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EAST ASIAN ECONOMIES AND FINANCIAL GLOBALIZATION IN THE POST-CRISIS
WORLD

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ABSTRACT

This paper assesses the East Asian Economies' openness to cross-border capital flows and exchange rate arrangements in the past decades, with the main focus on emerging market economies. Using Mundell's trilemma indexes, we note that the convergence of the three policy goals in East Asia toward a "middle ground" pre-dates the convergence of these indices in other regions. Another more recent development involves the high level of international reserve (IR) holdings—a feature that is known as the most distinct characteristic of Asian EMEs. Financial globalization made asset prices and interest rates in Asian EMEs more vulnerable to global movements of capital, and to the monetary policy of the center country, the United-States. The U.S. presence in trade ties with Asian economies has been declining over the last two decades, whereas China's has been on a rising trend. Yet, the share of trade among Asian economies with the dollar zone economies has been quite stable. China has been recently making efforts to "internationalize" its currency, the yuan (RMB). Hence, if China succeeds in its internationalization efforts and creates the RMB zone, the dynamics between the U.S. and Asia will most likely change. Recently, Chinese authorities have become more interventionist because of the slowdown of the economy and financial markets. For now, the Asian region's international finance continues to be dollar-centric.

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1. Introduction

The Asian economies are facing their greatest challenge since the East-Asian financial crisis of 1997–1998. Advanced economies reacted to the 2008 global financial crisis (GFC) by implementing both conventional and nonconventional monetary measures that led many small open emerging market economies (EMEs) to experience a rise in capital inflows and thereby currency appreciation pressure. After the U.S. started scaling down the nonconventional monetary measures in 2014, some EMEs experienced capital flight. Although most of the Asian EMEs faced this situation with higher levels of exchange rate flexibility and a much thicker buffer of international reserves (IR) than they did at the time of the Asian crisis, the fear was also shared by policy leaders in Asia, who saw flashbacks of the 1990s in which the influx of capital was followed by the crisis breakout.

Since the time of the Asian crisis, one of the biggest changes in Asian economies' open macro policy configurations is that they have become large IR holders, joining Japan, which has been a long-time major IR holder. In the mid-2000s, China became the largest IR holder and by the end of 2015, the country held \$3.8 trillion dollars, about 30% of the world's total (Figure 1 (a)). Among the top 10 largest IR holders, five are East Asian economies whose amount accounts for 49% of the world's total IR (Figure 1 (b)).¹

While many motives have been identified to explain EMEs' IR hoarding, precautionary motive and exchange rate stability are often pointed to as major factors for Asian EMEs (e.g., Aizenman and Lee, 2007). By observing the severity of the currency crisis as well as the stringency of the International Monetary Fund's conditionality for rescue loans, many economies in the region have found it better to accumulate IR on their own while maintaining intermediate levels of exchange rate stability. However, ironically, it has also been argued that massive IR holdings by EMEs have contributed to financing profligate—such as the U.S. economy—with accessibility to liquidity that eventually led to the bubble and its bust. Furthermore, increased dollar liquidity made EMEs more vulnerable to U.S. policy changes, thus making it appear as though economies are subject to “global financial cycles” (Rey, 2013). Thus, in the post-GFC period, Asian EMEs are facing a difficult challenge in international macroeconomics, which can

¹ They are China, Japan, Korea, Hong Kong, and Singapore. Additionally, India is ranked as the ninth largest IR holder.

be observed by examining the patterns of capital flows and exchange rate arrangements pertaining to Asian EMEs.

This paper looks into the policy configuration of Asian economies, especially Asian EMEs, from the perspective of open macro policies. In particular, we focus on both the arrangements of exchange rate regimes and cross-border capital flows. In Section 2, we first review the open macro policy arrangements in the context of the famous “trilemma” hypothesis. In Section 3, we examine whether and to what extent Asian economies are vulnerable to shocks arising from advanced economies, namely the U.S. In Section 4, we show the risks to which Asian economies are exposed that involve the dollar as a key currency, and trade with the U.S. We make concluding remarks in Section 5.

