

COSTS AND BENEFITS OF RENMINBI INTERNATIONALIZATION

© 2014
By Luan Vu

A thesis presented in partial fulfillment of the requirements for completion
Of the Bachelor of Arts degree in International Studies at the
Croft Institute for International Studies
The University of Mississippi

University, Mississippi
May 2014

Approved:

Advisor: Dr. Gang Guo

Reader: Dr. Kees Gispen

Reader: Dr. Joshua Hendrickson

COSTS AND BENEFITS OF RENMINBI INTERNATIONALIZATION

Second Draft

CONTENTS

Introduction	3
Chapter 1: Currency Internationalization—an Overview	7
1.1. What is Currency Internationalization?.....	7
1.2. The Origin of Money: Transaction Costs Matter	9
1.3. Conditions for Currency Internationalization: the Role of Transaction Costs Minimization	11
1.4. History of the International Monetary System and the Rise of the Dollar: Role of Transaction Costs Confirmed	13
1.5. A Preview to Costs and Benefits of Currency Internationalization.....	22
1.5.1. Benefits	23
1.5.2. Costs	25
Chapter 2: Renminbi Internationalization: Motivation, Policies, and Progress	27
2.1. Motivation	27
2.2. Policies	36
2.3. Progress.....	43
Chapter 3: Costs and Benefits of Renminbi Internationalization.....	47
3.1. Benefit 1: Neutralize Exchange Rate Risks in International Trade	47
3.1.1. Importance and Characteristics of China’s Manufacturing Sector.....	48
3.1.2. Measuring Foreign Exchange Exposure of China’s Manufacturing Sector	55
3.1.3. Further Analysis of Foreign Exchange Exposure of China’s Manufacturing Sector and Benefit of Renminbi Internationalization.....	65
3.2. Benefit 2: Neutralize Exchange Rate Risks in International Finance.....	70
3.3. Cost: Complicate Monetary Policy	78
3.3.1. Renminbi Internationalization and China’s Monetary Policy	79
3.3.2. Renminbi Internationalization and China’s Trilemma	83
Conclusion: Renminbi Internationalization and Beijing’s Commitment to Reforms	90
References	94

LIST OF FIGURES AND TABLES

FIGURE 1 PANEL REGRESSION FOR DETERMINANTS OF CURRENCY SHARE.....	12
FIGURE 2 US AND UK EXPORTS, 1900-1957.....	15
FIGURE 3 AGGREGATE FOREIGN CURRENCY HOLDINGS IN 1929: A SNAPSHOT (16 COUNTRIES)	16
FIGURE 4 DOLLAR AND STERLING ACCEPTANCES 1927-1937 (MILLIONS OF £).....	18
FIGURE 5 GLOBAL FOREIGN PUBLIC DEBT, EXCLUDING COMMONWEALTH COUNTRIES—SELECTED CURRENCY SHARES	19
FIGURE 6 SHARE OF THE DOLLAR IN FOREIGN EXCHANGE RESERVE HOLDINGS, 1965-2010	21
FIGURE 7 CHINA’S FOREIGN EXCHANGE RESERVES AND HOLDINGS OF US PUBLIC AND PRIVATE SECURITIES, 2002-2012, IN BILLIONS OF \$.....	27
FIGURE 8 QUOTAS AWARDED UNDER QUALIFIED FOREIGN INSTITUTIONAL INVESTOR, RENMINBI QUALIFIED INSTITUTIONAL INVESTOR, AND QUALIFIED DOMESTIC INSTITUTIONAL INVESTOR PROGRAMS, 2003-2013	39
FIGURE 9 OFFSHORE RENMINBI USAGE	43
FIGURE 10 RENMINBI DEPOSITS: HONG KONG	44
FIGURE 11 DIM SUM BOND MARKET AND ONSHORE RENMINBI BOND MARKET	45
FIGURE 12 CHINA INTEGRATING INTO ASIAN TRADING NETWORK	50
FIGURE 13 PRODUCTIVITY LEVEL OF EXPORTS AND GDP PER CAPITA	52
FIGURE 14 CURRENCY INVOICING OF JAPANESE EXPORTS TO ASIA	54
FIGURE 15 CHINESE RMB EXCHANGE TRADE-WEIGHTED INDEX, 2002-2012	56
FIGURE 16 DOLLAR EXCHANGE-WEIGHTED INDEX, 2002-2014	57
FIGURE 17 EXPORT PRICE IN USD AND RMB (LEFT) AND NOMINAL EFFECTIVE EXCHANGE RATE AND PRODUCER PRICE INDEX (RIGHT)	61
FIGURE 18 TRENDS IN CHINA’S MANUFACTURING SECTOR AND FOREIGN EXCHANGE EXPOSURE OF CHINESE FIRMS	65
FIGURE 19 RATIO OF FINAL EXPORTS TO IMPORTED COMPONENTS (LEFT) AND SHIFTS IN COMPOSITION OF EXPORTS (RIGHT)	66
FIGURE 20 VALUE OF CHINA’S PROCESSING AND ASSEMBLY EXPORTS AND IMPORTS, 1993-2011 (LEFT) AND VALUE OF CHINA’S PROCESSING WITH IMPORTED MATERIAL EXPORTS AND IMPORTS, 1993-2011 (RIGHT)	68
FIGURE 21 CUMULATED CURRENT ACCOUNT AND NET FOREIGN ASSET POSITION, BRAZIL, RUSSIA, INDIA, AND CHINA, 1970-2010. PERCENT OF GDP.....	73
FIGURE 22 PROJECTIONS FOR CHINA’S INTERNATIONAL INVESTMENT POSITION IF FINANCIAL ACCOUNT IS FULLY LIBERALIZED BY 2020.....	76
FIGURE 23 MONETARY POLICY INSTRUMENTS IN CHINA, 1994-2008	79
FIGURE 24 THREE MONETARY TRANSMISSION MECHANISMS.....	80
FIGURE 25 THE TRILEMMA AND THE EVOLUTION OF TRILEMMA INDEXES FOR EMERGING MARKET COUNTRIES	83
FIGURE 26 OFFSHORE RENMINBI USAGE, Q4 2012-Q3 2013.....	84
FIGURE 27 RELATIONSHIP BETWEEN ONSHORE AND OFFSHORE RENMINBI EXCHANGE RATE DIFFERENTIAL AND RATIO OF IMPORTS AND EXPORTS	85
FIGURE 28 TRILEMMA INDEXES AND INTERNATIONAL RESERVES HOLDING FOR EMERGING ASIAN ECONOMIES AND CHINA..	86
TABLE 1 ROLES OF AN INTERNATIONAL CURRENCY	7
TABLE 2 HOW SECURITIES ARE ISSUED	8
TABLE 3 EXPANSION OF THE RMB TRADE SETTLEMENT PILOT PROGRAM.....	37
TABLE 4 LIST OF PEOPLE’S BANK OF CHINA’S BILATERAL SWAP AGREEMENT PARTNER COUNTRIES.....	40
TABLE 5 TOP 10 MANUFACTURING COUNTRIES	48
TABLE 6 BREAKDOWN OF CHINA’S EXPORTS BY TRADING PARTNERS AND CUSTOMS REGIME.....	51
TABLE 7 SHARE OF CURRENCY FOR EXPORT FROM JAPAN TO ASIA	54
TABLE 8 INDUSTRY LEVEL EXCHANGE RATE EXPOSURE.....	58
TABLE 9 DESCRIPTIVE STATISTICS FOR PANEL DATA, EXCHANGE RATE PASS-THROUGH FOR MANUFACTURING AND NON-MANUFACTURING.....	63
TABLE 10 ONE-DIGIT STANDARD INTERNATIONAL TRADE CLASSIFICATION	64

“The desirable goal of reforming the international monetary system, therefore, is to create an international reserve currency that is disconnected from individual nations and is able to remain stable in the long run, thus removing the inherent deficiencies caused by using credit-based national currencies.” Zhou Xiaochuan, March 2009

“It is perhaps a good time for the befuddled world to start considering building a de-Americanized world.” Xinhua, October 2013

INTRODUCTION

Taken by itself, the Xinhua quote could be just about anything related to the delicate relationship between the US and the People’s Republic of China (henceforth “China”). The twentieth and early twenty-first centuries have witnessed a world where the US makes the rules. In this context, China rises. It is only natural that friction will arise between the two countries, fueling all kinds of opinions about how the Sino-American tango will unfold. The difficult nature of the relationship is only too clear from the tone of the quote. It suggests a sense of frustration with the status quo and a desire for change, citing justness and common global experience as rationale.

What exactly is the quote about? The third quarter of the year 2013 witnessed a showdown between American legislators on fiscal matters of the US. The international dimension of this paralysis began to play out as it became increasingly possible that the US would default on its debts. US sovereign debt, in the form of Treasury bills, has been a favorite asset among foreigners due to its almost risk-free nature: everyone believes the US is so strong it can never default. In those early October days, the US only managed to avert default in the very last hours. China as the US’s largest creditor nation had every reason to vent its frustration. The title of the Xinhua commentary accordingly reads “U.S. fiscal failure warrants a de-Americanized world.”

More broadly, China’s concerns have to do with US global monetary and financial leadership. Architect of the Bretton Woods system, issuer of the US dollar and home to Wall

Street, the US is at the apex of the international monetary and financial order. With leadership comes responsibility. On this account, the past few years have witnessed strains on the US's part, particularly the 2008 global financial crisis. If anything, the crisis has sown doubts among countries about America's qualifications to lead.

In the post-2008 world, Governor Zhou Xiaochuan of the People's Bank of China—China's central bank—calls for a new international currency, in reference to the US dollar's current status as the world currency. Advancing the Special Drawing Rights as one such candidate, China's intention nonetheless can be interpreted as “anything but the US dollar.” It is currently unclear how the Special Drawing Rights can become an international currency any time soon. It is much clearer how the renminbi, China's currency, has the potential to play a larger role in the international monetary system.

The internationalization of the renminbi, or China's effort to transform the renminbi into an international currency, is believed to be China's policy to fix the international monetary system. The logic is simple: if the US and its currency the US dollar cannot be relied on, then China and the renminbi should emerge as an alternative. The emergence of China as a global power warrants a currency that can best serve China's interests and assist the expansion of the Chinese economy.

This thesis aims to investigate renminbi internationalization, a contemporary phenomenon that could potentially change the world. The world in which the renminbi shoulders a considerable responsibility will differ from the world in which China has less influence, or equivalently the world in which the US exercises the most power in the monetary realm. The objective of this project is to assess the desirability of renminbi internationalization to China as a

deliberate policy of the Chinese government. To what extent would renminbi internationalization benefit China, and at what cost? What is the significance? This research shall proceed forward with the hope to gain an understanding of the modern Chinese economy in its relations to the global economy.

Chapter 1 constructs a framework for understanding currency internationalization. Currency internationalization revolves around the concept of transaction costs. Both economic theory and history make clear that the least costly currencies to transact in become international currencies. That currency internationalization can be successfully assisted by policy is arguably possible, but the respective currency must be supported by strong economic fundamentals in the first place and hence achieve the level of minimal transaction costs sufficient for international usage. The discussion of renminbi internationalization follows in chapter 2. On the surface, renminbi internationalization addresses the immediate negative consequences of the global financial crisis on China that relate to the status of the US dollar as the global currency. But an implicit motivation seems to also exist, aiming at driving forward internal economic reforms. Chapter 3 elaborates on the benefits and costs an internationalized renminbi could bring to China. The foreign trade sector of China, which is increasingly integrated into the Asian production network focusing on processing trade, has arrived at a point where increasing foreign exchange exposure suggests the relevance of being able to conduct trade in the renminbi to Chinese firms. International finance is another area where having an internationalized currency can be beneficial for China, and the trend towards deeper international finance integration justifies this gain. However, the lack of strong economic fundamentals may limit the benefits of renminbi internationalization, unless reforms take place to correct for the weaknesses of China's monetary and financial regime. But reforms themselves challenge existing economic arrangements, and

hence the potential costs of renminbi internationalization. Building on these findings and discussing recent events, the conclusion makes the case that renminbi internationalization gives monetary and financial reforms in China an additional source of impetus. The year 2014 will prove to be decisive to the Chinese economy, in which context reforms assume a new sense of urgency, hence the significance of renminbi internationalization as a stimulus of the whole process.

CHAPTER 1: CURRENCY INTERNATIONALIZATION—AN OVERVIEW

Currency internationalization revolves around the concept of minimum transaction costs. From the theory of origin of money to the conditions of international currencies, transaction costs figure as the most fundamental reason behind the attractiveness of a currency to the international community, and hence its successful internationalization. Indeed, the history of the international monetary system, especially the documentation of the rise of the US dollar as the international currency, confirms the salience of transaction costs. This chapter begins by looking at the definition of international currency.

1.1. WHAT IS CURRENCY INTERNATIONALIZATION?

One can view currency internationalization as the promotion of the international use of a currency through active policy (Cheung, Ma, and McCauley 2010, 45). An international currency is used outside of the issuing country between residents and non-residents or between non-residents (Tavlas 1997). Any entity that wishes to buy or sell an international currency shall be allowed to do so by the government of the issuing country (Kenen 2009, 3). The widespread use of the dollar in the world economy points to an undisputed example of an international currency. First, the dollar is used as the *de facto* or *de jure* currency of some countries, either by providing a reference exchange rate or completely substituting the domestic currency. Second, the US dollar accounts for the bulk of many countries' foreign exchange reserves. Third, it is widely used as a transaction currency in foreign exchange and trade between countries other than the US. Fourth, a great many international debts and loans are quoted in the US dollar. The US dollar dominates all other currencies in these accounts (Goldberg 2011).

TABLE 1 ROLES OF AN INTERNATIONAL CURRENCY

Source: Papaioannou and Portes 2008a

Functions of money	Governments	Private actors
Store of value	International reserves	Investment currency (incl. currency substitution)
Medium of exchange	Vehicle currency for foreign exchange intervention	Invoicing (vehicle) currency for trade in goods and assets.
Unit of account	Anchor for currency peg	Quotation currency for trade in goods and assets

An international currency plays many roles, as identified in an often cited method of categorization pioneered by Benjamin Cohen in 1971. Every currency performs the three functions of money, namely medium of exchange, unit of account, and store of value. The use of a currency is further distinguished between the public and private sector. Governments in other countries may use international currencies in domestic policy. A currency peg results when one such country fixes the value of its currency to an international currency. Currency pegs necessarily imply that the international currency be the bulk of that country's foreign exchange reserves, since foreign exchange intervention using the international currency to maintain the fixed exchange rate is necessary. Hence, the roles of an international currency overlap considerably with each other.

TABLE 2 HOW SECURITIES ARE ISSUED

Source: Kenen 2009, 2

(1) Issued by and to domestic entities and traded domestically and internationally	(2) Issued by domestic entities to foreign entities and traded internationally
(3) Issued by and to foreign entities and traded internationally	(4) Issued domestically by foreign entities and traded domestically

NB: The issues listed in panels (1) and (4) are denominated in the currency of the country in which they are issued. Those listed in panels (2) and (3) may be issued in the borrower's currency if it is a widely traded currency but are typically issued in a major international currency such as the dollar or euro.

International transactions, including international trade and finance, also make use of international currencies. When trade takes place between two countries, they must choose a currency to invoice the transaction. If both countries settle on a third party currency, the

transaction is made using a vehicle currency. The issuance of international financial instruments also necessitates the choice of a quotation currency plus the location of issuance. Cells (2) and (3) exemplify the use of a mature international currency.

The concept of international currency has roots in the concept of money. Money can be defined as a “commonly accepted medium of exchange” (White 1999, 1). People use money in transactions because everybody else does so (White 1999, 2). Indirect exchange, when people exchange some goods for money to obtain other goods, gave rise to money (White 1999, 4). An international currency, therefore, can also be viewed as a medium of exchange accepted in places outside of the issuing country.

1.2. THE ORIGIN OF MONEY: TRANSACTION COSTS MATTER

Why do people use money, and why do countries use international currencies? The theory of the origin of money, put forward in 1892 by Carl Menger, makes clear that the use of money stems from consideration for cost minimization in transactions. The first money must have been the most popular good used as a medium of exchange in indirect trade, which eliminates the necessity of “coincidence of wants” under direct trade (White 1999, 4). As time goes by, people realize that a certain good is accepted by more people than other goods. The good in question is said to have the highest “degree of marketability” or, in other words, “a good that is easier (less costly) to sell for a good price” (White 1999, 5). The use of this commodity money can reduce transaction costs, which makes it money.

Eventually gold and silver became the ultimate commodity money and the first macro monetary arrangement, due to their superior uniformity, durability, divisibility and fusibility, and portability (White 1999, 9-10). The invention of minting improved the monetary usefulness of gold and silver by providing authentication service (White 1999, 11). At the same time,

monetary institutions sprang into being, a process also driven by transaction costs minimization. At one point, the circulation of various monies gave rise to money-changers where people could exchange monies, which evolved to deposit-takers, or the first banks, given that they already held a large variety of monies (White 1999, 11). To further economize on the use of money, banks started to issue banknotes, which are claims to the money good residing in the issuing bank's vault (White 1999, 12). The operations of banks led to the birth of a central bank. Banks as a group had more business by accepting and exchanging each other's banknotes, an activity that took place at a clearinghouse association, the forerunner of a central bank (White 1999, 14, 18).

So far market forces have determined what good will become a commodity money, which resides in bank vaults and only circulates in the economy in the form of banknotes. However, the leap from commodity money to fiat money, a medium of exchange that has no intrinsic value, no backing by any real economic resources, and hence no convertibility—the ability of holders of the money to exchange it for the physical good that backs its issuance—requires a different logic. Simply, a bank risks destroying the meaning of money and losing business if it tells customers that the very banknotes that they hold for convenience no longer have any claims to valuable physical good. But modern economies operate with fiat monies; everybody knows money is just paper. Since no private banks have the incentive to issue fiat money, as history has unfolded a central government would first grant monopoly in printing banknotes to a central institution, perhaps the most powerful clearinghouse association or bank, and then, by passing a decree, suspend convertibility (White 1999, 19).

The creation of money and monetary institutions stems from the desire to minimize transaction costs. In this logic, an international currency arises because it makes international

transactions less costly. Furthermore, the artificial birth of fiat money suggests that under normal circumstances convertibility is a very important reason why people use money. The conditions of an international currency elucidate the first point, while the history of the international monetary system relates to the second point. Both points reiterate the notion of transaction costs minimization as the driver behind successful currency internationalization.

1.3. CONDITIONS FOR CURRENCY INTERNATIONALIZATION: THE ROLE OF TRANSACTION COSTS MINIMIZATION

The economic explanation behind the international use of currencies expands on the idea of transaction costs minimization. International transactions should theoretically take place using the medium of exchange that will incur the minimal transaction costs. In other words, “Agents select as money the assets that entail the smallest difference between the price at which they can be acquired and the price at which they are resold” (Flandreau and Jobst 2009, 644). The idea reminds one of Menger’s theory of the origin of money.

In this manner, the significance of the conditions for currency internationalization fundamentally hinges on the idea of transaction costs minimization. A currency may be successfully internationalized if it possesses the characteristics that make it a lowest-cost option. Since an international currency can play multiple roles, empirical tests usually specify upfront for which role they attempt to measure the theoretical validity of conditions for currency internationalization.

The literature has uniformly identified a number of general conditions for currency internationalization, namely size of the home economy, level of development of financial markets, and users’ confidence in the value of the currency (Chinn and Frankel 2005; Dobson and Mason 2009). The first two conditions can be grouped under a size factor, and the last

condition under a stability factor. If a country is a large economy that makes lots of transactions with the rest of the world, other countries have the incentive to use the currency of the large country. If a currency is a stable store of value relative to other currencies, foreigners will have the incentive to hold it. Furthermore, the more people accept a currency, the more popular the currency becomes, resulting in a type of network externalities and inertia force that resist erosion of international currency incumbency (Chinn and Frankel 2005, 300-301).

FIGURE 1 PANEL REGRESSION FOR DETERMINANTS OF CURRENCY SHARE

Source: Frankel 2011, 10

Dependent variable: logit of currency shares in reserve holdings		
Pre-euro sample (1973–98)		
	Coefficient estimate	Standard Error
Constant	-0.65	[0.15]
GDP ratio	2.77	[0.64]
Inflation differential	-2.64	[1.16]
Exchange rate variability	-0.98	[0.57]
FX turnover ratio	0.45	[0.29]
Lag of logit of shares	0.85	[0.03]

N	=	182	Adjusted	R2	=	0.97	Estimated	using	OLS.
---	---	-----	----------	----	---	------	-----------	-------	------

Notes: Dependent variable is logit, i.e., $\log(\text{share}/(1-\text{share}))$. All variables are in decimal form. GDP is at market rates. Figures in bold face are significant at the 10 percent level.

Economists have attempted to test the significance of conditions for currency internationalization (Chinn and Frankel 2005; Chen and Peng 2009). The dependent variable is currency share in countries' foreign exchange reserves, since data for the other dimensions of international currencies as recognized in Table 1 is relatively scarce (Chinn and Frankel 2005, 288). Figure 1 shows a simplified panel regression from the first study, which examines the likelihood of the euro surpassing the dollar as the world's leading reserve currency, as reported in a related paper (Frankel 2011, 10). All independent variables report expected signs. The effect

of GDP ratio, the chosen measurement of size of the economy, is statistically significant and large, while that of inflation differential is statistically significant, negative, and large. Foreign exchange turnover ratio, the chosen measurement for financial market development, is insignificant. The significance of lagged reserves factor, which represents the pace at which reserves' currency share changes, confirms the validity of network externalities and inertia.

Applying the methodology of Chinn and Frankel 2005 to China, two economists carried out a similar test for the renminbi (Cheng and Peng 2009). They also find significant, large, anticipated direction for size of the home economy, but inflation and exchange rate volatility as a measurement of confidence in value of the currency is insignificant, which may reflect the short sample period (Chen and Peng 2009, 12). Once more, financial market development is insignificant, probably demonstrating the difficulty in finding a good measurement (Chen and Peng 2009, 12; Chinn and Frankel 2005, 299). Lagged reserves factor is significant.

By testing the validity of the conditions for currency internationalization, the studies lend evidence of the significance of transaction costs for money in general and international currencies in particular. Size and stability entail cost reduction and induce usage of the respective currency, an observation confirmed by the history of the international monetary system and the rise and fall of international currencies.

1.4. HISTORY OF THE INTERNATIONAL MONETARY SYSTEM AND THE RISE OF THE DOLLAR: ROLE OF TRANSACTION COSTS CONFIRMED

Previous transitions from old to new periods of the international monetary system confirm the significance of transaction costs to determining international currency status. In addition, history hints at the relevance of precipitousness and policy to the process of currencies

becoming international. The international monetary system refers to “monetary and exchange rate arrangements that countries adopt—a set of institutions” (Krugman and Obstfeld 2006, 486).

A key structural issue of the international monetary system is convertibility, the ability of currency holders to exchange money for the commodity that backs its issuance. For example, the gold standard presupposes the convertibility of different currencies for gold. Without convertibility, the system would have been meaningless as nobody would even use currency in the first place.

Accordingly, the chronology of the international monetary system can be divided into different periods based on the presence or absence of convertibility. A basic segmentation splits this history into three periods, namely the classical gold standard, the Bretton Woods era, and the floating era (Eichengreen 1996; Chinn and Frankel 2005, 292-296). During the Bretton Woods era, the only truly convertible currency was the US dollar. In contrast, the current international monetary system consists of fiat currencies and lacks convertibility.

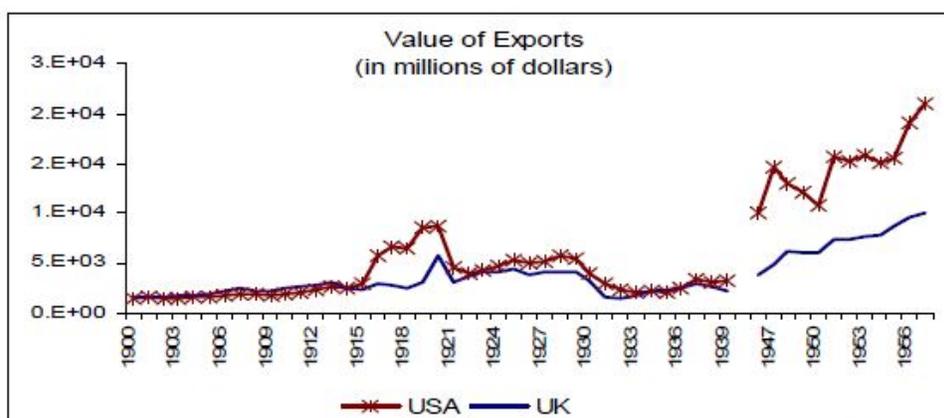
Different periods of the international monetary system seem to sponsor different dominant international currencies. The British pound sterling is associated with the gold standard, as the US dollar is with the Bretton Woods and post-Bretton Woods era. Due to this coupling of international currency and monetary system, China’s wish to reform the international monetary system also alludes to a desire for changes to the role currently played by the dollar.

