The Internationalization of the RMB:
RMB Potential International Status and its Influence on ASEAN

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Abstract: The restrictions on China´s capital account is the major restrictive factor for the international use of the RMB. The potential international status of the RMB must be included into the consideration by the monetary authority in designing the pace and form of liberalizing the restrictions, because, in general, the potential international status directly induces the potential benefits and risks. The purpose of this paper is to estimate the potential international status of the RMB. Based on the model, the share of RMB in reserve holding would be about 7.2% in this thesis. In addition, this thesis suggests that RMB has the potential to become a regional anchor currency in Southeast Asia. More specifically, RMB has increasing influences on the exchange rates of ASEAN members.

Key words: RMB, currency internationalization, international status, anchor currency.

Acknowledgements

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1. Introduction

"Sterling was the last to lose its status in the first half of the 20th century and the dollar will lose its status in the first half of this century."

----- Avinash Persaud of the U.S, Sate Bank and trust

After the World War II, the U.S. dollar generally replaced the pound sterling as the dominant currency. However, decades later, economists (e.g., Chinn and Frankel, 2005; Elwell, 2007; Galati and Wooldridge, 2009) are discussing the probability that the U.S. dollar would lose its central status in the next decades. Although the quote of Persaud (2004) might sound rather radical, it is not unrealistic. In fact, since 1999, the birth of the euro, euro was encroaching on the U.S. dollar's international position. Euro's share in the total reserves holdings that were allocated to the International Monetary Fund increased from 18% in 1999 to 26% in 2010. In the meantime, the U.S. dollar's share decreased from more than 70% in 1999 to about 60% in 2010.

Apart from the euro, there is another currency has become a new potential challenger to the U.S. dollar. It is the Chinese renminbi. In the global financial crisis in 2008, Zhou Xiaochuan (2009), the governor of People's Bank of China, has suggested to reform the existing international monetary system. Even though Zhou (2009) never mentioned the words "the U.S." or "dollar" in his article, the article was viewed as a provocation towards the United States. Since the U.S. dollar plays the central role in the existing international monetary system, it is believed that Zhou's real purpose of reforming the international monetary system is to lower the international status of the U.S. dollar and enhance the influence of the Chinese renminbi.

During the past thirty years, China has experienced rapid economic growth. Nowadays, as the second largest economy and a key driver in the world, China has the attempt to pursue the internationalization of its own currency in the early years of this century. After the outbreak

of the global financial crisis in 2008, China´s monetary authority accelerated the internationalization of renminbi. Through a series of policies and cooperation agreements with other countries, at present, the international use of the renminbi is much wider than few years ago. However, there are a lot of obstacles waiting to be overcome if the China´s monetary authority would intend to promote the renminbi to be a real international currency. The major obstacle is the restrictions on the capital account convertibility (CAC). The Reserve Bank of India (1997) has defined CAC as follows: CAC refers to the freedom to convert the local financial assets into foreign financial assets and vice-versa at market determined rates of exchange. That is the freedom of currency conversion in relation to capital transactions in terms of inflows and outflows. The openness of the capital account can bring not only significant benefits but also risks to the country. On the one hand, the liberalization of capital account can improve the efficiency of its domestic financial market, and lead to a better allocation of both saving and investment. On the other hand, the liberalization increases the vulnerability of the economy to swings in sentiment, because international capital flows tend to be highly sensitive to macroeconomic policies, to the soundness of the banking system, and to economics and political developments (Fischer, 1998). The restriction on China´s capital account is the major restrictive factors for the international use of the renminbi. Capital account convertibility is a prerequisite for international currency. A high convertibility of the renminbi will increase the incentives of individuals and institutions to use and hold renminbi. However, for the health of the domestic economy and the safe of the financial market, China´s monetary authority sets a certain number of restrictions on the convertibility of the renminbi. When and how China should open its capital account must be fully considered by its policymakers. The overall benefits and risks must be estimated before removing the restrictions on the renminbi. Without doubt, the liberalization of the restrictions on currency convertibility should be in harmony with the overall development and reform strategy, not just for the internationalization of the renminbi. Nevertheless, when China´s monetary authority tries to evaluate the overall influences of the openness of capital account, the benefits and risks of the internalization of the renminbi could not be negligible, and these benefits and risks are determined directly by the international status of the renminbi. Therefore, the potential international status of the renminbi must be

included into the consideration by the monetary authority in designing the pace and form of liberalizing the restrictions on currency convertibility, because, in general, the potential international status reflects the potential benefits and risks. Based on the experiences of other international currencies, it is achievable to estimate the potential of the renminbi as an international currency. The purpose of this paper is to estimate the potential international status of the renminbi. Specifically, the share of a currency in reserve holding of the world´s central banks is viewed as a proxy for the overall international status of the currency. And a model is established to explore the main factors which determine the share. Based on the model, renminbi´s potential internationalization status is estimated in this thesis. In addition, this thesis also discusses whether the renminbi has the potential to become a regional anchor currency in Southeast Asia. More specifically, renminbi´s influences on the exchange rates of ASEAN (the Association of Southeast Asian Nations) members are estimated and compared in this thesis.

The remainder of the thesis is organized as follows. Based on the previous literatures, the next section discusses the definition of an international currency and the benefits and risks of internationalization of the renminbi. China´s efforts for improving the international status of the renminbi are also reviewed in this section, following two tracks: trade track and finance track. Section 3 introduces a number of previous researches on international currency, both the theories from economic perspective and from economy perspective. In the section 4, the empirical analysis section, two models were established. The first model is used to explore the determinants of international reserve currency shares. Based on the first model, the potential share of the renminbi in the reserve holdings is attained under assumption that the restrictions on renminbi´s convertibility are removed. The second model is set to estimate the influences of the renminbi on the exchange rates of ASEAN members. Some conclusions and suggestions are presented in the final section of this thesis.

2. Research Background and Literature Review

2. 1 What is an international currency?

Hundreds of empires rose and collapsed in history. Although most of these empires have issued their own national currencies, only few of them served as a generally accepted means of payment in international transactions. Lopez (1951) suggested that the gold solidus of the Byzantine Empire in the medieval Mediterranean World is "the dollar of the Middle Age", because it was accepted everywhere and no kingdom has a currency that can be compared to it at that time. In the seventh century, the Byzantine coin was replaced by the dinar of the Arabs. In the thirteenth century, the florin of Florence became the dominant currency. Its dominance continued until the fifteenth century and was taken over by the ducato of Venice (Cipolla, 1956). Then, the pound sterling played the dominant role in international trading until the World War I. The US dollar became the dominant currency after World War II (Yeager, 1976).

There is a relatively respected definition of international currency. According to Chinn and Frankel (2005), and international currency is one that is used outside its home country. Kenen (2009) gave a more detailed definition of international currency, he described an international currency is the one that is used and held beyond the borders of the issuing country, not merely for transactions with that country ś residents but also for transactions between non-residents. Basic on the classic three functions of money domestically: store of value, medium of exchange and unit of account, Kenen (1983) introduced early thoughts on the roles of international currency, and Chinn and Frankel (2005) developed a list of the international functions of an international currency, as summarized in table 2.1.

Table 2.1 the functions of an international currency

Function of money	Governments	Private actors

Store of value	International Reserves	Currency substitution and investment
Medium of exchange	Foreign exchange market	Vehicle currency, invoicing trade and financial transactions, settlement currency
Unit of account	Anchor for pegging local currency	Denominating trade and financial transactions

Source: Chinn and Frankel (2005).