2. Review of the Open Macro Policies Among Asian EMEs in the Context of the Trilemma

In the process of managing open macroeconomic policies, policy makers cannot avoid confronting the “impossible trinity,” or the “trilemma”—Mundell’s hypothesis that states that a country may simultaneously choose any two, but not all, of the three goals of monetary independence, exchange rate stability, and financial integration. Hence, we evaluate the macroeconomic conditions and policies in the Asian region through the lens of this hypothesis.

The trilemma hypothesis can be explained using Figure 2, in which each of the three sides of the triangle—representing monetary independence, exchange rate stability, and financial integration—depicts a potentially desirable goal. Although policy makers can implement a mix of the three either within the triangle, or on one of the three vertexes or sides, it is impossible to be on all three sides of the triangle simultaneously. The left vertex depicts a policy combination of full monetary policy autonomy and full exchange rate stability, for example, but not financial integration. This combination was taken by China before it started a series of liberalization policies in the 1980s or by Bretton Woods member countries before the system’s collapse in the early 1970s. The right vertex represents a policy taken by members of a monetary union (e.g., the European Exchange Rate Mechanism), economies that adopts a currency board (e.g., Hong Kong, Argentina before 2002), and any countries that peg their currencies to hard currencies. The economies at this vertex enjoy free access to international financial markets and full exchange rate stability, but they would have to give up monetary policy autonomy. The top vertex illustrates a floating exchange rate regime, associated with full monetary independence and full

financial openness, as is the case with Canada, Japan, and other flexible exchange rate countries.²

Each of the three policy goals has singular merits and shortcomings. With greater monetary autonomy, policy makers could stabilize the economy independently from other economies' macroeconomic management. However, full monetary independence could allow policy makers to manipulate output movement (at least in the short run), thus potentially causing output or inflation instability.³

Exchange rate stability could reduce the volatility of domestic prices and therefore foster investment and international trade by mitigating uncertainty. However, it could also rid policy makers of the option of using exchange rate as a tool to absorb external shocks. Thus, pursuing exchange rate stability could potentially leave an economy more prone to boom-and-bust cycles and misallocation of resources.

Financial liberalization may enhance economic growth by allocating resources more efficiently, mitigating information asymmetry, enhancing and/or supplementing domestic savings, and helping to transfer technological or managerial know-how. Also, economies with greater access to international capital markets should be better able to stabilize through risk sharing and portfolio diversification. However, financial openness could expose economies to volatile cross-border capital flows that often results in sudden stops or reversal of capital flows, thereby making economies vulnerable to boom-and-bust cycles (Kaminsky and Schmukler, 2008).

Thus, theory and empirical evidence tell us that each one of the three trilemma policy choices can be a double-edged sword.⁴ To make matters more complicated, the effect of each policy choice can differ depending on how it is paired with other policies. For example, although exchange rate stability can be more destabilizing if paired with financial openness, it can be stabilizing if paired with greater monetary autonomy. In reality, however, it is more of a rare

² See Aizenman, et al. (2010, 2011, 2013, 2015), Aizenman and Ito (2013), Klein and Shambaugh (2015), Obstfeld (2014), Obstfeld, et al. (2005), and Shambaugh (2004) for further discussion and references dealing with the trilemma.

³ Monetary authorities could also abuse their autonomy to monetize fiscal debt, and therefore end up destabilizing the economy through high and volatile inflation.

⁴ For monetary independence, refer to Obstfeld, et al. (2005), Shambaugh (2004), and Frankel et al. (2004). On the impact of the exchange rate regime, refer to Ghosh et al. (1997), Levy-Yeyati and Sturzenegger (2003), and Eichengreen and Leblang (2003). The empirical literature on the effect of financial liberalization is surveyed by Henry (2007), Kose et al. (2009), and Prasad et al. (2003).

case when a country faces the stark polarized binary choices often envisioned by the trilemma triangle. As we see in emerging Asia, countries often mix all three policy choices at intermediate levels—i.e., choosing a policy mix that can be depicted as somewhere inside the triangle.⁵

Now, where do Asian economies stand in the context of the trilemma?