According to the account of the origin of money, gold and silver emerged as the ultimate commodity money. No uniform international monetary system existed as countries were either on a gold, silver, or bimetallic standard (Eichengreen 1996, 9). The gold standard, the first international monetary system, can trace its genesis to the year 1717 when Sir Isaac Newton,

master of the mint, set too low a gold price of silver, driving silver coins out of circulation and put an end to bimetallism in Britain (Eichengreen 1996, 12). Britain's status as the world power, not only militarily but also commercially and financially, induced other countries to adopt the gold standard and the pound sterling as the currency for international trade and finance. By the end of the nineteenth century, estimates put the pound sterling as responsible for 60% of trade invoicing and two-thirds of total world foreign exchange reserves (Frankel 2011, 2). Hence, the birth of the gold standard as the first truly international monetary system had roots in the action of a single man and coincided with the rise of Britain.

FIGURE 2 US AND UK EXPORTS, 1900-1957

Source: Frankel 2011, 17



Sources: UK Export Data: Department of Trade and Industry, UK; UK exchange rate (1946–1970): Global Financial Data; U.S. Export Data: *Historical Statistics of the United States, Colonial Times To 1970*, U.S. Census Bureau.

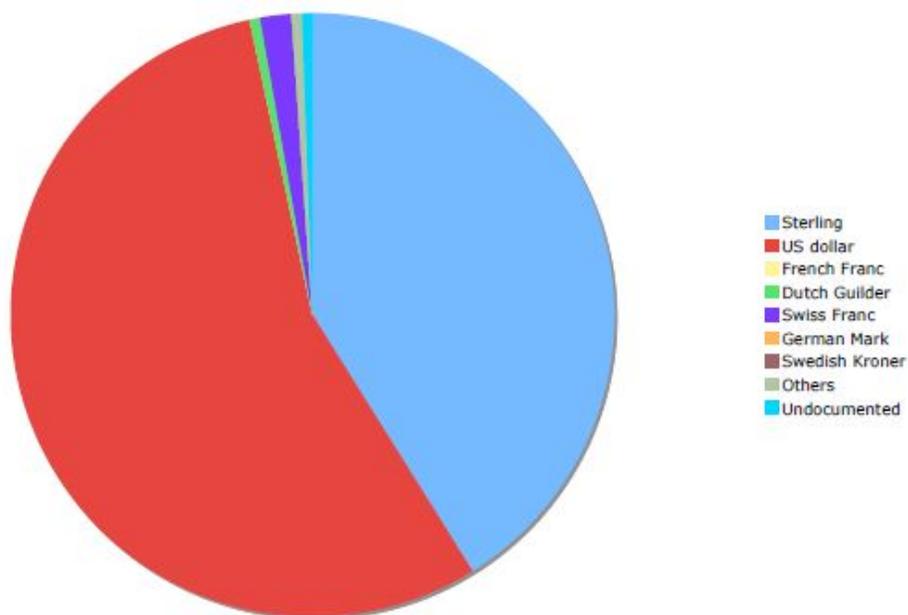
At the dawn of the twentieth century, important developments were taking place that reversed the relative position between Britain and the US. The US had surpassed Britain in terms of national output since 1872 and was competing closely with Britain in international trade (Frankel 2011, 2). Between the two world wars (1918-1939), the US was the only country to consistently maintain convertibility and remain on the gold standard (Chinn and Frankel 2005, 293). To fight World War I, Britain suspended convertibility to stem gold outflows and borrowed

more and more from the US, turning the latter from a net debtor to a net creditor (Eichengreen 1996, 46; Chinn and Frankel 2005, 292). Britain attempted to return to gold in 1925, only to exit for good in 1931 due to increasing gold outflows (Eichengreen 1996, 85). Meanwhile, the global network of British banks was shrinking (Eichengreen 2011, 26).

On US soil, under the pretext of duck hunting trips on Jekyll Island, a group of six men drafted the Aldrich Plan, which resulted in the creation of the Federal Reserve—the US's first central bank—in 1913 (Eichengreen 2011, 22). The Fed was not born to address the international role of the dollar, but rather to improve the resilience of the domestic financial institutions facing crises (Frankel 2011, 3). However, some individuals of the group did desire to see a more internationally active dollar that would help bring in profits, and hence provisions attached to the Federal Reserve Act that allowed for expansion of American banks abroad (Frankel 2011, 3; Eichengreen 2011, 26).

FIGURE 3 AGGREGATE FOREIGN CURRENCY HOLDINGS IN 1929: A SNAPSHOT (16 COUNTRIES)

Source: Eichengreen and Flandreau 2008, 12



Source: See Text.

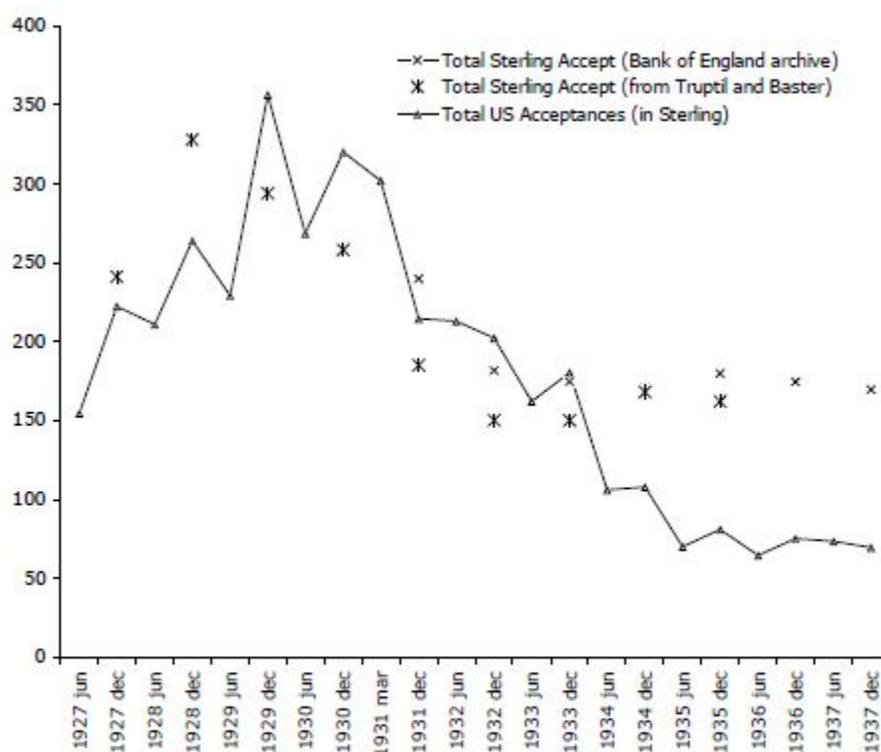
The declining state of British power and permissive institutional developments in the US presaged the internationalization of the dollar. US firms were displeased with having to rely on the British global banking network for trade credit, as the process was cumbersome and costly (Eichengreen 2011, 15-16). The discussion regarding the rise of the US dollar often asks when the dollar replaced the pound sterling as the dominant international currency. Two competing views exist: the old view puts the date at after World War II, while the “new view” asserts that the dollar overtook the pound sterling in the 1920s (Frankel 2011, 3). A series of papers on the rise of the US dollar substantiate the latter view (Eichengreen and Flandreau 2008; Eichengreen and Flandreau 2010; Eichengreen 2011; Chitu, Eichengreen and Mehl 2012). Figure 3 demonstrates that in 1929 the dollar overtook the sterling as the international reserves currency. Other currencies trailed far behind the dollar and the pound sterling.

Internationalization of the dollar was able to press forward on both international trade and finance fronts. To increase market liquidity and assist the international expansion of American

banks' trade credit business, the Fed actively bought trade acceptances from them—a popular form of trade credit (Eichengreen 2011, 28). At the same time, credit scarcity as a result of World War I forced Europe to look to the US for finance, and to satisfy that demand American investment banks underwrote bonds denominated in the dollar on a large scale to attract American bond buyers (Eichengreen 2011, 31). It was only a matter of time before the dollar displaced the sterling as the leading international currency.

FIGURE 4 DOLLAR AND STERLING ACCEPTANCES 1927-1937 (MILLIONS OF £)

Source: Eichengreen and Flandreau 2010, 14



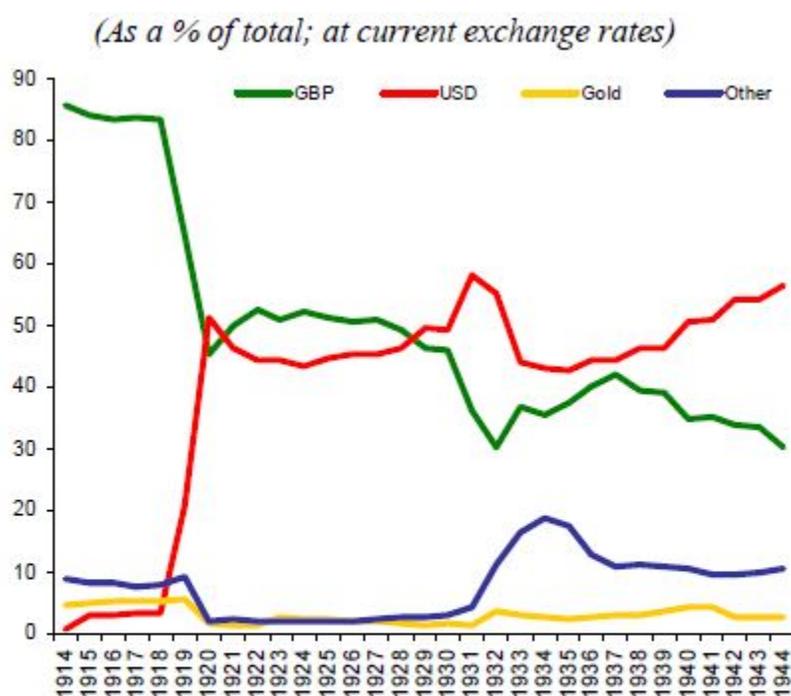
Source: Authors' estimates based on documents described in the text.

By 1929, more trade acceptances were denominated in the dollar than sterling, and the dollar continued to lead until the beginning of 1934. In 1933, the US suspended convertibility (Eichengreen 1996, 89). From 1934 till the end of the surveyed period, the dollar trailed behind

sterling by a difference slightly larger than to that prior to 1929, reflecting the severity of the Great Depression. What remains striking is that the dollar overtook sterling as the leading currency for international trade in less than two decades after the Americans became serious about contesting Britain's monopoly on trade credit. Furthermore, the decisive role of government intervention in currency internationalization clearly shows: as soon as the Fed stopped supporting the trade acceptances market, the amount of acceptances denominated in US dollar dropped to only a seventh of its peak (Eichengreen and Flandreau 2010, 14).

FIGURE 5 GLOBAL FOREIGN PUBLIC DEBT, EXCLUDING COMMONWEALTH COUNTRIES—SELECTED CURRENCY SHARES

Source: Chitu, Eichengreen, and Mehl 2012, 28



Notes: Authors' own estimates based on United Nations (1948) as well as the *GFD* and *Measuring Worth* databases on exchange rates. The figure shows the evolution over time of the shares of sterling, US dollar, gold and other currencies in the global stock of foreign public debt (in % and at current exchange rates) based on a restricted sample of 28 countries, i.e. the full sample minus our five Commonwealth countries (India, Australia, Canada, New Zealand and South Africa).

For most of World War I, the pound sterling still dominated over the dollar in international finance. Between 1918 and 1920, however, the dollar abruptly increased its role in international financing, shooting upwards to 50% and slightly above the sterling by the end of 1920. The pound sterling made a small comeback in the next few years, until the late 1920s when the dollar overtook the pound once and for all. If the analysis includes Commonwealth countries, after 1920 sterling would maintain a 20-40% difference lead over the dollar throughout all the surveyed years, demonstrating that Commonwealth countries held on to the pound sterling out of loyalty to Britain even as the currency was losing out against the dollar elsewhere (Chitu, Eichengreen, and Mehl 2012, 12).

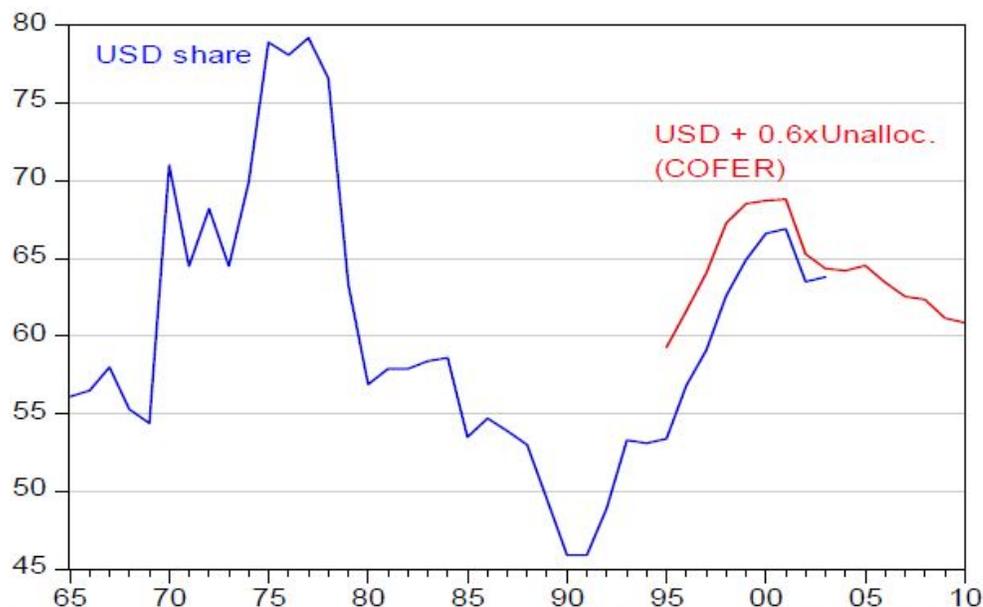
In any event, by the end of World War II the dollar had positioned itself to be the number one international currency. Under the Bretton Woods arrangement, the dollar was the only currency directly convertible for gold while other currencies maintained a peg to the dollar. To help Europe recover, the Marshall Plan was implemented, and European countries began to earn dollars by exporting to the US. The US essentially became the provider of international liquidity, and the dollar reigned as the international currency: each dollar under US current account deficit became a dollar in foreigner's hand (Eichengreen 1996, 98; Chinn and Frankel 2005, 294).

This new status also exposed the US to a new challenge. The US was providing liquidity to the international monetary system, but due to limited gold reserves, it was a matter of time before people started to doubt about the US's credibility. The US was faced with the Triffin Dilemma (Chinn and Frankel 2005, 294; Eichengreen 1996, 116). US monetary liabilities exceeded US gold reserves in 1960 (Eichengreen 2011, 50). In August 1973, the US suspended gold convertibility once and for all, in effect putting an end to the Bretton Woods system

(Eichengreen 1996, 133). The share of the dollar in world foreign exchange reserves has been on the decline since then.

FIGURE 6 SHARE OF THE DOLLAR IN FOREIGN EXCHANGE RESERVE HOLDINGS, 1965-2010

Source: Frankel 2011, 6



Source: Menzie Chinn (The first series is a spliced version of updated 2003 data obtained July 2004, for 1980 onward, to an unpublished data set for 1965–2001. The later series, data from the IMF's Currency Composition of Official Foreign Exchange Reserves, assigns a share of the unallocated residual to U.S. dollars.)

If history is any guide, size of the home economy and stability of currency's value are important determinants of currency internationalization, pointing to the significance of transaction costs minimization to the use of money. On one hand, the fortune of the pound and dollar declined and ascended with the might of the British and US economies. On the other hand, when Britain was having trouble maintaining convertibility, the international use of sterling shrank, just as the share of dollar in world reserves decreased starting from 1977. This may stem from the granted fact that convertibility was a government's guarantee of its currency's worth.

In addition, currency internationalization could be accelerated by precipitous events and active policy making. The two world wars, which significantly altered the relative power

between Britain and the US, took place out of no economic intention. The support the Fed lent to American trade acceptances business was helpful. These insights carry weight to the present, given that the 2008 financial crisis took place on US soil and that China seems to intend on pushing renminbi internationalization.

1.5. A PREVIEW TO COSTS AND BENEFITS OF CURRENCY INTERNATIONALIZATION

An international currency confers the issuing country with both benefits and costs. Some consequences are easy to see: the international status of the US dollar lets US residents to freely transact in their own currency almost everywhere they go. Not all benefits and costs are as straightforward, and welfare may deteriorate if costs trump benefits. To policymakers who intend to support the internationalization of the domestic currency, knowing the consequences is of great importance. This section aims to synthesize the costs and benefits of currency internationalization from a considerable stock of knowledge on this topic. Given the numerous findings, chapter 3, which deals with the costs and benefits of renminbi internationalization, will group the identified benefits and costs into more inclusive categories more conducive to doing a comprehensive analysis.

On its process of achieving international status, a currency impacts not just the home country but also its economic partner countries. A transaction involves two parties and also creates externalities. Similarly, a rising economy has implications abroad. It is important to distinguish between the local and global effects of currency internationalization. For example, the internationalization of the euro may result in a gain to the global economy in the form of diversification of currency choices (Papaioannou and Portes 2008b). In this paper, the focus lies on the consequences of currency internationalization on the domestic economy, with additional note of interaction between global and local effects made whenever appropriate.

Some scholars have argued that costs and benefits of international currency status are not only economic but also political (Cohen 2011). The widespread use of the dollar has bestowed the US with the capability to influence global politics, as evident in such measures as financial assets blockade of foreign oppositional institutions. The analysis will center on economic effects, however. The history of currency internationalization has not seen any nationalistic motivation for the process (Frankel 2011). Political leverage most likely follows economic profit, hence the attention on the latter.

1.5.1. BENEFITS

The benefits of having an international currency mostly result from the newly available options to residents of the home country, on both trade and financial accounts. The public as a whole also seems to gain, although less obvious so (Kenen 2009).

First, an international currency helps the issuing country avoid the costs associated with foreign exchange. Fluctuations in the exchange rate can result in losses for the party undertaking foreign exchange. If trade is invoiced in the exporter's currency, the importer must obtain foreign exchange to pay the exporter. If the latter's currency appreciates, the importer suffers a loss from having to buy it at a higher price. Likewise, on the financial account, an investor may incur a loss on her asset if the denominating foreign currency depreciates. Some economists have intensively studied this "valuation effect" (Gourinchas and Rey 2007, Lane and Shambaugh 2009). Moreover, foreign exchange comes with transaction costs charged by banks that offer foreign exchange services.

Second, the country that issues an international currency may earn seigniorage. Seigniorage comes in two flavors. Willing to hold the international currency, foreigners essentially exchange real outputs for fiat money. In other words, foreigners issue domestic

residents an “interest-free loan”, since the currency bill they hold does not pay any interest (Kenen 2009). Seigniorage also offers the issuing country a “liquidity discount”: if the assets denominated in the international currency are in high demand, their yields go down, benefiting the domestic issuer (Papaioannou and Portes 2008b).

Third, an international currency can help develop the domestic financial industry. Domestic financial institutions will have more business performing services in the international currency (Kenen 2009). The advantage lies in ready access to the currency (Gao and Yu 2009). They may also benefit from competition with foreign financial institutions. Truly so, developing financial market and currency internationalization are separate matters, but they also mutually influence (Papaioannou and Portes 2008b).

Fourth, an international currency can improve quantity and quality of finance for the domestic economy. An improved financial industry can better service the non-financial sector (Kenen 2009). The domestic economy can also benefit from an extra source of foreign capital from foreigners who wish to hold assets denominated in the currency, without incurring exchange rate risk.

Finally, the issuing country of an international currency may gain from “exorbitant privilege”. The term describes an advantage of the US from being home to the dollar, pointing at the fact that other countries lend to the US by accumulating US Treasuries and thus help it sustain a current account deficit, not to mention a large one. This usually applies to reserve currency countries (Kenen 2009). The demand for the international currency implies that the issuing country can find creditors who are willing to lend cheaply and debtors who are willing to

pay more to borrow. Serving in this function as the “world’s banker”, the US has been reaping significant gains from its external portfolio (Gourinchas and Rey 2005).

1.5.2. COSTS

The costs of having an international currency are rooted in the increased exposure of the home economy to potentially harmful foreign factors. These costs seem to be most amplified by the lack of maturity in the domestic financial system, factoring in the degree of development of financial markets and soundness of monetary policy.

First, the issuing country of an international currency is faced with the risks associated with opening the financial account. For instance, domestic currency debts issued by residents and held by foreigners can subject the home country to great losses should these foreigners default on these debts, as these residents may fail to honor the liabilities they have with other domestic lenders (Kenen 2009). That said, without an open financial account currency internationalization will not materialize (Kenen 2009, Gao and Yu 2009). But opening the financial account is risky, especially for countries that have hitherto relied on capital controls (Gao and Yu 2009). Therefore, a country interested in internationalizing its currency must first build capacity for dealing with increased exposure to capital flows before opening the financial account. If not, restriction on financial account transactions will suppress international use of the currency. According to the open economy trilemma, opening the financial account forces the country in question to choose between a fixed exchange rate and an independent monetary policy. Hence the cost of opening the financial account also includes forgone benefits from maintaining the remaining two arrangements.

Second, an international currency is more likely to come under a speculative attack. Easy access to the currency places foreign holders at a vantage point to carry out an attack (Gao and

Yu 2009). Kenen (2009) refers to this as the “confidence problem”, to deal with which the issuing country must unfailingly assure currency holders of its value. He emphasizes that, in the case of an attack, even as the issuing country successfully stops the currency from depreciating, domestic investors will still have suffered losses due to falling prices of their assets. The probability and possible magnitude of a speculative attack represents a cost to the home country.

Lastly, running an international currency complicates monetary policy. Issues include the circulation and deposit of the currency by foreigners and how monetary policy transmission mechanism will operate in the home country. Foreign demand for the currency can introduce an extra source of fluctuation to aggregate money demand, which together with the money supply determines interest and exchange rates through monetary policy transmission mechanism, hence increased volatility of monetary policy targets (Papaioannou and Portes 2008b, Hai and Yao 2010). However common are concerns about the complications in monetary policy that will result from currency internationalization, the literature that deals with this issue is limited to theoretical discussion (Gao and Yu 2009). It simply is hard either to isolate the direct effects of currency internationalization on monetary policy from indirect effects, choose an exact measurement of monetary aggregates, or obtain data (Cassola 2000, Papaioannou and Portes 2008b, Gao and Yu 2009). With regards to the effect of currency internationalization on transmission mechanism, Cassola (2000) projects that home interest rates will be more responsive to both home monetary policy and global economic conditions and that effects of the exchange rate channel on domestic prices and current account balance will be weaker. Therefore, the central issue for the home country is how to navigate the interest rate.

CHAPTER 2: RENMINBI INTERNATIONALIZATION: MOTIVATION, POLICIES, AND PROGRESS

2.1. MOTIVATION

China is a large open economy that does lots of trade with the rest of the world and depends on trade to generate economic growth. As such, China is naturally sensitive to developments of the global market, and how the global system operates can exert tremendous influence on China. Given the dominant role the US dollar plays in the global market, China has spent a great deal of effort on managing the relationship between its large open economy and the dollar. At its best, renminbi internationalization will help China mitigate the negative effects associated with doing business in the dollar.

FIGURE 7 CHINA'S FOREIGN EXCHANGE RESERVES AND HOLDINGS OF US PUBLIC AND PRIVATE SECURITIES, 2002-2012, IN BILLIONS OF \$

Source: Morrison and Labonte 2012, 6



Sources: U.S. Treasury Department, *Report on Foreign Portfolio Holdings of U.S. Securities as of June 30, 2012*, April 2013.

Note: Data on foreign exchange reserves are end of year values while data on holdings of U.S. securities are through the end of June.

