiment. But with the establishment of the ‘road-building’, the improvement level of RMB internationalization, we should try to mine media sentiment from other languages in the future to improve the accuracy and speed when forecast the level of RMB internationalization.

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# Purchasing Power Parity (PPPs) in the Framework of RMB Internationalization

## Exchange Rates and Purchasing Power Parities in Renminbi Internationalization: a Look with Statisticians' Eyes

By GUIDO FERRARI<sup>\*</sup> and ZHAO YANYUN<sup>Δ</sup>

*In this paper, the issue of the internationalization of the Renminbi (RMB) is approached from a statistical point of view.*

*In recent years, the Exchange Rate (ER) RMB – US\$ has been debated as US government claimed that it has been kept artificially too high by the Chinese political and monetary authorities to help the Chinese export.*

*The mainstream to follow to check whether this claim has foundations is that of the use of the Purchasing Power Parities (PPPs), which represent the economic price ratio, whereas the ERs represent the political-financial price ratio and to compare them.*

*The above debate may affect RMB internationalization as well, and the consequent ER modification, which in turn will affect ERs with the other countries other than US, by reverberating on Chinese provinces export and their income and welfare.*

*Biggeri, Ferrari, and Zhao (2015) have estimated China cross province PPPs: there is evidence that the effect of a further appreciation of the RMB against the US\$ will be remarkable, with repercussions on the whole China's economic structure.*

*Thus, it is shown the importance of the use of PPPs in RMB internationalization as a helping tool in the ER fixing with the different currencies.*

**Keywords:** RMB, internationalization, Exchange Rate, Purchasing Power Parity, International Comparison Program.

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## **Introduction**

Looking at the Renminbi (RMB)<sup>1</sup> internationalization with Statisticians' eyes, as announced in the title, can greatly contribute to the comprehensive understanding of the underlying effects of it on the whole China's economy. This is what we attempt to do in this paper, by approaching the problem from a quantitative point of view through the discussion of the Exchange Rate (ER) and the specific focus on Purchasing Power Parities (PPPs) as a powerful tool to help in ER management and related decisions to be taken by government and monetary authorities for RMB internationalization.

Before entering the core of the matter, we will have an eye at the short story of the RMB internationalization and at the economic foundations as starting point for our analysis. In this Conference, there will be contributions more specifically focused on the economic and financial features and consequences of the RMB internationalization, which better provide an in depth look at the problem from the pure financial point of view. Thus, our aim is not to enter the debate of the financial economists, but, instead, to use the above historical path and economic features as a background.

Armed with these tools, we will be in a position to demonstrate the potential of the PPPs as a supporting tool for ER handling in the framework of the RMB internationalization.

## **1. The Story of RMB Internationalization**

To begin with, let us remind some points useful as a common base for discussion.

A currency is considered "international" when it is used as a unit of account (for example corporate invoices), a medium of exchange (to settle cross-border trade) and a store of value (deposits, reserve currency). Analysis of two very practical measures, market shares in international payments and in foreign exchange markets, is informative.

Until 2002, China's domestic market was pretty much closed to foreign investors. Since then, China has developed into a world economic giant. In 2010, China overtook Japan to become the world's second largest economy with a Gross Domestic Product (GDP) of US\$ 5.8 trillion, or 9.5% of the world's total GDP, and is now the world's largest exporter: As is well known, import/export is typically a driver for the international use of a currency.

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<sup>1</sup> "Renminbi" is the official name of the currency introduced by the Communist People's Republic of China at the time of its foundation in 1949. It means "the people's currency". Some refers to the currency as the "Yuan", which is the name of a unit of the Renminbi currency (Mulvey, 2010).



China's GDP growth in 2010 was 10.4%, 9.3% in 2011, 7.7 in 2012, 7.7 in 2013, and 7.4% in 2014, with a continuous flexion that, according to the World Bank (WB) (2014) is due to factors including the slowing of export growth because of weaker demand from large developed economies, RMB appreciation and rising labor costs. It is worth noting that the Chinese 12th Five-Year Plan (2011-2015) predicted a GDP growth target of 7%. Several Chinese economists explain that the overall slowdown of China's growth is the consequence of the attempts of the government to re-organize the economy.

Indeed, recently, after announcing in January 2015 a planned second Stock Connect linking Shenzhen and Hong Kong exchanges, China's Prime Minister Li Keqiang said that the figures of Chinese economy of the first 3 months of 2015 were not good and that the country should expect difficult times. The traditional forces of Chinese economy, such as consumption and investment are decreasing, Li said, whereas the new forces do not compensate. It is generally recognized that China's growth has been based for long time on export, but after the financial crisis and the global economic slowdown of 2007 and 2008, it started to increasingly depend on government credit and investments in infrastructures. On the other hand, for its part, the government has recognized that this is a non-sustainable model in the long-run and is trying to make domestic consumption to restart.

The International Monetary Fund' (IMF) (2015) claims that China needs to rapidly start with new reforms to complete the rebalancing process of the economy from investment to domestic consumption confirms the above.

Notwithstanding this flexion, GDP growth rates like the above would be regarded as a miracle in whichever European or rest of the world country, including the US, and China confirms to be the country with by far the highest rate of economic development and candidate to a leading economic position in the world. Indeed, some analysts predict China will overtake the US as the world's largest economy by the mid-2020s.

Until 2010-2011, surprisingly enough, face to China's economic success of the last two decades, its currency was used far less internationally than one would expect.

For the vast majority of the payments with China, the currencies of other countries were used, while RMB was underutilized at the international level, although more than 1,050 financial institutions in over 90 countries were already doing business in the Chinese currency (SWIFT, 2011).

"China's payments were mainly in US\$ yet. In June 2011, 98% of payments in and out of China were not in RMB; out of this, nearly 80% was in US\$. There were

actually more cross-border trade settlements in RMB with Chinese corporates, but most happened via Hong Kong.

This was in sharp contrast to the US, where more than 90% of payments in and out were in US\$ and Japan, where more than 70% were in Japanese Yen (JPY). These are developed economies however, whose currencies are freely convertible and have been internationalized for many years. That said, it is worth noting that the RUB was used in 46% of payments with Russia.”

In June 2011, the RMB still was world payments currency number 21, with 0.24% share in payments value, while China’s share in world trade was 11.4% in 2010. These figures show a clear underutilization of the RMB in relation to China’s economy. Internationalized currencies like the EURO, US\$ and GBP are used way beyond their country’s share in trade. New Zealand is one example of a small economy with an extremely international NZ\$ currency. In the FX business, the RMB was underrepresented when compared to the size of China’s economy. With a world market share of 0.9% in FX value, still in June 2011, and a world GDP share of 9.5% in 2010, the FX/GDP coefficient was 9.5%, a very low figure, when compared to 197% of the US\$, 87% of the EURO, and 162% of the GBP.

The internationalization of the RMB should be supported instead, as, in a world dominated by the US\$, it can go in the direction of a multilateral approach to world economic themes.

And indeed, one might be impressed by the growth recorded by RMB since 2011: more than 10% of China’s cross-border trade is settled in RMB. In Hong Kong, ‘Dim Sum’ bonds and RMB Initial Public Offerings (IPOs) have really taken off. The RMB is now used for retail business in Singapore, and there’s active Forex (FX) trading around the RMB in London (Robert Cookson, 2011).

According to Juan Carlos Martinez Oliva (2015), there is a high probability for the RMB to become in the short period the principal regional currency in Eastern Asia and to become a dynamic and efficient vehicle for international trade and the investment in the area.

Nevertheless, some warnings have been raised. Tse Yung Hoi (2012), former Deputy General Manager of the Bank of China (1998-2002), points out that the internationalization of the RMB is taking it outside of China and allows non-residents to hold it extensively overseas and use it as a currency for routine payments, settlements, investments, and reserves, and that there is an international call for more currencies to be involved in the international monetary system. However, for true internationalization of the RMB, the preconditions are free convertibility, market-oriented interest rates, and open capital markets, but these preconditions have

not yet become reality. In such circumstances, one has to look at the offshore market for the RMB, for example Hong Kong, which means that the domestic and overseas RMB markets are separated.

Taking as an example the internationalization of the JPY, Tse argue that: (i) the internationalization of a currency should depend on a country's inherent rate of economic development rather than external pressures (as happened for Japan under the pressure of Western countries); (ii) China needs to develop independently and develop the ER and the internationalization of the RMB step by step according to its own needs; (iii) during the process of its internationalization, the RMB shouldn't appreciate too quickly.

The most critical issues are now:

(i) The further development of offshore centres of the RMB, as in the short term, Tse doesn't expect the full opening of China's capital markets and fully liberalized conversion and the offshore centres will still play important roles;

(ii) The further promotion of the RMB outside of China. This is because right now, China, differently than the US, has limited fiscal deficits, a trade surplus, and a capital surplus. So, plenty of efforts have to be made in this direction. Internationalization is impossible if the RMB is not accepted in international markets. China has taken the following measures so far: first, encouraging the use of the RMB in cross-border trade: China shares borders with 14 neighbouring countries, and there is cross-border trade at each border. Right now, about 80% of the volume of these cross-border trades is settled in RMB because most people are willing to use it. Second, China has signed a free-trade agreement with ASEAN. According to this agreement, 95% of trade between China and 10 ASEAN member countries is tariff free, so trade volumes are on the rise in both directions. In addition, many ASEAN countries accept RMB as the trading currency for transactions with China and they are using it for settlement more and more frequently. Third, China has signed currency swap agreements with 12 countries, meaning that China can swap RMB with the currencies of those countries so that it can purchase their resources and products using their currencies and they can buy China's products with RMB or use it as part of their foreign exchange reserves: and indeed, some countries have included the RMB as part of their foreign exchange reserves. Furthermore, in early 2012, the first document was issued by the People's Bank of China (PBC) that specifically addresses overseas direct investments in RMB: the detailed rules about overseas direct investments, which encourage domestic enterprises to invest overseas with RMB. Finally, some

international organizations, such as the IMF and the Asian Development Bank (ADB), also come to China to issue RMB bonds, to borrow RMB to use in some of their special projects.

Moreover, it is a somewhat largely shared opinion among economists that the *economic advantages* of the internationalization of a currency are few:

1. Reduction of the transaction costs;
2. Reduction of the uncertainty inherent to the fluctuations of the currency of a third country;
3. Benefits that spring from the seignior age seen as an interest-free loan by the foreign countries that hold the national currency.

There are relevant *political advantages* instead, represented by the geo-political influence of the country that hold the international currency due to the virtuous circle represented by the interaction between monetary dominance and political dominance.