2.2 Why does China wish to promote RMB internationalization?

There are lots of economists and political scientists have studied the benefits of having an international currency (e.g., Chinn and Frankel, 2005; Andrews, 2006; Gao and Yu, 2009). It is widely recognized that internationalization can bring enormous benefits to the issuing country. For China, the benefits from the internationalization of the renminbi can be discussed from two perspectives:

International perspective:

1. The internationalization of the renminbi will contribute to establish a more stable international monetary system. In the world's major economic regions, the United States has dollar, the Europe has euro, but the East Asia has no common currency to support this region's economy. As the largest economy in East Asia, meanwhile, the second largest economy in the world, China has huge influence in this region, and its currency renminbi is widely viewed as the principal Asian currency. Internationalization of the renminbi can contribute to retain the balance between these three major economic regions and to the establishment of a stable international monetary system supported by the reasonable economic policies of the United States, Euro zone and China.

2. The internationalization of the renminbi will contribute to the stability of exchange rates of East Asian currencies. China is playing the role of leader in East Asia, with the steady

increase in trade volume between China and other Asian countries, Chinás renminbi has greater impacts on the exchange rate of East Asian currencies. Improving the international role of the renminbi can contribute to the stability of exchange rates of East Asian currencies, and to the stability of East Asian economies.

Domestic perspective:

Kenen (2009) suggests that the benefits of currency internationalization accrue largely to a countrýs private sector and are fairly obvious.

1. The internationalization of the renminbi would reduce the exchange rate risk of Chinese exporters and importers. The widespread international acceptance of renminbi means that more foreign trade would be invoiced and settled in the renminbi, so the Chinese exporters and importers are able to shift exchange rate risk to their foreign customers. Chinn and Frankel (2005) has commented the international role of the U.S. dollar, they suggested "the global use of the dollar, as with the global use of the English language, is a natural advantage that American businessmen tend to take for granted".

2. The renminbís internationalization offers Chinás financial institutions more new profit opportunities. The internationalization of renminbi creates the possibility for developing new financial service businesses for the countrýs banks and other financial institutions, and it would also contribute to improve the competitiveness of Chinese financial institutions. Chinese banks have a comparative advantage at dealing in dollars, as U.S. banks at dealing in dollars and British banks at dealing in pounds. Furthermore, the domestic non-financial sector would also benefit from the development of Chinás financial sector, because a larger financial sector usually means a lower cost of capital and more financial services.

3. Seignorage. Chinn and Frankel (2005) suggest that seignorage is perhaps the most

important benefit of having other countries hold one's currency. With the internationalization of the renminbi, more and more non-residents would hold renminbi for its international functions, and the China's monetary authority would collect seignorage from these non-residents. Seigniorage is the margin between the denomination of the notes and the cost of issuing the notes obtained by the note issuer. Issuing an international currency is equivalent to levying seigniorage on other countries (Gao and Yu, 2009). The non-residents who use the international currency must give up their goods and services or the ownership of the real capital stock in order to obtain a certain amount of international currency. Currently, since U.S. dollar is the key currency, the United States can collect seigniorage from all over the world. Although China's renminbi is not expected to replace the status of U.S dollar in a short period of time, the internationalization of the renminbi could at least counteract some seigniorage that China has to pay to the United States.

4. Political power and prestige. Some political scientists, for example, Andrews (2006) and Cohen (2006) have suggested that key role of U.S. dollar has significantly enhance the international influence of the United States. They emphasized that the United States benefits from the reserve currency status of U.S. dollar, and the United States has disproportionate impacts on the policies and activities of international financial institutions, such as the International Monetary Fund (Kenen, 2009). With the rapid growth in economy, the Chinese authority is pursuing a greater say in the international community. The internationalization of renminbi is supposed to enhance China's international status and will increase its influence.

5. The internationalization of the renminbi will contribute to preserve the value of its significant amounts of foreign exchange reserves. China replaced Japan as the biggest holder of foreign exchange reserves in the world in 2006. The vast foreign exchange reserves are wealth to China, but the authority must face the risk of devaluation. All China's foreign exchange reserves are denominated in foreign reserve currencies, the

major reserve currency is the U.S. dollar. China has to bear the huge risk of the devaluation of the U.S. dollar. If the United States carried out some loose monetary policies, it can easily inflate away China's dollar reserves. The internationalization of the renminbi would contribute to reduce China's excessive foreign exchange reserves. If the reserves were denominated in the renminbi, China would not need to worry about the loss from devaluation.

Although these significant benefits can be obtained by the internationalization of the renminbi, the costs are also obvious. Chinn and Frankel (2005) have suggested that there are three major disadvantages of having an international currency, which are the reasons why Germany and Japan were reluctant to internationalize their currencies in the past. These disadvantages also explain why, until now, there has been no formal declaration of internationalization as official Chinese policy. These three costs are:

1. The "impossible trinity". The Nobel Laureate Mundell (1993) has pointed out that it was impossible to have all three of the following at the same time: a fixed exchange rate, perfect capital mobility, and an independent monetary policy. For example, if a country would like to maintain a fixed exchange rate and allow free capital flows, it has to give up the independence of its monetary policy. There is an intrinsic incompatibility between these three goals. As Kenen (2009) suggested, although currency internationalization does not require the authority to remove all restrictions on capital movements, a significant degree of capital account liberalization and convertibility are prerequisites of the internationalization. Cohen (2012) described renminbi as one of the most tightly controlled currencies in the world. China has to gradually remove most restrictions on capital account for internationalizing renminbi. The authority has to give up one goal among fixed exchange rates and independence of monetary policy. Actually, Hong Kong has abandoned the use of monetary policy and adopted the fixed exchange rates. On the contrary, Singapore Monetary Authority has chosen to rely on exchange rate changes to affect domestic economic activity.

2. Larger fluctuations in demand for renminbi. The internationalization would increase the amount of the currency circulates beyond the country's borders. If China's asset were made available to non-residents, the demand for renminbi would increase, and huge inflows of capital might appreciate renminbi drastically. The significant increase in exchange rate of renminbi would render exporters less competitive on world markets. In another situation, if the foreign holders come to believe that China's asset price may fall sharply, renminbi has a very high possibility of suffering a large depreciation. Moreover, foreign sales of renminbi assets will lead to the depreciation of their prices, and China's domestic investors will suffer losses.

3. More international responsibilities. The internationalization of renminbi will bring huge benefits to China, at the same time, with more international responsibilities. Actually, as the current key currency, the U.S. dollar is the center of international monetary system, any policy of the U.S. monetary authority would influence whole global economy. Thus, the U.S. authority has to take into account the impacts of their policies on international market, that means the U.S. could not solely focus on its domestic objectives, other countries´benefits also should be considered. The internationalization of the renminbi would enhance its international status significantly. When China enjoys the benefits from renminbi's international role, it also needs to take the corresponding responsibilities.

2.3 What China has done to promote RMB internationalization?

Cohen (1998) has pointed out that the size of a currency territory lies on two sides: one is a visible hand, and the other is an invisible hand. The visible hand is the monopoly of the government upon currency issue and monetary management. For national currency, its domestic circulation is enforced by the national government through a variety of legal restrictions. The government ensures the dominant status of the national currency in the administrative area. Since the legal restrictions merely work at home, so the visible hand is only significant interiorly. While the invisible hand plays an important role outside the