China's policy has led to extremely large holdings of dollar assets, which could be undesirable to China. The figure depicts the accumulation of China's foreign exchange reserves and holdings of US securities between 2002 and 2012. In total, the share of US securities in China's reserves has slowly declined, though in absolute terms both of these stocks have increased steadily over the years. To place these numbers in context, as of June 2012 with more than \$3.3 trillion of reserves China exceeds Japan, having just over \$1.2 trillion of reserves and so the world's second largest reserves country, both in terms of reserves as a percentage of GDP and reserves as a percentage of imports (Morrison and Labonte 2013, 3). China is the second largest holder of US securities behind Japan (Morrison and Labonte 2013, 7). Of China's total holdings of US securities, 72% is long-term Treasury bills (Treasuries), 14% is equity, 13% is US government agency bonds (Agencies), and only 2% is long-term corporate bonds and short-term debt (Morrison and Labonte 2013, 8). Clearly, China mostly invests in the safest US securities possible, placing first and second respectively in list of largest Treasuries and Agencies holders. These numbers have motivated scholars to estimate the dollar composition of China's foreign exchange reserves, which is believed to be at around 70% (Morrison and Labonte 13, 5). This level of currency exposure may well mean that China's claims to foreigners, in this case of who the most prominent is the US, are greatly subject to fluctuations in the value of the dollar.

China's currency management attracts vehement debate, a fact suggested by the controversial "currency manipulator" label the US has in the past placed on China, even though it is widely acknowledged that China manages its currency. To put the issue of assessing the renminbi exchange rate in perspective, consider this opinion by a group of respected scholars in the international monetary economics field:

“Do these studies imply renminbi is not undervalued? No, weak empirical evidence does not exclude the possibility of undervaluation. The evidence, in fact, is so weak that we could not reject a wide range of hypotheses related to renminbi valuation. Instead of arguing for undervaluation or overvaluation, the relevant message is that it is hard to deliver a renminbi undervaluation verdict that meets the standards of careful empirical work expected of academic study. Nonetheless, it is reasonable to be circumspect about formulating strong policy recommendations on the basis of weak empirical evidence” (Cheung, Ma, and McCauley 2010, 13-14).

Despite the caution above, the mainstream explanation for China’s massive foreign exchange reserves and its corresponding enormous pool of dollar assets is that to promote Chinese exports and reward foreign investment into China, the Chinese government purchases as many dollars as necessary to prevent the renminbi from appreciating against the dollar (Morrison and Labonte 2013, 2). On the trade account, since foreigners usually pay China with dollars, these incoming dollars place upward pressure on the renminbi. On the financial account, the inconvertibility of the renminbi dictates that incoming foreign capital be denominated in a foreign currency, usually the dollar, also placing upward pressure on the Chinese currency. Therefore, trade surpluses, FDI, and other sources of foreign capitals push China to accumulate lots of foreign exchange in the dollar. It is only natural that, given the level of development of US financial markets and the strength of the US government, China invests its dollars in US securities, especially Treasuries and Agencies (Morrison and Labonte 2013, 5).

China would have been happy to continue purchasing dollars and investing in US government securities but for a predicament into which it has sent itself. Paul Krugman names it the “dollar trap”: if the dollar weakens, China will suffer losses on its dollar assets (Krugman

2009). In details, a depreciated dollar relative to yesterday means that today the US is paying China back with less for what China lent to the US yesterday. Pushing the issue further, Yu Yongding refers to the “assets crisis” of emerging countries (Yu 2011). Not only may China lose from its assets, its large renminbi-denominated FDI stock can also hurt China if the dollar depreciates, magnifying the dollar amount China will have to repay foreigners and deteriorating China’s net international investment position, which is the difference between China’s total foreign assets and total foreign liabilities (Yu 2011). That China has intensively relied on the dollar to do global business has subjected its economic wellbeing to fluctuations in the value of the dollar.

In this context, renminbi internationalization is seen as a solution under the logic of “renminbizing China’s assets” (Cheung, Ma, and McCauley 2010). If foreigners accept the renminbi, they will be more likely to issue debts in the currency, hence China’s foreign assets renminbized. Thanks to past yen internationalization efforts, roughly a third of Japan’s foreign assets is denominated in yen, shifting the currency risk from Japanese to foreigners, and so China can expect to denominate the same amount of its foreign assets into the renminbi with renminbi internationalization (Cheung, Ma, and McCauley 2010, 3). The authors raise two potential problems with convincing foreigners to issue debt in the renminbi, namely expectations of renminbi appreciation and the alleged dollar peg of the renminbi. Foreigners will have no incentive to owe China in the renminbi today if they expect to repay more in the currency tomorrow and if they think the renminbi is no more than the dollar plus noise (Cheung, Ma, and McCauley 2010, 9, 13). Despite difficulty in predicting the exchange rate of the renminbi and weak evidence for a substantial renminbi undervaluation that would in normal circumstances result in great expectations of appreciation, the reputation of the Chinese government in

gradually appreciating the renminbi will appease obligors of concerns over any big jump in the value of the renminbi (Cheung, Ma, and McCauley 2010, 13). The renminbi has also been empirically tested to be anything but a perfect dollar peg, thus eliminating the remaining reservation of foreigners about borrowing in the renminbi (Cheung, Ma, and McCauley 2010, 17).

Renminbi internationalization can also be seen as China's response to problems of the US-centric international monetary system (Gao and Yu 2009). It is no coincidence that Governor Zhou made his speech and China rolled out relevant policies after the global financial crisis. The crisis has laid bare in front of China how the system can potentially hurt its interests. Fundamentally, China finds issue with a system heavily relying on a currency that is subject to US interests and policies (Yu 2010, 29). In an article assessing the damage of the financial crisis to China and China's policy response, Yu Yongding has explicitly named reform the international monetary system as an important undertaking for the world economy to do (Yu 2010).

To summarize the financial crisis and its relations to China, a period of increasing foreign purchase of US securities took place before the crisis (Bernanke et al 2009). These purchases came from Asian exporting countries like China as well as Europe. To finance these purchases and find the dollars necessary for acquisition of dollar debt, Europe issued its own debt and used foreign exchange swap for dollars (Bernanke et al 2009, Baba and Sakurai 2009). When the crisis broke out, Europe was scrambling to pay for those debts and foreign exchange swaps, resulting in a global dollar shortage (Baba and Sakurai 2009). Acting as the world's lender of last resort, the Fed established foreign exchange swap lines with central banks worldwide to provide them with dollar liquidity (McGuire and von Peter 2009). At the same time, the US government

engaged in quantitative easing, an expansionary monetary policy, to stimulate the US economy. These measures can weaken the dollar, exactly what China is afraid of considering potential losses on its dollar assets. Moreover, the paradox of this story is that even as the US was the origin country of the crisis, due to the indisputable international role of the dollar investors still flocked to the currency despite what was happening to the issuing economy. Normally this would not have been the case. For example, in the 1997-98 Asian financial crisis, investors pulled out of the baht as soon as it was clear that Thai debtors would not be able to repay them. In China's eyes, not only can the US borrow excessively but also get away once these debts start to default.

China is dissatisfied about US policy and the dynamics of the international monetary system. In spite of China's condemnation of the system, dramatic changes may have to happen to China first before the system can change, because China may have also played a role in the fomentation of the financial crisis. Since a low-interest environment was blamed for excessive borrowing, the question becomes what role might foreign capital inflows have played in lowering yields in the US. The previous section has made clear how China has sent lots of capital into the US. What is the logic behind the international monetary system that is so at odds with China's interests?

According to an influential article, the current international monetary system is simply a version of Bretton Woods, dubbed Bretton Woods 2 (Dooley, Folkerts-Landau, and Garber 2004). Countries that maintain fixed exchange rate and accumulate foreign exchange fall into the trade account region, constituting a periphery of the system. These countries rely on exports for growth. In contrast, countries that float the exchange rate and accumulate little foreign exchange belong to the financial account region. Through investments these countries hope to reap

significant returns. The US stands alone as the center of the system, runs current account deficits with trade account countries, gets financing from them through debt issuance, and invests this capital in profitable undertakings. When trade account surplus countries have reached a certain stage of growth, they will float the exchange rate and graduate to financial account surplus countries. Historically, at the end of Bretton Woods, Europe and Japan became financial account countries, but no other countries replaced them as the periphery. The 1980s came with decisive changes to the world map. Some countries chose to follow the Washington Consensus and opened the financial account. Most Asian countries chose to emulate the postwar Europe and Japan growth model. As an old periphery country graduates, a new periphery will replace it, and the system recycles, with the US still at the center providing financial intermediation.

Deep and broad financial markets and innovative capability at the root of the US economic success guarantee the perpetuity of the system, as the US unflinchingly attracts incoming capital and turns them into more profitable investments elsewhere. The period between 1980 and 2007 is known as the Great Moderation in the history of the US economy, during which the US experienced a series of economic expansions with only short and modest setbacks. It is no coincidence that beginning in 2000 the US financial markets were increasingly active with the birth of financial innovations and attraction of foreign capitals.

In this context, foreign capital may have been responsible for the low-interest environment that so stimulated the assets bubble in the US. Between 2002 and 2007, foreign purchases of US assets amounted to a return to safe assets (Bernanke et al 2009). In accordance with the Bretton Woods 2 hypothesis, exporting countries and Europe invested freely in US securities, though with different motivations and sources of funding. For exporting countries, a savings glut due to a number of reasons most importantly of which were current account

surpluses provided them with the money to invest in the safest US securities available. This cautious motivation was evident in the fact that 80% of China's current account surpluses went into securities issued by US Treasury or US agencies (Bernanke et al 2009, 6). In contrast, Europe's holdings of US securities were diversified into riskier products which in principle would deliver higher yields. In addition, Europe had no current account surpluses and so financed these purchases by issuing external debt, either in the form of sovereign debt or bank deposits (Bernanke et al 2009, 12). Clearly, Europe put itself into a dangerous situation, since it was backing riskier and less liquid assets with shorter-term liabilities, not to mention the exchange rate risk associated with swapping local European currencies for dollars. Together, emerging exporting countries and Europe accounted for most of foreign holdings' of US securities in the 2002-2007 period, and capital inflows from both regions help explain why yields in the US were so low.

China is rightfully worried about the value of its foreign exchange reserves. However, considering the events leading up to the financial crisis, the blame is not only on the rest of the world but also on China. On one hand, risky behavior by Europe and a shaky credit foundation in the US are very much responsible for the outbreak of the crisis. On the other hand, China's massive purchases of US securities have also helped lowering US interest rates and contributing to the buildup of the crisis. Due to this ambiguous role of China as both victim and accomplice of the financial crisis, an influential Chinese economist questions blaming China for the crisis but acknowledges that China could have committed itself to overdue reforms to avoid the crisis in the same article (Yu 2010).

China is conflicted with regards to its relationship with the US-centric international monetary system, a point further underscored by its planning of structural economic changes.

Recently, rebalancing has been a buzz word in discussions on the Chinese economy. It is widely recognized that it is high time China transitioned from the investment- and export-led growth model to one that is based on domestic consumption. Arguably this is what Yu Yongding means by the aforementioned overdue reforms, when he points out that Chinese policy responses to the financial crisis have deepened the structural problems of the Chinese economy, for the 4 trillion renminbi stimulation package explicitly targeted investment activities to boost growth. If China committed itself to rebalancing, an implied corollary would be moving to an exchange rate float, letting the renminbi appreciate significantly and improving the purchasing power of Chinese consumers. Within the Bretton Woods 2 framework, floating amounts to graduation to the financial surplus account club, and China will deal with the international monetary system in a different set of dynamics. Exchange rate liberalization is especially crucial considering that China might be able to further enhance the international use of the renminbi now that with financial liberalization already in place it can press ahead with developing domestic financial markets and let economic fundamentals attract foreigners to the use of its currency, carrying out the strategy of renminbi-zing China's assets.

Realistically, China is aware it can do very little about the current state of the international monetary system (Gao and Yu 2009). If replacing the dollar with the Special Drawing Rights, a supranational currency, is unfeasible, China can still gain by making the renminbi a direct competitor of the dollar. China can have hope, because China should have relatively more control of its currency than the call for international cooperation. In the language of Bretton Woods 2, China can choose to graduate from the periphery by floating the renminbi and implementing necessary reforms to turn itself into a competing center with the US. China

will have a long way to go if it chooses this road, but China's frustration with the international monetary system can motivate China to internationalize the renminbi.

Because of the reforms needed to develop China's financial system and facilitate renminbi internationalization, some observers consider renminbi internationalization a rally point for reform momentum. Yu Yongding asserts renminbi internationalization is financial account liberalization "in disguise" (Yu 2012, 21). In a similar vein, two authors associate renminbi internationalization with "reform by stealth," citing the precedent of China's ascension to WTO as a vehicle to carry out sweeping structural reforms (Huang and Lynch 2013, 574). China's financial markets are underdeveloped, its financial system sealed from market forces. If China wants to internationalize the renminbi, it must first implement some prerequisite financial reforms. Policies taken to facilitate renminbi internationalization have demonstrated this line of reasoning.

2.2. POLICIES

An international currency does not place restrictions on the entities that desire to transact in the currency (Kenen 2009). Renminbi internationalization begins with abolishing measures that prevent the use of the currency in certain transactions. In essence, policies to facilitate internationalization address the issues of financial liberalization and currency convertibility (Chen and Peng 2009, 23). Because these measures have been a part of China's macroeconomic plan, renminbi internationalization takes place in the context of financial liberalization and economic rebalancing. Notwithstanding the progress made so far, issues with renminbi internationalization point to necessary reforms on a deeper level.

Scholars have identified a distinct set of three policies to bring about renminbi internationalization (Cheung, Ma, and McCauley 2010; Liao and McDowell 2013; Lochel,

Packham, and Walisch 2013; Craig et al 2013). The first policy allows the use of the renminbi in specified ways that hitherto had been impossible. The second policy ensures renminbi liquidity abroad. The third policy creates more opportunities for international use of the renminbi while avoiding direct effects on China's domestic economy. Concurrently, China has also taken steps to foster its financial markets, a precondition for currency internationalization.

TABLE 3 EXPANSION OF THE RMB TRADE SETTLEMENT PILOT PROGRAM

Source: Jin 2012

	July 2009	June 2010	August 2011
Domestic geographical coverage	Shanghai, and four cities in Guangdong	Extends to other 18 provinces (autonomous regions, municipalities), such as Beijing, Tianjin, Xinjiang and so on	Entire China
Enterprises engaging in RMB settlement of export trade in goods	365 designated enterprises	67724 designed enterprises <small>Note: announced at Dec. 2010</small>	<ul style="list-style-type: none"> ● Enterprises with the qualification may carry out RMB settlement of export trade in goods ● A list of enterprises shall be subject to focused supervision
Transactions in-scope	Goods Trade	All current account transactions	All current account transactions and some capital account business (FDI, ODI, RMB loan)
Counter-party Regions	Hong Kong, Macau and ASEAN	No restrictions	No restrictions

 announced at Feb 2012

In July 2009, the State Council implemented the pilot program for renminbi cross-border trade settlement, which allowed Chinese exporters and importers in five mainland cities to settle trade with Hong Kong, Macau, and ASEAN in renminbi. Chinese companies in the approved geography must apply to be designated enterprises to settle trade in renminbi (HKMA 2009, 1). Participating offshore banks may provide a range of renminbi services to foreign counterparties of the Chinese designated enterprises, including deposit taking, currency exchange, remittances, trade finance, and checks (HKMA 2009, 1-2). Stipulations stress the principle of matching

renminbi flows with real trade flows but permit use of offshore deposited renminbi for offshore investments (HKMA 2009, 1). Since 2009, the pilot program has been expanded geographically to the entire mainland China and the rest of the world and nominally to virtually all Chinese enterprises (Jin 2012). The most significant change has allowed settlement in the renminbi for some financial account transactions, including FDI, ODI, and bank loans.

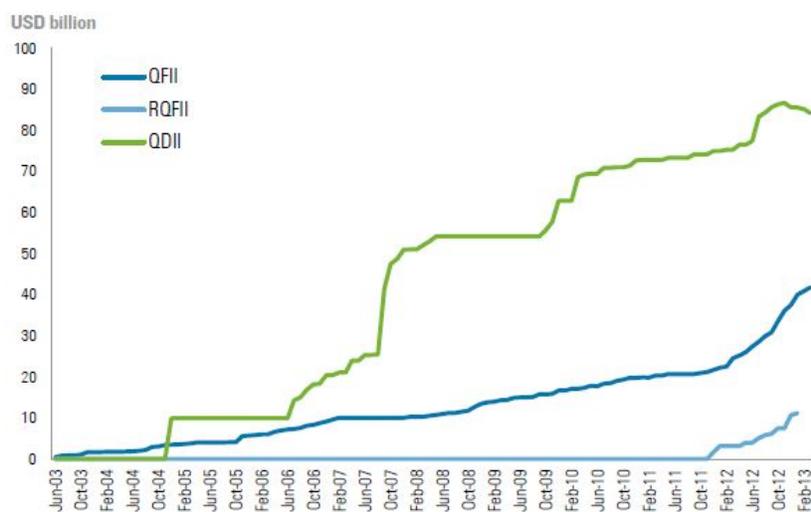
On the current account, the pilot program has lifted a ban on the international use of the renminbi as a medium of exchange. Before the pilot program, Chinese enterprises could pay for imports only by using foreign exchange. By achieving current account convertibility by IMF's definition in 1996, the Chinese government does not restrict any current account payments to non-residents or transfers between non-residents even as it retains the right to stipulate the terms of the transaction (Liu et al 2002, 6). The legal basis of banning renminbi settlement for both imports and exports stems from IMF's instructions that member countries can specify the methods of settlement and demand exporters to surrender foreign exchange (Liu et al 2002, 6-7). In practice, Chinese importers would be able to purchase foreign exchange with renminbi to pay for imports, and Chinese exporters would surrender foreign exchange earned from exports for renminbi (PBC 2008, 143). Whatever the reason for the ban on the renminbi, the transaction will nonetheless take place and foreign exporters will receive payments from their Chinese counterparties. In this context, the pilot program is safely liberating because it has made legal renminbi trade settlement in place of foreign exchange settlement, which promotes renminbi internationalization without altering the IMF's recognition of China's current account convertibility.

On the financial account, the pilot program has left an unusual effect: China has not achieved financial account convertibility and yet has permitted use of the renminbi for some

financial account transactions. According to three different measurements of financial account openness, China has one of the most restricted financial accounts (Bayoumi and Ohnsorge 2013, 4). Table 1 has also made clear that FDI, ODI, and loans shall be possibly settled in the renminbi. Put differently, even before allowing the financial account transaction to take place, China has already stipulated terms of the transaction. One might point out that the respective capital flows are not subject to the most severe restrictions. However, if China did not emphasize the importance of renminbi settlement on the current account even as current account convertibility had been achieved, that China is discussing renminbi settlement on the financial account without financial account convertibility should alert one to China's intentions. If renminbi internationalization is a much desired goal, then China will do anything it deems possible and practical. Perhaps China sees in financial account transactions the potentials of an effective renminbi internationalization roadmap.

FIGURE 8 QUOTAS AWARDED UNDER QUALIFIED FOREIGN INSTITUTIONAL INVESTOR, RENMINBI QUALIFIED INSTITUTIONAL INVESTOR, AND QUALIFIED DOMESTIC INSTITUTIONAL INVESTOR PROGRAMS, 2003-2013

Source: Hanemann 2013



Source: PBOC, SAFE, RHG.

Indeed, as a number of scholars have suggested, renminbi internationalization is part of China's strategy for financial account liberalization, the process of attaining financial account convertibility (Chen and Peng 2009; Yu 2012). Simultaneously with internationalization policies, China is gradually opening the financial account according to the "bridge and traffic concept" (Minikin and Lau 2013, 74). The figure demonstrates slow yet steady increases made to cross-border investment quotas by the Chinese government. The Qualified Domestic Institutional Investor program allows mainland residents to invest abroad, and vice versa the Qualified Foreign Institutional Investor program lets foreigners invest in mainland financial markets. One step further than Qualified Domestic Institutional Investor, the Renminbi Qualified Foreign Institutional Investor program grants foreigners the right to use offshore renminbi to invest in mainland securities. Due to its hybrid feature, this program signifies the marriage between renminbi internationalization and financial account liberalization.

TABLE 4 LIST OF PEOPLE'S BANK OF CHINA'S BILATERAL SWAP AGREEMENT PARTNER COUNTRIES

Source: Liao and McDowell 2013, 43

<i>Country</i>	<i>Signature Date</i>	<i>Extension Date</i>	<i>Expiration Date</i>	<i>Amount (bn RMB)</i>
Korea	December 2008	October 2011		180; 360
Hong Kong	January 2009	November 2011		200; 400
Argentina	March 2009		(?)	70
Indonesia	March 2009		(?)	20
Belarus	March 2009		August 2012	20
Malaysia	April 2009	February 2012		80; 180
Iceland	June 2010			3.5
Singapore	July 2010	March 2013		150; 300
New Zealand	April 2011			25
Uzbekistan	April 2011			0.7
Mongolia	May 2011	March 2012		5; 10
Kazakhstan	June 2011			7
Russia	June 2011			<i>unknown</i>
Thailand	December 2011			70
Pakistan	December 2011			10
U.A.E.	January 2012			35
Japan	February 2012			20
Turkey	February 2012			1.6
Australia	March 2012			200
Ukraine	June 2012			15
Brazil	June 2012			190
United Kingdom	June 2013			200
Hungary	September 2013			10
Albania	September 2013			2

In addition to the pilot program for renminbi settlement, China also signs bilateral swap agreements (BSA) with a number of partner countries. A BSA is a mutual agreement between two central banks to stand ready to exchange each other's currency. The table lists such agreements. BSAs enhance renminbi liquidity and thus support renminbi internationalization. A BSA between China and Malaysia means either country will have ready access to a specified amount of the other country's currency in a determined timeframe. Elsewhere BSAs have been an instrumental crisis management tool in the international monetary system. Following the 2007-2008 financial crisis and the subsequent global dollar shortage, the Fed established BSAs with a great number of central banks satisfying massive dollar demand to prevent further crisis (Liao and McDowell 2013, 7). In contrast, BSAs originated by the People's Bank of China—China's central bank—aim to facilitate renminbi internationalization in a controlled and incremental approach (Liao and McDowell 2013, 8). Say a foreign exporter thanks to the pilot program for renminbi settlement receives renminbi for his goods. The absence of renminbi investment channels means the exporter may want to exchange renminbi, and with a BSA with China in place his central bank stands ready to satisfy this demand (Liao and McDowell 2013, 8). Ensuring trade financing liquidity and reducing exchange rate risks and transaction costs associated with foreign exchange motivate China and its partner country to sign a BSA (Liao and McDowell 2013, 13-14).

China's BSAs foreground a motivation greater in scope than just bilateral benefits between China and a partner country. Together the BSAs establish a regional financial network in the Asia Pacific region. According to the head of the Research Department of the People's Bank of China, the 2007-2008 financial crisis was a "wakeup call" for regional cooperation, leading to formal discussion on currency swaps between major central banks to support regional

financial institutions and trade (Jin 2012). In October 2008, the joint statement made by the Monetary and Financial Stability Committee of the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) underscores the issues of confidence and liquidity in the international monetary system and vows to enhance regional cooperation (EMEAP 2008). The alleged liquidity problem refers to the global dollar shortage that followed the 2007-2008 financial crisis and adversely affected trade that had been dependent on the dollar (Cheung, Ma, and McCauley 2011, 1, 7). As trade financing in dollar became scarce, trade between China and its partners ran into difficulty (Liao and McDowell 2013, 12). Faced with the challenges of the financial and dollar crisis, Asia-Pacific countries choose cooperation to weather the storm together. It is no coincidence then that two months after the EMEAP joint statement China's first BSA was signed in December 2008 with South Korea. It follows that the largest renminbi BSAs have also been signed with Asia-Pacific countries. Given the context of BSAs, renminbi internationalization addresses the interest of not only China but also of a broader region.

