Will the Renminbi Emerge as an International Reserve Currency?

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June 2010

An earlier version was presented at the workshop on "China Toward an Upper Middle-income Country: Challenges and Policy Options," organized by ADB and China Center for Economic Research (CCER) of Beijing University, on 31 May – 1 June 2010. I am grateful to Dong He, Sabyasachi Mitra, Donghyun Park, Lei Lei Song, and the workshop participants for helpful comments and suggestions, and Ruth Francisco and Lea Sumulong for research assistance. The views expressed in this paper are the views of the author and do not necessarily reflect the views or policies of the Asian Development Bank (ADB), or its Board of Governors, or the governments they represent.

Abstract

This paper argues that the world needs a greater role for alternative currencies in order to strengthen the global reserve system. A gradual evolution to a multi-currency system is desirable because it reduces the ever-growing balance of payments deficit pressure on a single reserve currency issuer and provides alternatives for countries to diversify their foreign exchange currency holdings. Given the continuing strong growth of the People's Republic of China (PRC) and its expanding influence in the world economy, it is quite natural that the renminbi emerges as a new international currency. This is, however, contingent on PRC authorities' acceptance of a more convertible capital account and development of an efficient financial system. Simulations show that once the currency were to become more convertible, the renminbi can gradually grow to become an international currency within the region and beyond—sharing from about 3% to 12% of international reserves by 2035.

JEL Classification: F02, F31, F33, O53

Keywords: international reserve, currency internationalization, Asian monetary cooperation

I. Introduction

The global crisis in 2008 and 2009 revealed the inherent weaknesses of the current international monetary system that contributed to global financial instability and a weak global economy. For emerging economies, which depend heavily on international trade and capital flows for their growth and development, the failure of the current global reserve system in ensuring sufficient international liquidity caused them to suffer from the spillovers of global shocks.

After the collapse of Lehman Brothers in September 2008, emerging economies were hit hard by the speed and severity of the financial shock spillovers from the global economy. As the global credit shortage intensified, economic and financial systems came under increased pressures. Despite the large build-up of foreign exchange reserves over the past decade, severe dollar shortages tested the resilience of their financial systems. As their access to international interbank markets was limited, the cost of borrowing dollars increased sharply. The combination of the rapid financial shock spillover and deteriorating global economic situation made a slow-down of economic growth in emerging countries inevitable.

The use of a dominant country-issued reserve currency such as the US dollar as an international reserve currency heightens the so-called Triffin dilemma (Triffin 1960). The world's demand for international reserve assets increases with international income and trade. The reserve-issuing country must continue to run balance of payments deficits to meet the growing demand, while surplus countries accumulate reserves, seemingly indefinitely (Bergsten 2009). The outstanding external debt of the reserve-issuing country would rise without limit, causing at some point investors to lose confidence in the value of reserve assets. There is no ready mechanism forcing surplus countries or the reserve-issuer to make an adjustment to fix the unsustainable systemic imbalance.

In principle, floating exchange rates and well-functioning international capital markets help to reduce the need for reserves. Despite the increasing trend of adopting floating exchange rate systems and capital mobility, however, the demand for reserves has not declined.[1] A sharp rise in the demand for reserves in recent years reflects a motive to self-insure against capital

[1] Total foreign exchange reserves increased from just SDR 811.3 billion in 1994 to SDR 4.4 trillion at the end of 2008 (IMF, Annual Report, 2000 and 2009).

account crises by emerging economies since they cannot borrow at the going interest rate when they need to. Furthermore, high capital mobility provides an additional source of disturbance, heightening the need for reserves. During balance of payments crises, reserves play an important role in lessening output loss (Becker, Jeanne, Mauro, Ostry, and Ranciere 2009). Yet, hoarding international reserves is expensive and less efficient in the absence of assertive external debt management policies.

This paper argues that the world needs a greater role for alternative currencies in order to strengthen the global reserve system. [2] A gradual evolution to a multi-currency system is desirable because it reduces the ever-growing balance of payments deficit pressure on a single reserve currency issuer coming from the Triffin dilemma. A multi-currency reserve system provides alternatives for countries to diversify their foreign exchange currency holdings. If dollar liabilities increase and confidence declines, for example, central banks can switch to the other reserve currencies.

This paper focuses on the role of an Asian currency in the global reserve system and argues that the People's Republic of China (PRC) renminbi has a great potential to rise as a new international reserve currency. The euro has emerged as a serious rival to the US dollar because its international use has grown rapidly over time (Chinn and Frankel 2007; Eichengreen 2007). The euro is increasingly being used in trade invoicing, in international debt securities, and as a medium of exchange around the world. Once the PRC develops and removes its exchange and capital controls, it will become a strong candidate for supplying an international reserve like the euro.

The emergence of Asia, in particular the PRC economy, has been one of the most important features reshaping the world economy. The fast growing economies of developing Asia is providing an important source of global production and demand. Emerging market economies in Asia have maintained an average annual growth rate of 7.2% over 2000–09. In 2009, Asia (including Japan) accounted for over 22% of global GDP, up from a mere 12% in 1960. In comparison, the US contributes 24.6% and the European Union 28.4% (Table 1). In addition, Asia now controls 58.7% of global foreign exchange reserves, a figure that has grown

[2] Introduction of alternative insurance arrangements would be also important to strengthen the global reserve system because it helps to reduce the demand for the single reserve currency. These arrangements include capital control measures, bilateral swaps, private sector insurance, and regional financing facilities. See Mateos y Lago, Duttagupta, and Goyal (2009).

in tandem with its economic clout. Seven of the world's top 10 reserve holding countries are in Asia—PRC; Japan; India; Republic of Korea (Korea); Taipei,China; Singapore; and Hong Kong, China.

Underpinning this remarkable performance has been the dynamic growth in the PRC. It is now the third largest economy at market exchange rates and the second largest in purchasing power-adjusted terms. It is the second-largest trader globally, and holds the largest amount of foreign-exchange reserves (see Table 1). In recent years, the PRC economy accounted for about one-fifth of incremental demand in the world economy.

In fact, while the global financial crisis has harmed its economy, there have been lively discussions on the possibility that the crisis could move the PRC to global center stage (See, for example, the Economist 2008). Although its leaders have been quite guarded, many PRC scholars and policy makers, especially in local media, aspire for a world economic and financial order less dominated by the US and in which the PRC can play a more influential role. They suggest that the PRC should actively involve itself in the process of establishing a new world financial order. One proposal is to strengthen the position of the renminbi in bilateral trade and in capital flows as a prelude to its future internationalization. For instance, Ms. Wu Xiaolin, former deputy governor of the People's Bank of China (PBOC), argued in a public forum that the PRC should broaden and deepen its financial markets, speed up the renminbi convertibility, and create investment channels for holders of renminbi. She expects that the renminbi could become a reserve currency in 20 years (China News 2008).

In March 2009, the PBOC released a statement by its central bank governor, Zhou Xiaochuan, calling for a reform of the international monetary system (Zhou 2009). In particular, Mr. Zhou is promoting the creation of an international reserve currency that is detached from individual country economic conditions and is able to remain stable in the long run. He is advocating the wider use of special drawing rights (SDRs), [3] especially in international trade, commodities pricing, investment, and corporate bookkeeping. Mr. Zhou argues that a super sovereign currency will not have the inherent risks caused by using credit-based national currencies. The Stiglitz Commission (UN 2009) also argued for the creation of a new global

[3] The special drawing right (SDR) was created in 1969 to provide additional liquidity to the global financial system. Its value is based on a basket of four international currencies including the euro, yen, pound sterling, and US dollar. During the 2008-09 global crisis, allocations were made to avoid a liquidity shortage: a general SDR allocation was implemented on 28 August 2009, and a special allocation on 9 September 2009, raising the amount of SDRs from SDR21.4 billion to SDR204.1 billion.

reserve system based on SDRs. However, a key challenge here is how to make a super-sovereign currency commercially viable. The share of SDR in private markets is almost negligible. With no national constituency to back up its intrinsic value, the SDR is an unlikely candidate (Eichengreen and Frankel 1996).