borders of the nation. The invisible hand means the effects of market on the transaction network. After analyzing the several popular international currencies over the last two centuries, Frankel (2011) suggested that none of them came into widespread use due to the efforts of official planning by a formal governmental bureaucracy. A national currency can turn into an international currency, because its inherent qualities are attractive to traders, investors, and other interested agents. For example, the decline of sterling and the rise of the U.S. dollar were a result of an unplanned process of competition among them. Krugman (1984) argued that the internationalization of the U.S. dollar was driven by the spontaneous evolution of preferences on the demand side of the market and was a result of the invisible hand. However, these discussions about the "two hands" do not mean it is impossible to manufacture an international currency. Genberg (2009) has discussed the feasibility of promoting the international use of a currency by policy interventions. He suggested that it is possible to find justifications for government assistance to currency internationalization and it is possible to manufacture an international currency if the authority could design enough reasonable policies. Cohen (2012) has pointed directly that there is nothing in Beijing´s experience to suggest that China cannot internationalize its renminbi although there are limits to use the authority´s power to promote the internationalization of the renminbi. But frankly, China´s efforts for the internationalization of the renminbi which were described as "managed internationalization" by McCauley (2011) are unprecedented in recent history. As the second largest economy, largest trading nation, and the largest foreign holder of foreign exchange reserves, China has the motivation to improve the international status of renminbi to match its economic status in the global economy. As mentioned above, the managed internationalization of the renminbi is unique in modern times, so the Chinese government follows the previous leader Deng Xiaoping´s instruction "crossing the river by feeling for stones", implements its policies gradually. However, the authority speeded up the internationalization of the renminbi since the outbreak of the global financial crisis (2007-2008). Song and Song (2012) suggest that the financial crisis in 2008 caused a severe global recession and also changed the global economic structure, and the crisis provided a golden chance for renminbi internationalization. People´s Bank of China Governor Zhou Xiaochuan (2009) has published his article "Reform the International Monetary System"

during the financial crisis in 2009, and this article was viewed as an attempt to destabilize the domination of the U.S. dollar and improve the international status of the renminbi.

Subacchi (2010) has pointed out that China is pursuing a two-track strategy: trade track and financial track. Following the trade track, the authority is trying to boost cross-border usage of the renminbi in trade settlements. Following the financial track, China is making the RMB attractive to oversea investors by building an offshore market in Hong Kong for RMB-denominated assets. China's efforts along both tracks will be analyzed below:

Trade track:

1. The local currency swap agreements.

In December 2008, China launched its aggressive campaign of currency swap diplomacy. People's Bank of China and Bank of Korea announced that they agreed a currency swap deal in order to safeguard against any global financial crisis and strengthen their trade ties. Until now, China has signed about 18 currency swap agreements over the past four years with countries including South Korea, Hong Kong, Thailand, Singapore, Malaysia, Indonesia, Pakistan, Mongolia, Uzbekistan, Kazakhstan, Turkey, United Arab Emirates, Belarus, Iceland, Australia, New Zealand, Argentina, and Brazil. On the surface, the aim of these agreements was to safeguard against another global financial crisis. These agreements offer China's trading partner a helpful hedge against the future liquidity shortage. In emergency situations, these countries can use the renminbi as a settlement currency when trading with China. In fact, Cohen (2012) suggested that these agreements will provide indirect encouragement for commercial use of the renminbi, and they are seen as helping the internationalization of the renminbi.

2. The cross border trade settlement pilot scheme.

In December 2008, the cross border trade settlement pilot scheme was introduced by People ś Bank of China. This pilot scheme allows a limited number of firms in five Chinese cities (Shanghai, Guangzhou, Shenzhen, Zhuhai and Dongwan) to settle trade transactions in renminbi with counterparts in Hong Kong, Macao, and ASEAN members. One year later, in June 2010, another 15 provinces and cities on the mainland were included into the pilot scheme. Meanwhile, the number of firms on the mainland authorized to participate the pilot scheme has increased from 365 to more than 67,000. In September 2011, the coverage was expended to all provinces and cities in China. This scheme is viewed as a directly way to promote the renminbi ś use by non-residents, it increases the amount of the renminbi held overseas, and reduces reliance on the U.S. dollar. At the same time, the BRIC leaders are pursuing the ways to reduce their reliance on the U.S dollar. The leaders have advocated for "local currency trade settlement arrangement between our countries" (II BRIC Summit, 2010) on several BRIC summits. Apparently, it is a way to promote the international status of the renminbi, although, so far, limited actions have been taken by BRIC.

Finance track

The implementation of currency swap agreements and the cross border trade settlement pilot scheme would increase the amount of the renminbi held overseas. Therefore, the second track of China ś strategy for internationalizing the renminbi has to focus on providing enough and attractive renminbi-denominated financial products to renminbi holders. But, currently, China ś capital account is still under its strict control. So, the challenge here is to develop sufficient financial products without opening China ś capital account. Hong Kong is a perfect solution. Hong Kong is one of the largest international financial centers in the world, and China is trying to develop a renminbi offshore market in Hong Kong. Hong Kong is a good way of overcoming restricted convertibility on the mainland. Frankel (2011) suggested this is an unusual solution, "never before has any government sought deliberately to develop an offshore market for its currency while still maintaining strict financial control at home".

1. The renminbi deposit account in Hong Kong.

In February 2004, authorized banks in Hong Kong began to open renminbi deposit account for individuals and firms. The renminbi deposits increased rapidly since 2010, while the restrictions on the renminbi accounts were relaxed significantly. The smooth and robust expansion of renminbi deposits is significant helpful to promote the internationalization of the renminbi. A huge pool of renminbi deposits is the foundation of the renminbi offshore market in Hong Kong, and it contributes to the development of the renminbi-denominated financial products. The total value of renminbi deposits in Hong Kong has grown from less than 55 billion yuan in April 2009 to as much as 576 billion yuan in March 2012.

2. The renminbi-denominated bonds market in Hong Kong.

In order to provide more investment opportunities for renminbi holders in Hong Kong, China tries to develop an offshore renminbi bonds market, the dim sum bond market. It is also a way to facilitate renminbi flows back into the onshore market. In June 2007, People's Bank of China and National Development and Refrom Commission jointly issued "the interim measures for the administration of the issuance of renminbi bonds in Hong Kong special administrative region by financial institutions within the territory of China". One month later, China Development Bank became the first issuer in renminbi-denominated bond, with an amount of renminbi 5 billion and a tenor of 2 years. Until now, there are several types of issuers, including Ministry of Finance of Chinese government, foreign and Chinese banks and enterprises. The total issuance of renminbi bonds has increased from less than 10 billion yuan in 2007 to more than 100 billion yuan in June 2012. Although the volume is small, it grows steadily.

3. The renminbi-denominated stocks in Hong Kong.

In order to provide more financial products for renminbi holder in Hong Kong, China was pursuing to introduce Chinese firms to Hong Kong's stock market. In April 2011, a Chinese

property investment trust, named Hui Xian, raised 10.48 billion yuan in the first initial public offering outside mainland China to be denominated in renminbi. In October 2011, the Renminbi Equity Trading Support Facility was launched by the stock exchange of Hong Kong for the trading of renminbi denominated shares in the secondary market. The measures provide more investment opportunities for foreign investors, and contribute to develop renminbi into a currency that foreign investors are willing to hold.

4.   The renminbi qualified foreign institutional investor scheme.

In December 2011, the China Securities Regulatory Commission, the People's Bank of China, and the State Administration of Foreign Exchange jointly issued pilot measures concerning the launching of the Renminbi Qualified Foreign Institutional Investor Scheme in China. Qualified institutional investors were allowed to use the renminbi funds raised in Hong Kong to invest in the domestic securities market in Mainland China. The issuance of this scheme was viewed as a further step to internationalize renminbi. It would further enhance Hong Kong's role as the renminbi offshore market, and it would offer a channel for offshore renminbi flow back to the Mainland.

3. Theory

Theoretical discussion on currency internationalization generally starts with the functions of the international currency. These functions were widely used to define international currency. Chey (2012) suggested that the functional conceptualization of international currencies provides a basic framework for analyzing currency internationalization. Chinn and Frankel (2005) developed a list of the international currencýs functions, and based on the table, they found that the international status of a currency is usually determined by the size of the economy, the stability of the currencý value, and the development of the financial market and network externality. Helleiner (2008) grouped the major determinants of currency internationalization into three broad categories: confidence, liquidity, and transactional network. The selection of the potential independent variables for the first model will follow their theories.