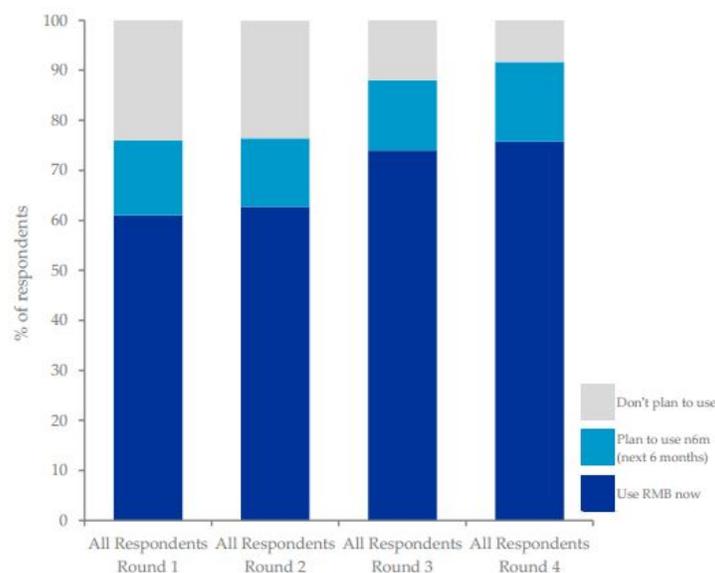
If the signings of renminbi BSAs result from Asia-Pacific regional discussion and relate to China's own currency internationalization effort, one wonders if renminbi BSAs are actually attractive to China's partner countries themselves. This question is worth asking since renminbi BSAs may seem to be a supply-side initiative of China (Liao and McDowell 2013, 2). An empirical study has found that countries with stronger trade and investment ties to China are more likely to sign BSAs with China, as BSAs provide currency cooperation in addition to existing preferential trade agreements and bilateral investment treaties (Liao and McDowell 2013, 29). This finding supports the view that some countries benefit from using the renminbi in their economic activities with China, contributing positively to the outlook of renminbi internationalization.

Among China's BSA partners, Hong Kong stands out as the territory that has so far signed the largest BSAs with China. Renminbi BSAs with Singapore and the United Kingdom are also among the largest BSAs. These three partners share the characteristic of being home to the world's most developed financial markets. With these ties, China is pushing renminbi internationalization via offshore renminbi markets, where the renminbi is freely traded in various international trade and finance transactions, unrestricted by financial account stipulations in the mainland.

2.3. PROGRESS

FIGURE 9 OFFSHORE RENMINBI USAGE

Source: Assets Benchmark Research 2013, 3



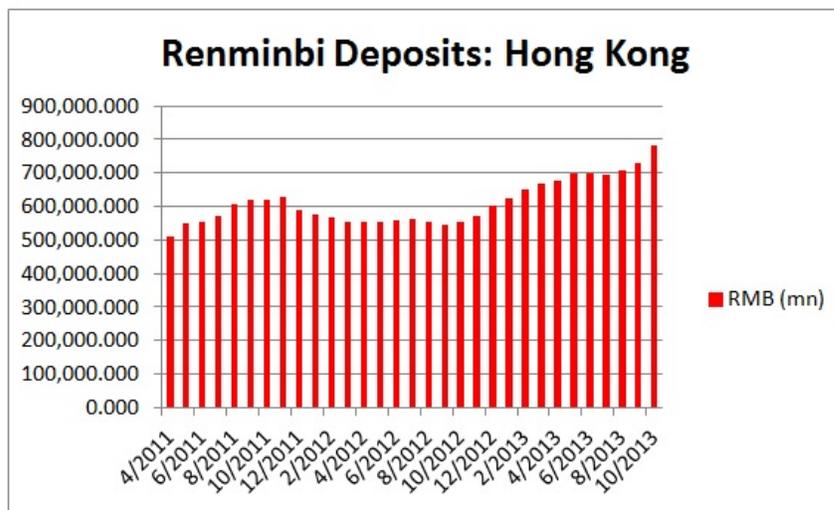
Stirred by the excitement of renminbi internationalization, financial observers have begun to track its progress. Indeed, the renminbi has enjoyed increasing international use since the Chinese government signaled policies that make the renminbi more convertible, open the financial account, and foster financial markets. In November 2012 Standard Chartered Bank introduced the Renminbi Globalization Index (RGI), noting that between December 2010 and

August 2012 the index had grown seven fold to hit the 750 threshold (Lau et al 2012). By June 2013, the index has hit 1,050, posting a 65% year-on-year growth (Standard Chartered Bank 2013). It took renminbi internationalization a year to deepen by two thirds. Standard Chartered Bank also sponsored a quarterly survey asking treasurers and finance directors about their companies' use of offshore renminbi products (Benchmark Research 2013). The figure above depicts the outcomes for the year 2013. Looking at Q3 and Q4, the percentage responding "plan to use CNH products in 6 months" in Q1 and Q2 does in fact convert into actual use six months later by more or less the same amount. If this trend continues, Q3 of 2013 predicts that Q1 of 2014 could witness close to 90% actual use, a 30% year-on-year increase comparing to Q1 of 2013.

The RGI measures the degree of renminbi internationalization using four criteria, namely outstanding renminbi deposits, renminbi trade settlements, outstanding renminbi bonds, and renminbi foreign exchange turnover (Lau et al 2012). These criteria cover almost all roles of an international currency, except for foreign exchange reserves and anchor currency. Reserve currency status is the highest evidence of currency internationalization, and the renminbi is far away from it. However, the renminbi has been found to significantly affect the exchange rates of ASEAN +3 currencies, due to China's increasing trade and investment influence in the region (Chen, Siregar, and Yiu 2013).

FIGURE 10 RENMINBI DEPOSITS: HONG KONG

Source: AsiaMoney



A detailed examination of the RGI's criteria confirms the progress the renminbi has made. The figure above shows the outstanding renminbi deposits in Hong Kong. Between April 2011 and October 2013, the amount of deposits increases by close to 300 billion renminbi, a 60% increase. The first three quarters of 2012 saw a lull in the buildup. As Kelvin Lau et al suggests, the levelling off of the RGI itself at the end of 2011 possibly results from the effects of the European sovereign debt crisis on the global financial market (2013). From the beginning of 2013, renminbi deposits in Hong Kong has resumed an upward trend, slowing down in Q3 before a strong leap between the month of August and October.

FIGURE 11 DIM SUM BOND MARKET AND ONSHORE RENMINBI BOND MARKET

Source: Fitch Ratings 2012, 1

Dim Sum Bond Market

Total amount issued

(CNHbn)

■ FI ■ Corp. ■ Sov



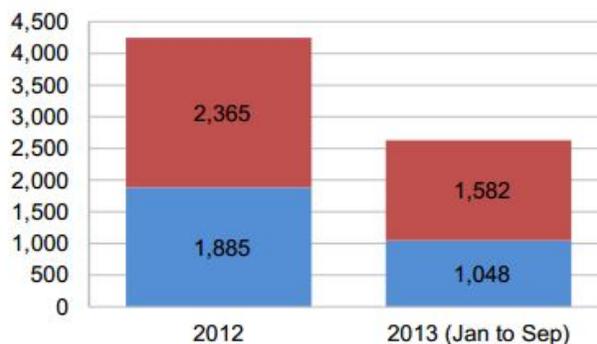
Source: Fitch, Bloomberg

Onshore CNY Bond Market

Total amount issued

(CNYbn)

■ FI ■ Corp.



Source: Fitch, Wind

The offshore renminbi bond market, also known as the “dim sum bond market,” has also posted growth on the aggregate level. In the above figure, Fitch Ratings notes that the dim sum bond market has grown 65% in size, yet it remains a mere 2% of the onshore bond market and is greatly dwarfed by onshore domestic banking activity (Fitch Ratings, 2012, 1). Furthermore, corporate issuance is only 60% of 2012, and so the market is driven by financial institution issuance, in particular Chinese banks (Fitch Ratings 2012, 2). On one hand, limited liquidity, the fact that issuance is smaller and has shorter tenor than US dollar bond, and renminbi appreciation expectations are cited as reasons for corporations’ reservation (Fitch Ratings 2012, 2). On the other hand, higher yields obtainable from US dollar Chinese issues and from deposits, together with lack of bondholder protection and operational transparency, have driven investors away from the dim sum bond market (Fitch Ratings 2012, 2). For renminbi internationalization to deepen the Chinese government can generate more liquidity in the offshore market by ensuring that, for foreign corporations, capital raised offshore can easily find the way back to fund mainland operations and that for Chinese corporations issuing offshore enhanced bondholder protection must be applied by such means as the developing of a viable bond ratings industry.

CHAPTER 3: COSTS AND BENEFITS OF RENMINBI INTERNATIONALIZATION

3.1. BENEFIT 1: NEUTRALIZE EXCHANGE RATE RISKS IN INTERNATIONAL TRADE

An international currency may allow residents of the issuing country to do international trade using their own currency. The most basic benefit of currency internationalization, it eliminates exchange rate risks inherent in a multi-currency trade environment, shifting the risks to foreign partners. Recall from chapter 1 that American traders' desire to do international trade without incurring exchange charges with British banks motivated the internationalization of the dollar. Also, chapter 2 discusses China's case for using the renminbi in its trade with the world to rely less on the dollar, especially following the 2008 financial crisis.

Researchers have devoted much effort to the topic of trade invoicing currency. When two countries trade, they must decide in what currency the transaction will be quoted and settled. Knowing the factors influencing this choice is helpful to determining whether a currency has great potentials to be used in international trade and thus minimizing foreign exchange risks for the issuing country. In general, both quality of the currency and general economic competitiveness of the issuing country matter. On one hand, currencies with relatively lower transaction costs and macroeconomic variability are more likely to be chosen as invoicing currency for international trade (Goldberg and Tille 2005). On the other hand, countries with relatively higher competitiveness, as reflected in large market share and high level of product differentiation, are more likely to dictate invoicing currency (Bacchetta and van Wincoop 2005). The second point is especially significant: with competitiveness comes pricing power, and with pricing power comes the influence in stipulating terms of the transaction, including the transacting currency.

Apply the invoicing currency choice framework to China, the tasks for policymakers are twofold. On one hand, the quality of the renminbi can benefit from the fulfillment of preconditions of an international currency, for instance the construction of a sound, deep domestic financial system. On the other hand, it is imperative that the Chinese exporting sector upgrades its competitiveness to increase the odds that it can choose to invoice in the renminbi. Even if the renminbi is successfully internationalized, no usefulness would result if China cannot co-opt trading partners to use it.

Through surveying the degree of foreign exchange risks exposure (henceforth “foreign exchange exposure” or “exposure”), this section points out the increasing exposure of the Chinese trade regime, which makes relevant the first benefit of renminbi internationalization. But reliance on manufacturing—especially processing trade manufacturing—implies that China has a competitiveness issue that can hinder the use of the renminbi in international trade. The issue has been significant and will continue to be so, despite new trends in the manufacturing sector. One then concludes that China has an incentive to invoice trade in its currency, but doubts arise about the feasibility.

3.1.1. IMPORTANCE AND CHARACTERISTICS OF CHINA’S MANUFACTURING SECTOR

TABLE 5 TOP 10 MANUFACTURING COUNTRIES

Source: Hanson and Robertson 2008, 22

Country	Manufacturing (% merchand. exports)	Manufacturing (% GDP)	GDP per capita (2000 US\$)	Population (millions)
China	88.21	32.28	979	1260.3
Philippines	85.83	22.56	996	75.8
Pakistan	84.96	15.91	531	138.4
Hungary	83.09	23.48	4591	10.2
Mexico	82.65	19.96	5682	97.6
Turkey	80.14	15.48	2915	67.3
Romania	79.85	24.11	1805	22.2
Poland	78.32	18.66	4356	38.4
Malaysia	78.26	30.23	3894	23.0
India	75.30	15.79	458	1015.2
Sri Lanka	74.93	16.12	838	18.9
Thailand	74.23	32.60	2085	61.4

Without dispute, manufacturing plays a sizeable role in China's exports, accounting for 88.21% of total exports over the 2000-2005 period (Table 2, Hanson and Robertson 2008). Even among countries with the highest share of manufacturing in total exports, China has one of the top three shares of manufacturing in GDP at 32.3%. With the other two countries being Malaysia and Thailand, one may conclude that Asian countries tend to do relatively more manufacturing production. In addition, processing trade is responsible for more than half of China's manufacturing exports between 2000 and 2007 (Table 5 and 6, Koopman, Wang, and Wei 2008). Processing trade refers to "imports of goods to be assembled or transformed in China and re-exported" (Gaulier, Lemoine, and Unal-Kesenci 2006, 15).

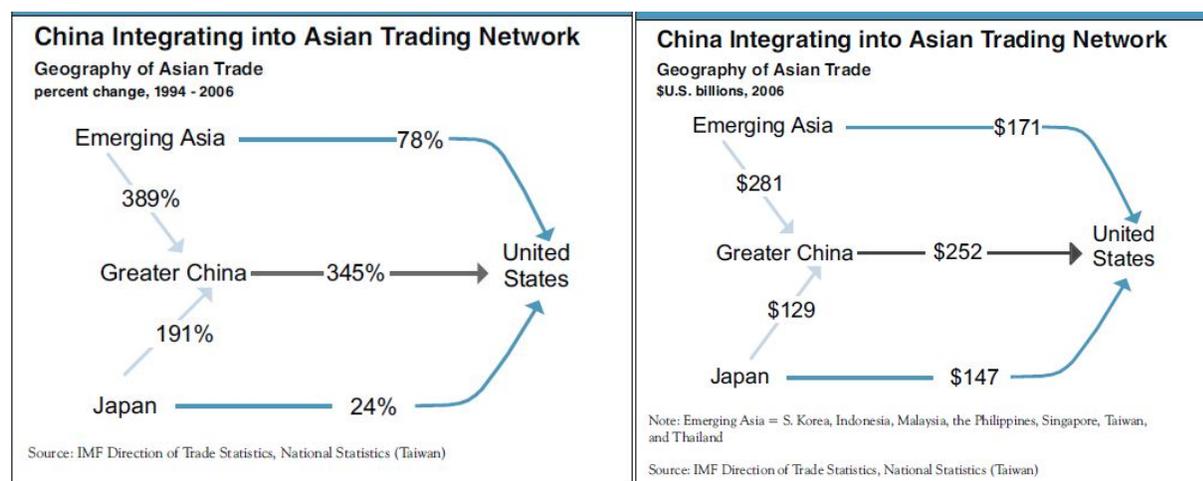
The importance of the manufacturing sector and its very characteristics significantly influence the foreign exchange exposure of the Chinese exporting regime. One needs to understand China's manufacturing sector in order to comprehend why renminbi internationalization can be beneficial to China. As the introduction of this chapter has mentioned, competitiveness is decisive to choice of invoicing currency in international trade. The subsequent

analysis will point out how the characteristics of China's manufacturing sector can influence its competitiveness, and hence its level of exposure.

With regards to the relationship between the characteristics and exposure of China's manufacturing sector, three fundamental issues arise. First, the degree of domestic content in Chinese exports can influence exposure through two channels. Second, the level of sophistication of Chinese manufacturing production also relates to exposure in intricate ways. Last but not least, the participation of foreign firms substantiates the other two issues. Indeed, this international exchange is at the heart of the exposure question.

FIGURE 122 CHINA INTEGRATING INTO ASIAN TRADING NETWORK

Source: Kianian and Yi 2009, 19



From the start, China's manufacturing sector is decisively a joint project between China and East Asian countries. The figure above suggests that over the years Asian countries indirectly export to the US via China. Then, international production defines the characteristics of China's manufacturing, which explain for the exposure facing Chinese exporters. China is positioned within the Asian production network, which refers to the "organization, across [Asian] national borders, of the relationships (intra and increasingly inter-firm) through which firms

conduct research, development, product definition and design, procurement, manufacturing, distribution and support services” (Gaulier, Lemoine, and Unal-Kesenci 2006, 9-10). Technology sharing and intra-network trade characterize the internal dynamics of the Asian production network, as more developed countries, such as Japan, upgrade production capacity of and relocate production to less developed countries, in this case China, with foreign direct investment and inflows of intermediate goods. The “recycling [of] comparative advantages” takes place, as richer countries move up higher in the production chain and poorer countries replace them. Simultaneously, “triangular trade” arises, in which richer Asian countries export intermediate inputs to China for processing and re-export to EU or the US (Gaulier, Lemoine, and Unal-Kesenci 2006, 11).

TABLE 6 BREAKDOWN OF CHINA'S EXPORTS BY TRADING PARTNERS AND CUSTOMS REGIME

Source: adapted from Table 2, Gaulier, Lemoine, and Unal-Kesenci 2006, 28

	Trade balance (billions of \$)		
	World	Dragons + Japan	EU + USA
1993			
Ordinary trade	5.2	-8.7	-2
Processing trade	7.9	-5.1	13.9
2002			
Ordinary trade	7.1	4.3	3.6
Processing trade	57.7	10.3	59.5
2002: 4 Dragons = Hong Kong, South Korea, Taiwan, Singapore			
1993: 3 Dragons = Hong Kong, South Korea, Taiwan			

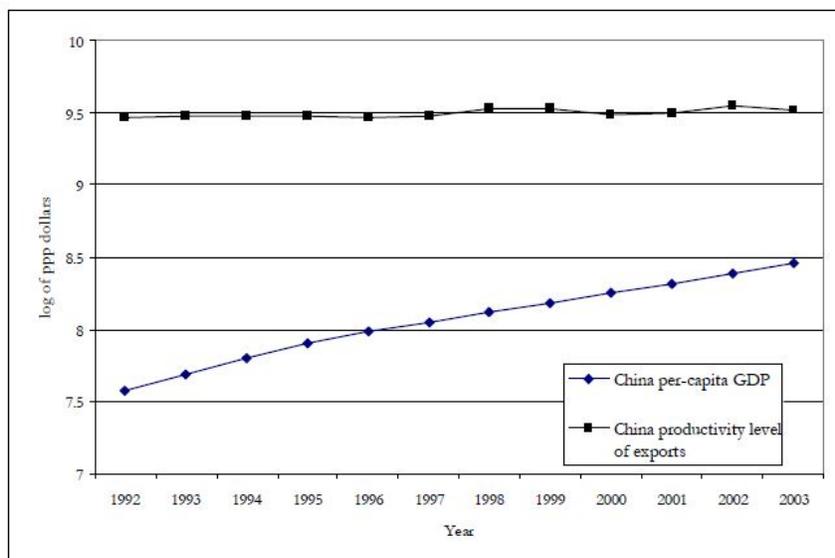
Processing trade defines the Asian production network and thus China’s manufacturing sector. First, related to intra-network trade and the impact of domestic content on competitiveness, China imports from Asia and exports to the EU-US market. Every \$10 of China’s processed exports includes \$4 worth of intermediate inputs from Asian supplier

countries (Gaulier, Lemoine, and Unal-Kesenci 2006, 19). The above figure shows the evolving role of processing trade in the production relationships between China and its Asian partners. In 1993 China's processing trade deficit with Japan and the Dragons (Hong Kong, South Korea, and Taiwan) amounted to \$5.1 billion, but its processing trade surplus with the US and fifteen EU countries was \$13.9 billion. In 2002, this number swelled more than four-fold to \$59.5 billion, dwarfing the gain made on ordinary trade. Most notably, processing trade balance with Asia swung into surplus at \$10.3 billion. The reorganization of production in Asia has begun, with China seemingly importing smaller amount of intermediate inputs or exporting larger number of final processed goods to developed Asia.

Second, technology sharing is at play, further complicating the competitiveness of China's exports. Even though China is exporting more to developed East Asian countries on the aggregate level, it is importing more and more high-tech intermediate goods from them, whose share in China's high-tech imports increases from 56% in 1997 to 70% in 2002 (Gaulier, Lemoine, and Unal-Kesenci 2006, 29). Parts and components still account for 60% of China's imports from and exports to Asia. Meanwhile, China's high-tech exports remain steady at one-half to Asia, one-fourths to the US, and one-sixths to the EU. China seems to experience technological upgrade from its participation in the processing trade Asian production network. But skeptics point out that four-fifths of China's high-tech exports fall under processing trade and that foreign affiliates of firms based in developed East Asia are responsible for most of these flows.

FIGURE 133 PRODUCTIVITY LEVEL OF EXPORTS AND GDP PER CAPITA

Source: Rodrik 2006a, 16



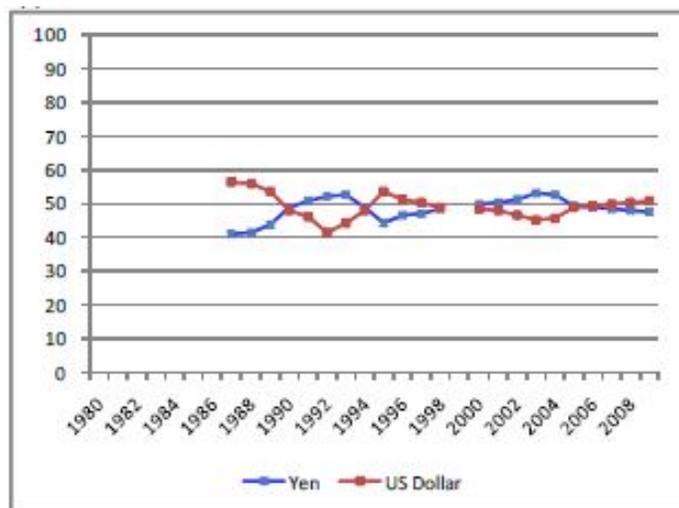
Technology sharing then implications for the level of sophistication of China's manufacturing exports. China makes policies that foster this technology spillover. A "dual track" trade policy that lowers tariff for imported inputs and raises customs tariff for other goods incentivizes Asian suppliers and protect Chinese industries (Gaulier, Lemoine, and Unal-Kesenci 2006, 15). This wholehearted absorption of processing trade has enabled China to sell an exports basket associated with a country having income three times that of China: China's manufacturing has been able to "latch on" to a production stage higher than its fundamentals could permit (Rodrik 2006a).

In this sense, China's exports are relatively sophisticated. However, as the figure above suggests, the degree of sophistication is not far ahead of income growth, suggesting that China's exports-growth model is running out of steam, unless it can "discover" newer products to latch on (Rodrik 2006a, 16). In other words, sooner or later China will have to deal with the competitiveness question: exporting sophisticated goods does not mean having the capability to

make goods with high level of product differentiation. The issue of competitiveness has ultimate impact on the choice of invoicing currency and hence foreign exchange exposure.

FIGURE 144 CURRENCY INVOICING OF JAPANESE EXPORTS TO ASIA

Source: Ito et al 2010, 8



Finally, actions of the China affiliates of foreign firms based in developed East Asia can have implications on competitiveness and exposure of China's exports. For example, more and more foreign companies are sourcing inputs to local Chinese suppliers with close supervision to ensure quality (Rodrik 2006a, 22), implying technology sharing. Since foreign firms export intermediate inputs to China, the choice of invoicing currency for these inputs can illuminate the level of exposure for China. For supplier countries like Japan, an interesting question to ask is given Japan's extensive production network in Asia and the international status of the yen, how is the yen being used in Japan's trade with the network and beyond (Ito et al 2010)?

TABLE 7 SHARE OF CURRENCY FOR EXPORTS FROM JAPAN TO ASIA

Source: adapted from Table 3, Ito et al 2010, 12

	Share of currency for exports from Japan to Asia		
	USD	JPY	Other
All sample firms	55.6	41.8	2.6
Automobile	32.6	65.6	1.8
Electrical machinery	93	6.4	0.6
Machinery	20	80	0
Electrical components	9.4	67.8	22.8

In terms of total exports, Japanese firms invoice in the yen much less than the dollar. In terms of exports to Asia, less than 3% of this trade is invoiced in currencies other than the yen and the dollar. Yen invoicing is more prevalent than dollar invoicing for automobile and machinery industries, but less for electrical machinery and electrical component. Therefore, the yen is used more for invoicing exports of industries over which Japan has comparative advantage. Interestingly, invoicing pattern of Japan's exports to China is very similar to that to Asia (Table 5, Ito et al 2010).

Since these industries fall under manufacturing, and since either the yen or the dollar is used for invoicing, it follows that China's manufacturing sector has very little control over what invoicing currency to be used, and hence cannot do much about its foreign exchange exposure. Econometric results further indicate that, for Japanese firms, the degree of equity ownership in foreign affiliates, foreign sales in North America, and competitiveness of exports have very strong explanatory power for choosing invoicing currency (Table 7, Ito et al 2010). As long as the goods that China produces obtain inputs from Japan and are meant for re-export to the US, foreign exchange exposure remains out of China's control.