In the above discussion, the ER was not mentioned. Of course, it plays a crucial role in any currency internationalization and therefore in RMB one, and we will enter the discussion on it shortly.

## **2. The Economic Effects of RMB Internationalization**

Since the RMB internationalization is pretty at an early stage, although with very relevant results already, the full implications of it on banks' revenues and the financial industry as a whole are not clear yet.

However, it can be said that several benefits can be achieved through the liberalization and promotion of the use of RMB beyond China's borders:

- (i) Chinese corporates, in particular Small and Medium Enterprises (SMEs), can use it for cross-border trade instead of a foreign currency and avoid FX costs and exchange risk;
- (ii) Foreign corporates paying in RMB can do business with more corporates in China, thus increasing the overall size of trade;
- (iii) large corporates can manage their RMB more globally and over time diversify their assets and protect against depreciation of one currency;
- (iv) from a macro-economic point of view a third world currency could be beneficial, particularly one from Asia, in which countries could hold their reserves, especially as trade between Asian countries increases. During the recent financial

crisis, banks in some Asian economies that use US\$ experienced liquidity issues because of the increased cost of funding.

While there is no roadmap with predefined timeframes for the full convertibility of the RMB, some market analysts expect the RMB to become convertible within the next five years, that's by 2020. Moving too quickly is not without risks: a currency whose value is determined by global markets is vulnerable to ER shocks, and if movement of money in and out of a country is fully open, it is prone to large and sometimes violent capital flows ('hot money').

In November 2014, direct negotiation between Euro and RMB has been introduced in Shanghai exchange market. According to Yves Mersch (2014), this decision might:

1. Favor the process of price level fixing for the couple of currencies;
2. Promote cost of transaction flexion.
3. Facilitate the access of European banks to China domestic currency market (on shore) and allow the Euro area to exploit the increasing importance of RMB.

The expansion of the on-shore markets should ensure the most efficient allocation of capital. It can contribute to rebalance Chinese economy by diverting funds from investments to address them towards domestic consumption.

Thus, it is the time now to enter the core of the discussion we want to stimulate, that is, the way in which the ER, basic in each currency internationalization and hence in RMB one, is determined by countries and the use of the PPPs to adjust or even to substitute it, and therefore, the use, the potential, and ultimately, the likely impact of PPPs on RMB internationalization

### **3. The US\$-RMB ER, and the Role of China's Overall and Cross-Province PPPs in RMB Internationalization**

#### **3.1 The US\$-RMB ER Problem**

Let us begin with the US\$-RMB ER debate, to shift then to the description-analysis of the frame where the PPPs are elaborated, including the PPP and GDP Parity (GDPP) for China.

Psychological issues and somewhat unmentionable reasons underlying the history of human occurrences are often at the basis of the explanation of political-economic behaviours and may help to the understanding of events and situations otherwise hard to disentangle.

This seems the case of the economic-financial relationships between China and the US that have met one of the most troubling sticking points in the so-called

“US\$-RMB ER controversy”, that animated the last decade of the political and economic relationships between China and the US and still involves the two governments and intrigues the economic and financial scholars and researchers. And that is likely one of the many reasons that have induced China’s government to undertake the road of RMB internationalization.

To try to adequately approach this issue anything but simple, and understand the humus underlying the issue, let us begin with by quoting the illuminating words written on 29 October 2010 by Siva Yam and Phil Wong in an article for “China Daily”:

“A lot has changed since the day that King George III sent an envoy to congratulate Emperor Qianlong on his 80<sup>th</sup> birthday.”

It marked the beginning of a formal East-West diplomatic relationship, although King George’s real agenda was trade and permission for missionaries to preach Christianity in China. In addition, it represented the starting point for the trade relationships between Europe and China, and afterwards, between China and the US, which started at that time, to definitely become stable after the Chinese opening policy, despite the misunderstandings and the disparities that characterized them and that remain nearly unchanged currently.

Three hundred years ago, European vessels sailed to China with a light load and returned with hundreds of thousands of pounds of tea, porcelain, silk and other Chinese products. Today, ocean tankers from the US sail to China and return full of toys, home appliances, consumer electronics and furniture.

The trade gap between China and the US has skyrocketed and China ships 17% of its exports to the US, creating a \$315 billion trade deficit in 2012<sup>2</sup>. Such a disparity, compounded with a high unemployment rate in the US has plunged global economic cooperation in disarray.

A currency war has started and is being fought that led to the recent years dispute, sharpened by the global economic slowdown. With US stepping up its warnings that manipulated ERs by China were standing in the way of global recovery, and with Beijing answering back that an extremely loose monetary policy in the advanced world – namely the US – was creating destabilizing capital flows. Consequently, a debate has come alive, hinging on the basic question whether the RMB was undervalued and the cause of the trade imbalance or China was the scapegoat for unemployment in the US.

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<sup>2</sup> In 2012 China exported \$2.021 trillion of its production, making it the world's second largest exporter. (The EU was the world's largest, exporting \$2.17 trillion, while the US was third, exporting \$1.612 trillion.).

For the best understanding of our discussion, it should be stressed that China's enormous trade surplus with the US heavily depends on *exports* - the engine driving the Chinese economy - characterized by *low prices* and usually *low value added* products. In turn, exports are caused by *excess production capacity* - due to *excess investment* - that cannot be absorbed by the domestic consumers' demand, not mature enough.

This has caused a huge China's foreign reserve accumulation in US dollars that has been a big problem for China: to keep the dollar stable, China must purchase dollar assets. When China's consumer market will be mature, exports to the US will no longer be so important and China will not need to massively buy US\$ denominated bonds.

The majority of the American/Anglo-Saxon economists, businessmen of the US\$ area and the Federal Reserve (Fed) - although with diverging opinions - claimed that the responsibility of the overall imbalance was on the RMB-US\$ ER that was reputed to be kept too low by Chinese government through the PBC<sup>3</sup>.

Before the global economic slowdown, some scholars, for instance, Frankel (2006), when the ER was at the peg, argued that "an ER that is *de facto* fixed has served China well over the last 8 years. Nevertheless, the time has probably come to allow the RMB to appreciate". This judgment was reached through the identification of four major reasons.

First, calculations based on Balassa-Samuelson relationship suggested that the real value of the RMB was low, not just as compared to the US\$ or to the currency of other rich countries, but substantially below the equilibrium value for a country at China's stage of development.

Second, although history shows that foreign exchange reserves are an useful shield against currency crises, China's Balance of Payments (BP) surplus has been so high in recent years that its level of reserve holdings in 2006 surpassed Japan's to become the world's largest; thus the country is currently giving up a lot when it buys

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<sup>3</sup> Each country, through varying mechanisms, manages the value of its currency. As part of this function, it determines the ER regime that will apply to its currency. For example, the currency may be free-floating, pegged or fixed, or a hybrid.

If a currency is free-floating, its ER is allowed to vary against that of other currencies and is determined by the market forces of supply and demand. ERs for such currencies are likely to change almost constantly as quoted on financial markets, mainly by banks, around the world.

A movable or adjustable peg system is a system of fixed ERs, but with a provision for the devaluation of a currency. For example, between 1994 and 2005, the Chinese Yuan RMB was pegged to the US\$ at RMB 8.2768 to \$1. China was not the only country to do this; from the end of World War II until 1967, Western European countries all maintained fixed ERs with the US\$ based on the Bretton Woods system. But that system had to be abandoned due to market pressures and speculations in the 1970s in favor of floating, market-based regimes.

Still, some governments keep their currency within a narrow range. As a result, currencies become over-valued or under-valued, causing trade deficits or surpluses.

(low-return) US treasury securities with the proceeds it raises from (high-return) inward investments.

Third, while the authorities have been remarkably successful at sterilizing the inflow since 2002, and the threat of overheating that existed in 2004 seems to have disappeared by 2006, it is doubtful that they can keep up sterilization on this scale indefinitely. A strategy that continues to exclude appreciation from the policy response mix will become increasingly difficult.

Fourth, the experience of other emerging markets suggests that it is better to exit from a peg when times are good and the currency is strong, than to wait until times are bad and the currency is under attack.

“A country as large as China”, Frankel concluded, “probably requires an ER regime with some flexibility, and this is a good time to begin moving in that direction. This need not mean a move to pure floating. An intermediate regime such as a target zone is probably more appropriate for the time being.”

These were basically the motivations brought to support the conviction that then RMB – US\$ ER was too low and the claim that Chinese monetary authorities should increase it<sup>4</sup>.

In the meantime, the global economic system slowed down and the global economic crisis stroke the countries all over the world. China is reputed to be the first country to recover, although with no lack of skepticism on its sustainability, shared by the highest level Chinese government leaders, and by prominent economists, such as Paul Krugman<sup>5</sup>. “While it is now widely understood that China was the first globally significant economy to begin to recover from the crisis, critics nonetheless increasingly charge that the stimulus program has substantial flaws and that China’s early economic recovery cannot be sustained”.

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4 Some of these claims seemed to be more justified by the will to coincide with the urgings of American politicians than by economics. Indeed, some economists argued, whether the RMB was undervalued was difficult to judge, as no one knew how much it should have been worth.

5 During the financial crisis of 2008, China pledged 4 trillion yuan, about \$580 billion, to stimulate its economy to avoid recession. The funds represented 20% of China’s annual economic output. It went towards low-rent housing, infrastructure in rural areas and construction of roads, railways and airports. China also increased tax deductions for machinery, saving businesses 120 billion RMB. China raised both subsidies and grain prices for farmers, as well as allowances for low-income urbanites. It eliminated loan quotas for banks to increase small business lending. China also took a leadership role by dropping interest rates three times in two months.

China’s economy is strong. It produced \$12.38 trillion in 2012, based on purchasing power parity. This makes it the third largest in the world, after the EU (\$15.7 billion) and the US (\$15.66 billion). Its economy slowed a bit, growing “only” 7.8% in 2012, after growing more than 10% per year for the last 30 years. Despite this growth, China is still a relatively poor country. Its economy only produces \$9,100 per person, compared to the GDP per capita of \$49,800 for the US.



“A prominent critic has gone so far as to suggest that the stimulus has created a debt-fueled bubble that will collapse, causing China’s growth to plunge to only 2%. But the empirical analyses suggest these critics are exaggerated “(Lardy, 2010)<sup>6</sup>.