Koepke (2009) has demonstrated the rationale for optimum anchor currency area (OACA). An OACA is a regional grouping of countries that peg their currencies to the same anchor currency. He suggested that with the increase in shares of intra-regional trade volume, countries may benefit from pegging to a regional anchor, even no monetary union exists in the area. Actually, with the establishment of the ASEAN-China Free Trade Area, the trade volume between ASEAN and China increased rapidly. The OACA theory shows that it is feasible to promote the renminbi as an anchor currency in Southeast Asia, at least in theory. Actually, the second model in this thesis is designed to investigate whether the renminbi has a trend to be an anchor currency in ASEAN.

As discussed above, the functional conceptualization was widely adopted in economics research. Actually, there are also a growing number of political economy studies on international currency. Strange (1971) suggested that the international status of a currency is shaped by both economic and political factors. Helleiner (2008) suggested that political factors have impacts on currencý s international status through the three economic factors:

confidence, liquidity and transactional networks. For example, government can use their political resources and administrative power to establish new market or spread their clearing and payments system to influence its currency´s international role. Meanwhile, political economy researches suggested that the issuing country can obtain international monetary power from the international role of a currency. The power exists when its monetary relationship with another country influences that country´s behavior (Andrews, 2006). For example, the issuing country can use monetary policy to pressure foreign countries to obtain benefits from them. For example, the United States has used the Quantitative Easing Policy to pressure China to purchase more US Treasure. Strange (1971) has classified international currencies into four groups: top currency, master currency, neutral currency and negotiated currency. She pointed that out master currency disappears today. And the U.S. dollar was viewed as a top currency before financial crisis which attractive because of the huge economic advantages of the United States. Neutral currency is Swiss franc which is attractive because it is stable with its own advantages. The last one is the negotiated currency, and its issuing country negotiates politically with other states for their future use of its currency, offering inducements such as military or diplomatic supports or economic benefits (Chey, 2012).

In the previous section of this thesis, both benefits and costs of the currency internationalization are discussed. However, the benefits and the costs are treated as static. Chey (2012) suggested that the balance between the benefits and the costs of issuing an international currency should change over time. Matsuyama et al (1991) have developed a two country model of the world economy, and he suggested that a country can improve its national welfare by internationalizing its currency, when the currency supply is fixed, a decrease in demand would reduce the national welfare. Mundell (1993) pointed out that the benefits of issuing an international currency are likely to decline over time, and the costs tend to increase. Thus, China must prepare for both benefits and costs with the internationalization of the renminbi.

4. Data and Methodology

4.1 The determinants of the international status of a currency

As shown in the table 1 above, there are three classic functions of a currency: medium of exchange, store of value and unit of account. If the currency is an international currency, each of these three classic functions can be discussed in two different situations: official use and private use. The international status of a currency is reflected in the "indicators" of these three classic functions. For example, the share of a currency in the reserve holdings of the world´s central banks is viewed as an indicator for its role as a store of value; the share of an invoicing currency in international trade can be used to measure this currency´s international function as a medium of exchange; similarly, a currency´s use as a unit of account can be evaluated by the percentage of bonds and notes which are denominated in this currency in the international bonds and notes markets. Ideally, each classic function should be discussed to assess the international status of a currency. With limited data available, the empirical analysis in this thesis only tries to evaluate the current major currencies ´international status based on their shares in the reserve holding of the world´s central banks and explores the main determinants of the shares. Actually, with the existence of economies of scope and scale, if a currency is held by many central banks as part of their foreign exchange reserves, this currency is more likely to be used as an invoicing currency in international trade and financial transactions. Yu (2012) suggests that being a reserve currency is the ultimate goal of the internationalization of a currency. So, it is reasonable to assume that reserve currency holding is a good proxy for the overall international status of a currency.

The data for the models in this thesis are mainly obtained from the International Monetary Fund and the World Federation of Exchanges. The shares of major currencies in world´s central banks are calculated from the data of the Currency Composition of Official Foreign Exchange Reserves (COFER). In the COFER, total foreign exchange holdings are separated into two different groups: allocated reserves and unallocated reserves. COFER data are

reported on a voluntary basis, some countries have the opinion that the structure of their foreign exchange reserves are strictly confidential, thus they just provide total value instead of the detailed composition of their foreign reserves. Then, the reserves of these countries are named "unallocated reserves". Nevertheless, all developed economies and some developing economies chose to report the composition of their foreign reserves to the COFER, their reserves are named "allocated reserves". The allocated reserves still are in the majority in total reserves since 1995. Thus, only the data of the "allocated reserves" were used in this thesis. The allocated reserves is composed of five major international currency (U.S. dollar, euro, pounds sterling, Japanese yen and Swiss francs) and others currencies. The sample period of the empirical analysis in this thesis is 1999 to 2010, since the introduction of the euro in 1999. The Chart 1 shows changes of the reserve shares of the five major currencies from 1999 to 2010.

Chart 1: Reserve currencies shares
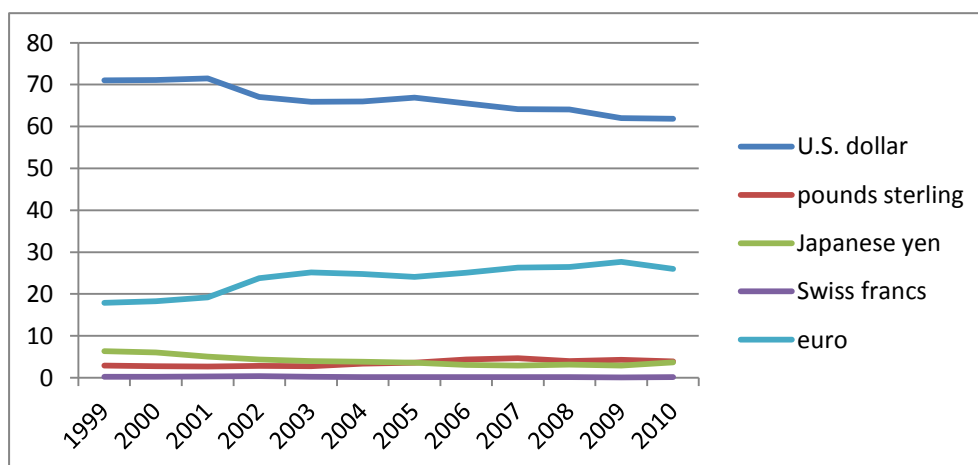
Source: the International Monetary Fund, author ś calculations

As shown in the table 1, the reserve share of the U.S. dollar had an obvious decline, decreased from more than 70% in 1999 to about 60% in 2010. Meanwhile, the reserve share of euro rose from 18% in 1999 to 26%. Apparently, the euro ś launch in 1999 had negative impacts on the international status of the U.S. dollar. The introduction of the euro provided an alternative to the U.S. dollar for other central banks. Actually, there are a plenty of researches focus on the euro versus dollar debate (see e.g. Chinn and Frankel, 2005; Galati and Wooldridge, 2009). Some of them (e.g. Frankel and Wei, 1994) pointed out that the U.S.

dollar would still retain its central role in international trade and finance as both a store of value and a medium of exchange. The share of the Japanese yen fell from 6.4% in 1999 to 3.7% in 2010. Actually, the internationalization of Japanese yen in the second half of 1990s is viewed as a failed attempt. The pounds sterling ś share increased slightly, from 2.9% in 1999 to 3.9% in 2010. The share of Swiss franc fell from 0.23 to 0.13. Undoubtedly, until now, the U.S. dollar still retains its dominance as a leading international reserve currency.

The potential determinants of international reserve currency shares

There are some previous literatures focused on what determines reserve currency status of a currency (e.g., Chinn and Frankel, 2005). Chen et al (2009) suggested that in the short term, the exchange rate and interest rate movements would impact the reserve share of a currency, and in the long term, the currency ś international status is determined by a number of fundamental factors. Five factors are discussed as independent variables to explore the potential determinants of international reserve share.