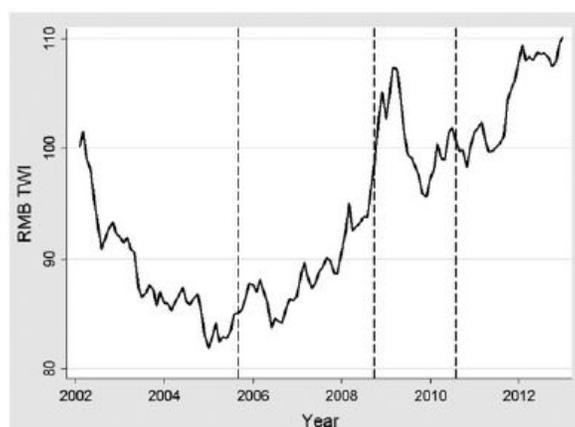
3.1.2. MEASURING FOREIGN EXCHANGE EXPOSURE OF CHINA'S MANUFACTURING SECTOR

The previous section suggests that China's manufacturing sector might not be competitive enough to allow China to choose invoicing currency. But is China really vulnerable to foreign exchange exposure? This section demonstrates that the answer is yes. Two different perspectives confirm that, comparing to other exporting sectors, China's manufacturing indeed suffers from considerable exposure. The literature looking at the relationship between firm's value and foreign exchange exposure shows that Chinese manufacturing firms have significant, negative exposure (Miao et al 2013). At the same time, an empirical exercise on the export prices of different Chinese industries confirms the high exposure of the manufacturing sector (Cui, Shu, and Chang 2009).

Since China relies so much on manufacturing for its exports, it follows that China's exports have significant foreign exchange exposure. True, a country that trades a lot can always benefit from using its own currency. In this respect, China is not different from Germany, another large trading nation. However, China is different from Germany. The reliance of China's export regime on manufacturing and processing trade makes China especially susceptible to foreign exchange exposure.

FIGURE 155 CHINESE RMB EXCHANGE TRADE-WEIGHTED INDEX, 2002-2012

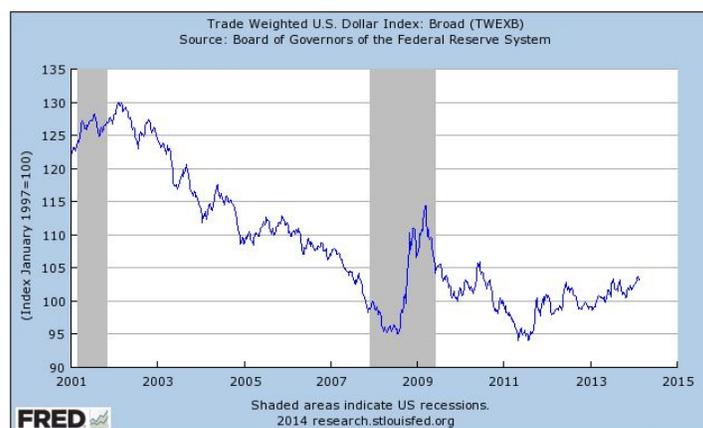
Source: Miao et al 2013, 237



One needs to know about fluctuations in the value of the renminbi before assessing the exposure of China's exports. The figure above shows the renminbi trade-weighted index between 2002 and 2012, a measurement of the value of the renminbi based on how much trade China does with different partner countries. The dotted lines separate the period into four sub-periods correspondingly to four different exchange rate arrangements that China adopted over time. Note that due to its trade-weighted nature, the renminbi exchange rate may appear to fluctuate even though the official exchange rate is fixed. From the beginning, China was maintaining a fixed exchange rate up to the second sub-period, when it adopted a managed floating regime and the renminbi thereby appreciated. The third period coincided with the 2008 global financial crisis and witnessed the reinstatement of exchange rate fixity and a short period of rapid depreciation. Once the crisis had gone through its nadir, China again floated the renminbi in a controlled fashion, and the currency resumed its appreciation in the fourth sub-period and onward.

FIGURE 166 DOLLAR EXCHANGE-WEIGHTED INDEX, 2002-2014

Source: Federal Reserve Economic Research



Why did the renminbi appreciate in the second and fourth sub-periods, when China abolished exchange rate fixity? The answer, as evident in the above graph, which is the dollar counterpart of the previous graph, lies in the combined facts that China and the US do a great

amount of trade together and that the dollar assumed a depreciation trend between 2002 and 2012, except for 2009 when it suddenly appreciated, most probably as a result of the global dollar shortage that ensued the 2008 global financial crisis. It is in this turbulent environment that one wonders about the foreign exchange exposure of China's manufacturing exports.

TABLE 8 INDUSTRY LEVEL EXCHANGE RATE EXPOSURE

Source: Miao et al 2013, 241

Industry	Whole sample			01.2002–08.2005		09.2005–09.2008		10.2008–07.2010		08.2010–12.2012	
	β	$t(\beta)$	$\sigma\beta$	β	$t(\beta)$	β	$t(\beta)$	β	$t(\beta)$	β	$t(\beta)$
Agriculture	0.375*	0.018	0.00	0.033	0.16	0.656	1.42	0.558**	2.32	-0.571*	-1.70
Mining	-0.598***	-5.74	0.23	-0.338**	-2.21	-0.487*	-1.82	-0.696***	-2.99	-0.806***	-3.20
Manufacturing	-0.092***	-3.91	0.01	-0.091**	-2.47	0.267***	4.28	0.031	0.71	-0.837***	-16.07
Utilities	0.122	1.50	0.28	-0.116	-1.09	0.524***	2.73	0.282*	1.86	-0.906***	-4.95
Construction	0.165	1.30	0.29	-0.195	-1.04	-0.140	-0.44	0.833***	3.18	-0.226	-0.79
Wholesale and retail	-0.126**	-2.18	0.04	0.087	1.06	-0.144	-0.95	-0.130	0.84	-1.042***	-7.24
Transportation	0.118*	1.74	0.09	-0.328***	-3.01	0.849***	4.51	0.379**	2.36	-0.196	-1.36
Hotel and catering	-0.072	-0.34	0.00	-0.085	-0.25	0.258	0.44	-0.217	-0.54	-0.680	-1.44
Information technology	-0.346***	-3.08	0.00	-0.319	-1.50	0.475	1.57	-0.366*	-1.64	-0.940***	-4.39
Real estate	-0.314***	-5.01	0.03	-0.004	-0.51	-0.948***	-5.97	-0.040	-0.32	-0.622***	-3.71
Leasing and commerce	-0.195	-1.04	0.29	0.041	0.14	0.254	0.45	-0.814**	-2.29	-0.415	-0.99
Scientific research	-0.292	-0.68	0.00	-0.554	-0.39	-1.040	-0.82	0.008	0.01	-0.423	-0.58
Environment and public facilities	-0.126	-0.70	0.29	0.072	0.26	-0.076	-0.19	-0.293	-0.90	-0.297	-0.74
Health and social work	0.206	0.25	0.00	-0.871	-0.45	0.894	0.41	0.547	0.44	-1.326	-1.00
Culture and entertainment	-0.028	-0.12	0.32	0.117	0.37	-0.428	-0.82	-0.462	-1.30	0.088	0.14
Miscellaneous	0.060	0.40	0.00	-0.137	-0.69	0.031	0.08	0.172	0.59	0.015	0.04

Notes: The table reports the results of the industry-level exchange rate exposure from the random coefficient regressions of Equation (3). Firms are sorted into 16 industrial sectors according to the CSRC classification. The estimated exposure β and the t statistics $t(\beta)$ for each industry are reported for both the whole sample period and different sub-sample periods.

*** indicates the significance level at 1%,

** indicates the significance level at 5% and

* indicates the significance level at 10%.

Measuring the correlation between exchange rates fluctuations and firms' stock returns, a study finds that, over the mentioned four sub-periods, ten out of sixteen Chinese industries have negative exposure, five of which the correlation is significant, including manufacturing, mining, IT, and real estate (Miao et al 2013). A negative sign means renminbi appreciation correlates to a decrease in firms' value. The first column of the table above shows the regression result for the whole sample, which spans across the mentioned four sub-periods of renminbi fluctuations. The remaining columns correspond to results from each sub-period. Among the industries with significant results, the IT sector exhibits a relatively similar pattern to manufacturing, while the mining and real estate sectors have much in common. A majority of Chinese industries exhibit negative foreign exchange exposure.

For the whole period, the relatively small magnitude for manufacturing suggests a set of interacting factors that affect its exposure. During the second and third sub-periods, the sign is actually positive. It seems that, as the renminbi appreciates and improves Chinese purchasing power, decreasing input prices offset price increases elsewhere. Recall that the Chinese processing trade regime imports a great amount of inputs from supplier countries. Contrary to common knowledge, renminbi appreciation may lead to gains for the exporting sector. But as results for the fourth sub-period show, sustained appreciation and at an even higher level can eventually turn exposure of the manufacturing sector into the negative.

Sub-sectors of manufacturing also report increasing exposure as renminbi appreciation continues (Table 6, not reproduced here, Miao et al 2013). By the fourth sub-period, all sub-sectors have negative exposure, and in eighteen out of these twenty six sub-sectors the relationship is significant. Interestingly, some sub-sectors that are more resource-based, such as metal presses and non-metal mineral products, have overall positive exposure, while some other resource-based sub-sectors such as chemical products has overall negative exposure. Some less resource-based sub-sectors, such as computer equipment and electric equipment and parts, report overall negative exposure.

The observations about the offsetting effects of renminbi appreciation and the distinction between more resource-based and less resource-based sub-sectors play out prominently in a second approach that looks at Chinese firms' exposure through the lenses of exchange rate pass-through, which refers to the "transmission of exchange rate changes to export prices" (Cui, Shu, and Chang 2009, 2). Exchange rate pass-through relates to the economic cost of foreign exchange exposure, according to which exporting firms are faced with destination market demand uncertainty when export price changes due to currency movements (Dohring 2008, 2).

As the section below will demonstrate, firms that have lower exchange rate pass-through are said to be more negatively affected by foreign exchange exposure.

When the domestic currency appreciates against the currency of the destination market, an exporter must decide how to adjust the export price quoted in the foreign currency. It can choose to do nothing, which represents a loss as the same amount of foreign currency earned will be exchanged for less domestic currency than before. Or it can mark export price up by the full amount of appreciation and maintain the same gross profit per unit, even though the higher price may cause foreign consumers to cut down on purchase quantity. Between these two extremes, the exporter may allocate the appreciation effect between domestic price and destination price using some ratio.

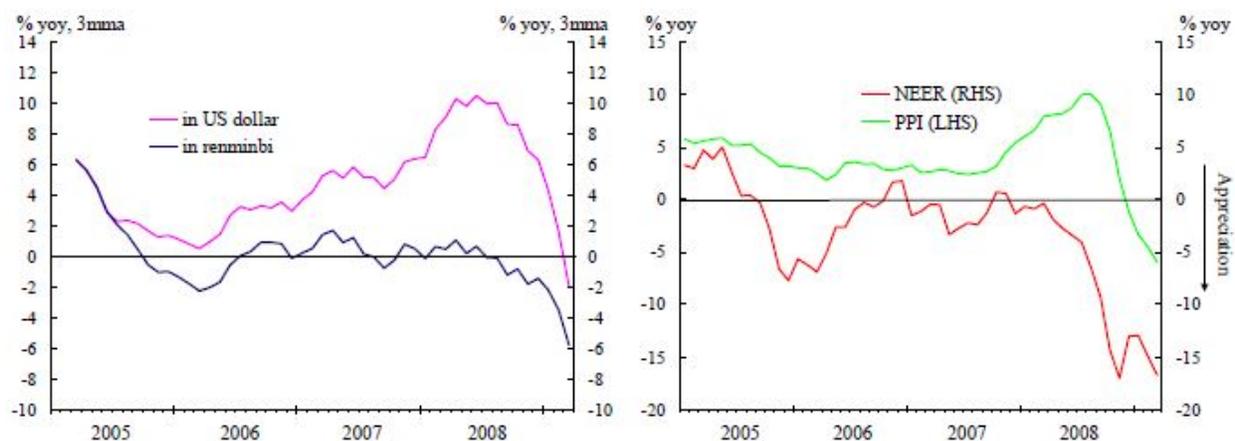
Therefore, for a given degree of domestic currency appreciation, exchange rate pass-through lies in a spectrum (Cui, Shu, and Chang 2009, 4-5). At one end is local currency pricing, when the exporter keeps price in foreign currency stable and absorbs the full amount of loss. At the other end is producer currency pricing, when the exporter keeps domestic currency price unchanged and passes the full markup to importers. Between these extremes is price to market, when an exporter strategically allocates price change to domestic and foreign export price. The degree of price to market is suggestive of exposure: firms that can keep domestic price stable can be said to have lower exposure, and vice versa.

Again, China's manufacturing sector demonstrates relatively high exposure: when the renminbi appreciates, it cannot fully markup export prices. Furthermore, exchange rate pass-through is a function of changes in both exchange rate and production cost. Domestic currency appreciation can lead to both an increase in foreign currency price and a decrease in domestic

currency price. As domestic purchasing power improves thanks to appreciation, imported inputs for production become cheaper (Cui, Shu, and Chang 2009, 6).

FIGURE 177 EXPORT PRICE IN USD AND RMB (LEFT) AND NOMINAL EFFECTIVE EXCHANGE RATE AND PRODUCER PRICE INDEX (RIGHT)

Source: Cui, Shu, and Chang 2009, 9



The graphs above convey the correlation between renminbi and dollar price as well as the change in renminbi nominal effective exchange rate and China's producer price index. Nominal effective exchange rate is another word for the trade-weighted exchange rate already cited. Producer price index measures the price that producers receive for their goods, and so reflects to a degree costs of production. These graphs are significant because they depict the observation made about the offsetting effects of appreciation related to changes in input price for production.

Between mid-2005 and mid-2008, corresponding to the mentioned second sub-period when China floated the renminbi, the gap between renminbi and dollar export price widened. Although the direction was rather similar with both prices heading in the same way, from the second half of 2007 onward they diverged. The divergence coincides with the start of faster increases in production costs, with dollar price moving upward together with producer price index. Renminbi price stayed relatively stable and for the whole period exhibited a deflationary

trend, mirroring the appreciation trend of the nominal effective exchange rate. To note, production costs were rising regardless of renminbi appreciation, which is contrary to the observation that domestic currency appreciation should suppress production costs as domestic purchasing power improves, and so factors other than the exchange rate were responsible for rising production costs. Therefore, during this floating period, increasing dollar price of exports reflected both renminbi appreciation against the dollar and rising production costs in China, implying successful exchange rate pass-through, but it is unclear if the appreciation or rising production cost effect was larger.

Since mid-2008 when the financial crisis hit and China reinstated exchange rate fixity, both renminbi and dollar prices assumed deflationary trend. The gap between them quickly narrowed. In overall, the movements converged and tell the story of diminishing export price during renminbi appreciation. What were the reasons? While the renminbi had been steeply appreciating, production costs had been plunging, reflecting collapse of global demand for all goods including inputs for production. Renminbi appreciation accelerated earlier at the beginning of 2008, although this is a late start if one accounts for the steadiness of dollar depreciation since 2002. The sudden acceleration either reflects deliberation of Chinese policymakers to let the currency go up or continuing deterioration of the global economy. In any case, renminbi price did not go up with renminbi appreciation, while dollar price did, that is until mid-2008 when it once more tracked renminbi price due to the return to exchange rate fixity. The collapse of the global market translated to lower production costs, which arguably also contributed to the steep decreases in both renminbi and dollar prices since mid-2008.

Overall, the analysis for the 2005-2008 period provides an explanation as to why exposure was not negative for many Chinese industries: even as the renminbi appreciates,

production costs go down and so do export prices (Miao et al 2013). But then, renminbi appreciation during the 2005-2008 period was not as large as that during the fourth sub-period of 2010-2012, which also explains why not until the later years did the majority of industries report negative exposure. Hence, how far Chinese policymakers are willing to let the renminbi appreciate will greatly dictate the magnitude of exposure. Nevertheless, foreign exchange exposure is indeed significant for the Chinese exporting sector, especially manufacturing.

Substantiating the analysis above, econometric results show that, on the aggregate level, a 10% appreciation of the renminbi results in a 5% decrease in renminbi price and 5% increase in foreign currency price (Cui, Shu, and Chang 2009 10). By only increasing foreign currency price by 50% of the magnitude of renminbi appreciation, a Chinese exporter absorbs 50% of the loss. Furthermore, out of the 5% decrease in renminbi price, only 0.6% stems from a decrease in production costs, suggesting that this type of savings from renminbi appreciation is low, and the majority rest of price decrease represents a loss to the Chinese exporter. Hence, foreign exchange exposure is significant for Chinese exporters.

TABLE 9 DESCRIPTIVE STATISTICS FOR PANEL DATA, EXCHANGE RATE PASS-THROUGH FOR MANUFACTURING AND NON-MANUFACTURING SECTORS

Source: Cui, Shu, and Chang 2009, 22

	All	Non-manufacturing sectors	Manufacturing sectors	Resource-based manufacturing sectors	Non-resource-based manufacturing sectors
Export price (in RMB)					
Mean	4.9	6.8	3.4	5.1	1.5
Standard deviation	13.7	17.2	9.8	10.0	9.2
NEER					
Mean	-3.9	-3.8	-3.9	-4.1	-3.8
Standard deviation	4.5	5.2	3.8	4.4	3.1
Marginal cost					
Mean	4.3	6.6	2.5	3.8	1.2
Standard deviation	9.5	12.5	5.5	6.8	3.0

What is the source of this negative exposure? As the second and third columns and the corresponding means of export price of the above table demonstrate, China's manufacturing sector displays relatively higher exposure than its non-manufacturing sector. The likelihood that the former can inflate export price is 100% lower than that for the latter. Furthermore, descriptive statistics on the disaggregate level reveal that, comparing to non-manufacturing sector, manufacturing sector indeed reports lower export price inflation (Cui, Shu, and Chang 2009, 12). In other words, given renminbi appreciation, dollar price of manufacturing exports is more likely to stay unchanged than that of non-manufacturing exports, and so manufacturing exporters are absorbing more losses from renminbi appreciation, other things equal.

TABLE 10 ONE-DIGIT STANDARD INTERNATIONAL TRADE CLASSIFICATION

Source: Cui, Shu, and Chang 2009, 22

		SITC section	Descriptions
Non-manufacturing sectors	{	0	Food and live animals
		1	Beverages and tobacco
		2	Crude materials, inedible, except fuels
		3	Mineral fuels, lubricants and related materials
		4	Animal and vegetable oils, fats and waxes
Manufacturing sectors	{	5	Chemicals and related products, n.e.s.
		6	Manufactured goods classified chiefly by material
		7	Machinery and transport equipment
		8	Miscellaneous manufactured articles
		9	Commodities and transactions not classified elsewhere in the SITC

Moreover, the fourth and fifth columns show that more resource-based sub-sectors display more foreign currency price inflation than less resource-based ones, which is consistent with findings from the first study. The table above shows the United Nations standard classification for international trade into manufacturing and non-manufacturing sectors and more resource-based and less resource-based manufacturing sub-sectors. For example, petroleum products demonstrate the highest inflation. Follow this fact, more resource-based manufacturing sub-sectors report higher foreign price inflation than less resource-based manufacturing sub-

sectors, implying lower exposure for more resource-based exports. Econometric analysis confirms these observations (Cui, Shu, and Chang 2009, 13). Price to market for manufacturing sector is highly significant while that for non-manufacturing sector is insignificant.

Moreover, for a given appreciation intensity, more resource-based manufacturing sub-sectors decrease domestic price by a larger margin than less resource-based manufacturing sub-sectors do, but more of this markdown is more likely be due to decrease in production costs for more resource-based exports than for less resource-based exports. One can conclude that China's manufacturing sector has significant exposure and does not greatly benefit from production costs reduction due to renminbi appreciation, its exposure highly affected by the type of inputs used for production.

3.1.3. FURTHER ANALYSIS OF FOREIGN EXCHANGE EXPOSURE OF CHINA'S MANUFACTURING SECTOR AND BENEFIT OF RENMINBI INTERNATIONALIZATION

The existing characteristics of China's manufacturing sector can partly account for its level of exposure. Technology sharing and intra-network trade and their corollaries, degree of sophistication and control over economic resources, point at the extent to which exposure has been an issue for China's manufacturing sector. However, structural changes are taking place, increasing the level of sophistication and domestic value added of China's exports, which may have different implications on future exposure. But these changes may actually intensify exposure, making even more relevant the benefit of being able to invoice trade in the renminbi.

FIGURE 18 TRENDS IN CHINA'S MANUFACTURING SECTOR AND FOREIGN EXCHANGE EXPOSURE OF CHINESE FIRMS

Source: author's own synthesis

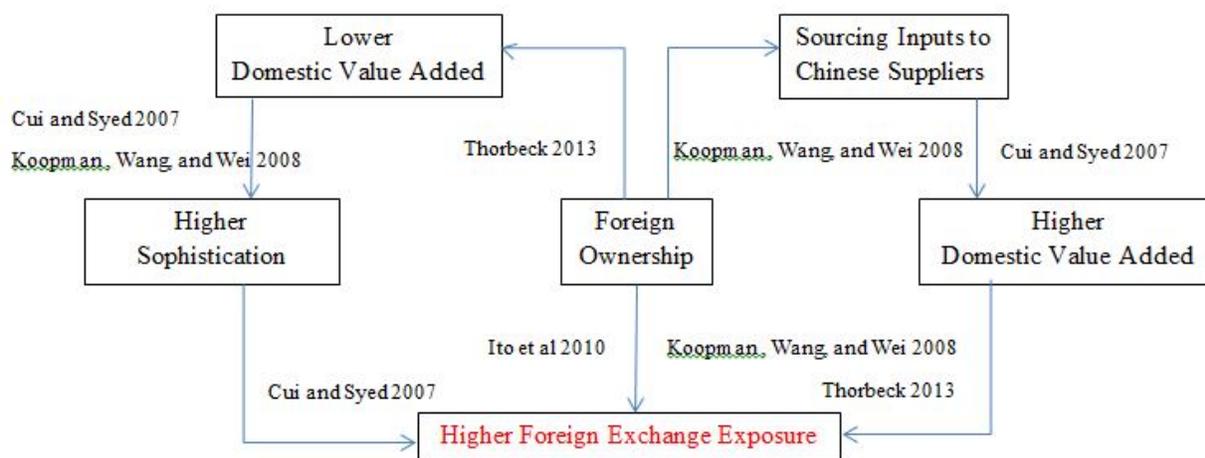
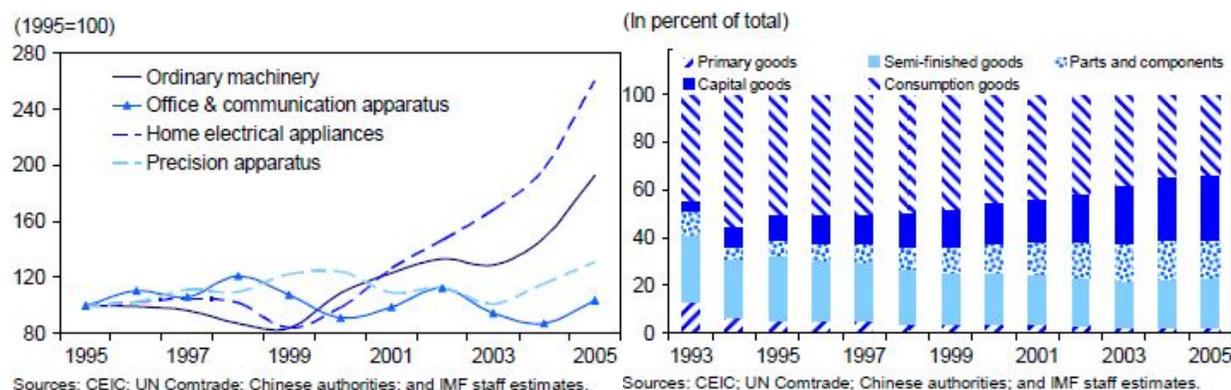


FIGURE 19 RATIO OF FINAL EXPORTS TO IMPORTED COMPONENTS (LEFT) AND SHIFTS IN COMPOSITION OF EXPORTS (RIGHT)

Source: Cui and Syed 2007, 7-8



Two trends of China's production and trade regime are clear over the 1993-2005 period. First, China is exporting more goods than it imports for production, especially for the ordinary machinery and home electrical appliances industries, which also seem to be the less sophisticated among the four industries represented. The implication is more domestic content for Chinese exports: an increase in the portion of inputs produced locally is replacing the inputs imported from abroad. Second, China is exporting an increasing amount of parts and components and capital goods relatively to primary goods, semi-finished goods, and consumption goods. In addition, the share of high-tech imports has been on the rise at the expense of low-tech imports,

and the same also applies to high-tech exports (Cui and Syed 2007, 9), suggesting that high-tech processing trade is playing a larger role in China's processing trade mix. This is especially clear when one considers that between 1992 and 2004, the change in the level of sophistication of China's exports increases by a slightly larger margin than that of China's imports (Cui and Syed 2007, 8). China's production and trade regime is trending towards higher domestic production and higher sophistication.