Thus, the debate shifted on *sustainability* of Chinese economic recovery and on whether, for China to be capable to complete and strengthen it and enhance country’s economic position in the international scenario, it might be worth keeping more flexible the RMB-US\$ ER. This additional issue, somewhat specious, have added a further complication to the whole analysis. Indeed – so the above scholars argued, and in some cases, feared - if for China it already would be difficult to allow a more flexible ER, in view of getting the recovery from global economic slowdown sustainable it would have any interest to keep it as much rigid as possible.

Thus, *overall imbalance plus need for keeping economic recovery sustainability*: a blasting blend!

To try to disentangle the skein and provide a contribution to the discussion that aims at suggesting a solution to this puzzle, it seems useful to approach the issue from the *financial-political* point of view supported with the *statistical economic* evidence.

Let us look at the first one. Some economists focus on macroeconomics. According to Wang, Fan and Peng (2006), the pattern of China’s economic growth was characterized by: (i) very high rates of saving and investments; (ii) massive transfer of unskilled labor from the agricultural to urban non-agricultural sectors (which was the main source of Total Factor Productivity (TFP) growth); (iii) low labor cost; (iv) low level of employees education; (v) low level of technical innovation; (vi) large income inequality; (vii) heavy dependency on external demand; and, (viii) inefficient energy consumption, and (ix) heavy environment pollution. Some others emphasize the advantage China should have gained in manipulating the value of RMB by artificially keeping its value low.

The above mentioned policy of keeping the dollar stable and saving China’s foreign reserve in US dollars actuated by Chinese monetary authorities over a long period of time has been regarded as having a dirty float (although this is contradicted by the event that a 2005 appreciation of the RMB by 22% was followed by a 38.7% increase in Chinese imports to the US). This was based on the consideration that if it

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<sup>6</sup> China faces major challenges in sustaining its economic growth in a period of weak global recovery, particularly in Europe. In 2009 China’s net exports of goods and services dropped precipitously, resulting in a substantial drag on economic growth. To overcome this drag China launched a massive stimulus program, financed largely with bank credit. Contrary to repeated criticisms, this stimulus had a substantial consumption component and directed investment primarily toward infrastructure rather than expanding capacity in traditional industries such as steel.

was a free float, as China exported more and more, demand for the RMB went up and it should appreciate.

Notice that while this keeps Chinese products still relatively cheap in US\$ terms, it also helps the US government who can easily issue bonds to finance the growing deficits in the US. If China buys less of US\$ bonds, then the US\$ will depreciate and/or the interest rate that the US has to pay on its bonds will rise (to entice more investors to buy the bonds), making it more expensive for the US to finance its deficit<sup>7</sup>.

Nevertheless, the prevailing opinion of the western economists and financial analysts, hardly influenced by the above American/Anglo-Saxon economists, businessmen of the US\$ area and the Federal Reserve (Fed), continued to claim that any change in RMB policy bringing into play any degree of flexibility was a good one, especially for China and that a more rationally determined RMB, so they argued, will have helped China.

So, the decision for the RMB to appreciate RMB has been commended as desirable and timely and should have: (i) helped contain inflationary pressures in the short run and rebalance the Chinese economy over the medium and long run; (ii) helped China to make that difficult but crucial adjustment from an invest-and-export economic model to one based more on domestic demand; (iii) given China another tool by which it can moderate inflation; (iv) got minimal the downside to China in terms of lost exports; (v) been positive for the stock market, even though a stronger RMB would likely hurt low margin exporters who do not have pricing power; (vi) been positive for RMB to take increasingly importance in the global economy; and above all, (vii) ensure China's economic recovery sustainability and enhance its economic position in the international framework.

After months of debate, China in June 2010 announced a new policy on its currency and the PBC, in view of the economic situation and financial market developments at home and abroad, and the BOP situation, decided to proceed further with reform of the RMB ER regime and to enhance the ER flexibility, to be actuated gradually to maintain the RMB ER basically stable at an adaptive and equilibrium level, and achieve the macroeconomic and financial stability in China.

The PBC further signaled a return to the currency valuation system that existed before the peg was resumed in 2008, i.e., a managed float in which the RMB traded

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<sup>7</sup> China is the largest foreign holder of US Treasury bills, bonds and notes. As of January 2013, China owned \$1.264 trillion Treasuries. This is 11% of the total \$11.6 trillion of debt held by the public. China temporarily cut back on its holdings after July 2011, when it held \$1.173 trillion. By June 2012, it only held \$1.147 trillion. China buys US debt to support the value of the US\$.

in a narrow band against an unnamed basket of currencies. Thus, the RMB did begin appreciating against the US\$ in trading, reaching the strongest levels in modern times.

This process does continue indeed: in April 2013 the ER was 1 US\$ = 6,197 RMB; currently (July 2015) it is 1 US\$ = 6,202 RMB against that of Autumn 2010 – less than 5 years ago – which, after the rebalancing made by the Chinese government, accounted for 6,640 (thus, a decreasing of 6.6% in the last 5 years).

For many economists, including the Anglo-Saxon economic main stream followers, this is not enough and they persist in claiming further appreciation. A look at the issue from the economic-statistical perspective, with evidence from the price levels comparison can help to lighten the debate and confirm or not the foundation of the above claims.

This evidence relies on PPPs, which are based on price level economic ratio, whereas the ER relies on price level financial-political ratio. This would allow to introduce, in the decision of increasingly making flexible the ER, the actual price level difference, that can provide additional economic-based information to supplement the financial-economic-political arguments<sup>8</sup>.

To use the words of the International Comparison Program (ICP), the worldwide statistical partnership to collect comparative price data and compile detailed expenditure values of countries' GDPs, and to estimate PPPs of the world's economies, "before PPPs became widely available, Ers were used to make international comparisons of GDP."

ERs, however, only convert GDPs to a common currency. They do not provide GDPs valued at a common price level because they do not reflect the relative purchasing power of currencies in their national markets. For them to do so, all goods and services would have to be traded internationally, and the supply and demand for currencies would have to be driven predominantly, if not solely, by the currency requirements of international trade. But this is not the case. Many goods and services such as buildings, government services, and most household market services are not traded internationally, and the supply and demand for currencies are influenced primarily by factors such as currency speculation, interest rates, government intervention, and capital flows between economies. Consequently, GDPs converted to a common currency using Ers remain valued at national price levels. The differences between the levels of GDP in two or more economies reflect

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<sup>8</sup> According to WB (2010), using PPPs instead of market ERs to convert currencies make it possible to compare the output of economies and the welfare of inhabitants in real terms (that is, controlling for differences in price levels).

both differences in the volumes of goods and services produced by the economies and differences in the price levels of the economies. On the other hand, GDPs converted with PPPs reflect only differences in the volumes produced by the economies.

Therefore, using PPPs instead of market ERs rates to convert currencies makes it possible to compare the output of economies and the welfare of their inhabitants in real terms (that is, controlling for differences in price levels).

It was established to compare the GDPs of economies in real terms, and PPPs were seen primarily as a means of converting nominal expenditures to real expenditures. Comparisons of real expenditure are still the ICP's primary purpose. But now international users and national users are showing a growing interest in PPPs as measures of the relative prices between economies at all levels of aggregation and in the national annual average prices underlying them<sup>9</sup>.

For the first time in the history of the ICP, China fully participated in ICP 2011, following all the prescribed procedures and methods. In ICP 2005, China provided price data collected only from 11 cities or provinces. By contrast, for ICP 2011 China conducted nationwide surveys covering both rural and urban outlets in all provinces of the country.

Below, the evidence for China 2011 from ICP 2014.

#### PPPs

(US\$ = 1.00)\*

Gross domestic product	3.506	Housing, water, electricity, gas, and	2.651
Actual individual consumption	3.493	other fuels	
Food and nonalcoholic beverages	5.155	Furnishings, household equipment	5.827
Alcoholic beverages, tobacco, and narcotics	5.564	and maintenance	
		Health	2.026
Clothing and footwear	4.351	Transport	4.619
		Communication	2.392

\*The above results are estimated by the 2011 ICP Asia and the Pacific Regional Office and the Global Office. The National Bureau of Statistics of China does not recognize these results as official statistics.

<sup>9</sup> The results presented in the tables are based on data supplied by all the participating economies and compiled in accordance with ICP principles and the procedures recommended by the 2011 ICP Technical Advisory Group.

As above said, currently the ER US\$-RMB is 1 US\$ = 6.202 RMB, against the PPP for actual individual consumption (the sum of individual consumption by households and individual consumption by government), of 1 US\$ = 3.493 RMB, a little more than half the ER, stating that the consumer price level of China is nearly half that of US. Thus, to answer the question put at point 3.1, there is food for further RMB realignment to the US\$<sup>10</sup>.

Clearly, in RMB further appreciation, China's exporters would have a heavy damage; therefore, the whole China too would be damaged, at least in the short run. But if one looks at the general interests, in the medium-long run<sup>11</sup> a stronger RMB might be good for China's economy as a whole, because of stimulation of the domestic demand (with the structural adjustment in the low value-added export sector), and of the firm competitiveness, that in turn can drag innovation and entrepreneurial emulation model, ensuring economic growth sustainability, and enhancing a leading role in the world economic system<sup>12</sup>.

### 3.2 The Use of PPPs in RMB Internationalization

As the PPPs provide the right ERs that is used for the international comparisons of GDP and of consumption, and therefore of the income and wealth levels, they should be used also for money exchange and hence in RMB internationalization framework, when fixing the ER to which it is exchanged. If not entirely, due to the many political economic-financial implications that prevent it, at least as a guidance factor.

Contradictorily enough, the ICP 2014 points out that the PPPs are designed specifically for international comparisons of GDP and are not designed to compare monetary flows or trade flows. International comparisons of flows -

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<sup>10</sup> For European Union (EU), for example for Italy, France and Germany, on average the PPP Euro-US\$ ranged in the last 10-15 years 1.15-1.20, whereas the official ER averaged 1.30-1.40, meaning that the US\$ was kept undervalued by the Fed and that the US undertook against EU nearly an as heavy pro - US\$ and US trade interests policy as that they accuse China to conduct against them. It should be noticed that in the last year the ER decreased to 1.10-1.15 because of the monetary policy by the European Central Bank (ECB), so moving towards the equilibrium ER-price level ratio.

<sup>11</sup> As regards short or medium-long run events, it is worth stressing their character of relative concepts. Indeed, in May 2004, in Dalian, during a debate on the short run-long run advantages and disadvantages of a RMB floating ER, when asked on how long the short run might be, Li Ruogu, Deputy Governor, PBC, by resorting to the millennial Chinese philosophical spirit, said : " I think those who call for a fixed ER are right in the short run. And those who call for a floating ER are right in the long run. How long is the short run, you ask. You must understand. China is 8000 years old. So when I say, short run, it could be 100 years."