1. The economic size.

Generally, the size of the economy is measured by the gross domestic product (GDP). According to the data from the IMF, the United States was the largest economy over the last decades. In 1999, the United States accounted for about 24 percent of the total global GDP. Since then, it experienced a steady and slight decrease, from 23.67 percent in 1999 to 19.47 percent in 2010. Despite all this, nowadays, the United States still is the largest economy in the world. The second economy, the Euro Area accounts for 14.24 percent in 2010. Almost all previous researches had listed GDP share as a potential determinants of international reserve currency share. Chinn and Frankel (2005) have suggested that there is a positive relationship between GDP share and the reserve share of the currency based on the data before 1999. They pointed out "the currency of a country that has a large share in output, trade and finance has a big natural advantage". In this thesis, table 2 shows the relationship between GDP share and reserve currency share based on the data from 1999 to 2010. As shown in table 2, the

high GDP share always couple with high reserve share, and low GDP generally couple with low reserve share.

**Chart 2**: GDP share versus reserve share (1999-2010)
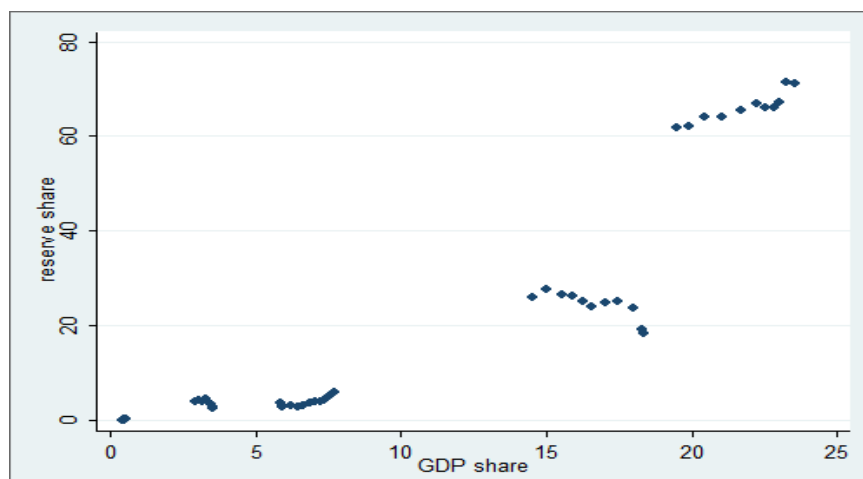
Source: the International Monetary Fund, author´s calculations

2. *The development of financial market*

Chinn and Frankel (2005) suggested that a free and well-developed financial market would contribute to promote the currency´s international status. Review the history of the pounds sterling, London used to be the largest financial center when the world was under the region of pounds sterling. Until the end of the World War II, the U.S. dollar became the new premier international currency. At the same time, the New York also replaced London as the largest financial center. Actually, the several current largest financial markets are located in the home countries of the five major international currencies mentioned above. Generally, a large and well-developed financial market can provide more investment opportunities and financial services to international investors. The participants of the market can lend or borrow money at relative low transaction costs. The former Federal Reserve Chairman, Greenspan (2001) has suggested that a large, open and well-developed financial market can help investors to hedge currency risk and manage their portfolio efficiently. The advantages of such financial markets are attractive to international investors, particularly those central banks of various countries. Thus, the development of the financial market in the home country is viewed as an

important determinant of a currency´s international status. There are several "indicators" for financial market development. Chinn and Frankel (2005) used the foreign exchange turnover in the major financial centers to measure the development of these financial centers. They also suggested the market capitalization is an alternative proxy for the development of financial centers. Thus, in this thesis, the market capitalization was used to measure the development of financial centers. The raw data of stock markets of the five economies (the United States, the United Kingdom, Switzerland, Japan and Euro area) was collected from the World Federation of Exchanges. These raw data was used to calculate the share of each stock market capitalization in the total of the five countries. The share of the United States fluctuates around 55 percent since 1999. And the Euro area has the second largest stock market capitalization, it accounts for about 20 percent over the past ten years. Japan has the third largest stock market among these five countries and its share experienced a slight decrease from 14.7% in 1999 to 12.8% in 2010. The shares of the United Kingdom and Switzerland maintained at about 10 percent and 3 percent from 1999 to 2010, respectively. As shown in chart 3, large market capitalization unites with high reserve share, and low share of market capitalization generally couple with low reserve share.

Chart 3: Reserve share versus Market capitalization share (1999-2010)
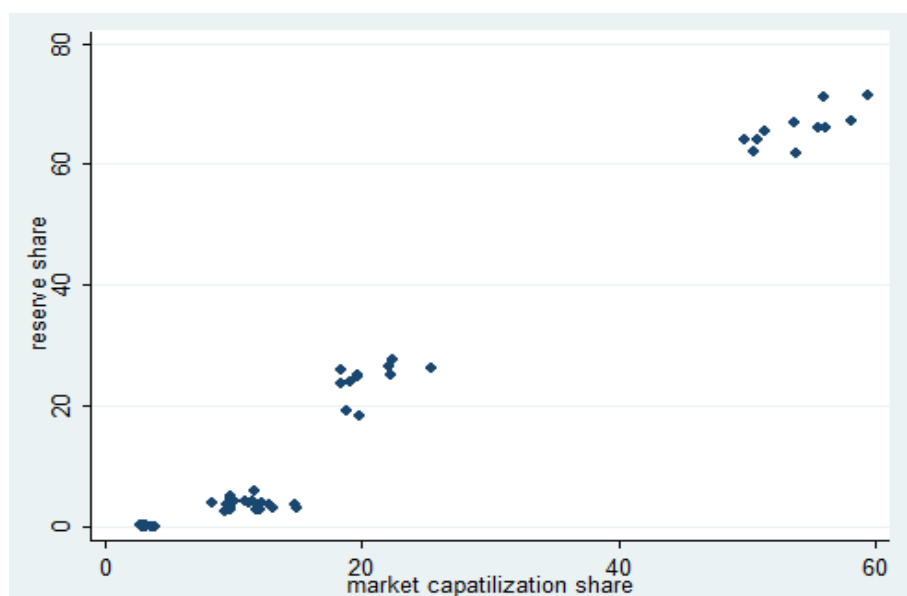
Source: the IMF, the World Federation of Exchanges, author´s calculations

3. Inflation and the exchange rate volatility

Store of value is an important function of an international currency. Central banks generally seek to minimize the currency risk of their foreign reserves. Thus the stable value of the currency is a necessary condition for making the currency to be accepted as foreign reserves by the central banks. Generally, there are two indictors for the stability of a currency, one is the inflation rate and the other one is the currency's exchange rate volatility.

The inflation rate is a measure of inflation. It is the percentage rate of change in price level. That is, the rate of change in the purchasing power of money. A higher inflation rate of a currency means more loss of the currency's purchasing power. In this thesis, the annual percent change of average consumer prices was defined as the inflation rate, and included as one of the independent variables. As we discussed above, the inflation rate was expected to have negative impacts on the reserve share of a currency. The data of inflation rate were obtained from the International Monetary Fund.

The other indictor for the stability of a currency is the exchange rate volatility. Volatility is interpreted as uncertainty, and uncertainty is viewed as a risk in financial market. Obviously, for those monetary authorities whose aim is to minimize the currency risk, they have lower incentive to hold the international currency with higher exchange rate volatility as their foreign reserves. Thus, the exchange rate volatility was also expected to have negative effects on the reserve share of a currency. Generally, exchange rate volatility is measured with reference to the Special Drawing Rights (SDR). Chen et al (2009) have attempted to use the annualized standard deviation of daily percentage change of the exchange rate of a currency against the SDR as the exchange rate volatility. This thesis follows their method of calculating the exchange rate volatility. All calculations were based on the data from the International Monetary Fund.