The significance of these trends lies in how they can affect foreign exchange exposure of China's trade regime. On one hand, the more domestic added value in a good, the more the price of the good should be subject to exchange rate fluctuations (Koopman, Wang, and Wei 2008, 1). On the other hand, higher sophistication should magnify exposure, as sophisticated imports are highly differentiated and sophisticated exports are faced with more price elasticity of demand (Cui and Syed 2007, 18-19).

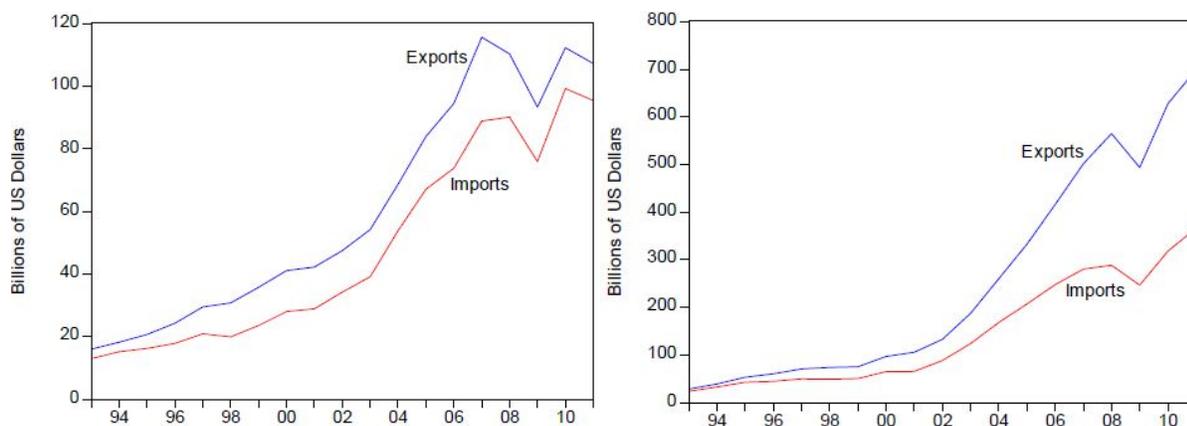
One may interpret the lowering share of low- and mid-tech imports as evident of local Chinese suppliers' improved capability to replace importation with local production. Then high-tech production remains largely an enterprise of foreign firms and their affiliates in China. The above figure shows that, even though for certain exports China is producing more inputs locally, for exports with higher technology China is still importing the required inputs. If this reading is true, at the same time as China is heightening domestic value added (DVA) in and upgrading its exports, the growing domestic added value belongs to lower-tech exports. In other words, China's DVA is increasing, but not for the highest-tech sectors. This may mean that China has not climbed very high on the competitiveness ladder, resulting in a lack of pricing power. Then, despite the appearance of increasing sophistication, which is driven mostly by processing trade

with the involvement of foreigners, China's exports will still likely have high level of foreign exchange exposure, as China does not have the clout to determine the invoicing currency.

Indeed, an accounting method shows that industries with the highest DVA have the lowest level of sophistication, and vice versa (Table 6, Koopman et al 2008). Low-DVA, high-sophistication exports comprise 35% of China's exports in 2007, two-thirds of which falling under processing trade (Koopman, Wang, and Wei 2008, 20). In overall, DVA for all of China's exports increases from 21.0% to 37.3% between 1997 and 2007 (Koopman, Wang, and Wei 2008, 27). Foreign invested enterprises are driving this trend, pushing DVA in their production upward by 10% between 2002 and 2007, substantiating the claim that foreign firms are sourcing intermediate inputs locally. Finally, Chinese exports to such markets as Hong Kong, the US, Singapore, and Taiwan are mostly goods with the lowest DVA and highest sophistication (Koopman, Wang, and Wei 2008, 21). As most of these exports eventually end up in developed markets, their distribution responsible for by foreign firms, China does not have much control over the terms of the transaction, including invoicing currency. These findings highlight the interconnections between foreign firms, DVA, product sophistication, and exposure of Chinese manufacturing exports.

FIGURE 20 VALUE OF CHINA'S PROCESSING AND ASSEMBLY EXPORTS AND IMPORTS, 1993-2011 (LEFT) AND VALUE OF CHINA'S PROCESSING WITH IMPORTED MATERIAL EXPORTS AND IMPORTS, 1993-2011 (RIGHT)

Source: Thorbecke 2013, 21-22



The connection between foreign firm involvement, domestic value added (DVA), and exposure is underscored in a study on the effect of renminbi appreciation on the volume of China's processing exports, which by definition are differentiated into processing and assembly (PAA) and processing with imported material (PWIM) (Thorbecke 2013). PAA refers to foreign firms exporting inputs to their affiliates in China, while PWIM refers to China-based foreign firms importing inputs from non-parent sources (Thorbecke 2013, 3). In terms of size, in 2011 China's surplus in PAA trade amounted to \$10 billion, while that in PWIM trade was more than \$300 billion (Thorbecke 2013, 3). The gap between exports and imports for PAA has remained steady for PAA exports, while that for PWIM has widened over the years, reflecting DVA on the rise for PWIM but not for PAA. Therefore, one may say that local input sourcing is a phenomenon done by PWIM firms rather than PAA firms. Moreover, recall that for Japanese firms equity ownership is a decisive factor of choosing invoicing currency, and since PAA implies foreign ownership, PAA exports are likely to be invoiced in currencies other than the renminbi.

Econometric results confirm this line of reasoning. Appreciation of the integrated exchange rate causes both PAA and PWIM exports to drop, while appreciation of the renminbi

only negatively affects volume of PWIM exports (Thorbecke 2013). This may be because no renminbi is used to invoice PAA exports. In his own line of reasoning, the author concludes that more DVA equals more exposure (Thorbecke 2013, 15).

Taken together, all of these findings indicate that higher sophistication and higher DVA will exacerbate foreign exchange exposure of China's trade regime. The benefit of renminbi internationalization, then, is relevant and should be sizeable. However, recall that the choice of invoicing currency does not only depend on having an international currency but also on competitiveness. A further question to ask is, does higher sophistication equal higher product differentiation? The answer is negative. One paper examines the similarity between China's exports basket and that of OECD countries and compares relative prices (Schott 2007). The findings reveal considerable content overlap between these exports baskets, but Chinese prices are lower and in some industries are even trending downward, suggesting the resort to price competition due to lack of technological sophistication as well as "moving up" or "moving out" on the part of OECD countries to climb up the comparative advantage ladder (Schott 2007, 4). In other words, even as China can export sophisticated products, its products are not highly differentiated and simply are latecomers to the market. As mentioned earlier, China will need to produce more technologically advanced products if it wants to continue to benefit from the exports-growth model (Rodrik 2006a). If China's exports are not differentiated enough, the chance of renminbi invoicing can be very slim, and hence exposure will continue to be a problem.

3.2. BENEFIT 2: NEUTRALIZE EXCHANGE RATE RISKS IN INTERNATIONAL FINANCE

An international currency can potentially let the issuing country engage in international finance using its own currency. Similarly to international trade, international finance is an

activity with foreign exchange rate risks. Being able to refrain from using foreign exchange eliminates these risks and offers the country a benefit.

International finance is an important component of the world economy. Countries expect to benefit from international finance, but caveats exist, bringing into question some conventional thoughts on international finance.

In the textbook model, international finance can help countries with needed capital. Countries that cannot generate enough domestic capital may borrow abroad to finance economic activities. A positive correlation between growth and foreign capital appears to be a taken. However, empirics has shown the opposite, as countries with higher current account balance, which corresponds to lower reliance on foreign capital, also experience higher growth (Prasad, Rajan, and Subramanian 2007). In another vein, countries with higher self-financing also report higher growth (Aizenman, Pinto, and Radziwill 2004). For example, Latin American countries borrow more foreign capital than East Asian countries but experience slower growth (Aizenman, Pinto, and Radziwill 2004, 5).

In the neoclassical model, capital should flow from developed countries to developing countries (Prasad, Rajan, and Subramanian 2007). But observations validate the Lucas paradox, according to which direction of international capital does not conform to neoclassical specifications. The US has been running current account deficit since 1982, its capital imports coming from emerging Asia and China in the most recent period (Gourinchas and Rey 2013, 5).

International capital does not necessarily bring about benefit or flow from rich to poor countries. However, countries do exhibit a common pattern. As a share of total liabilities, debt decreases while equity increases, foregrounding foreign exchange accumulation (Lane and

Filesi-Miretti 2007, 236). Countries appear to have taken a more conservative stance toward international capital, since equity flows are long-term and reserves may help buffer external shocks. Moreover, it is developed countries that export these equity flows to developing countries (Gourinchas and Rey 2013, 5).

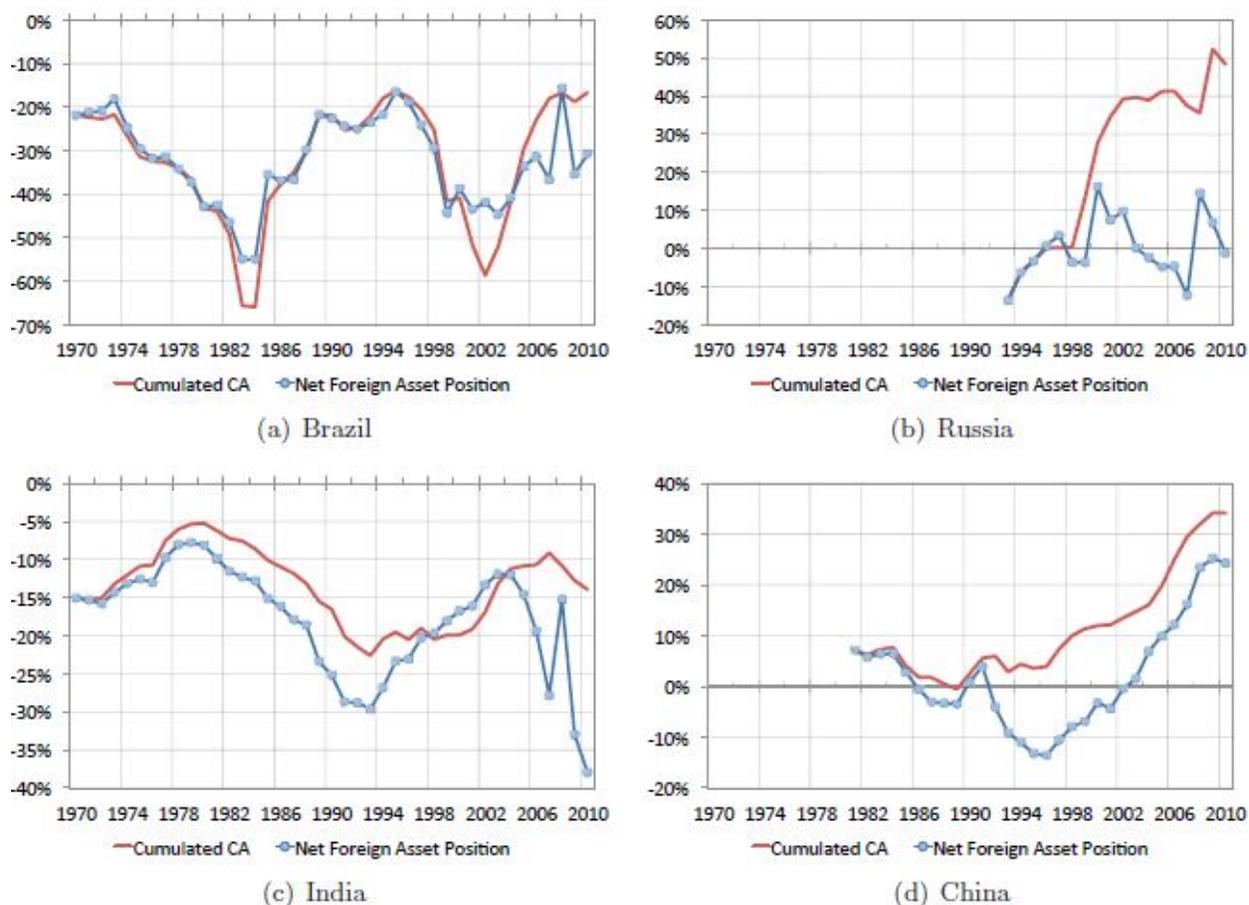
China's place in the international finance landscape reflects the points mentioned. China has mostly financed itself, although with a declining rate, hence relatively low usage of foreign capital (Aizenman, Pinto, and Radziwill 2004, 11). But self-sufficiency does not mask the fact that financial intermediation in China is inefficient and selective, resulting in limited access to capital for smaller firms that do not enjoy preferred treatment and prompting them to look for FDI (Hericourt and Poncet 2008, 4). Not only is China financially self-sufficient, it also supplies capital to foreigners and earns net creditor status, its gross foreign assets and liabilities standing at 110% of GDP comparing to 250% for more advanced Asian countries (Ma and Zhou 2009, 6). China has a long debt, short equity position and accumulates significant reserves, amounting to two thirds of foreign assets (Ma and Zhou 2009, 7). The official sector holds 70% foreign assets while the private sector holds 60% foreign liabilities (Deer and Song 2013, 5). China's international finance position can be vulnerable to changes in the exchange rate.

In the literature, valuation effect refers to gains or losses on countries' international balance sheet due to price and exchange rate fluctuations, which result in the gap between current account and net foreign assets (Gourinchas and Rey 2013). Constructed foreign assets and liabilities indices show that a majority of countries suffer from these losses (Lane and Shambaugh 2009). The indices represent two sides of an international finance transaction, a debtor or borrower and a creditor or lender.

Expanding on Lane and Shambaugh 2009, a study estimates that valuation effect cost China \$134 billion between 2005 and 2010, with magnitude increases year on year as China's international balance sheet expands (Deer and Song 2013, 9). As 70% of its foreign exchange reserves are denominated in the dollar, China is especially sensitive to the strength of the dollar (Deer and Song 2013, 11).

FIGURE 21 CUMULATED CURRENT ACCOUNT AND NET FOREIGN ASSET POSITION, BRAZIL, RUSSIA, INDIA, AND CHINA, 1970-2010. PERCENT OF GDP

Source: Gourinchas and Rey 2013, 57



On the debtor side, the inability to borrow in own currency is known as original sin (Eichengreen and Hausmann 1999). Original sin is prevalent: between 1999 and 2001, out of \$5.8 trillion worth of securities placed in international markets, \$5.6 trillion was issued in five

major currencies (Eichengreen and Hausmann, 2003, 4). Countries with original sin have higher solvency risk, higher output volatility and pay the costs associated with running a fixed exchange rate to offset the effect of original sin, especially by giving up the interest rate as an adjusting tool (Eichengreen and Hausmann 2003; Hausmann, Panizza, and Stein 2000). The East Asian dollar standard, whereby a number of East Asian countries peg their currencies to the dollar, can be said to help address the original sin problem (McKinnon and Schnabl 2009, 343).

China also pegged the renminbi to the dollar, but since China is a net creditor, valuation effect on China leans towards the creditor side. China has surplus savings and makes loans to foreigners in currencies other than the renminbi, exemplifying the immature creditor country problem (McKinnon and Schnabl 2009, 12). Investments made by these countries usually include long-term outward direct investment or liquid portfolio assets (such as US Treasury bills), and immature creditor countries worry over losses on their foreign assets resulted from changes in foreign exchange (McKinnon and Schnabl 2009, 15). Similarly to the original sin problem, running a fixed exchange rate can mitigate valuation effect, but at a cost.

The cost of running a fixed exchange rate to address valuation effect of international finance suggest that currency internationalization can help by eliminating this cost altogether. Sterilized intervention, the policy taken to maintain a fixed exchange rate regime without causing inflation, incurs the mentioned cost. The cost can be measured through three different lenses (Rodrik 2006), but in China's case fiscal cost is the most appropriate, since it gauges the difference between returns on reserves and interests paid on issued domestic instruments. Effectiveness of sterilization is an important topic relevant to the discussion on China's monetary policy.

China's immature creditor country problem stems from its economic fundamentals and financial account policy. Between 2002 and 2007, the investment-saving gap widened from -2% to 7% of GDP (Ma and Zhou 2009, 7), turning China into a net creditor country in 2004. Falling youth dependency, a demographic factor, is found to be the major driver of China's net creditor status, while other factors including growth and level of financial development do not play any significant role (Ma and Zhou 2009, 15). In addition, China's "welcome to FDI, but no-thank-you to foreign debt and portfolio flows" only permits the type of foreign capital inflows thought to be most conducive to growth (Prasad and Wei 2007, 453), preventing China from taking on too much foreign debt. On the outflows side, capital controls mean the official sector makes most of the investments from China (Prasad and Wei 2007), and private outflows are strongly affected by renminbi appreciation expectations, increasing for a stop and vice versa (McKinnon and Schnabl 2009, 13). The capital supplying these official investments comes from the foreign exchange reserves.

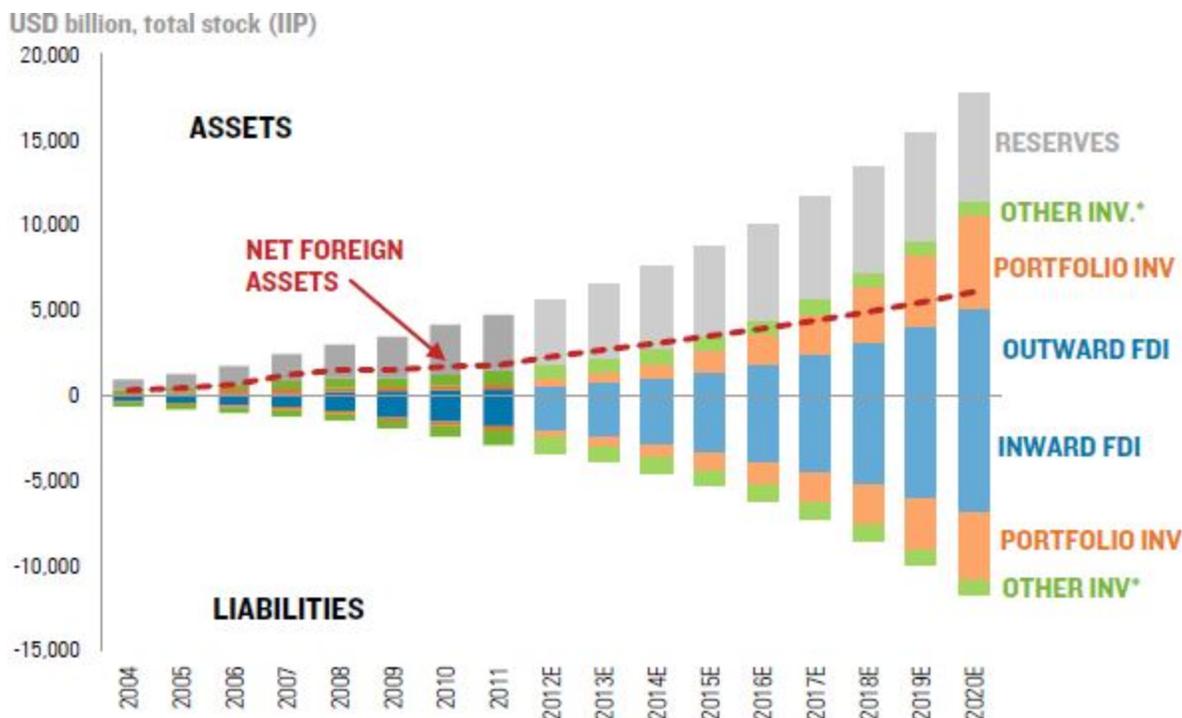
China's foreign exchange reserves accumulation has been the subject of much debate, especially that over its origin. On one side, as championed by the exceptionally popular Dooley, Folkerts-Landau, and Garber 2004 paper, mercantilist motivation leads to reserves accumulation, which is a "residual" of policies aiming at fixing the exchange rate in order to promote exports and FDI flows to exporting sector (Aizenman and Lee 2005, 3). As attractive as this theory sounds, the exports model has been behind the success story of East Asian countries for long, yet reserves accumulation only ticked up starting from 1997 (Aizenman and Lee 2005, 3). Moreover, inbound FDI is from countries that export to rather than import from China, weakening the argument that two-way goods and FDI flows act as the lock-in mechanism that binds exporting and importing countries together (Prasad and Wei 2007, 456).

On the other side, precautionary motivation drives reserves accumulation to anticipate “sudden stops”, the abrupt reversal of international capital flows during financial crises (Aizenman and Lee 2005). Though mercantilist variables are found to be significant, their magnitude is very small comparing to that of variables controlling for financial crises, suggesting that countries in the geographical scope of the Asian financial crisis in 1997 built up their reserves as a response to the event (Aizenman and Lee 2005, 4). The model also provides evidence of larger gain from precautionary reserves than the alleged cost of accumulating reserves (Aizenman and Lee 2005).

Subsequent research characterizes reserves accumulation as driven by a mix of mercantilist and precautionary considerations. An expression of “monetary mercantilism”, reserves accumulation is pursued to buffer against negative consequences of financial mercantilism, which has historically preceded its monetary counterpart and led to financial fragility for countries that practice it (Aizenman and Lee 2007). In Japan and Korea, financial mercantilism hinged on financial repression and selective capital allocation policies, rapidly promoting the exporting sector at the expense of the financial sector (Aizenman and Lee 2007, 6). As export-led growth slowed, threats from a weak financial sector—such as nonperforming loans—became increasingly eminent, hence the necessity for monetary mercantilism and reserves accumulation (Aizenman and Lee 2007, 7). China, therefore, diverges from Japan and Korea as it started to accumulate reserves in early 2000s when growth was still fast, arguably because it learns from the experience of the forerunners (Aizenman and Lee 2007, 16).

FIGURE 22 PROJECTIONS FOR CHINA'S INTERNATIONAL INVESTMENT POSITION IF FINANCIAL ACCOUNT IS FULLY LIBERALIZED BY 2020

Source: Hanemann 2013



Source: Hong Kong Institute for Monetary Research, Working Paper 9/2012. *The model does not project the evolution of the "other investment" position, therefore it is held constant at 2011 levels.

So far valuation effect has been exerted on China's foreign exchange reserves. However, China's international balance sheet is evolving, so exchange exposure of international finance for China will likely change, too. Financial account liberalization promises to bring about big changes to the composition of capital flows into and out from China, perhaps reducing the relative prominence of foreign exchange reserves and FDI. On one hand, the size of China's international balance sheet will likely increase, tripling itself and reaching 150% of GDP (Ma and Zhou 2009, 15). On the other hand, the direction of net flows is quite uncertain, but an account puts China's net foreign assets at between 11-18% of GDP in the next five years (Bayoumi and Ohnsorge 2013, 15). If China continues to be a net creditor, outward direct investment seems to be a key component of China's investments, becoming a significant source of change to international reserves after the 2008 financial crisis (Aizenman, Jinjarak, and Marion 2013, 14).

3.3. COST: COMPLICATE MONETARY POLICY

Renminbi internationalization can complicate China's monetary policy, especially if it is an active policy course, which it seems to be. In the setting of an immature monetary policy, currency internationalization seems like a stretch. Historically, international currencies have sprung into being quite naturally as a result of the fulfillment of some preconditions, including a developed financial system, which in turn grow out of a sound monetary policy. In other words, it is more apt for China to first reform its monetary policy and financial system before even considering renminbi internationalization.