<sup>12</sup> "The exchange rate policy has propped up poor performing exporters at the expense of the broader economy. It's important to ask why exporters are currently doing well or remaining in business. Many of them can only do so because they're able to exchange the dollars they earn for RMB at the peg. That's great for exporters but the PBC has to buy all those dollars at the peg, invest them, and neutralize the inflationary effect. That's a significant burden". (Chovanec, 2010).

such as development aid, foreign direct investment, migrants' remittances, or imports and exports of goods and services - should be made with ERs, not with PPPs.

This statement is difficult to be shared as monetary flows reflect real flows and ultimately the real economy, which make PPPs the perfect candidates also for international comparisons of monetary flows. However, even though one would be inclined to follow the above advice, PPPs would be very useful as indicators to understand which are the competitive advantages and disadvantages in terms of international trade, namely in terms of import-export, and therefore, manage the ER, which is used to establish the RMB price in terms of the other currency involved in the international transaction, accordingly.

For example, let us take, other than the US one we have discussed in previous lines, the case of some significant countries for RMB internationalization.

Country	ER: country/RMB	PPP: 1 US\$/country	PPP: country/China
France	1 Euro = 6.884	1 = 0.856 Euro	1 Euro = $3.493/0.856 = 4.081$ RMB
Germany	1 Euro = 6.884	1 = 0.781 Euro	1 Euro = $3.493/0.781 = 4.472$ RMB
Italy	1 Euro = 6.884	1 = 0.797 Euro	1 Euro = $3.493/0.797 = 4.383$
UK	1 BRP = 9.683	1 = 0.735 BRP	RMB
Australia	1 AUD = 4.728	1 = 1.505 AUD	1 BRP = $3.493/0.735 = 4.752$ RMB
Russian Federation	1 RUB = 0.112	1 = 14.837 RUB	1 AUD = $3.493/1.505 = 1.542$
Canada	1 CAD = 4.937	1 = 1.271 CAD	RMB
Japan	1 JPY = 0.050	1 = 109.100 JPY	1 RUB = $3.493/14.837 = 0.235$
Brazil	1 BRL = 1.999	1 = 1.487 BRL	RMB
India	1 INR = 0.098	1 = 14.006 INR	1 CAD = $3.493/1.271 = 2.748$
South Africa	1 ZAR = 0.506	1 = 4.769 ZAR	RMB
			1 JPY = $3.493/109.100 = 0.032$
			RMB
			1 BRL = $3.493/1.487 = 2.349$
			RMB
			1 INR = $3.493/14.006 = 0.249$
			RMB
			1 ZAR = $3.493/4.769 = 0.732$ RMB

As is easy to see, the ER is in favour of China in international trade, except the cases of Russian Federation, Brazil, India and South Africa, for which the ER is below the PPP, that is, below the bilateral inter-countries price level ratio. More than a chance, they all are BRICS countries.

It is to be expected that the countries of the first group, those with PPP below the ER, like the US will set up pressure for the RMB to be realigned; the US, on their side, will continue to call for further RMB appreciation. It should be said that, as the US\$ is the world currency and the majority of the other currencies are linked to it, any realignment of the RMB to the US\$ will affect them as well. On the other hand, there is food for China to claim for appreciation of the BRICS countries' currencies against RMB.

For China's government and the PBC to drive the realignment, the PPPs are crucial as they can provide guidance on speed, timeliness, constraints and bound of it, both in the first case and in the second one.

The above, is even more true at China's province level. Chinese provinces correspond to proper countries and in terms of population are sometimes bigger than the majority of them. Indeed, it is very important to consider *cross-province PPPs*, as the price level differences among provinces are crucial due to their impact on international trade and therefore on province welfare and economic development as well as on cross province income and welfare differences.

Biggeri, Ferrari, and Zhao (2015) have estimated the cross province price level differences, i.e. the Gini-Eltő-Koves-Szulc (GEKS) PPPs for 31 Chinese provinces, including 4 metropolitan cities for year 2015, based on a sample of 62 goods and services, reported at the annexed Table A1 below: as can be seen from inspection of the table, there is evidence of a great cross province variability that leads to infer a strong effect of ER modifications on provinces' export competitive advantages and disadvantages.

If one takes Beijing as a representative of national average, with all the cautions that such a rough simplification implies, one sees that there are provinces or municipal cities that have a PPP higher than the country's average, such as Tianjin (1.073), Hebei (1.053), Shanxi (1.046), Liaoning (1.059), Jilin (1.025), and Heilongjian (1.010). For them, a strengthening of the ER will imply a loss of international competitiveness, even stronger for those with a higher PPP, such as Tianjin and Liaoning: their price level, being already higher than the average, will further represent a discouraging factor for export. The other provinces and municipal cities show PPPs lower than the average; they are: Inner Mongolia (0.990), Shanghai (0.871), Jiangsu (0.926), Zhejiang (0.670), Anhui (0.972), Fujian (0.956), Jiangxi (0.956), Shandong (0.895), and Henan (0.980). For them, and namely for those with a very low PPP, such as Zhejiang, but also for Shanghai and Fujian, the loss of international competitiveness will be very limited, being compensated by the fact that their price level is just below the country's average.

All that, will inevitably affect the income level, the income distribution, ultimately the overall welfare of provinces, and, although in a more intermediate way, the welfare and development of the whole China's economic system.

The above rough analysis allows concluding that the PPPs are crucial in RMB internationalization, both at national and province levels.

Not to say that the knowledge of the PPPs, both at a national level and at province one, is in itself a helping factor for both the internationalization and the balanced development of the provinces.

#### **4. Conclusion**

In this paper we have stressed the crucial role plaid by the ER in the economic relationships among countries, as is confirmed by the debate on the US\$-RMB ER.

We have shown as the PPPs can greatly help to clarify the true size of the ER and therefore the relative position of the countries involved in currency internationalization as regards their actual price level, which should provide the true ratio among currencies.

Moreover, based on the evidence from the ICP 2011, we have shown that the US\$-RMB ER can be realigned and that the RMB can be further appreciated, with short run problems for Chinese exporters, but with benefits for the whole economic system in the medium-long run.

Hence, in RMB internationalization, it is very useful and effective to take account of the PPPs among the various countries involved in it.

Again, based on the estimates of the China's cross province PPPs, we have shown that in RMB internationalization it is useful to take account of the different price levels among the provinces, to drive the ER at the best, so not to create too many export problems as well as imbalance among the provinces and support their balanced and harmonious economic and social development and ultimately their overall welfare.

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# On the Interpretation of Purchasing Power Parities between China and other Economies: Factors Affecting the Differences and Need for Sub-national PPPs

By LUIGI BIGGERI \*

*The Purchasing Power Parities (PPPs) computed by the International Comparison Program (ICP) deal with the comparisons of price levels across many countries. They are useful for a wide variety of purposes, especially for comparisons, of GDP and its components and living conditions, between countries in real terms, that is, controlling the differences in price levels*

*However, when the PPPs are published, their users frequently do not accept the results as valid, as it happened in China in 2014, because they do not find reasonable the values of the differences existing in the comparison between couple of countries and put forward criticisms on their reliability.*

*It is possible, at least in part, to help the users in the interpretations of the PPPs trying to measure the main factors that affect the differences between two PPPs, that is the level of prices for the different products and services and the system of weights related to their share on the expenditure. However, a more adequate and complete understanding of the National PPPs could be achieved only computing Sub-national PPPs.*

*The paper faces these two topics, presenting also the estimation of the factors that affect the comparisons of PPP between China and other Economies.*

**Keywords:** International Comparison Program, Purchasing Power Parities, Decomposition, Pure Price Effect, Weight Effect, Sub-national Purchasing Power Parities

## 1. Introduction

The International Comparison Program (ICP) is a worldwide statistical operation to compute the trust worthiest Purchasing Power Parities (PPPs) at country and international level, taking into account the methodological and practical problems to

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be faced for the computation. The 2011 Round involved nearly 200 countries.

The PPPs deal with the comparisons of price levels across different countries or areas. They are useful for a wide variety of purposes, because using PPPs instead of market exchange rates to convert currencies makes it possible to compare the Gross Domestic Product (GDP) and/or its components and the welfare, poverty and living conditions of the inhabitants of different countries in real terms (that is, controlling the differences in price levels).

However, when in 2014 the World Bank published the 2011 ICP Round PPPs data, showing changes to relative income levels that were larger in lower-income countries, thereby narrowing the world income distribution - several users (researchers, policy makers, economic operators, journalist, etc.) did not accept the results as valid (see the ICP web site: ICP 2011 Media & Blog Coverage). This has attracted a good deal of attention, particularly on the fact that the aggregate Chinese economy and the US one seems much closer than previously estimated, and also that the Indian economy is larger than the Japanese economy. During the debates, many media in China highlighted the fact that National Bureau of Statistics of China did not recognize the PPPs as official statistics<sup>1</sup>.

Actually, the data users seem not to justify both the differences in the average prices level of two countries and the differences from the results of ICP 2005 as showed by the estimated PPPs, and put forward criticisms on their reliability.

The researchers know very well that changing the methods and models used to measure relative prices and income levels (as happened between the 2005 and 2011 ICP rounds) can have a notable effect on the resulting relative income estimates. The researchers involved in the definition of the methodologies used to compute the PPPs defended the new ICP computations and results showing that the computation are the best possible taking into account the data collected and available and evaluating the impact of the 2011 methodological innovations (see, for example: Deaton and Aten, 2014/15; Inklaar and Rao, 2014/15).

Apart from the scientific debate on the methods used for the PPPs computation, that obviously is still lively, to be honest there is another issue concerning the PPPs interpretations of many users, and in particular of the journalists, the economic operators and the inhabitants. It seems that the users forgotten an issue they should be aware of, but has not so far received attention in the debate. They usually interpret and comment on the PPPs results considering only the overall PPP of an economy,

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<sup>1</sup>In fact, in the tables on PPPs published by ICP/World Bank, appears the following footnote: "The results for China are estimated by the 2011 ICP Asia and the Pacific Regional Office and the Global Office. The National Bureau of Statistics of China does not recognize these results as official statistics".

forgetting that an average value must be interpreted considering the behaviour of its components, especially when it is a weighted average. Doing that, the users have two main possible problems to interpret and appreciate the different average values of the PPPs between two different countries.