The PRC seems to support the move to a partial or total switch to a multi-currency reserve system, backstopped by the greater use of SDRs as well as the gradual internationalization of the renminbi (Chin and Yong 2010). But internationalizing the renminbi will likely happen as a gradual and drawn-out process. The network externality effect suggests that an incumbent international currency will have a natural advantage of maintaining its dominance. It will also take a significant amount of time before the PRC develops an efficient financial system and removes its exchange and capital controls, No matter how and when it would happen, however, a tripolar monetary system, in which the renminbi plays a greater role, would occur inevitably in line with emergence of a multipolar world.

The remainder of this paper is organized as follows. The next section discusses characteristics of an international reserve currency and the prospects of the shift to a multi-currency reserve system. Section 3 investigates empirically the determinants of reserve currency status and makes predictions for the share of the renminbi in the international reserve holdings in the coming decades. Section 4 assesses the current monetary cooperation in Asia and explores the possibility of an Asian currency. Concluding remarks follow in Section 5.

II. Shift from a Single Reserve Currency to a Multi-Currency System

Fall and Rise of International Currencies

The question of using the renminbi as an international currency is directly linked to the future of the US dollar. As the US-originated global financial crisis continues to intensify, many observers tell the story of how the US dollar will lose its international preeminence as an international reserve currency. It is clearly too early, however, to write off the US dollar. According to the literature, an international currency must satisfy the following roles: (i) unit of account; (ii) medium of exchange; and (iii) store of value (Table 2). These roles have uses both for private and official purposes. Officially, an international currency may be used as the

reference currency in exchange rate determination, a vehicle currency for foreign exchange intervention, and the currency for international reserves. In addition, private entities may use an international currency in invoicing and settlement of trade and financial transactions, and in international asset holdings.

The dollar remains the dominant reserve currency for the world's central banks and governments, and the US Treasuries' market remains the most liquid financial market in the world—making it attractive for central banks to hold reserves there. The dollar is still the dominant currency in invoicing trade and is used in denominating most foreign debt securities.

An examination of the long history of reserve currencies shows the tendency for one currency to dominate, with any change in status often reflecting a shift or rebalancing of economic and political power. The theory of network externalities is used to back up this view of a dominant single international currency at any given point in time. The argument is that there are strong incentives to conform to the choice of the currency that others use for international transactions, as it helps lower transaction costs. From the perspective of an individual central bank, it is best to hold reserves in the most liquid asset market—one where everyone else holds reserves as well. The concept of network externalities explains why an incumbent international currency has a natural advantage of maintaining its lead.

The network externalities theory does not mean, however, that a change in currency rank within the hierarchy is impossible. Over time, a dominant currency can lose its hegemony to a competing currency. History supports this view. The British pound sterling was the leading international currency prior to 1914. While historical statistics are scarce and less reliable than those available today, estimates show that between 1860 and 1914, about 60% of world trade was invoiced and settled in sterling, as was a similar share of holdings in global foreign exchange reserves (Eichengreen 2007). Britain's great imperial power and London's deep and liquid financial markets encouraged the use of the pound in British colonies and around the world. It took decades—until the end of World War II—for the US dollar to become the dominant international currency by supplanting the sterling atop the currency pyramid. Since then, the dollar has held its hegemony as leading international currency.[4]

[4] Schenk (2010) argues that the transition process was much longer than popular perception because there was collective global interest in the continuation of the preeminent role of the sterling as an international reserve currency.

As the sterling fell in the past, so too can the dollar lose its dominant position in the future. Its reserve currency status is attributed to the vibrant US economy, liquidity of financial markets, and stability in US monetary policy (Eichengreen 2007). It is also in the strong interest of the US to maintain the reserve currency seignorage and prestige. There is the ego inherent to the so-called "exorbitant privilege".[5] Nonetheless, the threat to the dollar's dominance is obvious. Current account and fiscal deficits, external indebtedness, overseas military commitments, and currency weakness were all tribulations the British pound experienced following World War II. Similar trends are pressuring today US Treasuries' holders to search for alternatives. With the meltdown on Wall Street, the attractiveness of raising funds there for both foreign companies and governments is now waning, despite its position as the deepest and most liquid financial market in the US.

For the time being, the dollar remains the dominant currency of choice for international trade. Although the US trade share in the global economy is declining, exporters still choose an invoicing currency that keeps *ex post* prices of goods similar to competitors' prices and provides hedging benefits (Goldberg and Tille 2008). However, it is very much in doubt whether central banks and governments will continue to buy and hold US securities in large amounts. The US economy faces unsustainable structural problems. The key question is whether economies with surplus savings will continue to finance US current account and fiscal deficits as confidence in the US financial system weakens. As emerging Asian economies shift away from export-led growth and stop foreign exchange intervention, it is likely that Asian authorities will look for alternative assets for their accumulated reserves.

The US dollar maintained currency hegemony for 60 years mainly because no alternative asset was as attractive. But times have changed—and are changing. The eurozone provides as large, as deep, and as liquid a market as the US. And the euro has grown to become an international currency from being a simple consolidation of fragmented national currencies. The eurozone economy is roughly the same size as the US one and accounts for a larger share of world trade. And, for the most part, the eurozone has maintained macroeconomic stability as its members adhere to the Stability and Growth Pact, a rules-based framework for coordinating

[5] It is argued that the United States got gains amounting to over $1 *trillion* for several years just before the crisis (Clarida 2009) and $40-$70 billion in a "normal" year (McKinsey Global Institute 2009).

national fiscal policies, and as the European Central Bank (ECB) pursues its anti-inflationary monetary policy.

The euro has emerged as a credible alternative to the dollar, and is a useful second reserve currency held by many of the world's central banks (Figure 1). At end-2009, the euro's share of global foreign exchange reserves was 27.4% compared with 62.1% for the US dollar (Table 3).[6]

As these figures indicate, there is no evidence that the euro is replacing the dollar as the main international currency. The share of the euro in foreign exchange market turnover has remained stable, but far below that of the US dollar (Table 4). And while the euro's role in trade invoicing and foreign exchange transactions has been increasing, it has come mostly from neighboring countries. The US dollar continues its preeminent role in the trading of Asian currencies—it was on one side of about 92% of transactions in Asian foreign exchange markets in April 2007 (Table 5).

As many scholars point out, there can be more than one international currency competing with each other at any given point in time (Eichengreen 2007; Cohen 2008). Eichengreen cites the coexistence of the US dollar and pound sterling as reserve currencies during the interwar period, supporting the idea that there is room for more than one major reserve currency. While the theory of network externalities emphasizes a dominant single international currency, it may hold in the case of trade invoicing or denomination of foreign debt securities. It is less valid, however, when it comes to the denomination of reserves. Several liquid financial markets can exist side by side as risk diversification motivates central banks to accumulate reserves in an array of assets denominated in several currencies. With the euro now providing a deep and liquid financial market, it offers significant benefits for central banks seeking greater diversification.

In the short term, the US dollar and the euro will remain the main reserve currencies, and any relative shift between their respective shares will be gradual (Galati and Woodridge 2006; Chinn and Frankel 2007). The biggest threat to the reserve currency status of the euro in the long-term is the perceived lack of economic dynamism in the eurozone. There is a widespread perception that the eurozone's future economic prospects lag behind those of the US and Asia. The ongoing debt crisis in the eurozone adds credence to this perception. Also, with its separate

[6] If the United Kingdom (UK) joins the eurozone, this will further strengthen the euro's reserve currency status, especially since London is a global financial center with deep and liquid markets.

national governments, the EU cannot offer a universal euro-denominated financial instrument that can match US Treasury bills. In addition, the future of the euro as the world's next primary reserve currency—replacing the troubled US dollar, has been compounded by worsening financial crisis in the eurozone in recent years. The euro area needs to strengthen coordination to enforce fiscal discipline and harmonize regulation and supervision of the financial system for a well-functioning monetary union.