4. Network externalities

In international trade and financial transactions, people tend to use the currency which is already widely used in the economy. This phenomenon can be shown in the history of pounds sterling. At the beginning of the twentieth century, the United States surpassed the United Kingdom in economic size, but the British pounds retained its dominant position until the end of the World War II, and a dollar-centered international monetary system was established in 1944 at Bretton Woods. It suggests that there is a considerable inertia in currency use, and the inertia is even more important than some intrinsic characteristics of the currency, at least for the short term. The United Kingdom has enjoyed the inertia, and the United States is enjoying it when the world is under the reign of the U.S dollar. Chinn and Frankel (2005) used the prominence of English to explain the network externalities of a currency. They suggested that English is the most widely used language in the world while it is not the most ideal one. Moreover, an international currency is general coupled with a large, free and well-developed financial market, and this would contribute to keep its international role. Most countries are more likely to use the currency is used by other countries. It is difficult for these countries to accept a less entrenched currency. Thus, the inertia of network externality is expected to have positive impacts on the reserve share of a currency. Chinn and Frankel (2005) have used a lagged dependent variable to capture the effect of the inertia. This thesis follows their way to consider the network externality as an independent variable.

Table 4.1: Currency Share of Reserve Holdings and Determinants: Some Indictors

	The United States	The United Kingdom	Switzerland	Japan	Euro Area	China	Date
Currency Share in Foreign Reserves (%)	61.84	3.93	0.13	3.66	26.01	NA	2010
GDP share	19.472	2.948	0.438	5.871	14.538	13.576	2010
Market Capitalization (U.S. dollar, Bill)	17283	3613	1229	4100	5907	4028	2010
Inflation Rate (percentage)	1.64	2.34	0.69	-0.72	1.62	1.38	2010
Exchange Rate Volatility	0.37	0.56	0.54	0.69	0.53	0.36	2010

Data Sources: the International Monetary Fund, the World Federation of Exchanges, and author's calculation.

Notes: 1. GDP share is the gross domestic product based on purchasing-power-parity (PPP) share of world total.

    2. The inflation rate is the annual percentages of average consumer price are year-on-year changes.

    3. The exchange rate volatility is the annualized standard deviation of daily percentage changes of the exchange rate against SDR.

In order to answer whether the euro would eventually surpass the dollar as leading international reserve currency, Chinn and Frankel (2005) has established a well-developed model to analyze the potential determinants of international reserves currency shares. This thesis established a similar model to the one used in their paper.

The data collected are panel data, which contain observations over both units and time. Thus, a panel data model should be used in here. A fixed effect model is selected. A fixed effect model is a statistical model that represents the observed quantities in terms of explanatory variables that are treated as if the quantities were non-random.

The model is a liner model, and it can be represented by the following equation:

$$Share_{it} = \alpha_i + \beta_1 GDP\_share_{it} + \beta_2 Capitalization\_share_{it} + \beta_3 Inflation_{it} + \beta_4 Volatility_{it} + \beta_5 Share(-1)_{it} + \varepsilon_{it} \qquad \textbf{(1)}$$

In the equation (1), the $Share$ is a currency's share in the total allocated world foreign reserves. The GDP_share is the GDP share of a currency's home country in the world total. The $Capitalization\_share$ is the percentage of stock market in the total of the five economies. The $Inflation$ and the $Volatility$ are the inflation rate (percent change) and exchange rate volatility of a currency, respectively. The exchange rate volatility is annualized standard deviation of daily percentage change of the exchange rate of a currency against the SDR. $Share(-1)$ denotes the lagged dependent variable. The $\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are the

coefficients of these five independent variables. Between them, the β_1, β_2 and β_5 are expected to have positive signs, while β_1 and β_2 are expected to have negative signs. The i refers to the different reserve currencies (the U.S. dollar, British pounds sterling, Japanese yen, Swiss franc and euro). The sample period is from 1999 to 2010.

Table 4.2 shows the regression results of the model above:

Table 4.2: The regression results of equation (1)

Variables	Coefficients
GDP_share	0.060
	(0.138)
$Capitalization\_share$	0.139*
	(0.071)
$Inflation$	0.775***
	(0.259)
$Volatility$	-2.151**
	(0.940)
$Share(-1)$	0.731***
	(0.062)
Constant	3.191
	(2.036)
Number of obversations	55
Adj R-squared	0.998

Note: the standard errors of coefficients are in ( ).

*** Very significant p-Value < 1 %, ** Significant P-Value 1-5 %,

* P-Value 5-10 %

According to the results shown in the table 1, the stock market capitalization share and the

lagged dependent variable are significant, consistent with the results in Chen et al (2009). The inflation rate and exchange rate volatility are also statistically significant. Surprisingly is that the GDP share is insignificant. Li and Liu (2008) has focused on the determinants of international reserve currency shares, they suggested that the GDP share was a significant variable. However, the inflation rate is insignificant in their regression results. But the empirical analysis of this thesis provides an opposite result. A possible explanation is that the short-term changes in reserve holdings maybe influenced by exchange rate and interest rate movements. However, in the long term, the international status of a currency is determined mainly by more fundamental factors, such as the size of economy (Chen et. al 2009). The sample period in Li and Liu (2008) is from 1967 to 2004 while the sample period in this thesis is from 1999 to 2010. Therefore, their research was more likely to estimate the factors which have impacts on reserve currency share in a long term, and this thesis tends to provide an estimate for a relative short term.

After abandoning the two insignificant variables, the final estimate is represented by the following equation:

$$Share = 3.772 + 0.145 Capitalization_{share} + 0.794 Inflation - 2.267 Volatility + 0.729 Share(-1) \qquad (2)$$

According to the equation above, the coefficient of the share of stock market capitalization is 0.145, which means stock market capitalization has a positive impact on the reserve share. If the share of stock market capitalization rises by 1 percentage point, the reserve share would increase by 0.145 percentage point.

Surprisingly as well is that the inflation rate´s coefficient is also positive. Actually, the coefficient of inflation rate is expected to be negative, and the inflation rate is expected to have a negative impact on the reserve share, because a higher inflation rate of a currency generally means more loss of the currency´s purchasing power. However, in the regression results, its coefficient is 0.794, which indicates that an increase in the inflation rate by 1

percentage point would lead to a rise in the reserve currency share by 0.794 percentage point.

The coefficient of exchange rate volatility is -2.267, which means the reserve share would decrease by 2.267 percentage point if the volatility increases by 1.

As expected, the lagged dependent variable has a positive coefficient, 0.729, which is close to the estimates in some previous researches (e.g. Chinn and Frankel, 2005). This indicates that the "inertia" has a positive and significant impact on the reserve share. One percentage point increase in the reserve share in this year would lead to the reserve share rise by 0.729 percentage point in next year.

4.2 The potential international status of the renminbi as an international reserve currency

One of the purposes in this thesis is to gauge the potential international status of the renminbi as an international reserve currency. The equation (2) above shows the relevant determinants of the reserve share of a currency, and the coefficients of these determinants. Thus, the potential international significance of the renminbi as a reserve currency can be calculated based on the values of China ́s GDP share, inflation rate and the renminbi ́s reverse share in the previous year.