First, it is not that easy for everybody to have an idea of the national average level of the prices and then to compare the average levels of two countries. This is because everybody is conditioned by personal experience of the economic sector where he/she works and of the territorial areas where he/she is living. Second, the national average level of the of prices depend also on the distribution of the prices by areas of the country. Large countries as China have surely high variability of prices across the areas (Biggeri, Ferrari and Zhao, 2015) and the same thing happens in USA (Aten, Figueroa and Martin, 2014; Aten and Figueroa, 2015), India (Majumder, Ray and Sinha, 2013), and Philippines (McCarthy, 2010; Dikhanov et al., 2011). However, also in medium-size countries where territorial areas have different level of development, as in Italy, the level of prices can show heterogeneity across territorial areas (De Carli, 2008; Istat, 2010). In these countries the understanding and the interpretation of the National PPPs is still more difficult, as the national PPP often do not represent the local situation, and, obviously, the National PPPs cannot be used for comparative analysis in the context of poverty, rural-urban and economic regional (provincial) differences in general.

Actually, having at disposal detailed data on products and services (or groups of them) the differences between two PPPs can be explained considering the differences in the level of prices of the products and services, and also the differences in the economic structure and in the economic situation of the regions (territorial areas) of the countries involved in the comparison.

The aim of this paper is twofold. First, to present simple methods to obtain rough evaluations of the factors that affect the value of a PPP and the differences between two PPPs, that is, the *level of prices* for the different products and services and the *system of weights* related to the share of expenditure concerning the different products and services. The evaluation should give a clear interpretation of the comparisons of PPPs between two countries. Second, to illustrate a proposal for a project to carry out experiments in China for the compilation of Sub-national (Provincial) PPPs that should be important both to interpret the national PPPs and to assess the relative income and poverty level in the provinces.

The remainder of this paper is structured as follows. Section 2 illustrates the tools and methods for interpreting the PPPs and for decomposing the difference between the PPPs (or better between Price levels of two countries), The methods are simple

enough, in order to give approximate estimations of the factor that affect the value of the PPPs and to provide a tool of interpretation also for non-specialists. They allow for splitting the difference of the average level of the prices between two countries in different components (effects), both at level of groups of products and at the aggregate level. However, to highlight the usefulness of the proposed tools and of measuring these effects, some preliminary and approximate estimations of them comparing PPPs for China with USA and other Economies are briefly discussed in Section 3. Section 4 is devoted to discuss the need for sub-national PPPs dealing with a technical proposal to compute PPPs at provincial level in China. The proposal refers to the computation of PPPs for the Household Consumption Aggregate and categories, using data collected for the computation of Consumer Price Indexes (CPIs) and deepening the methodological and empirical problems to be faced. The project proposal could be useful to make significant improvements in the definition and collection of price data and in the methodology to compute the index numbers for the construction of CPIs and PPPs. Finally, Section 5 provides some comment and concluding remarks.

## **2. The comparisons of price levels between two countries: tools and methods for measuring the factors that affect the values and the differences**

### **2.1 The interpretation of PPPs in the framework of International Comparison Program: basic elements**

In order to interpret correctly a statistical information (or an indicator, as a price index) it is necessary to know accurately the definition of the variables, the methods of data collection and the process of construction of the information (or of the indicator).

Therefore, to facilitate the interpretation of PPPs it is important to resume the main characteristics of their construction, referring to the ICP book (World Bank, 2014), from which we take the most part of the following sentences.

PPPs are *spatial price indexes*. They show, with reference to a base economy (or country or region), the price of a given basket of goods and services in each of the economies being compared. The composition of the baskets will vary between economies and reflect differences in taste, culture, climate, price structure, product availability, and income level, but both baskets should provide, in principle, equivalent satisfaction or utility.

PPPs formally are price relatives. In their simplest form, they show the ratio of prices of a product or service in national currencies of the same precisely defined

product in different countries. For example, if the price of a kilo of oranges of a specified quality is 12 RMB Yuan in country A and 3 dollars in country B, the PPP for such oranges between the two countries, when B is the base country, is the ratio 12 to 3 or 4 RMB to the dollar. In other words, for every dollar spent on oranges of the specified quality in country B, 4 RMB would have to be spent in country A to obtain the same quantity and quality of oranges.

The calculation of PPPs is made in three stages. First, at the product level, where price relatives are calculated for individual goods and services. Second, at the basic heading (BH) level, where the price relatives calculated for the individual products in the basic heading are averaged. Third at the aggregation levels, where the PPPs for the basic headings covered by the aggregation level are weighted and averaged to obtain weighted PPPs for the different aggregation levels up to GDP. The weights used to aggregate the PPPs in the third stage are the expenditures on the basic headings.

All the definitions of products and of groups of classifications refer to the conceptual framework provided by the Gross Domestic Product (for the structure of the classification used and the PPPs computed in the ICP see the table reported in the *Appendix*). Instead, the basic heading is defined as the lowest level of final expenditure for which explicit expenditures can be estimated. In theory, it should cover a group of similar well-defined goods or services. This does not mean that the baskets of goods and services will be identical in both countries. Therefore, in practice, an actual basic heading can include a broader range of products than is theoretically desirable.

PPPs continue to be *price relatives* whether they refer to a product group, to an aggregation level, or to GDP. As one moves up the aggregation hierarchy, the price relatives refer to increasingly complex assortments of goods and services.

It comes immediately from above, *that the value of a PPP at BH and aggregate level depends on both the value of price relatives and the system of the weights* (share of the expenditure at the third stage).

The computation and aggregation of PPPs for all countries that participate to the ICP is a highly complex statistical exercise, in order to have price indexes that satisfy the spatial transitivity requirement among all the countries involved in the comparisons.

The PPPs for a product between any pair of economies are aggregated at the superior level of aggregation first using economy A's expenditures as weights (*Laspeyres* index) and then using economy B's weights (*Paasche* index). The Laspeyres and Paasche indexes will result in different estimates of the PPPs of each economy. The geometric mean is then taken, which is the *Fisher* index. The Fisher indexes are not transitive or base economy-invariant. Therefore, it is necessary to

find an approach or method that guarantee the transitivity. There are two main approaches to aggregation at the basic heading level. The first is based on Fisher index and on Jevon index, which are used in the computation of elementary price index numbers using the *Gini-Eltő-Koves-Szulc* (GEKS). The second alternative approach makes use of a regression model known as the *Country Product Dummy* (CPD), as a way of filling or imputing missing price data. The GEKS approach, which in simple form use different types a geometric average of the Fisher or Jevons indexes, has the advantage of being a binary one, which involves couples of places, and does not need to choose a common basket for all places, and produce multilateral results satisfying transitivity and base economy invariance. Actually, now there are many different improved versions of those methods and of other methods that can be and are used for aggregation above the Basic Heading level and for linking the regions of group of countries.

Here is not the case to explain the characteristics of the methods, which are very well explained in Rao (2014) and Diewert (2014a and 2014b). For our purpose, it is enough to remember that in any case, all the methods applied to guarantee the transitivity at multilateral level must allow that the final results for the binary PPPs are as close as possible to the direct computation of the binary PPPs obtained with the Fisher or Jevons formulae.

Once the PPPs are obtained, to do the comparisons among countries one would have to standardize the indexes by expressing them in a common unit of currency. The common currency used for the global comparison is the U.S. dollar, and so the PPP of each economy is standardized by dividing it by that economy's dollar Exchange Rate. The standardized indexes so obtained are called *Price Level Indexes* (PLIs).

## **2.2 Tools and methods for interpreting the PPPs and for decomposing the difference between the PPPs concerning two countries**

Considering the aim of this paper, we limit the analysis to the *binary comparison approach*, that is we limit to *binary PPPs*, at the level of BHs and at the subsequent aggregate levels (a previous presentation of the approach presented here, can be found in Biggeri, De Carli and Laureti, 2008; Biggeri, Laureti, 2010).

A general approach is used to describe spatial indices formulae and PPPs, without specific reference to the procedure applied by the ICP that compile PPPs at present.

By assuming that the requirement of comparability is perfectly well-matched with the principle of representativeness and following the suggestion made by Kravis et al. (1975), an “equal weighting system” is used and a simple geometric mean of price relatives is selected as a method for averaging when more than one price ratio is

available for a detailed product or category<sup>2</sup>. This formula was called “average relative price or PPP” by the Authors mentioned above and it is identical to the ratio of the unweighted geometric mean of prices of the  $j$  area to the unweighted geometric mean of prices of the  $l$  area.

Therefore, it is possible to calculate the following spatial index PPP, frequently called *Average Prices' Parity*, at the basic heading level:

$$PPP^h_{l,j} = \left( \prod_{k=1}^{n_{jl}} \frac{p_k^j}{p_k^l} \right)^{\frac{1}{n_{jl}}} = \frac{\left( \prod_{k=1}^{n_{jl}} p_k^j \right)^{\frac{1}{n_{jl}}}}{\left( \prod_{k=1}^{n_{jl}} p_k^l \right)^{\frac{1}{n_{jl}}}} \quad [1]$$

where  $p_k^j$  denotes the price of item specification  $k$  in country  $j$ ,  $p_k^l$  the price of item specification  $k$  in country  $l$  and  $n_{jl}$  is the number of items within the basic heading  $h$ , priced in both areas, which in this case is the same in the two area compared.

Considering the computation and aggregation of the  $PPP^h$  over all the basic headings<sup>3</sup>, it is likely that there be different share of expenditure for the products within the basic heading in the areas  $j$  and  $l$ . This can be expressed through relative weights  $w_k^j$  and  $w_k^l$  in basic headings specification  $h$  (where  $h=1,...,m$  is the number of basic headings), in country  $j$  and  $l$ , respectively<sup>4</sup>.

In this case, two different global (for example at GDP level)  $PPPs$  can be calculated depending on which area is selected as the base or reference area and on the weighting system chosen. Considering for each area the corresponding weighting

<sup>2</sup>It should be emphasized that a geometric mean is preferred to an arithmetic one because the former meets the country-reversal test, whereas the latter does not. Among the consistency conditions, the country reversal test or symmetric treatment of countries requires that in a given binary comparison it should be no matter which country is used as the base country. In other words, if we interchange the role of the countries in the spatial index number formula, then the resulting value of the index equals the reciprocal of the original value of the index (Diewert, 1987).

<sup>3</sup>Actually, the decompositions presented here should be referred to the prices of each product and service, in order to have a clear economic interpretation of the proposed decomposition. We present the formulae referring to the aggregation of basic headings price level, because the detailed data at our disposal are at the level of basic heading.