The Rising Renminbi—Toward a Tripolar System

Is there room for a new major international currency to join the dollar and euro, forcing a shift from the current bipolar structure to a tripolar international monetary system?

History tells us that there have often been more than two currencies vying for the title of dominant international reserve currency. At the end of 1913, pound sterling balances accounted for less than half of total official foreign exchange holdings, while the French franc accounted for about a third, and the German mark about one-sixth (Eichengreen 2007). In the 1920s and 1930s, again it was three currencies, although the US dollar by then had replaced the German mark as a reserve currency. During the 1970s and 1980s—after the post-war recovery had transformed Japan into the second largest world economy—the international use of the yen accelerated significantly (see Table 3). This led to a brief tripolar period involving the US dollar, the mark, and the yen. However, the yen's appeal as an international currency eroded quickly as Japan's economic bubble burst at the end of the 1980s when its financial system lagged in efficiency.

The obvious candidate for a new international currency is the renminbi. With the PRC's growing weight relative to the world economy, the notion that the renminbi will become the key currency in Asia and holds promise to become a new international reserve currency over the long run is widely shared. In light of the PRC's large and growing influence in the global economy, it is only natural to ask when the renminbi will become a reserve currency.

If it continues to maintain rapid growth, the PRC is set to overtake the US as the world's largest economy within a few decades. Its economy is highly dependent on exports and imports, both of which are expected to continue to grow rapidly. The fact that the PRC exports a diverse mix of manufactured goods to virtually all countries reinforces the role of the renminbi as a

medium of exchange. And growing PRC overseas investments further increases its influence on the world economy. In addition, the PRC has achieved macroeconomic stability in recent years. Inflation has been low and stable, averaging 1.9% during 2000–09. Its fiscal balance has been healthy, with a deficit averaging 1.6% of GDP over the same period. The government places high priority on macroeconomic stability, and this bodes well for the renminbi as a store of value.

However, internationalizing the renminbi has its obvious limitations because the PRC's financial system remains relatively undeveloped and its capital account has limited convertibility (Dobson and Masson 2008). Financial system efficiency and transparency lags far behind major international financial centers. The financial system—subject to extensive government guidance and control—remains dominated by banks. Despite their rapid growth in recent years, the PRC's capital markets are still relatively underdeveloped. For the renminbi, the main lesson from the yen's failure to become a reserve currency is that open and efficient financial markets are an indispensable precondition for reserve currency status. Like today's PRC, the Japan of the 1970s and 1980s enjoyed rapid growth in output and trade, rising overseas investments, macroeconomic stability, and a consummate growing influence on the world economy. What was missing among the preconditions for internationalization was the existence of open and efficient financial markets—as Japanese markets lagged the US and many European countries. The same is true for today's PRC, only to a much greater extent.

There is a fairly firm consensus that strict capital controls preventing the free flow of capital between the PRC and the rest of the world constrain the use of the renminbi as an international currency. For the past 5 years, the PRC has undertaken financial sector reforms and lifted capital controls. Recently, it introduced the Qualified Foreign Institutional Investors and Qualified Domestic Institutional Investors programs to gradually allow cross-border capital movements. The PRC appears increasingly ready to remove remaining controls. It could be years, however, after first introducing greater exchange rate flexibility, before the renminbi could become a freely convertible currency for capital account transactions.

But, the PRC authorities are likely to proceed cautiously and will strive to minimize potential risks from rapid currency internationalization. Holding reserve currency status carries several benefits—including convenience, seignorage, and geopolitical prestige. It also reduces currency mismatches in the international balance sheet by allowing external claims and liabilities

to be denominated in its own currency. But it also entails costs. Loss of control over money stocks and currency appreciation due to stronger demand are powerful deterrents against the internationalization of a currency. In the PRC case, it is not at all clear whether the benefits outweigh the costs, and this uncertainty can deter attempts to internationalize the renminbi. In particular, authorities are concerned about the loss of export competitiveness due to upward pressure on the renminbi's exchange rate. However, and this may surprise some, the PRC government thus far appears more enthusiastic about internationalizing the renminbi than the Japanese government did prior to the 1990s with regard to the yen (Cohen 2008).

Renminbi use in the settlement of border trade between the PRC and some of its neighbors is now increasing.[7] Once the PRC engages actively in regional financial and economic cooperation and ensures exchange rate and monetary stability, the renminbi can become a dominant currency in regional trade invoicing, for example. Hong Kong, China, being an international financial center, could become a conduit for promoting the internationalization of the renminbi in trading and financial transactions.[8] As argued by He and McCauley (2010), the development of offshore markets can help to increase the recognition and acceptance of the currency. The PRC has a big advantage that it can develop a renminbi market in Hong Kong, China without disturbing its domestic financial system. Shanghai will also develop into an international financial center in the near future.

As the global financial crisis of 2008–09 played out, the PRC actively engaged in cooperative agreements with its neighbors, particularly relating to the provision of mutual liquidity assistance. Table 6 lists the bilateral and regional currency swap arrangements the PRC has concluded with selected partners. In a span of four months, from December 2008 through March 2009, the PBOC has signed six bilateral currency swap arrangements with the central banks of Korea; Hong Kong, China; Malaysia; Belarus; Indonesia; and Argentina for a total of 650 billion yuan. Discussions with other central banks for similar arrangements are ongoing.

[7] A survey by the State Administration of Foreign Exchange Taskforce found that by the end of 2007, seven of the 14 countries sharing borders with the PRC (i.e., Russian Federation, Mongolia, the Democratic People's Republic of Korea, Kazakhstan, Viet Nam, Myanmar, and Nepal) had set up renminbi settlement accounts with banks in the PRC's border trade areas. From a year earlier, the amount of settlement in renminbi had risen by 52% to reach $3.2 billion (http://www.cbmedia.cn/html/09/n-56409.html). Belarus, Argentina, and most recently Brazil have also made a deal to use renminbi for trade settlement.

[8] In fact, renminbi deposit taking was introduced in Hong Kong, China on 25 February 2004. From just RMB 895 million in February 2004, renminbi deposits have risen to RMB 66.1 billion in February 2010.

In short, the renminbi faces a daunting array of difficult challenges it must overcome before it appears a serious candidate for international reserve currency status. Not surprisingly, therefore, the internationalization of the renminbi to date has been insignificant. It will take time before the government removes restrictions on currency conversion by non-residents through the capital account. Building an open and strong renminbi bond market and integrating that with the domestic monetary system will be a big challenge. In the PRC, appropriate monitoring and managing of massive borrowing of local governments is also important for the stability of the monetary system and the internationalization of the renminbi. It is most likely that the evolution of the renminbi toward reserve currency status will be a gradual, drawn-out process that takes place over several decades—rather than a sudden, quick shift over a few years. The slow, deliberate, and gradual emergence of the renminbi as a new reserve currency is consistent with historical patterns.

III. Empirical Investigation of Reserve Currency Shares

This section explains the factors that determine the use of international reserve currencies and apply the estimated relationships to forecast the shares of the renminbi in the coming decades. This quantitative assessment is for an illustrative purpose and relies unavoidably on a number of simplifying assumptions.

According to the literature, there are four major factors that determine the suitability of a currency for international currency status (Chinn and Frankel 2008).

Size of Output and Trade. The relative size of a country's output and trade gives it a distinct advantage in having its currency used internationally. The US is the largest economy in the world in terms of output. But, the combined economic size of the 16 countries in the euro area has increased to match the US in output and surpass it in trade volume. The PRC's share in world GDP has also increased rapidly over the past decades, from 3.0% in 1973 to 7.1% in 2008 (Figure 2).

Financial Markets. A country's financial market must be open, unrestricted, deep, and developed for its currency to attain international currency status. We use the foreign exchange turnover data

from Chinn and Frankel (2008) to measure the size, depth, and development of financial centers. Since 1998, foreign exchange turnover in the PRC has been rising. From a daily average of $211 million, foreign exchange turnover increased to $9.3 billion in 2007. However, the daily turnover in the PRC still dwarfs those in the more developed and open financial centers of the United Kingdom ($1.4 trillion) and the US ($664 billion). In addition, we use the index of capital account liberalization generated by Chinn and Ito (2008) to measure the degree of a country's openness to global financial markets. The index ranges from -1.81 to 2.54. While, the PRC has maintained a higher index since the early 1990s (-1.13) from only -1.81 in the late 1980s, it is still very low relative to the indexes of the US and the eurozone, (2.54 and 1.73, respectively), implying greater use of restrictive policies.