Nowadays, the share of stock market capitalization in the total of the six markets (including China) was 11.139 percent in 2010. The inflation rate and the exchange rate volatility were 3.325 and 0.364 in 2010, respectively. The data of these three variables are available from the International Monetary Funds. However, the record of the renminbi ́s reserve cannot be obtained. The IMF ́s Currency Composition of Official Foreign Exchange Reserves database only provides the reserve shares of the five major international currencies. There is no data on the volume of the renminbi was held as foreign reserves by central banks. Actually, it is believed that the reserve share of the renminbi is very small, as the limited capital account

convertibility of the renminbi. The restrictions for renminbi capital account transaction are viewed as a major obstacle to the internationalization of the renminbi, because an international currency, particularly a reserve currency, must be easily tradable in international trade and financial transactions. If a country imposes restrictions on capital flows, it would have negative impacts on the convertibility of its currency. Central banks have less incentive to hold a currency with limited convertibility as their foreign reserves. Thus, the lagged reserve share of the renminbi is assumed to be 0 percent. Based on data, the renminbi΄s share in the world reserves would be about 7.2 percent. Chen et al (2009) have estimated the potential reserve share of the renminbi based on the data from 1999 to 2006. They suggested that the renminbi΄s share would be about 10 percent. The estimate in this thesis is broadly in line with their estimation.

It should be noted that there is a hidden assumption in the equation above. In order to explore the determinants of international reserve currency share, five current major international currencies (the U.S. dollar, British pounds sterling, Japanese yen, Swiss franc and euro) were included into the database. All of them are fully convertible. Therefore, the hidden assumption about the estimate on renminbi΄s potential reserve share is that the renminbi should become fully convertible. That is, China should gradually remove the restrictions on capital account if it is seeking a more significant international role for renminbi.

4.3 Renminbi΄s influence on the exchange rates of ASEAN members

A number of economists (e.g., Li and Ding, 2010; Zhang and Sun, 2003) have suggested that the regionalization should be the first step of the internationalization of the renminbi. As Cohen (2012) suggested, renminbi΄s internationalization is a long march with a plenty of obstacles and uncertainties. China΄s president Hu Jintao has answered the questions with Washington Post, "It takes a long time for a country΄s currency to be widely accepted in the world. And making the renminbi an international currency will be a fairly long process". However, the regionalization of the renminbi in Southeast Asia is much more likely to be

achievable in the foreseeable future. Actually, China's monetary authority has made some efforts to promote the regionalization of the renminbi in Southeast Asia. Through the efforts of China, most members of the Association of Southeast Asian Nations (ASEAN) have signed the local currency swap agreements with China. The renminbi deposits in ASEAN countries grow rapidly since all ASEAN member countries were covered by China's cross border trade settlement pilot scheme. The announcement of Chiang Mai Initiative is also viewed as an attempt to promote the renminbi as an international reserve currency. In addition to these improvements, the ASEAN-China Free Trade Area was created in 2010, it reduced tariff, and made commodities, services, labor and capital move freely. The elimination of tariff barriers and free movement of production elements are prerequisites to establish a monetary union. Although it is unlikely to create a common currency like euro in Asia, the establishment of the ASEAN-China Free Trade Area was supposed to contribute to facilitate renminbi regionalization.

In addition to the efforts from China's government, the market forces also increase renminbi's influence on ASEAN. Most ASEAN members adopt an export-led growth strategy. Their export products are usually similar to China's exports. They are in fierce competition with China in international market. In order to maintain the competitiveness of their export products, ASEAN countries have incentive to moving away from a dollar bloc and peg to renminbi (Kawai, 2008).

In the second half of 1990s, the Japanese monetary launched the internationalization of the yen, and the influence of yen increased rapidly in East Asia during that period. Frankel and Wei (1994) have introduced a framework to explore its impacts on the exchange rate policies of the East Asian Economies. In this section, a similar model was established to test the renminbi's impacts on a number of Asian currencies, and it can be represented by the following equation:

$$\Delta e_{Aseancurrency/swissfranc} = \beta_0 + \beta_1 \Delta e_{usdollar/swissfranc} + \beta_2 \Delta e_{euro/swissfranc} +$$

$$\beta_3 \Delta e_{yen/swissfranc} + \beta_4 \Delta e_{pounds/swissfranc} + \beta_5 \Delta e_{renminbi/swissfranc} \qquad \textbf{(3)}$$

where $Aseancurrency$ denotes five currencies of ASEAN members, including Thai Baht, Indonesian Rupiah, Singapore Dollar, Philippine Peso and Malaysian Ringgit. Indonesia, Thailand, Malaysia, Singapore, Philippines are included into the ASEAN six majors. ASEAN six majors refer to the six largest economies in ASEAN with economies many times larger than the remaining four ASEAN countries. The sixth is Vietnam. Only the five largest was included into the model, as the data about the exchange rate of Vietnamese Dong is not available. The $usdollar, euro, yen, pounds, renminbi\ and\ Swissfranc$ are the U.S. dollar, euro, Japanese yen, British pounds sterling, Chinese renminbi and Swiss franc, respectively. The U.S. dollar, euro, British pounds sterling and Japanese yen are the four most important international currencies, which play crucial roles in the international monetary system. Thus they are clearly on the list of candidates. China is the largest economy in East Asia, and one purpose of this thesis is to estimate renminbi´s impacts on ASEAN, so renminbi is included into the model. Frankel and Wei (1994) suggested that in the case of a perfect basket peg, ordinary least squares (OLS) regression would display the correct weights regardless of the choice of numeraire used to measure the values of currencies. However, if the currency was not perfectly pegged to any basket, the choice of numeraire would affect the interpretation of the error term. As the Swiss franc is widely considered as one of the most stable currencies, and it is one of major reserve currency, in this thesis, the values of all currencies are represented by their exchange rate against the Swiss franc. For example, the $usdollar/swissfranc$ denotes the value of the U.S. dollar in terms of the Swiss franc. The Δe is the daily change rate of a currency´s value. β_i is the coefficient, it represents the importance of the corresponding currency in the currency basket. The sum of the β_i´s should be close to one.

There are two sample periods in this thesis. The first period is from 1 January 1999 to 20 July 2005. The second period begins from 21 July 2005 to 1 August 2012. The cut-off point is set on July 21 2005 because China implemented a reform of the exchange rate regime on that

day. The purpose of this section is to compare the renminbiʹs influence on ASEAN currencies during the two different periods. All data used in this section are obtained from the International Monetary Fund.

The first sample period (1/1/1999-20/07/2005):

Table 4.3 shows the regression results for the period before the exchange rate reform.

Table 4.3: The estimation results for the first period (1/1/1999-20/07/2005).

	Thai Baht	Indonesian Rupiah	Singapore Dollar	Philippine Peso	Malaysian Ringgit
U.S. dollar β_1	-4.672 (3.45)	6.605 (17.877)	-3.142 (2.203)		1***
Euro β_2	0.016 (0.033)	0.245*** (0.095)	0.004 (0.020)		
Japanese Yen β_3	0.201*** (0.016)	0.213*** (0.045)	0.191*** (0.010)		
Pounds sterling β_4	0.031 (0.025)	-0.004 (0.066)	0.040** (0.016)		
Renminbi β_4	5.394 (3.449)	-5.928 (17.878)	3.849* (2.203)		
Constant β_0	0.011 (0.010)	0.008 (0.026)	0.001 (0.006)		
Adjusted R-2	0.777	0.51	0.884		1
Observations	1322	667	1403	0	1435

Note: the standard errors of the coefficients are in ( ).

*** Very significant p-Value < 1 %, ** Significant P-Value 1-5 %, * P-Value 5-10 %

The data about the exchange rate of Philippine Peso starts from 21 September 2010, thus there is no data for Philippine in the first sample period. Before July 2005, Malaysia officially pegged the U.S. dollar. The exchange rate of Malaysian Ringgit against the U.S. dollar was retained at around 8.2768. Thus, obviously, the U.S. dollar was significant and equal to 1 for the Malaysian Ringgit. However, the U.S. dollar was insignificant for the other three ASEAN currencies: Thai Bat, Indonesian Rupiah and Singapore dollar. According to table 4.3, Japanese yen has the largest influence on ASEAN currencies as it is significant for all the three ASEAN currencies. For Thai Baht, the Japanese yen was the only one variable whose coefficient was significant. The euro only had impact on the exchange rate of Indonesian Rupiah, and its coefficient is even larger than the coefficient of Japan yen. Similarly, the British pounds is only significant in the equation of the Singapore dollar, and its coefficient is only 0.04. The renminbi is also significant for Singapore, and its coefficient is 3.849, which means the movement of the exchange rate of Singapore was mainly influenced by the renminbi.