<sup>4</sup>The weights are sometimes available also for the products within the BH. In this case the weighting system can be used also in the formula [1]



system, formula [1], which considers  $l$  as the base area, becomes:

$$PPP_{l,j}^G = \frac{\prod_{h=1}^{m_{jl}} (p_h^j)^{w_k^j}}{\prod_{h=1}^{m_{jl}} (p_h^l)^{w_k^l}} \quad [2]$$

Where now  $p_h^j$  denotes the average of price of basic heading specification  $h$  in country  $j$ ,  $p_h^l$  the average price of basic heading specification  $h$  in country  $l$ ;  $m_{ij}$  the number of the PPPs computed at BH level in both countries and  $G$  the aggregate group above the BH.

From a different point of view, by considering  $j$  as the base area, we can obtain a similar PPP, comparing area  $l$  to area  $j$ :

$$PPP_{j,l}^G = \frac{\prod_{h=1}^{n_{jl}} (p_h^l)^{w_h^l}}{\prod_{h=1}^{n_{jl}} (p_h^j)^{w_h^j}} \quad [3]$$

It can be seen that the above formulae are weighted versions of the *Jevons* index used in formula [1].

From the formulae, a first suggestion for the interpretation of the PPP comes immediately: it is possible to *compute the contribution of each PPPs* of the BHs at the value of the overall  $PPP^G$ . The contribution depends on the difference in the level of average prices at each BH in the two countries and on the weight of the BH expenditure on the total expenditure (depending on expenditure shares in both countries).

Moreover, by examining formulae [2] and [3] we can get two different decompositions of each, following two different ways.

Starting with formula [2] and therefore with the index which compares area  $j$  relative to area  $l$ , by taking the natural logarithms and by adding and subtracting the hybrid product between the weights of the base area  $l$  and the log of average price of area  $j$ , we can state that:

$$\begin{aligned}\ln(PPP_{l,j}^G) &= \sum_{h=1}^{m_{jl}} w_h^j \ln(p_h^j) - \sum_{h=1}^{m_{jl}} w_h^l \ln(p_h^l) + \sum_{h=1}^{m_{jl}} w_h^l \ln(p_h^j) - \sum_{h=1}^{m_{jl}} w_h^j \ln(p_h^j) \\ &= \sum_{h=1}^{m_{jl}} w_h^l [\ln(p_h^j) - \ln(p_h^l)] + \sum_{h=1}^{m_{jl}} \ln p_h^j (w_h^j - w_h^l)\end{aligned}\quad [4]$$

Looking at the exponential function, decomposition [4] can be equivalently expressed as:

$$PPP_{l,j}^G = \frac{\prod_{h=1}^{m_{jl}} (p_h^j)^{w_h^j}}{\prod_{h=1}^{m_{jl}} (p_h^l)^{w_h^l}} = \prod_{h=1}^{m_{jl}} \left( \frac{p_h^j}{p_h^l} \right)^{w_h^l} \cdot \prod_{h=1}^{m_{jl}} (p_h^j)^{w_h^j - w_h^l} \quad [4bis]$$

The first product on the right hand side of [4bis] represents the *pure price effect* (*PPE*), corresponding to a bilateral PPP, calculated by using a weighted Jevons index with weights of area  $j$ .

The second product, which refers to the *weight effect* (*WE*), is related to the impact of the difference in expenditure structures, expressed by  $d_{h^{j,l}}^{j,l} = (w_h^j - w_h^l)$ .

We must emphasize that by using this multiplicative decomposition, as well as those illustrated later in the paper, the WE can be greater than 1, indicating a positive influence of the weighting system. If there are no differences in expenditure patterns, the WE is equal to 1 and, obviously, there is no influence of the weighting system.

Obviously, if we take the natural logarithms in [2] and add and subtract the hybrid product between the weights of area  $j$  and the log of average price of the base area  $l$  we can obtain a second decomposition, which after applying the exponential function, is expressed as:

$$PPP_{l,j}^G = \frac{\prod_{h=1}^{m_{jl}} (p_h^j)^{w_h^j}}{\prod_{h=1}^{m_{jl}} (p_h^l)^{w_h^l}} = \prod_{h=1}^{m_{jl}} \left( \frac{p_h^j}{p_h^l} \right)^{w_h^j} \cdot \prod_{h=1}^{m_{jl}} (p_h^l)^{w_h^j - w_h^l} \quad [5]$$

where the pure price effect, expressed as a weighted Jevons index using the weights of the base area  $l$ , is multiplied by the weight effect obtaining the PPP.

From a different perspective, we can take into account formula [3] and thus referring to the comparison between  $j$  and  $l$ , with  $j$  as base area. By taking the natural logarithms and by adding and subtracting the hybrid product between the weights of the base area  $j$  and the log of the average price of area  $l$  we can obtain a similar

decomposition, which after applying the exponential function is expressed as:

$$PPP_{j,l}^G = \frac{\prod_{h=1}^{m_{jl}} (p_h^l)^{w_h^l}}{\prod_{h=1}^{m_{jl}} (p_h^j)^{w_h^j}} = \prod_{h=1}^{m_{jl}} \left( \frac{p_h^l}{p_h^j} \right)^{w_h^j} \cdot \prod_{h=1}^{m_{jl}} (p_h^l)^{w_h^l - w_h^j} \quad [6]$$

where the pure price effect is now expressed by the weighted geometric mean of average price ratio between area  $l$  and  $j$  using the expenditure shares of the base country and the weight effect is related to the influence of the difference  $d_h^{l,j} = (w_h^l - w_h^j)$ .

On the other hand, by taking the natural logarithms of [3] if we add and subtract the hybrid product between the weights of the area  $l$  and the log of the average price of the base area  $j$  the decomposition, after using the exponential, becomes:

$$PPP_{j,l}^G = \frac{\prod_{h=1}^{m_{jl}} (p_h^l)^{w_h^l}}{\prod_{h=1}^{m_{jl}} (p_h^j)^{w_h^j}} = \prod_{h=1}^{m_{jl}} \left( \frac{p_h^l}{p_h^j} \right)^{w_h^l} \cdot \prod_{h=1}^{m_{jl}} (p_h^j)^{w_h^l - w_h^j} \quad [7]$$

where the Jevons index which identifies the pure price effects is calculated using the weights of area  $l$ .

As we can see, by using equations [4bis] and [5] the  $PPP^G$  are the same, although the values of the pure price effect and of the weight effect differ in the two decompositions. On the other hand, by applying decomposition [6] and [7] it is possible to obtain overall identical results differing however in the pure price and weight effects. It is important to emphasize that the results obtained from [4bis] and [5] are the reciprocal of those obtained from [7] and [6] respectively.

Besides, it is evident that when the decomposition [4bis] and [7] or [5] and [6] are used, the area reversal property is easily satisfied since the results obtained imply

$$\text{that } PPP_{l,j} = \frac{1}{PPP_{j,l}}, \quad PPE_{l,j} = \frac{1}{PPE_{j,l}} \quad \text{and} \quad WE_{l,j} = \frac{1}{WE_{j,l}}$$

On the other hand, the symmetric treatment of areas could be achieved for the pure price effect and for the weight effect by using a geometric mean of the indices obtained from [4bis] and [5] initially, and then by applying a geometric average to

the results from [6] and [7] and therefore obtaining Törnqvist indices<sup>5</sup>. Considering for example the PPE, we can state:

$${}^T PPE_{l,j} = \sqrt{\prod_{h=1}^{m_{jl}} \left( \frac{p_h^j}{p_h^l} \right)^{w_h^j} \cdot \prod_{h=1}^{m_{jl}} \left( \frac{p_h^j}{p_h^l} \right)^{w_h^l}}$$

$${}^T PPE_{j,l} = \sqrt{\prod_{h=1}^{m_{jl}} \left( \frac{p_h^l}{p_h^j} \right)^{w_h^j} \cdot \prod_{h=1}^{m_{jl}} \left( \frac{p_h^l}{p_h^j} \right)^{w_h^l}}$$

where  ${}^T PPE_{l,j} = \frac{1}{{}^T PPE_{j,l}}$

Moreover, a further question is: which are the factors that affect the two components PPE and WE?

Obviously, the different economic structure of the two countries involved in the comparison and the functioning of their markets of goods, services and labour, etc. affect the differences in prices and in the structure of the expenditures.

Actually, it is very difficult to deepen the study of these phenomena limiting to their effects on the PPE and WE components. However, from the statistical point of view we can further decompose these two components in order to understand how their value is formed.

This analysis can be carried out following the same approach presented in Biggeri, Brunetti and Laureti (2008). The rationale of this second decomposition can be applied to the expressions 4bis, 5, 6, 7, but here as an example we focus only on decomposition of [4bis].

By introducing the logarithm of the price ratios between the prices in country  $j$  and

$l$ ,  $\alpha_h = \ln \left( \frac{p_h^j}{p_h^l} \right)$ , and the difference between the corresponding expenditure weights,

$c_h^{l,j} = (w_h^j - w_h^l)$ , after some simple algebra, formula [4] is expressed as:

$$PPP_{l,j}^G = \exp \left( \bar{\alpha} \right) \exp \left( m_{ij} \times s_{\bar{\alpha}} \times s_{w_h^l} \times R_{w_h^l, \bar{\alpha}} \right) \cdot \exp \left( m_{ij} \times s_{\ln p^j} \times s_c \times R_{\ln p^j, c} \right) \quad [8]$$

where the PPP are expressed as the results of the multiplication of three terms: the

<sup>5</sup> As it can be easily seen, the indices obtained are proper Törnqvist indices since they use a simple average of the expenditure shares in the two areas as weights.

first is  $\exp(\bar{\alpha}) = \prod_{h=1}^m \left( \frac{p_h^l}{p_h^j} \right)$ , the unweighted geometric mean of the price ratios

between country  $j$  and  $l$ ;

the other two have exponents depending on the standard deviations of the distribution of the prices, of the weights and of the differences between the weights and on the correlation coefficient between them.

Particularly  $s_{w_h^l}$  the standard deviation of the weighing system of the base country  $l$ ,  $s_{\alpha}$ , the standard deviation of the logarithm of the price ratios,  $R_{w_h^l, \alpha}$  the linear correlation coefficient between the log price ratios and the weights of country  $l$  are the factors that explain the *pure price effect*.

It is worth noting that  $\exp(\bar{\alpha}) = \prod_{h=1}^m \left( \frac{p_h^l}{p_h^j} \right)$  is the unweighted geometric mean of

the price ratios between country  $j$  and  $l$ . This index is the Jevons index, which is the best estimator of a price index when the log - distribution of price changes is Normal. Therefore, the spatial index and the evaluation of the degree of the influence of the factors in which it is decomposed depends on the shape of the distribution of the ratio between the prices of the products in the baskets of the two countries. In this way the measure of the factors has also a possible economic interpretation. However, as the distribution of the ratios of the price levels in two countries may vary according to the choice of the reference country, the influence of the shape of the distribution on the spatial indices could cause problems and therefore further analyses may be required.