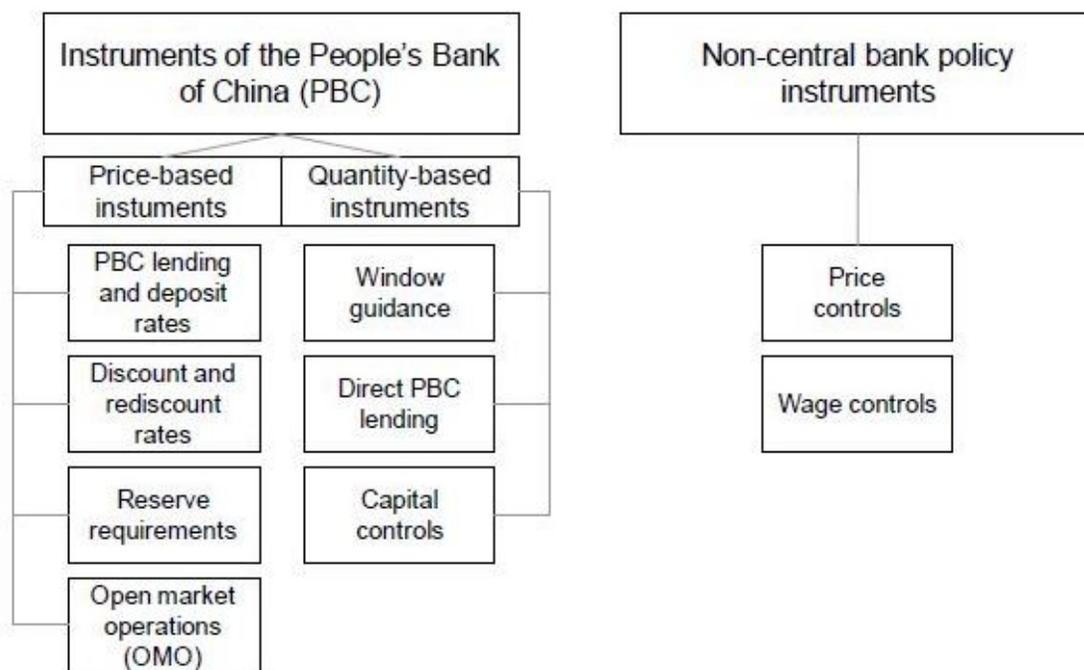
To China, renminbi internationalization can serve as a rally for monetary and financial reforms. Internationalization and integration have usually been a sort of politically correct and neutral excuse for big changes that strive to liberalize some closed system. If so, the cost of renminbi internationalization can be traced to those policies that directly bring about liberalization. Independent of supportive policies, currency internationalization can incur its own costs. But in the context of China, the costs of liberalizing policies that prepare the stage for an internationalized renminbi matter.

China's monetary policy is still in a developing stage. Renminbi internationalization therefore is a daunting task as it exerts a two-fold pressure on China's current monetary arrangements. On one hand, renminbi internationalization itself complicates monetary policy, regardless of the sophistication level of China's monetary policy. On the other hand, renminbi internationalization requires the type of reforms that will bring about fundamental changes to China's monetary policy. To accommodate renminbi internationalization, multiple interrelated facets of China's current monetary policy mix will have to change, including the exchange rate and financial account policy.

3.3.1. RENMINBI INTERNATIONALIZATION AND CHINA'S MONETARY POLICY

FIGURE 233 MONETARY POLICY INSTRUMENTS IN CHINA, 1994-2008

Source: Geiger 2010, 70



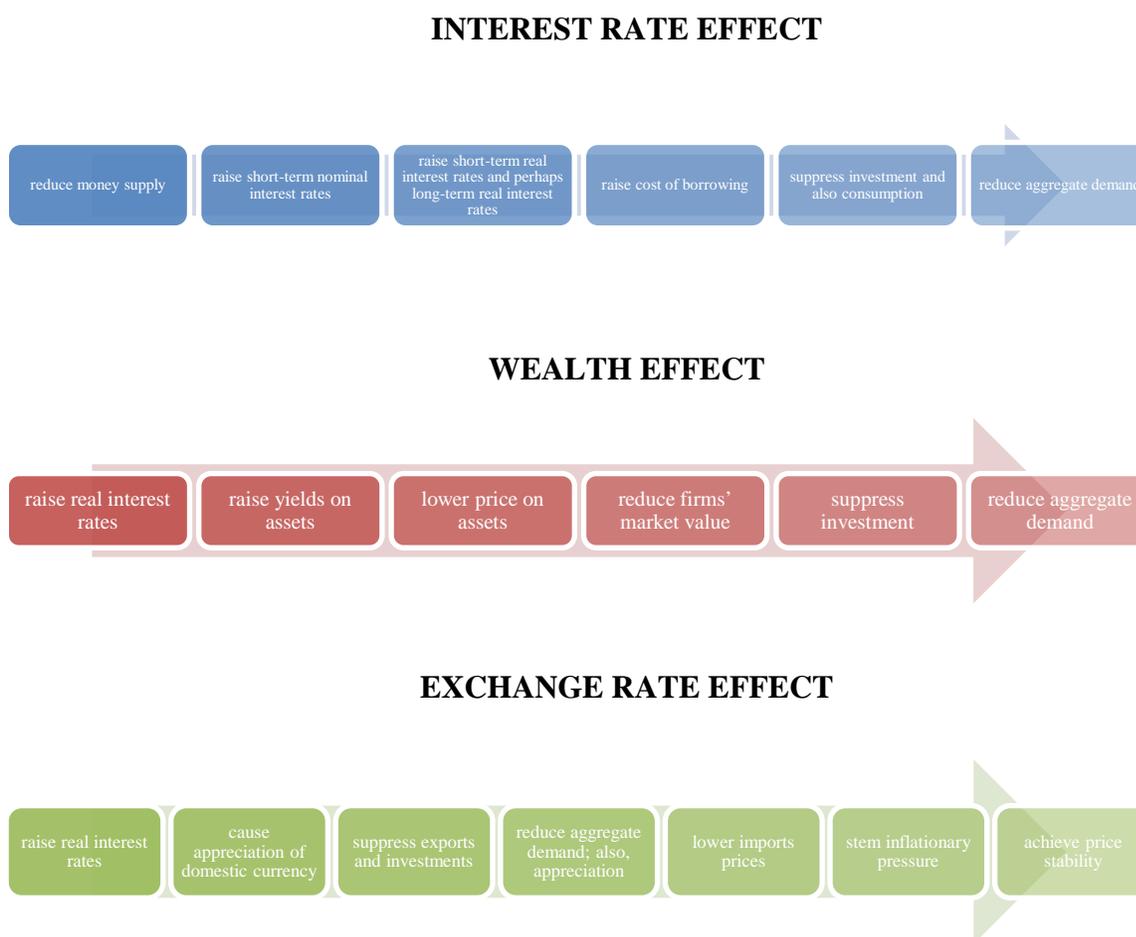
China's monetary policy is not mature since it still does not fully operate on a market basis. Up to this point, China's monetary policy operates with two nominal anchors, namely monetary aggregates plus the exchange rate, in pursuit of two final targets, the economically stipulated price stability and politically mandated growth (Geiger 2010, 58-59, 67-68). The People's Bank of China employs both quantity-based and price-based instruments to affect nominal anchors. Price-based instruments are market-based, its influence operates through voluntary price adjustments induced by deliberate policy, such as open market operations. Quantity-based instruments are not market-based, affecting monetary aggregates without considering the price of money (Geiger 2010, 71). As such, monetary policy in China is still transitioning from a planned to a market-based nature, the interest rate effect of transmission

mechanism is extremely weak, and the exchange rate has mostly been the effective nominal anchor (Geiger 2010, 71-72, 134-135).

In this premature monetary policy context, renminbi internationalization can affect the transmission mechanism and strategy of China's monetary policy. Transmission mechanism refers to how monetary actions may influence output and other real variables (Cassola 2008, 81). Economists agree that money has short-term effect on real variables, but disagree on how transmission mechanism works. In sum, monetary policy influences real variables through three channels, namely interest rate, wealth, and exchange rate effects.

FIGURE 244 THREE MONETARY TRANSMISSION MECHANISMS

Source: adapted from Cassola 2000



The strength of the interest rate depends on how much official interest rate can influence the yield curve, and how fast money market rates respond to changes in retail deposits and loans rates (Cassola 2008, 82). Banks may amplify the effect of transmission mechanism if somehow lending supply is sensitive to changes in the interest rate.

Comparing to China's immature monetary policy, for the EU monetary policy, the international role of the euro will quicken market interest rates adjustment to official rates, magnify effect of the interest rate channel, and diminish the strength of the exchange rate channel (Cassola 2008, 83-84). Due to the active role of the euro, direct financial markets are likely to develop more relatively to banks, making market interest rates more sensitive to economic events. If other countries peg their currencies to the euro, interest rate effect in the EU may transmit to these countries, which may feedback into EU's exports, creating ripping effect for EU monetary policy. Since EU goods are increasingly invoiced in the euro, exchange rate shocks may not impact EU trade as much.

Some of the scenarios above may play out for China (Gao and Yu 2009, 113-115). Renminbi internationalization will likely help direct financial markets develop, enhancing the interest rate effect. But the interest rate has never been a viable policy tool, and the government will need to do much work to make the interest rate effect operate. An internationalized renminbi will popularize renminbi assets, hence a stronger wealth effect. However, the case of China may be unique due to its vulnerability to speculative financial flows. The existence of the gap between onshore and offshore interest rates and exchange rates motivates speculative inflows or outflows depending on the sign of the gap, complicating the authority's effort to influence the economy via monetary operations. Fear of speculative financial flows was among the reasons Germany and Japan were averse to internationalization of their currencies (Gao and Yu 2009,

115; Frankel 2011, 6). These counteracting forces to channels of transmission mechanism suggest the necessity of liberalizing reforms if the Chinese government wishes to ensure effectiveness of its monetary policy in the context of renminbi internationalization.

Besides affecting transmission mechanism, currency internationalization may impact monetary policy strategy, especially one explicitly geared towards maintaining price stability operating on a monetary nominal anchor (Cassola 2008, 84-88). Foreign demand may affect the “stability and information content” of the monetary nominal anchor, partly depending on the definition of offshore currency. But a problem of measurement exists for offshore currency. Considerations for the exchange rate must remain prudent and largely neutral of macroeconomic conditions of third countries that have currencies pegged to the euro. Monetary authority must ensure that the financial system, especially for bank-dominated system, does not believe in a helping hand from the government should they take on too much risks and fail in pursuit of profits.

On the point of considerations for the exchange rate, an unconventional opinion holds that the Fed has had a rich history of factoring international macroeconomic conditions into the formulation of its monetary policy (Eichengreen 2013). The Fed’s “dual mandate” of price stability and full employment may preclude it from making international considerations. However, at its beginning, following World War I, and following World War II the Fed was taking actions that reflected international activism. It is high time the Fed returned to an international orientation once more, as the global financial weight of emerging countries increases and the international role of the dollar gets challenged by other currencies (Eichengreen 2013, 11-13). Hence, a relatively diminishing global financial clout may prompt the most financially powerful country to make more international considerations in its monetary

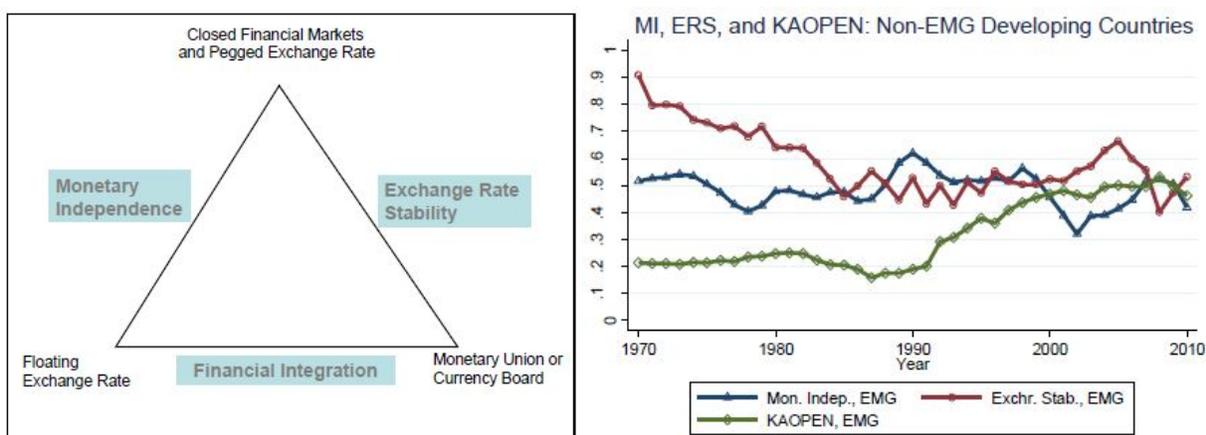
policy. This is arguably the opposite case for China due to its rising financial power. However, the interdependence the Chinese economy has with rest of the world will mean that China trot the global monetary system with finesse.

3.3.2. RENMINBI INTERNATIONALIZATION AND CHINA'S TRILEMMA

A prominent point of the discussion on currency internationalization is whether financial account liberalization is a prerequisite for an international currency. For countries with a closed financial account like China, if currency internationalization requires financial account liberalization, past policy arrangements associated with a closed financial account will have to change, which could represent the cost of renminbi internationalization. The costs of these reforms relates to China's open economy trilemma.

FIGURE 25 THE TRILEMMA AND THE EVOLUTION OF TRILEMMA INDEXES FOR EMERGING MARKET COUNTRIES

Source: Aizenman, Chinn, and Ito 2012 37, 41



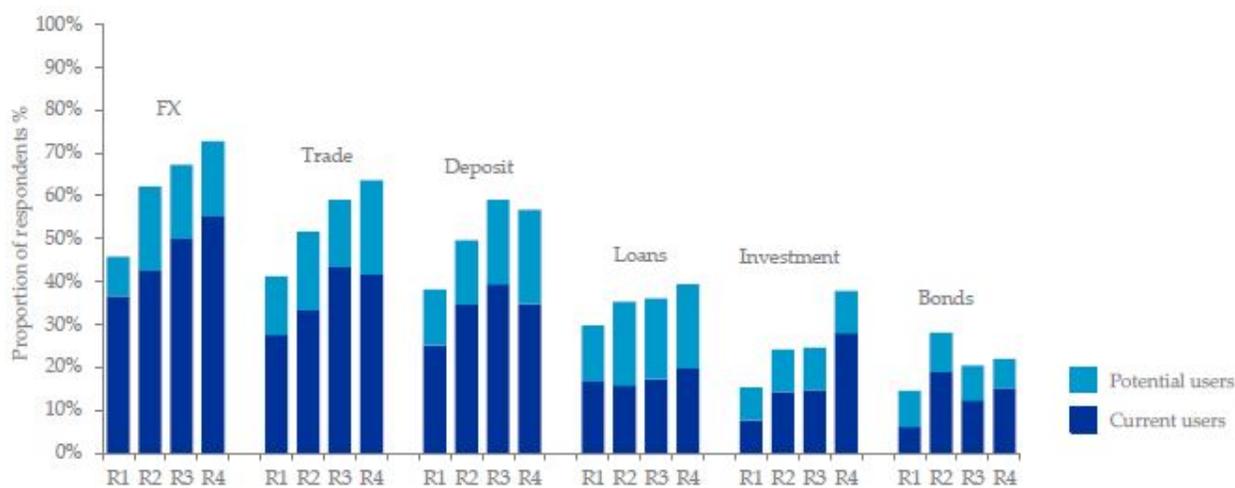
The open economy trilemma forces countries to choose two between three desirable policy goals, namely exchange rate stability, financial integration, and monetary independence. Empirically, the trilemma has been found to be binding (Aizenman, Chinn, and Ito 2012). But reserves accumulation may help countries “relax the trilemma”, adding a fourth dimension to the

analysis (Aizenman, Chinn, and Ito 2012, 32). Emerging countries tend to accumulate reserves, keep steady the level of monetary independence, and increase financial integration at the expense of exchange rate stability.

It seems that China intends on pushing financial account liberalization. If China indeed chooses to liberalize the financial account in order to facilitate renminbi internationalization, the trilemma dictates that China will either have to abandon exchange rate stability or monetary independence. So far, conservative financial account policy and exchange rate stability have served China well. The departure from this past policy arrangement represents a cost to China.

FIGURE 266 OFFSHORE RENMINBI USAGE, Q4 2012-Q3 2013

Source: Assets Benchmark Research 2013, 8



Financial account liberalization, however, can theoretically be crucial to successful currency internationalization. It extends the use of a potential international currency from international trade to international finance, reducing the transaction costs (Genberg 2009, 5). Many trade transactions are highly financial in nature, such as trade financing and foreign exchange hedging (Genberg 2009, 5). Truly so, a survey of corporations in Q3 2013 clearly shows that, the most used offshore renminbi services—including foreign exchange, trade

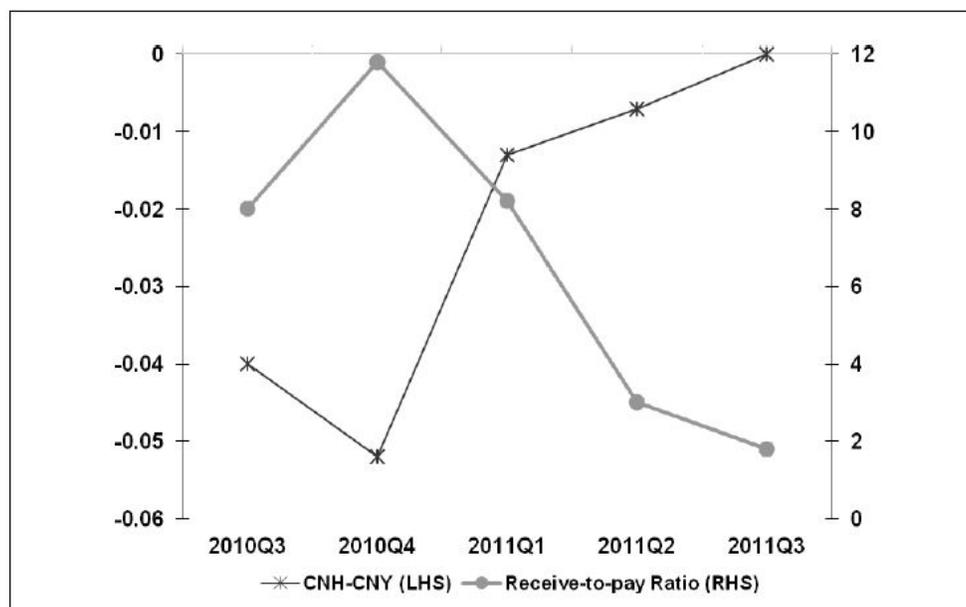
settlement, deposits and loans—relate to trade financing. Corporations cite risk management as the top reason to use the renminbi (Asset Benchmark Research 2013, 6). However, renminbi investment services are less popular, and corporations cite red tape and illiquidity as barriers to using the renminbi (Asset Benchmark Research 2013, 7). On the financial account the renminbi has not made great strides. A currency may not enjoy broad adoption if its usage is limited to the current account.

How close is the relationship between financial account liberalization and renminbi internationalization? An influential scholar contends that renminbi internationalization is financial account liberalization “in disguise” (Yu 2012, 21). He points out that even as the financial account is *de jure* closed, since the pilot trade settlement scheme allows mainland residents to move renminbi in and out of the country, flowing renminbi can be used to purchase mainland assets, leading to the same outcome as in *de facto* financial account liberalization.

In practice, financial account liberalization seems to at least be a necessary condition for currency internationalization, even though not a sufficient one. The development of the Australian dollar fixed-income market, plus the high interest earnable on these instruments, allowed the Australian dollar to internationalize very quickly (McCauley 2006). In contrast, Japan too opened up its financial account in conjunction with policies encouraging international use of the yen, but progress was slow (Takagi 2009). Financial account liberalization may not guarantee successful currency internationalization, but has historically preceded it.

FIGURE 277 RELATIONSHIP BETWEEN ONSHORE AND OFFSHORE RENMINBI EXCHANGE RATE DIFFERENTIAL AND RATIO OF IMPORTS AND EXPORTS

Source: Yu 2012, 19

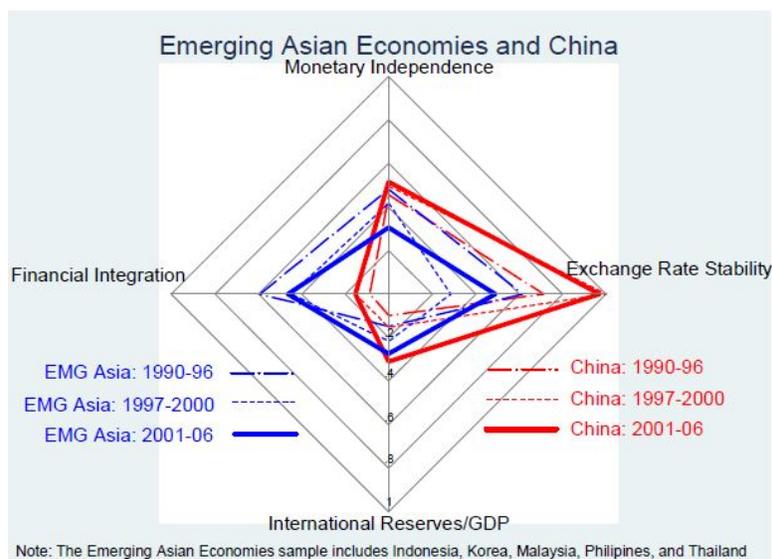


Source: Zhang and Xu (2011).

If China must indeed liberalize the financial account in order to internationalize the renminbi, policy costs of extensive reforms are inevitable. Financial account liberalization and its prerequisite reforms will force China to departure from past policy arrangements. For example, interest rate and exchange rate liberalization will need to happen first to avoid speculative financial flows, a reality evident in the inverse relationship between onshore renminbi and offshore renminbi exchange rate differential and ratio of export and import invoicing (Yu 2012, 15). An obvious cost of these reforms is the abandonment of the fixed exchange rate regime. Renminbi internationalization then underscores the trade-offs of the trilemma.

FIGURE 288 TRILEMMA INDEXES AND INTERNATIONAL RESERVES HOLDING FOR EMERGING ASIAN ECONOMIES AND CHINA

Source: Aizenman, Chinn, and Ito 2008, 72



China conspicuously differs from other emerging Asian countries in its emphasis on reserves and exchange rate stability. In a comparative study, researchers find that India accumulates reserves and is able to achieve a middle position between the three policy goals, but for China exchange rate stability is very salient and financial integration is not significant to its policy mix. They suggest segmentation of domestic financial market, various capital controls, and large reserves as the explanation for this departure (Aizenman and Sengupta 2011). In this setting, renminbi internationalization and financial account liberalization promise to bring profound changes to existing exchange rate and monetary policy in China. Changes can be beneficial and costly.

If renminbi internationalization must change the status quo, certain policy course should follow, hence a certain list of costs. Before renminbi internationalization, the topic of comprehensive reforms to China's exchange rate and monetary policy has attracted much attention. A normative stance argues that, before attempting financial account liberalization, China should liberalize the exchange rate and reform domestic financial markets in order to foster a mature monetary policy regime, readying China to deal with adverse consequences of

financial integration (Prasad, Rumbaugh, and Wang 2005). They point out that the interest rate as a policy tool has never been an option under China's fixed exchange rate regime, and that financial account liberalization coupled with fixed exchange rate or weak domestic financial market are recipes for disaster (Prasad, Rumbaugh, and Wang 2005, 6). Therefore, potential costs of renminbi internationalization relate to costs of abandoning fixed exchange rate and liberalizing the financial account.

Evidence of China's shift from exchange rate stability towards financial integration abound, which also implies movement towards monetary independence. The People's Bank of China has taken an increasingly assertive stance in the conduct of monetary policy. In June and December 2013, to curb credit growth the bank refused to inject liquidity into the interbank market, surprising the market and sending seven-day repo rate up through the roof. Investment quotas, such as Qualified Foreign Institutional Investors, Qualified Domestic Institutional Investors, and Renminbi Qualified Foreign Institutional Investors, are expanded in terms of size and geography. The establishment of the Shanghai Free Trade Zone is an experiment with financial account liberalization. PBC officials, including Governor Zhou Xiaochuan and Deputy Governor Yi Gang, have expressed disapproval of China's high level of reserves.

Certain costs have been associated with exchange rate flexibility for China (Prasad, Rumbaugh, and Wang 2005, 6-8). Fixed exchange rate has provided China with a nominal anchor to stabilize macroeconomic conditions. A flexible exchange rate may hurt China's exports, disrupt trade and FDI flows, and increase foreign exchange exposure of banks and corporations. Financial account liberalization may lead to excessive foreign capital borrowing, but this problem should be significant only if the domestic financial market is weak (Prasad, Rumbaugh, and Wang 2005, 13-14). Most importantly, if financial account liberalization is not

to be costly, exchange rate liberalization must have been in place. The Mexican, Russian, and Asian financial crises sprang from a combination of financial integration and fixed exchange rate.

Renminbi internationalization can be seen as a driver for financial account liberalization. In the past, under the banner of WTO integration, Premier Zhu Rongji was able to push for many structural reforms, and financial account liberalization driven by renminbi internationalization may fall under this type of “reform by stealth” (Huang and Lynch 2013, 574-575). Speaking about renminbi internationalization at a conference, Ming Zhang, Senior Researcher at the influential, state-backed Chinese Academy of Social Sciences, asks, “Could opening up promote domestic reform just as before?” (Zhang 2012). If the intention of the Chinese authority is to liberalize the financial account through renminbi internationalization, the cost of renminbi internationalization will include the cost of financial account liberalization.