Confidence in the Value of the Currency. A key requirement for an international currency is stability in its value. An international currency is more attractive to hold if there is an assurance that its value will not be depleted in the future. We use a country's inflation rate as the confidence measure of its currency. In the last 10 years, the mean of the PRC's inflation rate has been lower than that for advanced economies. Its standard deviation, however, is much larger, as the change in its consumer prices range from -2.0 to 8.7 during the period. We include a lagged value of currency share to capture the persistence of currency share.

Network Externalities. An international currency that is more widely used by others has higher value. There is a bias due to inertia in favor of currencies already used as international currencies. This suggests that changes in the determinants of reserve currency status are unlikely to lead to parallel changes in reserve currency share holdings in the short run. In other words, the switch in dominance from one international currency to another will happen only gradually.

We have constructed variables for these determinants for the empirical investigation (see Appendix). For all variables, Germany and eurozone data are spliced to come up with a complete series from 1974–2008. Following Chinn and Frankel (2008), we estimate the following international reserve currency demand function:[9]

[9] Since trade and output are highly correlated, we use only output shares in our estimation. We have also used exchange rate volatility, measured by standard deviation of the log first difference of the monthly SDR value of each currency. It is not statistically significant in the regression.

$$Logit\ (currency\ share)_{it} = \beta_0 + \beta_1\ (GDP\ share)_{it} + \beta_2\ (Inflation\ difference)_{it} + \beta_3\ (FX\ turnover)_{it} + \beta_4\ (KA\ openness)_{it} + \beta_5\ (lag\ logit\ of\ currency\ share)_{it} + \gamma_{it} \quad (1)$$

The data set has a feature of panel structure consisting of 35 annual observations for six country groups (US, Eurozone (Germany), Japan, PRC, UK, and Switzerland) from 1973 to 2008. The specification uses the logit transformation of currency share, log (share/(1-share)), to consider the nonlinear relationship between currency share and its determinants. Figure 3 shows the scatter plot between currency shares and GDP shares. The slope of curve between currency share and GDP share switches in the middle.[10]

Table 7 presents the regression results for the determination of currency shares. The model is estimated by adopting random-effects panel estimation procedure. Specification (1) excludes renminbi shares in the sample while specification (2) includes them.

The results are similar for the samples without and with the renminbi, i.e. column (1) vs. column (2). The relative size of the home country and the lagged dependent variable are shown to have statistically significantly positive effects on currency shares, with and without the renminbi. Foreign exchange turnover or the relative depth of the home financial center enters statistically significantly in column (1), but becomes less significant in column (2). Inflation enters negatively in both specifications but is not statistically significant. The estimated coefficient on GDP share is lower in column (2) with the renminbi (1.46) than in column (1) without the renminbi (1.77).

The coefficient of the index of capital account liberalization is positive and significant only in specification (2). This explains that the renminbi's lowest standing in the rank of an international currency is strongly related to its capital account restrictions.

We can use the estimation result to project the shares of the dollar, euro, and renminbi in the coming decades. First of all, the change in GDP shares will influence the long-run shares of the currencies. We make projections under two growth scenarios for the PRC: (1) high growth path, in which the historical real GDP growth rate of 9.5% for 1999-2008 and real exchange rate

[10] To keep the PRC's zero observations, when making the logit transformations, we added 0.001 across all currencies.

appreciation rate of about 3.4%[11] are maintained through 2035; and (2) low growth path, applying a 6.0% real GDP growth rate.

In both scenarios, we assume that the US, euro area, and the rest of the world maintain nominal GDP growth at their historical rates.[12] We construct the projected economic sizes for the US, eurozone, and the PRC under the two scenarios. Assuming that the PRC continues to take its high growth path, the PRC is forecast to account for 31.1% of world GDP by 2035, surpassing the US (13.3%) and the eurozone (14.1%). Meanwhile, if the PRC falls on a low growth path, the PRC and the US will have roughly the same economic size (16% of world GDP) by 2035, while the eurozone's size will be slightly higher at around 17%.

In Figure 4, we present our currency share projections for the renminbi under the two growth scenarios. We use the coefficient estimates in column (2), along with our economic size projections, to examine how the renminbi shares will change as the PRC's share in world GDP increases over time. In this simulation, we assume that the PRC gradually improves the foreign exchange turnover and capital account openness to the averages of the US in 2008, from 2011 to 2020.[13]

The share of the renminbi is expected to increase marginally to 2.7% only by 2035 if the PRC grows moderately. Meanwhile, it can reach up to around 11.6% if the PRC's economic size grows faster. Note that these projections were generated with the assumption that the sum of the three currency shares—the US dollar, euro and the renminbi—would remain unchanged at the current level.[14]

The estimation results show that once the PRC gains full renminbi convertibility and operates a stable and prudent financial system, the renminbi would eventually become an international currency within the region and beyond—sharing from about 3% to 12% of global central bank reserve holdings in 2035, which would exceed that of the Japanese yen or pound

[11] Real exchange rate appreciation for the PRC is estimated as the difference between the growth in GDP deflator in US $ terms between the PRC and the US [5.88 – 2.49 = 3.39].

[12] Real GDP growth rates for the US, euro area, and the rest of the world are assumed at 2.1%, 1.7%, and 4.0%, respectively.

[13] The simulation shows that without capital account convertibility, the renmibi's share will be insignificant despite the significant share of the PRC in world GDP.

[14] The model predicts that, without the restriction, as the US GDP share decreases over time, the share of the US dollar falls to 35.1% by 2035 in the PRC high growth scenario and to 41.9% in the PRC low growth scenario, from 64.1 % in 2008. The euro's share in total global foreign currency reserves also decreases, albeit at a very slow rate, from 26.6% in 2008 to 16.2% in the PRC low growth scenario and to 12.5% in the PRC high growth scenario. It would be implausible that the significant decline in the shares of the US dollar and euro occurs without a rise in an alternative currency (other than the renminbi). We recalibrated the estimated shares with the restriction in the sum of the three currency shares.

sterling. But, the simulation exercises also demonstrate that despite the substantial increase in the PRC's GDP share, the renminbi's reserve currency share does not increase in parallel. This reflects the strong influence of network externalities. The strong, positive coefficient of the lagged dependent variable (with its value close to one) implies that the renminbi's rise to a new international currency status would take place only gradually. With a small initial value of currency share, the increase of renminbi's share in international reserve currency holdings in response to the GDP share increase is smaller.[15] On the other hand, the rise of PRC's GDP share and the strong effect of the lagged currency share term imply that if there occurs a 'tipping point' in which the renminbi's reserve currency share jumps immediately to a higher level, the increase of the renminbi's currency share will accelerate over time. As other major currencies stagger, the moment that the renminbi rises as an international currency may come more quickly.

IV. Monetary Cooperation and Asian Common Currency

The failure of yen internationalization during the 1970s and 1980s provides important implications to the renminbi internationalization. The reluctance of Japanese authorities to internationalize the yen was a key reason it failed to take root as a reserve currency. Another important reason was that the yen failed to establish itself as a regional currency first. For historical and geopolitical reasons, most Asian countries were reluctant to use the yen for trade or financial transactions. The emergence of a yen bloc in East Asia would have helped consolidate the region's fragmented currencies, and would have boosted the yen's chances of reaching reserve status.