Similarly, the *weight effect* is influenced by  $s_{\ln p^j}$ , the standard deviations of prices of country  $j$ ,  $s_c$ , the standard deviation of the difference between the weights in the two countries compared  $c_h^{j,l} = (w_h^l - w_h^j)$  and  $R_{\ln p^j, c}$ , the linear correlation coefficient between the prices and the differences in the corresponding weights.

As already mentioned, it is possible to obtain similar decomposition forms considering country  $j$  as the reference country, which give two estimations of the effects, which differ slightly. In any case, the most important aspect is that we obtain statistical measures (standard deviation, central tendency and correlation coefficient)

concerning the variability of price changes and the consumers' behaviour in the two countries, which are interpretable both from a statistical and economic point of view.

The algebraic expressions reported in this part of the paper have not a very simple notation. However, as we have seen, the interpretation of the results, allowed by these more complex formulae, is very simple and understandable.

### **3. The interpretation of 2011 China PPPs and preliminary evaluation of the factors that affect them: the comparison with some important economies**

#### **3.1. The interpretation of China PPPs**

In order to highlight the usefulness of the tools and of the decomposition methods presented, we present now some preliminary analysis and approximate estimation referring to the PPPs for China and for their comparison with other economies. For the time being, we have conducted the analysis for the comparison with USA, India, Indonesia and Japan.

We start with the analysis and explanation of the values of PPPs GDP and its components for China, taken from the data disseminated by World Bank in the ICP web site. The data, published at category level, are reported in table 1 which include the values of PPPs (with US\$=1), PLIs (obtained by diving the PPPs for the Exchange Rate (ER) RMB-US\$ and the Expenditure Shares. Therefore, the values of PPPs and PLIs are directly compared with USA values.

The overall PPP for the GDP is 3,506 while the PLI is 0,543. This means that the general level of prices in China is lower of about 50% of the level of price in USA.

Table 1. ICP 2011. PPPs, PLIs and Expenditure Shares for China

Main Aggregates Categories	PPPs (US\$=1)	PLIs (US =1)*	Expenditure Shares
Individual consumption expenditure by households	3,696	0,572	34,4
- .01 Food and non-alcoholic beverages	5,155	0,798	8,1
- .02 Alcoholic beverages, tobacco and narcotics	5,564	0,861	0,9
- .03 Clothing and footwear	4,351	0,673	3,0
- .04 Housing, water, electricity, gas and other fuels	2,651	0,410	5,9
- .05 Furnishings, household equipment and maintenance	5,837	0,903	2,1

- .06 Health	2,026	0,314	6,4
- .07 Transport	4,619	0,715	2,5
- .08 Communication	2,392	0,370	1,5
- .09 Recreation and culture	3,179	0,492	2,3
- .10 Education	1,761	0,273	4,3
- .11 Restaurants and hotels	3,453	0,534	2,2
- .12 Miscellaneous goods and services	4,425	0,685	3,7
- .13 Net purchases abroad			0,0
Individual consumption expenditure by government	2,115	0,327	8,6
Actual Individual Consumption	3,493	0,541	42,9
Collective consumption expenditure by government	3,407	0,527	6,3
Gross fixed capital formation	3,769	0,583	45,6
- .01 Machinery and equipment	7,771	1,203	13,1
- .02 Construction	2,184	0,338	28,8
- .03 Other products			3,7
Change in inventories and acquisitions less disposals of valuables			2,7
Balance of exports and imports			2,6
Gross Domestic Product (GDP)	3,506	0,543	100.0

(\*) PLIs is obtained dividing PPPs by the exchange rate RMB-US\$ = 6, 461

To understand the use of PPP or PLI to deflate China GDP, instead of using a common currency as US\$, we can do the deflation using the ER and the PLI.

The computed GDP of the year 2011 in National Currency was for China 47,310 BillionRMBand for the USA 15,539 Billion US\$. Using the RMB-US\$ Exchange Rate (ER) the GDP value of China became 7,322 Billion US\$, but using the PPP became 13,494 Billion of US\$. It means that in terms of PPP, that is controlling the differences in price level between China and USA, the GDP of China is much higher in comparison of the value computed using the ER, and so in real terms the aggregate Chinese economy seems much close to the USA economy.

To understand better why this happened, we need, however, to take into account the different values of PPPs and PLIs for the different aggregates of the GDP component. As we can see from Table 1 the variability of the values is high, going

from a PPPs equal 7,771 for the aggregate Machinery and Equipment to a value of 2,184 for the aggregate Construction and 1,761 for the aggregate Education. It is evident that the aggregate of Machinery and equipment has a negative impact in the evaluation of the GDP in real terms (in fact the PLI is equal to 1,203; the only up to the level of prices in USA), while the aggregate of Construction - taking into account that the PLI is 0,338 - has a strong positive impact in the evaluation of GDP in real terms. To confirm how much the analysis of disaggregated data is important to interpret the overall aggregate (GDP) PPP, the values of the Chinese Expenditures for some aggregates are reported below in national currency (RMB), in US\$ and with PPPs deflation:

<b>Aggregates</b>	<b>Billion</b>	<b>RMB</b>	<b>US\$</b>	<b>in t. of PPPs</b>
GDP	47,310	7,321	13,494	
Food and non-alcoholic beverages	3,814	590	740	
Housing, water, electricity, gas	2,814	435	1,061	
Health	3,045	471	1,503	
Education	2,042	316	1,160	
Machinery and equipment	6,185	957	796	
Construction	13,610	2,106	6,203	

However, it is obvious from the presentation of the previous sections that to deepen the interpretation it is convenient to *compute the contribution of each PPPs* of the BHs to the value of the overall PPP. The contribution depends on the difference in the level of average prices at each BH in the two countries and on the weight of the BH expenditure on the total expenditure (depending on expenditure shares in both countries).

The third column of the table 1 gives an idea of the importance of each aggregate by showing the Expenditure Share for each aggregate.

Anyway, some computations highlight interesting results. First, in 2011 the most important contribution to the value of the overall China PPP was done by the Gross fixed Capital formation, about the 45% (about 24% by Machinery and Equipment; and 17% by Construction), while the Individual Consumption Expenditure by Household gave a contribution to the value of overall PPP only for about the 37%. Second, this particular situation depends obviously on the particular economic structure of the Chinese economy. For a comparison with other countries, consider



that the contribution to the PPPs of the main aggregates, Capital formation and Individual Consumption was respectively in 40% and 57% in India, 62% and 26% in Indonesia, and 65% and 21% in Japan.

### 3.2. Preliminary estimation of the factors affecting the differences in PPP (or in PLI) between China and other economies

In order to do the computations for the decomposition of the differences between the PLI of two countries it is necessary to have detailed data at the BH level at least, but actually a better interpretation of the estimated components requires detailed data at the product level.

To this end, we used detailed data of the 2011 ICP round at level of the Basic Heading<sup>6</sup>.

We carried out some first computations for China, India, Indonesia and Japan making binary comparisons with USA and between them, by using the decomposition methods defined in the formula [4bis] and formula [8] of section 2. For the time being, we do not consider other formulae changing the reference country, which lead to a lit bit different estimations of the the components. For this reason and for the lack of more detailed data the interpretation of the different factors that affect the differences between two PPPs are approximate.

Just to show the interest of the proposed computation, we report here the decomposition of the comparison between China and USA:

- <b>New computed PLI</b> (as Jevon Index)	<b>0,5685</b>
- <i>Exp</i> □ (unweighted geometric mean of the price ratios between country <i>j</i> (China) and <i>l</i> (USA))	-0,4764
- <b>Pure Price Effect (PPE)</b>	<b>0,4550</b>
- standard deviation of the weighing system of the base country <i>l</i> (USA)	0,0137
- the standard deviation of the logarithm of the price ratio	0,6595
- linear correlation coefficient between the log price ratios and the weights of the country <i>l</i> (USA)	-0,2224
- <b>Weight Effect (WE)</b>	<b>1,2494</b>
- standard deviations of prices of country <i>j</i> (China)	0,6595
- standard deviation of the difference between the weights in the two countries compared	0,0159
- linear correlation coefficient between the prices and the differences in the corresponding weights.	0,1378

<sup>6</sup>To do this research, we made an application to the Development Data Group of the World Bank for unpublished detailed data of the ICP 2011 round, as for Data Access and Statement of Confidentiality rules. We would like to thanks the staff members of the Data Group for their availability to give the explanations if necessary.

This rough estimations of the components of the value of the PLI between China and USA show that the level of prices (PPE) has small influence on the PLI value, reducing it, while the system of weight affect the PLI value, increasing it, quantifying its importance. As far as the statistical indicators, the computation shows that there are high variability of the logarithm of the price ratio; high variability of the prices at Basic Heading level in China; a small negative linear correlation between the log price ratios and the weights system of the USA and a small positive linear correlation between the prices and the differences in the corresponding weights. It seems therefore, as it is expected, that the variability of the level of the prices play an important role to determine the influence of the economic structure (weighting system) on the value of the general price level (PLI) of the Chinese economy.

The estimations made for the binary comparisons of PLI between the above-mentioned countries, have showed coherent results also if with different measures of the components. Obviously, the comparison of the Japan PLI with the USA PLI has given a higher price effect and a smaller weight effect of those showed by China, because the economic structure of Japan is similar to that of USA economy.

#### **4. Cross-province Price Level Differences in China: a project for computing sub-national PPPs**

Following the same approach of section 2, we can state that, in general and having all the necessary data, the numerator of formula [2], that is the global (national) average price level (or the PLI) can be written as a weighted average of sub-national (provincial) average price level. The aggregation from the sub-national (provincial) to the national PPP could be done both starting from the PPPs for each Basic Heading in each province and/or from the global PPPs for each province.

Unfortunately, in China, as in the most part of the countries all over the world (Biggeri, Laureti, Polidoro, 2015), official sub-national PPPs computed by the National Bureau of Statistics of China (NBS) according to the ICP approach are not available, therefore it is not possible to conduct the analysis to verify the contribution of each province to the national PPPs.

However, some approximate estimations, made by University researchers (Li, Zhang and Du Y., 2005; Biggeri, Ferrari and Zhao, 2015), show that in China there is evidence of a great variability of the level of prices across the provinces that surely affects with different importance and sign the value of the national PPPs.