Goodness of fit is reasonable for most of the four equations. Malaysian Ringgit ́s adjust R^2 is equal to 1 as it officially pegged the U.S. dollar. The adjusted R^2 of Singapore Dollar, Thai Baht and Indonesian Rupiah are 0.884 and 0.777, respectively. Indonesian Rupiah has a relative small adjusted R^2, 0.51, it indicates that the explanatory of the equation for Indonesian Rupiah is relative low.

The second sample period (21/07/2005-01/08/2012)

Table 4.4 shows the regression results for the period after the exchange rate reform.

Table 4.4: The estimation results for the second period (21/07/2005-01/08/2012).

	Thai Baht	Indonesian Rupiah	Singapore Dollar	Philippine Peso	Malaysian Ringgit
U.S. dollar β_1	0.477***	0.308	-0.261***	0.627*	-0.091

	(0.087)	(0.213)	(0.080)	(0.195)	(0.096)
Euro β_2	0.038*	0.197***	0.210***	0.010	0.181***
	(0.020)	(0.053)	(0.019)	(0.044)	(0.023)
Japanese Yen β_3	0.028**	-0.192***	-0.029**	0.022	-0.083***
	(0.013)	(0.033)	(0.012)	(0.038)	(0.015)
Pounds sterling β_4	0.057***	0.039	0.072***	0.052	0.053***
	(0.016)	(0.040)	(0.015)	(0.055)	(0.018)
Renminbi β_4	0.416***	0.631***	1.015***	0.289	0.968***
	(0.090)	(0.220)	(0.083)	(0.206)	(0.099)
Constant β_0	-0.012	0.009	-0.003	-0.009	0.003
	(0.010)	(0.024)	(0.009)	(0.023)	(0.010)
Adjusted R-2	0.855	0.418	0.819	0.835	0.792
Observations	1348	1439	1480	346	1439

Note: the standard errors of the coefficients are in ( ).

*** Very significant p-Value < 1 %, ** Significant P-Value 1-5 %, * P-Value 5-10 %

In the first period, the coefficient of the U.S. dollar was only significant for Malaysian Ringgit. However, in the second sample period, the dollar is statistically significant for Thai Baht, Singapore Dollar and Philippine Peso, except Indonesian Rupiah and Malaysian Ringgit. Actually, in July 2005, Malaysia officially abandoned the dollar peg. Euro, the Japanese yen, British pounds and renminbi are significant in the equation of Malaysian Ringgit. And renminbi ś coefficient is 0.968, much higher than other four currencies. Renminbi has largest influence on the exchange rate of Malaysian Ringgit. Actually, the Bank Malaysia has announced that it was purchasing Chinese government bonds, and renminbi was held as an important reserve currency by them. The only significant variable in the equation of Philippine Peso is the U.S. dollar. All euro, Japanese yen and renminbi are significant for Indonesian Rupiah, and renminbi ś coefficient is the largest one. The exchange rate of Indonesian Rupiah in the second period is mainly determined by the renminbi. In the equation for the Thai Baht and Singapore Dollar, all variable are significant. For Thai Baht,

the U.S. dollar has the largest influence on the exchange rate of Thai Baht, and the coefficient of the renminbi is the second largest one. In the equation for Singapore Dollar, renminbi has the largest coefficient.

All adjusted R^2 are generally reasonable except the Indonesian Rupiah. In the first sample period, Indonesian Rupiah also has the lowest adjusted R^2.

It is obvious that the effect of renminbi on ASEAN currencies has experienced a significant growth during the two sample periods while the effects of Japanese yen diminished. The renminbi is more likely to be the Asia anchor currency than Japanese yen.

This result supports the optimum anchor currency area (OACA) theory that the increase in share of intra-regional trade volume, countries in this region have incentive to pegging to a regional anchor, even no monetary union exist in this area.

The ASEAN-China Free Trade Area not only increased the trade volume between China and ASEAN, also contributed to the regionalization of the renminbi.

Meanwhile, the result also confirms the studies of political economics on international currency. China's government designed and signed a series of currency swap agreements and cross border trade settlement pilot schemes with various countries through diplomatic negotiations. This can be viewed as an example that politics have influence on the role of an international currency. And the renminbi is playing a role as a negotiated currency.

5. Conclusion

As discussed in the introduction, before opening the capital account, China's monetary authority should estimate the potential international status of the renminbi. Thus, based on previous researches, this thesis tries to establish a model to explore the determinants of international reserve currency shares. Based on the model in the empirical section, the potential reserve share of the renminbi would be 7.2%, but the prerequisite is that the restrictions on the capital account must be removed. Actually, capital account convertibility is a critical condition. If a currency lacks capital account convertibility, it never has the chance to become a dominant international currency. It is undoubted that the restrictions on capital account must be removed, if China hopes to promote renminbi as a major international reserve currency. However, if the restrictions were removed too fast, China's economy would suffer huge risks, especially the financial sector. The Asian financial crisis of 1997-98 clearly showed the consequences. Thailand and other South East Asian Countries opened their capital account before the establishment of solid and healthy financial sectors. The openness of their capital accounts increased the vulnerability of their financial institutions to exogenous shocks. Thus, based on the experiences of these neighbors, it is wise to remove China's restrictions on the currency convertibility gradually. The capital account liberalization must not outpace the strengthening of the domestic financial sector and monitoring capability. Moreover, according to the estimation in this thesis, the size of the market capitalization has positive effects on the international status of a currency. That is, the development of financial market is not only necessary for opening the capital account, but also conducive to significantly increase the renminbi's potential reserve share. Thus, it is advisable to build a deep, liquid, free and safe financial market patiently before releasing the restrictions on capital account, even if it would take a rather long time to attain the goal.

In addition, according to the estimation of the second model in the thesis, China can concentrate on promoting the regionalization of the renminbi before the openness of capital account. In some sense, the emergence of the euro can be viewed as the internationalization

of the Deutsche mark. The euro zone was officially founded in 1999, actually, as Germany's huge economic size and the stable value of its currency, the Deutsche mark always played the role of anchor currency in Europe before the launch of the euro. The result of the second model in this thesis suggests that China has the potential to become a regional anchor currency. Thus, based on Germany's experiences, China can continue to strengthen renminbi's role in Southeast Asia. With the development of globalization and the efforts of the governments, Asian economies are linked more closely than ever. The financial integration and cooperation among Asian countries are conducive to stabilize the value of their currencies, and beneficial to all of them. For both China and the ASEAN, the economic relationship between them is more and more important in these years. In this context, China could pursue more opportunities to strengthen cooperation in trade and finance with the ASEAN members. And it is an effective way to increase the international use of the renminbi and promote renminbi's regionalization in this region. There are still a plenty of work need to be done before removing the restrictions on capital account.

The internationalization of the renminbi is a long process. At current growth rate, China would surpass the United States and become the largest economy in the 2030s. However, as the existence of network externalities, renminbi needs to take much longer time to replace the status of the U.S. dollar. The Nobel laureate in economics, Robert Mundell, has said confidently that "the renminbi is likely to become a reserve currency in the future, even if the government of China does nothing about it. The progress of the renminbi as an international currency is assured" (Cohen, 2012). In some sense, his words can be understood as patience and cautiousness. China's monetary authority needs to determine the pace and form of the internationalization of the renminbi very patiently and cautiously, especially the removal of the restrictions on renminbi's convertibility. Sometimes, it is better to do nothing than to do something wrong.

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