The PRC may face similar problems. Despite its growing economic and financial influence, it is doubtful whether other Asian countries are prepared to submit to a regional

[15] In the logit specification, the coefficient does not correspond to the marginal effect of the independent variable on currency share. The elasticity can be calculated by using estimates and the values of the variables. The elasticity of currency share to GDP share at the mean values $\xi = (\partial \textit{currency share} / \partial \textit{GDP share})(\textit{GDP share}/\textit{currency share})$ are approximated as β_1 *GDP share* (1-*currency share*). This implies that the elasticity with respect to GDP share increases with GDP share and decreases with currency share. For the PRC, this ranges from around 0.11 to 0.27 under the low PRC growth scenario; 0.12-0.52 under the high PRC growth scenario, holding all else constant. These imply that a 1% increase in the PRC's shares in world GDP leads to a rise of around 11% to 27% increase in the renminbi's share in global central bank reserve holdings under the low PRC growth scenario; 12% to 52% under the high PRC growth scenario. The long-run elasticity of currency share with respect to any explanatory variable is much higher because of the strong persistence of currency share.

hegemony. It could depend on how the PRC's political system and regional geopolitics evolve over time.

In East Asia, members of the ASEAN+3[16] used the 1997/98 Asian financial crisis as an opportunity to bolster regional financial and monetary cooperation. There has been substantial progress in information sharing, economic surveillance, strengthening regional bond markets, and reserve pooling. In 2001, ASEAN+3 finance ministers agreed to establish a network of bilateral swap arrangements, known as the Chiang Mai Initiative (CMI), which can provide emergency liquidity lending for troubled members.[17] The global crisis in 2008–09 gave the ASEAN+3 new momentum to upgrade the bilateral system of swap agreements into a multilateral pooled fund of US$120 billion. The global financial crisis in effect expedited the CMI's multilateralization (CMIM) by setting up a regional reserve-pooling arrangement. In May 2009, the ASEAN+3 Finance Ministers agreed on the details of the CMI multilateralization including governance structure, voting rights, and financial contributions. The Multilateralization of the Chiang Mai Initiative has been concluded, and has been in effect since 24 March 2010. PRC (including contribution from Hong Kong, China as a part of PRC's contribution) contributing 32% of the US$120 billion or US$ 38.4 billion.

Monetary cooperation in Asia is still weak and formal regional institutions remain underdeveloped in Asia, especially compared with Europe. Nevertheless, over time, East Asian economies undoubtedly will improve exchange rate and monetary policy coordination. A successful regional cooperation on the regional financing facility is a promising first step for future rules-based regional institutions. Enhanced economic cooperation may help for neighboring countries to accept the increasing role of the PRC economy as well as its currency in the region.

Perhaps an option to promoting regional monetary cooperation is building an Asian Monetary System (AMS), in which each currency is pegged to a common basket currency—call it initially an Asian Currency Unit (ACU)—whose value is based on a basketspecified amount of ASEAN+3 currencies and its bilateral exchange rate is allowed to fluctuate within a limited band around a central exchange rate. The ACU could become a basis for trade or other financial

[16] ASEAN+3 includes the 10 countries of the Association of South East Asian Nations (ASEAN) plus the PRC, Japan, and Korea.

[17] East Asia Summit, which adds India, Australia, and New Zealand to ASEAN+3, have also been an active forum for regional economic cooperation.

transactions within the region. Asian governments could issue ACU-denominated bonds. Of course this is fraught with political considerations on currency weightings and how they should evolve over time. There are plenty of sensitivities between the PRC, Japan, Korea, the 10 ASEAN members, as well as India. AMS faces the sensitive N-1 problem: when N currencies are linked to each other, there are N-1 restrictions and one exchange rate must be determined exogenously. This is how the European Monetary System (EMS) evolved to become a Deutsche mark-led arrangement (Wyploz, 2010). Nevertheless, enhanced regional cooperation in regional liquidity provision, economic surveillance and capital market development might lead to the adoption of the ACU (Kawai 2010). Eichengreen (2006) argues that that the circulation of ACU as a parallel currency alongside national currencies would be advantageous for East Asian economies. The parallel currency system would not conflict with the gradual emergence of the renminbi as a credible regional currency.

On the other hand, a currency union in East Asia is unlikely in the immediate future. Barro and Lee (2010, forthcoming) show that judging from optimum currency area (OCA) criteria, including the symmetry of output and price shocks across countries, commitment to price stability, trade and financial integration, as well as the degree of political proximity, East Asia does not appear to have very favorable economic conditions for a currency union, particularly when compared to the euro area. They explain, however, that most countries in East Asia would obtain a net welfare gain from forming a currency union involving a broad group of East Asian economies and that the prospect for an East Asian currency union will hinge on future developments of economic and political conditions, rather than current environments. However it fleshes out, the PRC—and the renminbi—will play a major role in any new Asian currency arrangement. Contradict

V. Concluding Remarks

The world economy is already tripolar—comprising the US, EU, and Asia. And Asia's relative economic and financial weight is set to rise even further in light of its faster output growth. So it is somewhat of an anomaly that only two currencies of the poles of this tripolar world—the US dollar and the euro—hold reserve currency status. Asia is being left out. A more natural reserve currency arrangement in a tripolar world would be for each pole, including Asia,

to have a reserve currency of its own. Given the PRC's continuing strong growth and its expanding influence in the world economy, it is quite natural that the renminbi emerges as a new international currency as long as PRC authorities accept a more convertible capital account and promote the development of an efficient financial system.

The current global financial crisis has hampered the long-term prospects of both the US dollar and the euro as reserve currencies. The crisis has compromised both currencies as safe-haven stores of value. The renminbi is not a significant international currency yet. The simulation shows that once the currency were to become more convertible, the renminbi can gradually grow to become an international currency within the region and beyond—sharing from about 3% to 12% of international reserves by 2035. As other major currencies stagger, however, the renminbi may rise more quickly as an international currency than many anticipate.

Creating a more efficient, stable, and equitable global reserve system is a vital priority for emerging economies, which rely heavily on international trade and capital flows. The internationalization of the renminbi will offer an alternative to the US dollar and the euro. The well-functioning multi-currency system with an expanded role for the renminbi as an international currency can play an important part in maintaining global financial stability and sustained growth.

Appendix: Variables and Data

Reserve currency shares: Official foreign exchange reserves of member central banks of the International Monetary Fund (IMF) as a share of total identified official foreign exchange reserve holdings. Data from 1995 are from the IMF Cofer Database. Data prior to 1995 are from various issues of the IMF Annual Reports. Since the renminbi's share in total reserve holdings is not available from the IMF's Cofer database, we assume that it is close to zero.

GDP shares: GDP in current US$ as a proportion of world GDP. Data sourced from World Bank, World Development Indicators Database until 2008.

Inflation: Difference between each country's monthly CPI inflation and that for advanced countries. The annual differences are calculated as centered five-year moving averages. Except for the eurozone, data are from the IMF, International Financial Statistics. Data for eurozone pertain to the following: before 1992, data are for West Germany and sourced from CEIC Data Company Ltd.; from 1992–98, data are for Germany and sourced from the Federal Statistical Office of Germany; from 1999, data are for the eurozone and sourced from the European Central Bank.

Foreign exchange turnover ratio: This is the ratio of average daily turnover in financial centers to the average daily turnover in all the financial centers in the sample. Except for the PRC, average daily turnover data are from Chinn and Frankel (2008). For the PRC, data are from the Bank for International Settlements (BIS) Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity (various years).

Capital account liberalization: The capital account liberalization index is a composite measure encompassing the presence of multiple exchange rates, restrictions on current account transactions, and requirements to surrender export proceeds. Data are from Chinn and Ito (2008), and are available through 2007. Data for 2008 were carried over from 2007.