From the work of Biggeri, Ferrari and Zhao (2015), if one takes Beijing as a

representative of national average, with the caution that such a rough simplification implies, one sees that there are provinces or municipal cities (as for example: Tianjing, Hebei, Shanxi, etc.) which show PPP over 1.000 and other provinces (for example: Shandong, Zhejiang, etc.) which show PPP below 1.000. Moreover, the PPPs for the basic heading show much more variability.

These results underlined that the official estimation of the sub-national PPPs in China is extremely important for the interpretation of the national PPP, for improving their estimation (as we will justify later on) and for the possible interventions on price policy for different products and services at the provincial level.

On the other hand, the need for constructing sub-national Purchasing Power Parities (PPPs) to carry out analyses on inter-area price level, living standards and real income comparisons in the context of poverty, rural-urban and regional (local) differences has been discussed since long time in literature (Biggeri and Laureti, 2015).

At this end, China Government and NBS have to invest on the computation of sub-national PPPs taking into account their policy goals to reduce disparities and the poverty. Chinese Institutions perhaps had already decided to do it, but as far as I know, no information have been disseminated on this. In any case, it is important to share the discussion on the characteristics of a possible project to be implemented for the construction of the sub-national PPPs clarifying objectives, activities, realization, including the timing and the subsequent steps and the necessary resources.

We have already explained, together with other researchers (Biggeri et al. 2010) what is preferable to do in this field. In reviewing international practice, the most promising approach is, for the time being, the *computation of PPPs for the aggregate of Household Consumptions*, by using the official data collected for computing the CPI and the CPD (Country Products Dummy) models to estimate PPPs.

As the main purposes of the CPIs and spatial PPPs are quite different, the price data available from the CPI sources are usually not in a suitable form for spatial price comparisons. The issues of *comparability* and *representativity* need to be considered carefully in making use of the CPI data. However, products collected for CPI may neither be comparable nor representative across different regions especially if the country, as China, is large and the provinces diverse in terms of economic development, climate and tastes and preferences of the consumers. The current ICP methodology is not designed to make efficient use of CPI price data if the items are not comparable within all the regions, and could be necessary to deepen this issue.

For the implementation of the project three major stages can be identified:

(i) data preparation: evaluation of the current survey design and sample design of the CPI surveys conducted in China to collect price data in urban and rural areas; examination of the currently available CPI data; list the price determining characteristics of the product with key identifiers and harmonization of the product description across regions (or sub-national area); evaluation of the nature and extent of overlaps of products between different regions; carrying out, if it is necessary, of a specific price data collection for some groups of products; identification of the data to be used for the system of weight to compute the PPPs.

(ii) aggregation at the Basic Heading level: identification of the most appropriate method among these already experimented for that in the ICP, such as various CPD and GEKS methods, but also the new implemented method CTPD (Country-Time-Product-Dummy) proposed by Y. Dikhanov and the MST (Minimum-Spanning-Tree) proposed by R. Hill.

(iii) aggregation above the Basic Heading level: computation of PPPs for various consumption aggregates choosing the most adequate among the current ICP methods; verification of the adequacy of the data on expenditure share weights available from CPI or from other sources.

Therefore the first and most important stage in constructing PPPs is the data preparation based on CPI data and other existing data at country level.

In order to identify the efficient way and methodology that allow us to effectively use the existing data, a lot of specific information on the available data and related database must be provided, depending also on the objective of the PPPs computation for the region-to-region and/or rural-urban comparisons.

The main information and technical requirements needed for the data preparation phase can be specified separately for CPI structure and price collection (in the urban and rural areas) and for the estimation of the expenditure weights, along with the data that would be needed.

#### *Data requirements for computing the Sub-National PPPs*

The main objective of the data preparation is to examine the extent to which the data used to compute the CPI could be used to compare price levels between areas within the country and thus organize this data for computing Sub-National PPPs.

To this end, it is necessary to have access both to the prices and expenditure weights databases. Information on data structure and data descriptors of the databases is required.

Firstly it is necessary to have the prices database at a very detailed level, which include elementary price data collected for each product in each outlet (different type of shops, etc). The detail of these information is very important also because the

choice of the methods to estimate the PPPs depend on, the characteristics of data available (average prices or individual price data and including or not quality characteristics).

If this kind of database with detailed data is not available, a less detailed database populated with the averages of the prices of each product, classified by kind of outlet and by enumeration area (municipality, etc.) where the data collection is carried out.

This process of “diagnostic” of price data should assure that products that appeared to be the same are actually identical in practice and their prices not unduly influenced by differences in key characteristics. Moreover an analysis of the consistency of variability of territorial area price levels and of the relationships between product prices across product groups should be carry out.

A matrix of prices by products and territorial area must be prepared and the classification of products must be as much as possible comparable with that used at level of the ICP Basic Heading.

Second, the matrix of expenditure weights at detailed level by products and territorial areas used for the compilation of CPIs is needed. Also in this case it is necessary to verify the correspondence of the system of weights both with the national accounts household data and the expenditure weights used for the aggregation above the BH level in the ICP exercise. It is worth nothing that the system of expenditure weights used for the CPI may be not split by territorial areas.

In order to produce the expenditure weights referring to each BH and to the various areas the estimation should be carry out using the data coming from Regional Accounts and Household Expenditure or Budget Survey (HES).

To this end the micro-database of both Regional Accounts and HES must be acquired.

At the end of these processes the matrix of prices will be, almost surely, not complete and a lot of cells will not contain data due to lack of identical or similar products in all the territorial areas. To compute the Sub-National PPPs at BH level it is necessary to impute the lacking data moving to the second stage of the project, thus identifying the most appropriate method among those already experimented in ICP, such as various CPD and GEKS methods, but also the new implemented method CTPD (Country-Time-Product-Dummy) proposed by Y. Dikhanov and the MST (Minimum-Spanning-Tree) proposed by R. Hill. The information on the characteristics of the price data fo

The third stage will be the aggregation above the Basic Heading level: computation of PPPs for various consumption aggregates choosing the most adequate among the current ICP methods.

If the project will be implemented, the computation of Sub-national PPPs by using CPIs data and CPD methods have many advantages:

(i) the availability, in China, as in many other country, of price data collected to compute CPIs, frequently on regular basis; this fact could allow to compute PPPs every year;

(ii) the possibility to make significant improvements in the definition and collection process of price data (revising, if it is necessary the survey design of urban and rural surveys on price, subject to various criticism in China) and in the methodology to compute the index numbers for the construction of CPIs which are not trusted enough by the economic operators;

(iii) the price data collection conducted in the same time for the computation of CPIs and Sub-national PPPs, should surely allow estimations of sub-national, national and international PPPs in a more consistent framework;

Moreover, if this kind of project have success it could be a reference project for other countries in which is important to compute the sub-national PPPs. If the computation of the sub-national PPPs will be carried out in in most of the countries participating to the ICP, there will be also the possibility to save resources, using CPI data, because the ICP surveys could reduce the collection of specific data in those countries and obtain the requested integration between PPP and CPI construction (Rao, 2001; Biggeri and Laureti, 2010).

## **5. Concluding Remarks**

To help the users in the interpretation of Purchasing Power Parities (PPPs), we have presented some tools to analyze them. Moreover we recalled some simple methods to obtain rough evaluations of the factors that affect the value of a PPP and the differences between two PPPs. The effects of the *level of prices* for the different products and services and the *system of weights* related to the share of expenditure concerning the different products and services have been illustrated and discussed.

The first set of computations highlight the usefulness of the tools and of the decomposition methods presented. In fact, it seems clear from the results obtained that the low value of the PLI in China in comparison with the USA economy depends essentially on its economic structure with a big expenditure share pertaining to the Capital formation and the low level of the PLI for the Construction aggregate.

Moreover, the approximate estimation of the value of the components of the PLI differences between China and USA confirms the importance of the structure effect (Weight Effect) and of the effect due at the high variability of the price in China and of the distribution of the price ratio between Chia and USA.

In any case it is not possible to deepen the effects on the overall China PLI due to

the prices level in the various Chinese provinces because there is no information on these. To face this issue a project proposal for the computation of sub-national PPPs in China has been presented.

The project proposal is useful to make significant improvements in the definition and collection of price data and in the methodology to compute the index numbers for the construction of CPIs and PPPs. Therefore, China Government and National Bureau of Statistics in China have to invest on the computation of sub-national PPPs also taking into account their policy goals to reduce disparities and the poverty.

We are available to co-operate with NBS considering the previous long and fruitful co-operation with the Institution. But, obviously, it should be important to do the exercise of computation of Sub- national PPPs under a umbrella framework of the ICP as discussed in a TAG meeting in Washington D.C. ( Biggeri et al., 2010),

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(ICP).

## Appendix

### ICP

Number of Categories, Groups, Classes and Basic Headings by Main Aggregates for which the PPPs are computed

Main Aggregates Categories	Categories	Groups	Classes	Basic Headings
11.00 Individual consumption expenditure by households	13	43	90	110
- .01 Food and non-alcoholic beverages		2	11	29
- .02 Alcoholic beverages, tobacco and		3	5	5
- .03 Clothing and footwear		2	5	5
- .04 Housing, water, electricity, gas and		4	7	7
- .05 Furnishings, household equipment and		6	12	13
- .06 Health		3	7	7
- .07 Transport		3	13	13
- .08 Communication		3	3	3
- .09 Recreation and culture		6	13	13
- .10 Education		1	1	1
- .11 Restaurants and hotels		2	2	2
- .12 Miscellaneous goods and services		7	10	10
- .13 Net purchases abroad		1	1	2
12.00 Individual consumption expenditure by NPISHs	1	1	1	1
13.00 Individual consumption expenditure by government	5	7	16	21
- .01 Housing		1	1	1
- .02 Health		2	7	12
- .03 Recreation and culture		1	1	1
- .04 Education		2	6	6
- .05 Social protection		1	1	1
14.00 Collective consumption expenditure by government	1	1	5	5
15.00 Gross fixed capital formation	3	6	11	12
- .01 Machinery and equipment		2	7	8
- .02 Construction		3	3	3
- .03 Other products		1	1	1
16.00 Change in inventories and acquisitions	2	2	2	4

less disposals of valuables				
-.01 Change of inventories		1	1	2
-.02 Acquisitions less disposals of valuables		1	1	2
18.00 Balance of exports and imports	1	1	1	2
GDP	26	61	126	155

Source: ICP-World Bank



# Call for Papers

## International Monetary Review

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