CONCLUSION: RENMINBI INTERNATIONALIZATION AND BEIJING'S COMMITMENT TO REFORMS

Recently, policy developments in China hint at commitment to financial reforms despite slowing economic growth. Having maintained a steady appreciation trend against the dollar since 2008, starting from late February 2014 and in an unexpected manner the renminbi has devalued by an increasing margin, reversing renminbi appreciation expectations that have long been taken for granted by the market. Two weeks later, the People's Bank of China (PBC) allowed the fluctuation band of the renminbi to widen from 1% to 2%, in effect amplifying the margin by which the market can determine the renminbi's value away from the official rate set daily by the PBC. At the same time, Governor Zhou Xiaochuan said the ceiling on deposit interest rate, an important lynchpin in China's financial system that suppresses household savings income and gives the banking system much leeway to lend to favorite borrowers including SOEs, would be abolished in two years. In mid-March 2014, China experienced the first corporate bond default ever, raising the prospect that the no government intervention will take place. Since then two more corporate bond defaults have followed.

Together these developments point at a movement toward the market for the Chinese financial system. Marketization means that prices, including interest rates and the exchange rate, will be spontaneously determined and act as the undisputed guide for investors and any participants in the system. The planned economy and its corollary in the financial system do not exist without good reasons, if one probes into the economic reality of China. However, the Chinese government has indicated its commitment to reforms.

Many believe that, more than an end in itself, renminbi internationalization provides financial reforms with an impetus. By allowing foreigners to hold and use the currency, the

Chinese authority may cite external pressure as reason for internal reforms that will truly address the root of the problem. On the recent turn of tide of the renminbi, the PBC says it wants to stem arbitraging on renminbi appreciation expectations, which brings short-term, speculative foreign capital inflows into China susceptible to reversal and hence harmful to the Chinese economy. The Chinese central bank also hopes that the increased volatility in renminbi value as a result of band widening will further deter speculators from seeing the renminbi as a one-way bet. The PBC is preventing the renminbi from becoming a speculator's currency in order to ensure renminbi internationalization is healthy and foreigners are using the currency for reasons other than arbitrage. Between scrapping renminbi internationalization and stemming renminbi appreciation expectations, China chooses the latter. In other words, at the same time as China is opening up its financial markets to foreigners via renminbi internationalization, it tries to minimize the disruptiveness of this exchange by implementing reforms that, in a context without renminbi internationalization, will otherwise not seem as urgent and necessary.

The opaqueness of China's economic policies often leads outsiders to interpret policy intentions in a negative light. Accordingly, a second theory associates the recent devaluation trend of the renminbi with Beijing's effort to boost exports and revive growth. Granted, nobody can be sure about whether implicit motivation matches with rhetoric. But the currently anemic state of global demand suggests that reliance on external demand for economic growth cannot sensibly be, at the moment or anytime soon, an option for China. Nor does a return to the previous growth model based on investment serve China's long-term prospects well. To prevent the aftershocks of the global financial crisis from slowing growth, Beijing executed a 4 trillion renminbi stimulus that combined monetary and fiscal expansion that unfortunately has deepened the very structural issues that the Chinese government wishes to correct (Yu 2010). Since 2009,

economic growth has stood on a shaky basis of easy credit and overcapacity, as evident in the housing bubble, overproduction in key state-owned industries, and the exponentially increasing leverage of the economy. The Chinese government's awareness of the deficiency of the previous growth model is shown in its efforts to curb the swelling housing market and burgeoning shadow banking. In short, China has every reason to rebalance its economy away from past arrangements, which includes emphasis on exports as a source of growth.

Moreover, the argument that past economic policies represent a mercantilist external orientation that disregards the interest of other countries fails to account for the complexity of the problems facing China and hence the validity of the rationale for such policies. As a relevant point of discussion, the unification of two-track exchange rates into a single fixed exchange rate in 1995 heralded a period of monetary stability unseen in the prior period (McKinnon and Schnabl 2009). The early 1990s witnessed the highest level of inflation in the past thirty years, causing great economic hardship. For the first time, the institutionalization of the fixed exchange rate provided China with an effective monetary anchor, and inflation subsided afterwards. Indeed, as the thesis has mentioned, it is the exchange rate that has been the effective monetary anchor in China, and the underdeveloped nature of the interest rate as a price signal has justified quantity-based monetary policy instruments, in effect further stymying the role of the interest rates in monetary policy and reinforcing the validity of alternative arrangements. The criticism that China's fixed exchange rate regime is mercantilist may have failed to recognize a motivation other than concerns for foreign trade.

Regardless of the past, Beijing should find reforms an increasingly pressing issue. Maintaining a fixed exchange rate requires intervention in the foreign exchange market, which creates inflationary pressure remediable by sterilization, which in turn increases liabilities of the

public sector. Financial repression, a set of policies to artificially allocate credit in the economy that includes the mentioned ceiling on deposit rate, can help reduce the weight these liabilities (Lardy 2008). But credit allocation distortion reflects the weakness of the interest rate in China as a price signal, leading to a whole range of such serious issues as housing bubble and run-away leverage. The effectiveness of an independent monetary policy based on interest rate is indisputably compromised.

Indeed, signs are abound that China is implementing reforms to the best extent possible. The loosening of the fixed exchange rate regime via widening the fluctuation band is a step closer to financial account liberalization. Likewise, stemming one-way arbitrage on the renminbi aims to achieve a more balanced mix of inflows and outflows on the financial account. Forgoing exchange rate management means threatens the effectiveness of monetary policy in China, but this also frees China from financial repression, making the interest rate a replacement of the exchange rate as a monetary anchor. Accordingly, PBC officials have at times announced the due consideration made for interest rate liberalization.

Renminbi internationalization presents Chinese policymakers with its own costs and benefits, but one may not fully understand the implications without looking at the big picture of the Chinese economy, which manifests multiple internal weaknesses. Intensifying the link between the domestic economy and the global economy, renminbi internationalization brings to the forefront the necessity of reforms, especially those on the monetary and financial dimensions, injecting a sense of urgency that can help realizing reforms sooner. As a push for reforms, it is understandable why renminbi internationalization sometimes places the dollar and the US's monetary and financial leadership under the barrel, appealing to nationalism and new China global leadership to facilitate the process.

REFERENCES

- Aggarwal, R., Chen, X., & Yur-Austin, J. (2011). Currency risk exposure of Chinese corporations. *Research in International Business and Finance*, 25(3), 266-276.
- Aizenman, J., Chinn, M. D., & Ito, H. (2008). *Assessing the emerging global financial architecture: Measuring the trilemma's configurations over time* (No. w14533). National Bureau of Economic Research. Retrieved from: http://www.nber.org/papers/w14533.pdf?new_window=1
- Aizenman, J., Chinn, M. D., & Ito, H. (2012). *The "impossible trinity" hypothesis in an era of global imbalances: Measurement and testing*. Retrieved from http://www.web.pdx.edu/~ito/ACI_Trillema_RIE_April25_2012WP.pdf
- Aizenman, J., Jinjarak, Y., & Marion, N. P. (2013). *China's growth, stability, and use of international reserves* (No. w19739). National Bureau of Economic Research.
- Aizenman, J., & Lee, J. (2005). *International reserves: precautionary versus mercantilist views, theory and evidence* (WP/05/198). International Monetary Fund. Retrieved from <https://www.imf.org/external/pubs/ft/wp/2005/wp05198.pdf>
- Aizenman, J., & Lee, J. (2007). *Financial versus monetary mercantilism: long - run view of large international reserves hoarding*. Working paper No. 06-15. Santa Cruz Center for International Economics. Retrieved from <http://hdl.handle.net/10419/64084>
- Aizenman, J., Pinto, B., and Radziwill, A. (2004). *Sources for financing domestic capital – is foreign saving a viable option for developing countries?*. UC Santa Cruz: Department of Economics, UCSC. Retrieved from: <http://escholarship.org/uc/item/31n8m3bt>
- Aizenman, J., & Sengupta, R. (2011). *Financial trilemma in China and a comparative analysis with India*. UC Santa Cruz: Department of Economics, UCSC. Retrieved from: http://economics.ucsc.edu/research/downloads/The_Trilemma_in_China-Draft_Nov_Final.pdf
- AsiaMoney. (2013, December). *Renminbi Deposits: Hong Kong*.
- Assets Benchmark Research (2013). *The Offshore Renminbi Review Q3 2013*. Standard Chartered Bank. Retrieved from: <https://www.sc.com/en/resources/global-en/pdf/Research/Offshore-Renminbi-Review-Issue-4-Q3-2013.pdf>
- Baba, N., & Sakurai, Y. (2009). *When and how US dollar shortages evolved into the full crisis? Evidence from the cross-currency swap market*. Seminar Paper No. 349. Hong Kong Institute for Monetary Research. Retrieved from: http://www.hkimr.org/uploads/seminars/138/sem_paper_0_349_naohiko-baba.pdf

- Bacchetta, P., & Van Wincoop, E. (2002). *A theory of the currency denomination of international trade*. Working Paper No. 9039. National Bureau of Economic Research. Retrieved from: http://www.nber.org/papers/w9039.pdf?new_window=1
- Cassola, N. (2000). Monetary policy implications of the international role of the euro. In *International Financial Markets and the Implications for Monetary and Financial Stability*, BIS, Conference Papers (No. 8, pp. 79-91). Retrieved from: <https://www.bis.org/publ/confer08d.pdf>
- Chen, C., & Yiu, R. Y. S. M. S. (2013). *RMB as an anchor currency in ASEAN, China, Japan and Korea region*. Conference on Renminbi and Global Economy. ASEAN +3 Macroeconomic Research Office. Retrieved from: <https://www.cb.cityu.edu.hk/ef/doc/Conference%20on%20Renminbi%20and%20the%20Global%20Economy/papers/Chuling%20Chen.pdf>
- Chen, H., Peng, W., & Shu, C. (2009). The potential of the renminbi as an international currency. *BIS Asian Research Program Research Papers*. Retrieved from: <http://www.bis.org/repofficepubl/arpresearch200903.06.pdf>
- Cheung, Y. W., Ma, G., & McCauley, R. (2010). *Renminbizing China's foreign assets*. CESifo Working Paper No. 3009. Retrieved from: http://www.cesifo-group.de/portal/page/portal/DocBase_Content/WP/WP-CESifo_Working_Papers/wp-cesifo-2010/wp-cesifo-2010-04/cesifo1_wp3009.pdf
- Chitu, L., Barry E., and Arnauld M. (2012). *When did the dollar overtake sterling as the leading international currency? Evidence from the bond markets*. Working Paper Series 1413. European Central Bank.
- Cohen, B. (2011). The benefits and costs of an international currency: getting the calculus right. *Open Economic Review* 23 (1): 13-31.
- Craig, R. S., Hua, C., Ng, P., & Yuen, R. (2013). *Development of the Renminbi Market in Hong Kong SAR: Assessing Onshore-Offshore Market Integration* (No. 13/268). International Monetary Fund. Retrieved from: <http://www.imf.org/external/pubs/ft/wp/2013/wp13268.pdf>
- Cui, L., & Syed, M. H. (2007). *The shifting structure of China's trade and production*. International Monetary Fund. Retrieved from: <http://www.imf.org/external/pubs/ft/wp/2007/wp07214.pdf>
- Cui, L., Shu C., and Chang L. (2009). Exchange rate pass-through and currency invoicing in China's exports. *China Economic Issues* 2/09. Hong Kong Monetary Authority.
- Deer, L., & Song, L. (2013). International financial adjustment for China: A financial valuation approach. *China & World Economy*, 21(1), 1-25.

- Dobson, W., & Masson, P. R. (2009). Will the renminbi become a world currency?. *China Economic Review*, 20(1), 124-135.
- Döhring, B. (2008). *Hedging and invoicing strategies to reduce exchange rate exposure-a euro-area perspective* (No. 299). Directorate General Economic and Monetary Affairs (DG ECFIN), European Commission.
- Dooley, M. P., Folkerts-Landau, D., & Garber, P. (2004). *The revived Bretton Woods system: the effects of periphery intervention and reserve management on interest rates & exchange rates in center countries* (No. w10332). National Bureau of Economic Research.
- Eichengreen, B. J. (1996). *Globalizing capital: a history of the international monetary system*. Princeton University Press.
- Eichengreen, B. J. (2003). Hegemonic stability theories of international monetary system. In *International political economy: perspectives on global power and wealth* eds. Jeffrey Frieden and David Lake. Routledge.
- Eichengreen, B. (2011). *Exorbitant privilege: The rise and fall of the dollar and the future of the international monetary system*. Oxford University Press.
- Eichengreen, B., & Flandreau, M. (2008). *The rise and fall of the dollar, or when did the dollar replace sterling as the leading international currency?* (No. w14154). National Bureau of Economic Research.
- Eichengreen, B., & Flandreau, M. (2012). *The federal reserve, the bank of England, and the rise of the dollar as an international currency, 1914–1939*. Retrieved from: <http://www.bis.org/events/conf100624/eichengreenflandreupaper.pdf>
- Eichengreen, B., Hausmann, R., & Panizza, U. (2005). *The pain of original sin*. Retrieved from: <http://emlab.berkeley.edu/~eichengr/research/ospainaug21-03.pdf>
- Eichengreen B. (2013). *Does the Fed care about the rest of the world*. Retrieved from: http://www.nber.org/federalreserve_SI2013/Eichengreen.pdf
- Executives' Meeting of East Asia Pacific Central Banks. (2008). *Statement by EMEAP monetary and financial stability committee*. Retrieved from: <http://www.emeap.org/emeapdb/upload%5CPress%5CEMEAP%20Joint%20Statement%202008-10-30.pdf>
- Federal Reserve Economic Research. (2014). Dollar Weighted-Exchange Rate 2002-2014. Retrieved from: <http://research.stlouisfed.org/fred2/series/TWEXB>
- Fitch Ratings. (2012). *Dim sum bonds-corporate issuance in the doldrums*. Retrieved from: <http://www.btinvest.com.sg/system/assets/20541/Dim%20Sum%20Bonds-Corporate%20Issuance%20in%20the%20Doldrums%20Oct%202013.pdf>

- Flandreau, M. and Clemens J. (2009). *The empirics of international currencies: network externalities, history and persistence*. Retrieved from: http://www.researchgate.net/publication/227603146_The_Empirics_of_International_Currencies_Network_Externalities_History_and_Persistence*/file/d912f50f939ed70b48.pdf
- Frankel, J. (2011). *Historical precedents for internationalization of the RMB*. Retrieved from: http://i.cfr.org/content/publications/attachments/CGS-IIGG_WorkingPaper17_Frankel.pdf
- Gao, H. and Yu Y. (2009). *Internationalization of the renminbi*. Retrieved from: <http://www.bis.org/repofficepubl/arpresearch200903.05.pdf>
- Gaulier, L., Lemoine, F. and Unal-Kesenci D. (2006) *China's integration in East Asia: production sharing, FDI and high-tech trade*. Retrieved from: http://cepii.fr/PDF_PUB/wp/2005/wp2005-09.pdf
- Geiger, M. (2010). *Monetary policy in China: institutions, targets, instruments and strategies*. Retrieved from: http://opus.bibliothek.uni-wuerzburg.de/files/5722/MGeiger_Monetary_Policy_in_China.pdf
- Genberg, H. (2009). *Currency internationalization: analytical and policy issues*. Retrieved from: <http://www.bis.org/repofficepubl/arpresearch200903.12.pdf>.
- Goldberg, L. and Tille, C. (2005), *Vehicle currency use in international trade*. Retrieved from: <http://www.econstor.eu/bitstream/10419/60683/1/480357382.pdf>
- Goldberg, L. (2011). *The international role of the dollar: does it matter if this changes?* Retrieved from: http://www.newyorkfed.org/research/staff_reports/sr522.pdf
- Gourinchas, P.O. and Hélène, R. (2005). *International financial adjustment*. Retrieved from: <http://escholarship.org/uc/item/124628cx#page-1>
- Gourinchas, P.O. and Hélène, R. (2007). *From world banker to world venture capitalist: U.S. external adjustment and the exorbitant privilege*. Retrieved from: <http://www.nber.org/chapters/c0121.pdf>
- Gourinchas, P.O. and Helene, R. (2013). *External adjustment, global imbalances and valuation effects*. Retrieved from: http://socrates.berkeley.edu/~pog/academic/HB_POGHR_0325.pdf
- Hai, W. and Yao H. (2010). Pros and cons of international use of the RMB for China. In W. Peng and C. Shu (Eds.), *Currency internationalization: international experiences and implications for the renminbi*. Basingstoke, UK: Palgrave Macmillan.
- Hanemann, T. (2013). *An update on China's international investment position*. Retrieved from: <http://rhg.com/notes/chinas-international-investment-position-an-update>

- Hanson, G.H. and Robertson, R. (2008). *China and the manufacturing exports of other developing countries*. Retrieved from: http://www.nber.org/papers/w14497.pdf?new_window=1
- Hericourt, J. and Poncet, S. (2008). *FDI and credit constraints: firm-level evidence from China*. Retrieved from: http://halshs.archives-ouvertes.fr/docs/00/63/39/01/PDF/ES_Hericourt_Poncet.pdf
- Huang, Y. and Lynch, C. (2013). *Does internationalizing the RMB make sense for China*. Retrieved from: <http://object.cato.org/sites/cato.org/files/serials/files/cato-journal/2013/9/cjv33n3-18.pdf>
- Ito, T. et al. (2010). Why has the Yen failed to become a dominant invoicing currency in Asia. Retrieved from: http://www.nber.org/papers/w16231.pdf?new_window=1
- Jin, Z. (2012). *The use of RMB in international transactions: background, developments, and prospects*. Retrieved from: http://china.ucsd.edu/_files/renminbi/pdf-rmb-JinZhongxia.pdf
- Kenen, P. (2009). *Currency internationalization: an overview*. Retrieved from: <http://www.bis.org/repofficepubl/arpresearch200903.01.pdf>
- Kianian, B. and Yi, K. (2009). *China's emergence as a manufacturing juggernaut: is it overstated?*. Retrieved from: http://www.philadelphiafed.org/research-and-data/publications/business-review/2009/q4/brq409_china-manufacturing-juggernaut.pdf
- Koopman, R., Wang, Z. and Wei, S. (2008). *How much of Chinese exports is really made in China*. Retrieved from: <http://www.nber.org/papers/w14109>
- Krugman, P. (2009, April 2). China's dollar trap. *The New York Times*. Retrieved from: http://www.nytimes.com/2009/04/03/opinion/03krugman.html?_r=0
- Lane, P.R. and Milesi-Ferretti, G.M. (2007). The external wealth of nations mark II. *Journal of International Economics*, 73(2), 223-250.
- Lane, P.R. and Shambaugh, J. (2008). *Financial exchange rates and international currency exposures*. Retrieved from: <http://www.dartmouth.edu/~jshambau/Papers/LSAER.pdf>
- Lau, K. et al. (2012). *Introducing the renminbi globalization index*. Retrieved from: https://research.standardchartered.com/configuration/ROW%20Documents/CNH_%E2%80%9393_Introducing_the_Renminbi_Globalisation_Index_13_11_12_22_08.pdf
- Lardy, N. (2008). *Financial repression in China*. Retrieved from: <http://www.iie.com/publications/pb/pb08-8.pdf>

- Liao, S. and McDowell, D. (2013). *Redback rising: China's bilateral swap agreements and RMB internationalization*. Retrieved from: http://faculty.maxwell.syr.edu/dmcdowel/redback_rising_mcdowell_liao.pdf
- Liu, S. et al. (2002). *The full convertibility of the renminbi: sequencing and influence*. Retrieved from: http://www.hkimr.org/uploads/publication/300/ub_full_0_2_39_wp200209_text.pdf
- Loechel, H., Packham, N. and Walisch, F. (2013). *Determinants of the onshore and offshore Chinese government yield curves*. Retrieved: <http://www.frankfurt-school.de/clicnetclm/fileDownload.do?goid=000000503950AB4>
- Ma, G. and Zhou, H. (2009). *China's evolving external wealth and rising creditor position*. Retrieved from: <http://www.bis.org/publ/work286.pdf>
- McGuire, P. and von Peter, G. (2009). *The US dollar shortage in global banking and the international policy response*. Retrieved from: http://www.bis.org/publ/qtrpdf/r_qt0903f.pdf
- McKinnon, R. and Schnabl, G. (2004). *The East Asian dollar standard, fear of floating, and original sin*. Retrieved from: <http://www.stanford.edu/~mckinnon/papers/EastAsianDollarStandardN.pdf>
- McKinnon, R. and Schnabl, G. (2009). *The case for stabilizing China's exchange rate: setting the stage for fiscal expansion*. Retrieved from: http://www.stanford.edu/~mckinnon/papers/fulltext_McKinnon%20and%20Schnabl.pdf
- Miao, B. et al. (2013). *Renminbi exchange rate exposure: evidence from Chinese industries*. Retrieved from: http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID2295521_code889972.pdf?abstractid=1914803&mirid=1
- Minikin, R. and Lau, K. (2013). *The offshore renminbi: the rise of the Chinese currency and its global future*. Hoboken, NJ: Wiley.
- Morrison, W.M. and Labonte, M. (2012). *China's holdings of US securities: implications for the US economy*. Retrieved from: <http://www.fas.org/sgp/crs/row/RL34314.pdf>
- Papaioannou, E. and Portes, R. (2008a). *The international status of the Euro: a status report*. Retrieved from: http://ec.europa.eu/economy_finance/publications/publication12409_en.pdf
- Papaioannou, E. and Portes, R. (2008b). *Costs and benefits of running an international currency*. Retrieved from: http://ec.europa.eu/economy_finance/publications/publication13486_en.pdf

- People's Bank of China. (2008). *China: the evolution of foreign exchange controls and consequences of capital flows*. Retrieved from: <http://www.bis.org/publ/bppdf/bispap44h.pdf>
- Prasad, E., Rumbaugh, T. and Wang, Q. (2005). *Putting the cart before the horse: capital account liberalization and exchange rate flexibility in China*. Retrieved from: <http://www.imf.org/external/pubs/ft/pdp/2005/pdp01.pdf>
- Prasad, E., Rajan, R.G., and Subramanian, A. (2007). *Foreign capital and economic growth*. Retrieved from: http://www.nber.org/papers/w13619.pdf?new_window=1
- Prasad, E. and Wei, S. (2007). *The Chinese approach to capital inflows*. Retrieved from: <http://www.nber.org/chapters/c0158.pdf>
- Rodrik, D. (2006a). *What's so special about China's exports*. Retrieved from: http://www.nber.org/papers/w11947.pdf?new_window=1
- Rodrik, D. (2006b). *The social cost of foreign exchange reserves*. Retrieved from: <http://www.nber.org/papers/w11952>
- Schott, P. (2007). *The relative sophistication of Chinese exports*. Retrieved from: http://faculty.som.yale.edu/peterschott/files/research/papers/chinex_310.pdf
- Subramanian, A., and Kessler, M. (2013). *The renminbi bloc is here: Asia down, rest of the world to go*. Retrieved from: <http://www.iie.com/publications/wp/wp12-19.pdf>
- Takagi, S. (2009). *Internationalizing the yen, 1984-2003: unfinished agenda or mission impossible*. Retrieved from: <http://www.bis.org/repofficepubl/arpresearch200903.04.pdf>
- Tavlas, G. (1997). The use of the US dollar: an optimum currency area perspective. *The World Economy*, 20(6), 709-747.
- Thorbecke, W. (2013). *Investigating China's disaggregated processed exports: evidence that the RMB matters*. Retrieved from: <http://www.rieti.go.jp/jp/publications/dp/12e003.pdf>
- White, L. (1999). *The Theory of Monetary Institutions*. Oxford, UK: Blackwell Publishers.
- Yu, Y. (2010). *The impact of the global financial crisis on the Chinese economy and China's policy responses*. Retrieved from: <http://www.twinside.org.sg/title2/ge/ge25.pdf>
- Yu, Y. (2011). *The "assets crisis" of emerging economies*. Retrieved from: <http://www.project-syndicate.org/commentary/the--asset-crisis--of-emerging-economies>
- Yu, Y. (2012). *Revisiting the internationalization of the renminbi*. Retrieved from: <http://www.adbi.org/files/2012.07.04.wp366.revisiting.internationalization.yuan.pdf>

Zhang, M. (2012). *RMB internationalization or onshore-offshore arbitraging*. Retrieved from:
http://china.ucsd.edu/_files/renminbi/pdf-rmb-ming-zhang.pdf