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Table 1: Comparison of Asia, Europe, and the United States: Selected Indicators

	GDP (US$ billion), 2009	GDP (PPP billion), 2009	Foreign Trade (US$ billion), 2009	Stock Market Capitalization (US$ billion), Dec. 2009	Government Bond Oustanding (US$ billion), Sep. 2009	Foreign Exchange Turnover by Country (Total=100 %), Apr. 2007	Foreign Exchange Turnover by Currency (Total=200 %), Apr. 2007	Reserve asset share (%), Dec. 2009
Developing Asia								
China, People's Rep. of	4,909	8,765	2,206	4,138	1,420	0.2	0.5	27.2
Hong Kong, China	211	302	666	2,291	55	4.4	2.8	3.0
India	1,236	3,526	416	2,523	492	0.9	0.7	3.1
Indonesia	539	962	211	216	92	0.1	0.1	0.7
Korea	833	1,364	684	763	433	0.8	1.1	3.2
Malaysia	191	382	281	292	88	0.1	--	1.1
Philippines	161	325	84	130	75	0.1	0.1	0.5
Singapore	177	240	516	478	87	5.8	1.2	2.2
Taipei,China	379	736	376	657	128	0.4	0.4	4.1
Thailand	264	540	287	176	121	0.2	0.2	1.6
Other								
European Union	16,447	14,794	4,826	10,066	10,881	48.9	56.9	7.8
Euro Area	12,517	10,530	3,536	3,550	8,984	10.9	37.0	2.9
Japan	5,068	4,159	1,131	3,187	9,708	6.0	16.5	12.0
United Kingdom	2,184	2,139	841	2,708	1,180	34.1	15.0	0.7
United States	14,256	14,256	2,661	14,536	9,163	16.6	86.3	1.6

Notes: European Union comprises the 27 countries. Reserve asset share refers to international reserves as percent of world total. Data for the People's Republic of China for reserve asset share is for October 2009.

Sources: Asian Development Outlook database; Bank for International Settlements, *Triennial Survey* (2007); CEIC Data Company Ltd.; European Central Bank, available: http://sdw.ecb.europa.eu; Eurostat, http://epp.eurostat.ec.europa.eu; International Monetary Fund, *International Financial Statistics* online and *World Economic Outlook* database, available: http://www.imf.org ; all downloaded 22 April 2010; author's calculations.

Table 2: Roles of an International Currency

	Official use	**Private use**
Unit of account	Reference currency in exchange rate denomination	Invoicing of trade and financial transactions
Medium of exchange	Vehicle currency for foreign exchange intervention	Settlement of trade and financial transactions
Store of value	International reserves	International asset holdings

Source: Author based on Chinn and Frankel (2007).

Table 3: Currency Composition of Foreign Exchange Reserves (%)

	U.S. dollar	Japanese yen	Pound sterling	Swiss franc	Euro	Deutsche mark	French franc	Netherlands guilder	ECU	Other currencies
1973	76.1	0.1	5.6	1.4	-	7.1	1.1	0.5	-	8.1
1974	75.2	-	5.4	1.4	-	5.9	0.9	0.4	-	10.8
1975	79.4	0.5	3.9	1.6	-	6.3	1.2	0.6	-	6.5
1976	76.5	2.0	1.8	2.3	-	9.0	1.6	0.9	-	5.9
1977	80.3	2.5	1.8	2.3	-	9.3	1.3	0.9	-	1.6
1978	76.0	3.3	1.7	2.1	-	10.9	1.2	0.9	-	3.9
1979	73.2	3.6	1.8	2.4	-	12.0	1.3	1.0	-	4.8
1980	68.6	4.4	2.9	3.2	-	14.9	1.7	1.3	-	3.0
1981	71.4	4.2	2.1	2.7	-	12.7	1.3	1.1	-	4.4
1982	70.5	4.7	2.3	2.7	-	12.3	1.0	1.1	-	5.4
1983	71.1	4.9	2.5	2.3	-	11.7	0.8	0.8	-	6.0
1984	70.0	5.8	2.9	2.0	-	12.6	0.8	0.7	-	5.3
1985	55.3	7.3	2.7	2.1	-	13.9	0.8	0.9	11.6	5.4
1986	56.4	7.1	2.3	1.9	-	13.2	0.7	1.0	12.5	4.8
1987	55.7	6.9	2.1	1.8	-	13.3	0.8	1.2	13.6	4.6
1988	54.6	6.9	2.3	1.8	-	14.2	1.0	1.0	11.7	6.6
1989	51.3	7.2	2.3	1.4	-	17.8	1.4	1.1	10.8	6.7
1990	50.6	8.0	3.0	1.2	-	16.8	2.4	1.1	9.7	7.1
1991	51.3	8.5	3.3	1.2	-	15.4	3.0	1.1	10.2	6.2
1992	55.3	7.6	3.1	1.0	-	13.3	2.7	0.7	9.7	6.5
1993	56.6	7.7	3.0	1.1	-	13.7	2.3	0.7	8.2	6.8
1994	53.1	7.8	2.8	0.6	-	15.3	2.5	0.7	7.7	9.5
1995	59.0	6.8	2.1	0.3	-	15.8	2.4	0.3	8.5	4.8
1996	62.1	6.7	2.7	0.3	-	14.7	1.8	0.2	7.1	4.3
1997	65.2	5.8	2.6	0.3	-	14.5	1.4	0.4	6.1	3.8
1998	69.3	6.2	2.7	0.3	-	13.8	1.6	0.3	1.3	4.5
1999	71.0	6.4	2.9	0.2	17.9	-	-	-	-	1.6
2000	71.1	6.1	2.8	0.3	18.3	-	-	-	-	1.5
2001	71.5	5.0	2.7	0.3	19.2	-	-	-	-	1.3
2002	67.1	4.4	2.8	0.4	23.8	-	-	-	-	1.6
2003	65.9	3.9	2.8	0.2	25.2	-	-	-	-	2.0
2004	65.9	3.8	3.4	0.2	24.8	-	-	-	-	1.9
2005	66.9	3.6	3.6	0.1	24.0	-	-	-	-	1.7
2006	65.5	3.1	4.4	0.2	25.1	-	-	-	-	1.8
2007	64.1	2.9	4.7	0.2	26.3	-	-	-	-	1.8
2008	64.1	3.1	4.0	0.1	26.4	-	-	-	-	2.2
2009	62.1	3.0	4.3	0.1	27.4	-	-	-	-	3.1

Notes:
1. Data cover only countries that report their currency composition to the IMF.
2. There was a large change in 1979–1980 from the 1978 figure because of the substitution of European Currency Units (ECUs) for US dollars in the reserves of members of the European Monetary System.

Sources: International Monetary Fund, *Annual Report* (various years); Currency Composition of Official Foreign Exchange Reserves (COFER), available:http://www.imf.org/external/np/sta/cofer/eng/index.htm, downloaded 7 April 2010; author's calculations.

Table 4: Currency Composition of Reporting Dealers and Other Financial Institutions in Foreign Exchange Market Turnover (Percentage shares of average daily turnover)

	1992	1995	1998	2001	2004	2007
US dollar	83.1	84.1	88.5	91.9	90.4	88.2
Euro	-	-	-	37.5	36.5	36.1
Yen	22.0	23.1	19.6	22.3	19.7	16.3
Pound sterling	14.0	9.4	11.0	13.4	17.0	14.9
Swiss franc	8.7	7.2	6.8	6.0	6.0	6.7
Canadian dollar	3.3	3.4	3.6	4.4	4.1	4.2
Deutsche mark	40.4	36.3	31.0	-	-	-
French franc	3.8	8.0	5.1	-	-	-
Chinese renminbi	-	-	-	0.0	0.1	0.6
Other currencies	24.7	28.6	34.3	24.6	26.1	33.0
All currencies	200.0	200.0	200.0	200.0	200.0	200.0

Notes:
1. Reporting dealers and other financial institutions are used to proxy private transactions in the foreign exchange market. Nonfinancial customers in the Bank for International Settlements data are excluded as they cover government firms, in addition to corporate firms.
2. Because two currencies are involved in each transaction, the sum of the percentage shares of individual currencies totals 200% instead of 100%.

Source: Bank for International Settlements, Triennial Survey (various years).

Table 5. Currency Shares in Asian Foreign Exchange Markets

	US dollar		Yen		Euro		Pound sterling		Other currencies	
	2001	2007	2001	2007	2001	2007	2001	2007	2001	2007
Developing Asia	95.6	92.3	22.0	18.4	21.7	18.3	7.1	9.7	53.5	61.2
China, People's Rep. of	-	98.5	-	0.7	-	0.7	-	1.1	-	98.9
Hong Kong, China	96.7	96.1	20.9	10.4	17.2	12.8	5.8	7.4	59.5	73.2
India	94.9	95.8	4.5	27.7	8.9	9.3	5.9	9.7	85.7	57.5
Indonesia	79.1	93.0	7.1	8.3	9.9	11.2	3.7	2.6	100.2	84.9
Korea, Rep. of	98.7	92.0	7.3	11.6	3.2	6.1	0.8	4.4	90.0	85.8
Malaysia	96.9	97.1	12.4	7.0	7.1	5.9	1.9	4.9	81.7	85.1
Philippines	99.5	99.2	10.2	2.3	2.3	2.3	0.8	1.9	87.2	94.2
Singapore	95.3	88.3	25.8	25.1	28.4	27.2	9.2	13.2	41.3	46.3
Taipei,China	94.7	94.6	22.3	23.7	13.1	14.5	2.2	7.5	67.7	59.7
Thailand	96.4	94.4	10.8	15.2	4.0	8.8	0.7	2.2	88.1	79.3
Australia	96.4	91.3	15.3	10.7	12.9	17.5	7.0	7.7	68.3	72.8
Japan	92.0	84.6	74.7	71.1	17.7	18.3	3.4	6.9	12.2	19.1
New Zealand	92.3	94.2	6.1	4.6	7.8	10.4	4.7	3.7	89.1	87.2
ASEAN	94.8	88.7	24.6	24.2	26.8	26.0	8.7	12.6	45.1	48.5
ASEAN+3	93.4	87.2	51.7	44.2	20.9	20.8	5.5	9.3	28.5	38.5
ASEAN+6	93.9	88.6	44.9	35.2	19.3	19.3	5.7	8.9	36.2	48.0

Notes:
1. Data cover spot, outright forward, and foreign exchange swap transactions and were adjusted for local inter-dealer double-counting.
2. Because two currencies are involved in each transaction, the sum of transactions for each country in each year is equal to 200 percent.
3. ASEAN+3 covers ASEAN, PRC, Japan, and Korea
4. ASEAN+6 covers ASEAN+3 and India, Australia and New Zealand.

Source: Bank for International Settlements, *Triennial Survey* (2001, 2007); author's calculations.

Table 6. PRC's Currency Swap Arrangements

Country/Economy	Date Signed	Amount
Bilateral Agreements		
Korea, Rep. of	12 December 2008	180 billion yuan or $26.0 billion
Hong Kong, China	20 January 2009	200 billion yuan or $29.3 billion
Malaysia	8 February 2009	80 billion yuan or $11.7 billion
Belarus	11 March 2009	20 billion yuan or $2.8 billion
Indonesia	23 March 2009	100 billion yuan or $14.6 billion
Argentina	30 March 2009	70 billion yuan or $10.2 billion
Regional Agreement		
ASEAN+3 – Chiang Mai Initiative	28 December 2009	$120 billion

Sources: People's Bank of China News Releases; Deloitte (2009).

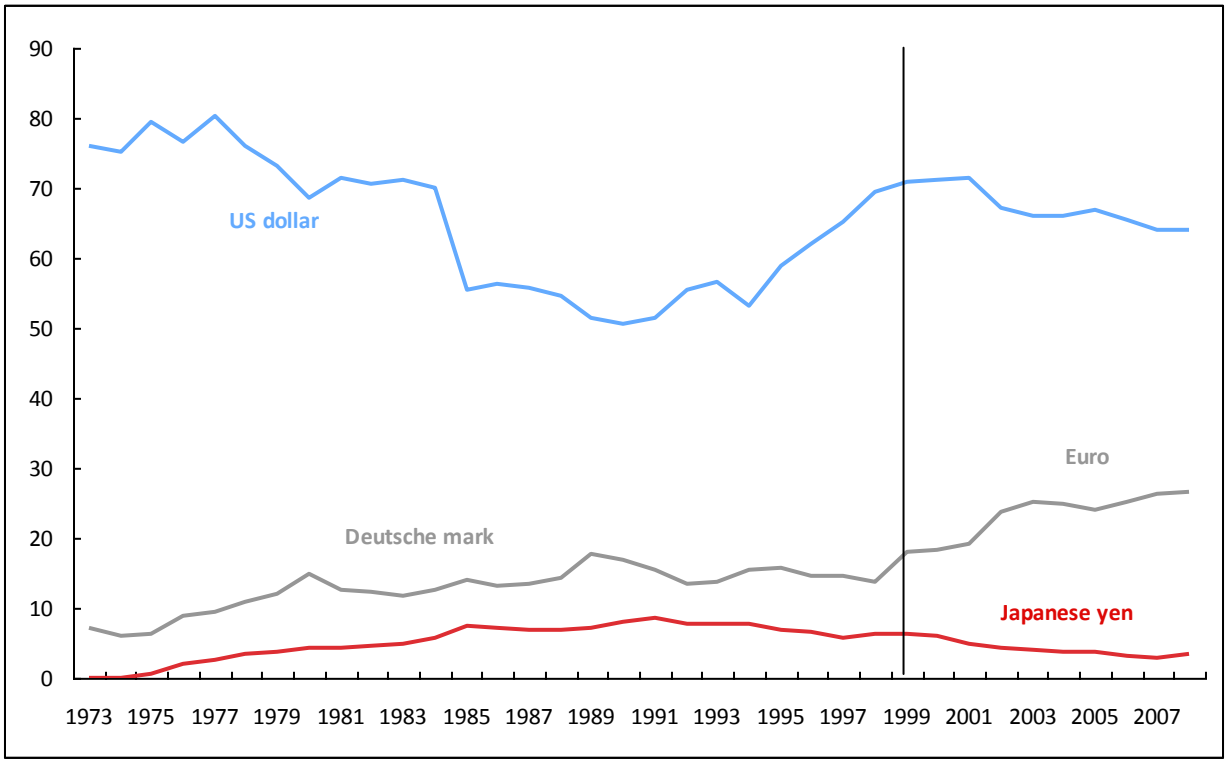
Table 7. Panel Regression Results for the Determination of Currency Shares
Dependent Variable: logit of proportion of currency reserve holdings, logit(share/(1-share))
Sample: 1974-2008

Explanatory variable	w/o the PRC	w/ the PRC
	(1)	(2)
GDP share	1.7680	1.4570
	[3.68]***	[3.53]***
Inflation difference	-1.1650	-0.3810
	[1.19]	[0.69]
Foreign exchange turnover	0.3190	0.2500
	[1.69]*	[1.55]
Lag of logit currency share	0.8990	0.9160
	[33.77]***	[40.18]***
Index of capital account liberalization	-0.0110	0.0370
	[0.31]	[2.16]**
Constant	-0.5360	-0.5430
	[3.12]***	[3.55]***
Observations	175	210
Number of currencies	5	6
R2	0.98	0.99

Notes:
Estimated using OLS random effects model.
* significant at 10%; ** significant at 5%; *** significant at 1%.
Absolute value of z statistics in brackets.

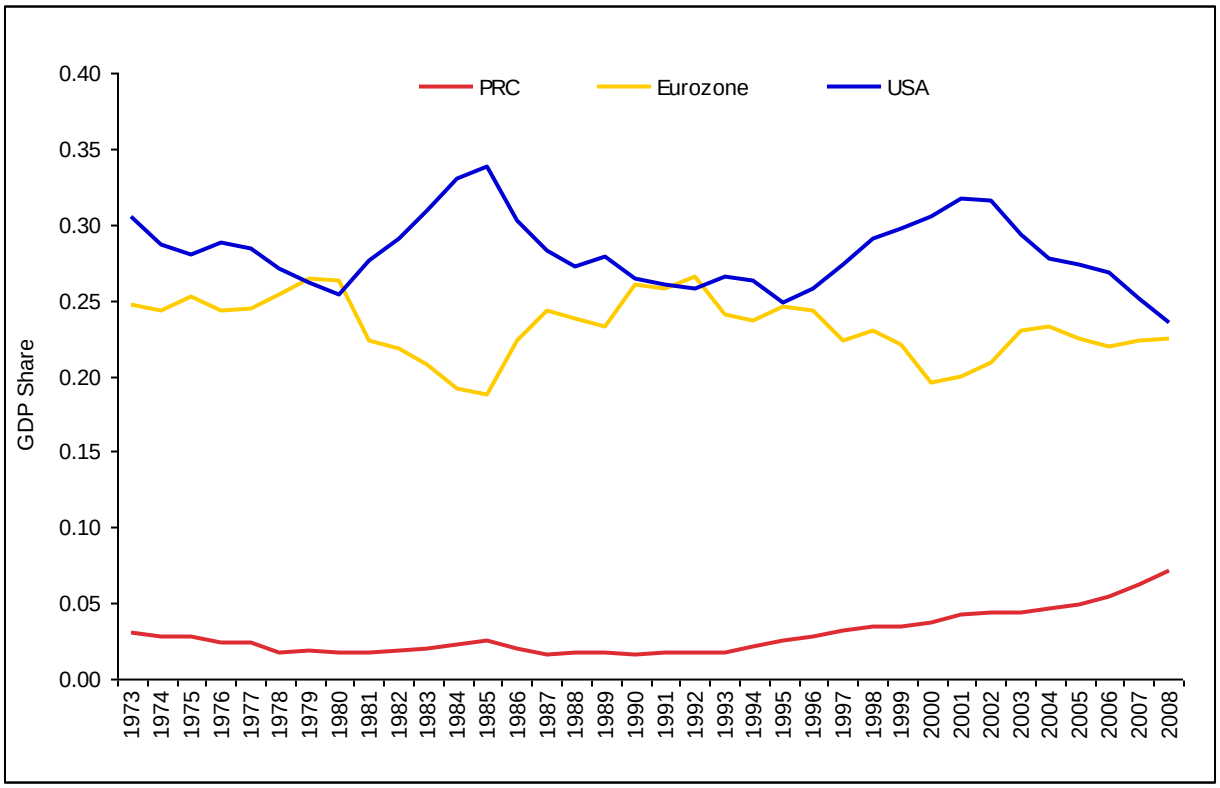
Source: Author's calculations.

Figure 1. Reserves held by central banks as shares of total – Major currencies, 1973-2008



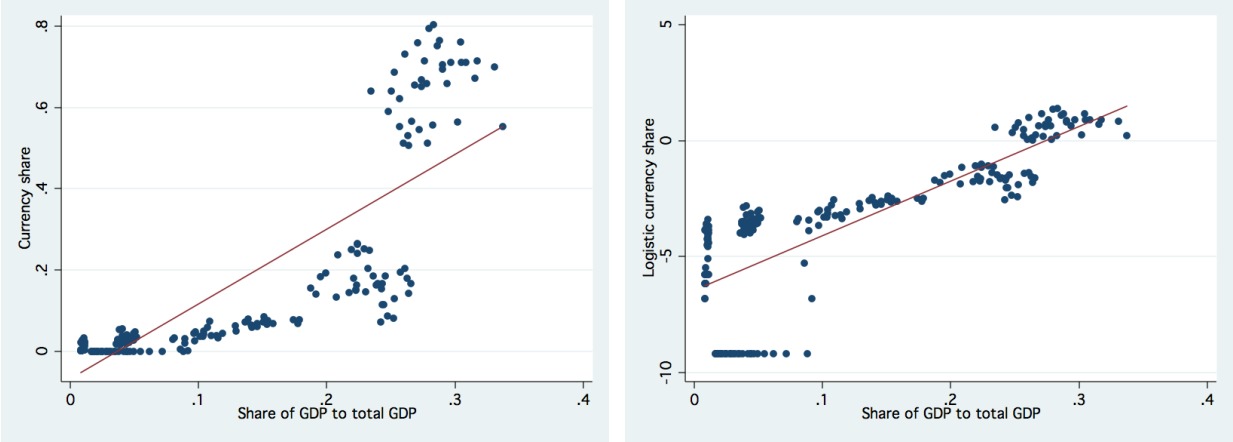
Source: IMF, Annual Reports, various years; IMF, Currency Composition of Foreign Exchange Reserves Database.

Figure 2. GDP shares, 1973–2008



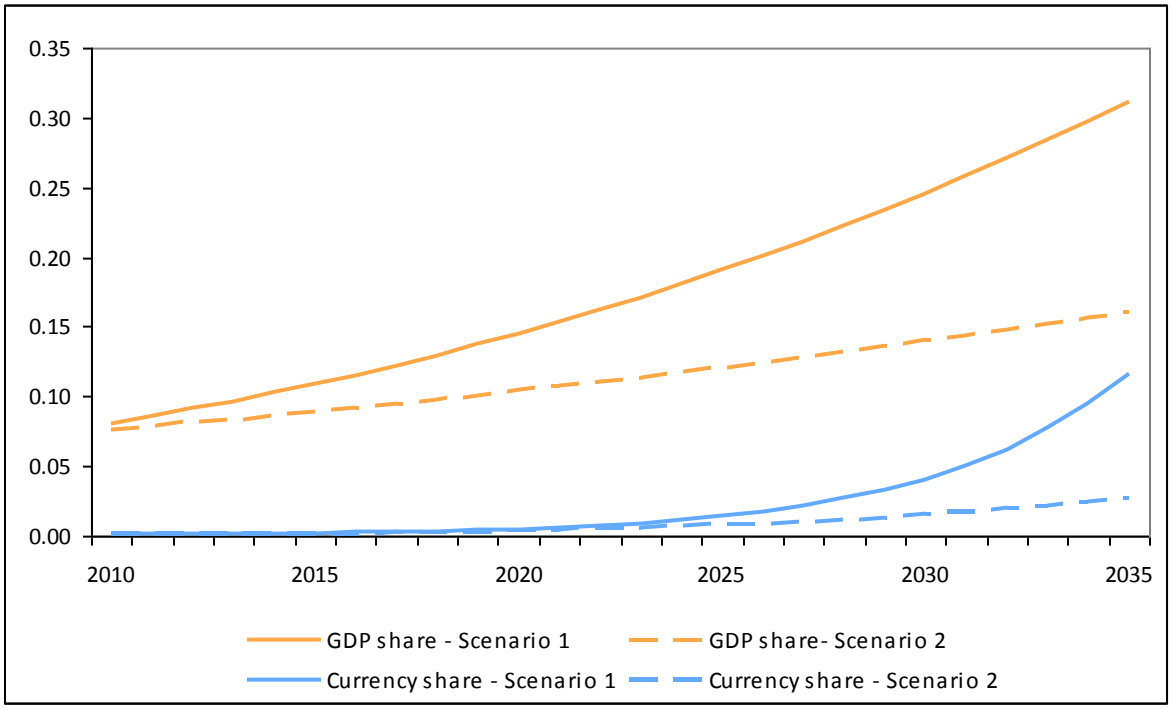
Source: World Bank, World Development Indicators.

Figure 3. Scatter plots of GDP share and Currency Share, 1973-2008



Sources: World Bank, World Development Indicators; IMF, Annual Reports, various years; IMF, Currency Composition of Foreign Exchange Reserves Database.

Figure 4. Projected GDP and Currency Shares of the PRC, 2010–2035



Note: Scenario 1 denotes a high growth path for the PRC; Scenario 2 denotes a low growth path for the PRC. The high growth path assumes that the historical real GDP growth rate of 9.5% for 1999-2008 and real exchange rate appreciation rate of about 3.4% are maintained through 2035; and the low growth path assume a 6.0% real GDP growth rate. In both scenarios, we also assume that the PRC will achieve the same daily foreign exchange turnover and capital account openness as in the US from 2011 to 2020. Projections were generated with the assumption that that the sum of the three currency shares—the US dollar, euro, and the renminbi—would remain unchanged at the current level.

Source: Author's calculations.