To answer this question, we use a set of the “trilemma indexes” developed by Aizenman et al. (2008) that measure the degree to which each of the three policy choices is implemented by economies for more than 180 economies from 1970 through 2014. The monetary independence index (MI) is based on the correlation of a country’s interest rates with the base country’s interest rate. The index for exchange rate stability (ERS) is an invert of exchange rate volatility, that is, standard deviations of the monthly rate of depreciation for the exchange rate between the home and base economies. The degree of financial integration is measured with the Chinn-Ito (2006, 2008) capital controls index (KAOPEN).⁶

Figure 3 shows the trajectories of the trilemma indexes for different income-country groups. For the industrialized economies, financial openness accelerated in the 1990s while, at the same time, the extent of monetary independence started to decline and exchange rate stability began to rise significantly. All of these trends reflect the introduction of the euro in 1999. Developing economies do not present such a distinct divergence of the indexes, though their experiences differ depending on whether they are emerging or non-emerging market economies.⁷ For EMEs, exchange rate stability declined rapidly from the 1970s through the mid-1980s. After some retrenchment around the early 1980s, financial openness started rising from 1990 onwards, though it started to decline again at the end of the 2000s. These trends are not discernable among the non-EME developing economies.

Interestingly, for the EMEs, the indexes suggest a convergence toward the middle ground. In other words, these economies may have been maintaining moderate levels for all of the three indices. This policy trend coincides with the period of time in which some of these economies began accumulating sizable IR to potentially buffer the trade-off arising from the trilemma.

⁵ The bottom line is, as Mundell (1963) argued, that the extent of achievement of the three policy choices must be linearly related to each other. In other words, if there are measures representing the levels of attainment in the three policy choices, such measures must add up to a constant. This has been empirically proved by Aizenman et al. (2012) and Ito and Kawai (2012).

⁶ More details on the construction of the indexes can be found in Aizenman et al. (2008, 2010, 2011), and the indexes are available at http://web.pdx.edu/~ito/trilemma_indexes.htm.

⁷ The emerging market economies are defined as the economies classified as either emerging or frontier during 1980–1997 by the International Financial Corporation.

While this is not observed among non-EME developing countries (Figure 2 (c)), Asian emerging markets stand out from other geographical groups of economies in that these economies have had this sort of convergence for almost the entire sample period (Figure 4 (a)).⁸ However, with the exception of the Asian crisis years of 1997–1998, exchange rate stability seems to have been the most pervasive policy choice for most of the time. Although the indexes diverged in the 2000s post-crisis years, they have converged again in recent years. This characterization does not apply to non-EME economies (Panel (b)) or Latin America (Panel (c)). For non-EME economies in Asia, convergence in the trilemma configurations occurs in the later part of the sample period. Among non-Asian developing economies, exchange rate stability is distinctly the first priority throughout the sample period and middle-ground convergence has not occurred at all.

We now add the role of IR holding to the three-trilemma dimensions to shed further light on the open macro configuration, especially for the Asian region. As we have seen, since the Asian crisis of 1997–1998, EMEs, especially those in East Asia and the Middle East, have been rapidly increasing their amounts of IR holding. Researchers have tried to identify the causes for rapid IR accumulation among EMEs, especially those in Asia. Aizenman and Lee (2007) provide evidence that countries hold IR for both precautionary and exchange rate stability motives. Many researchers have argued the benefits of self-insurance against the volatility associated with financial globalization (Aizenman and Marion, 2003; Cheung and Ito, 2008, 2009). As a series of crises experienced in emerging markets in the late 1990s and early 2000s led to reserve hoarding by China and other EMEs in the 2000s, new factors have been added to the list of determinants of IR hoarding, including mercantilist motives (Aizenman and Lee, 2007), regional competitive incentives (“keeping up with the Joneses,” Cheung and Qian, 2009), and self-insurance against local residents’ flight from domestic assets in the trilemma context (Obstfeld, et al., 2010; Aizenman, et al., 2011, Aizenman, et al., 2015).

One might argue that economies accumulate massive IR to achieve a certain combination of exchange rate stability, monetary policy autonomy, and financial openness. For example, a country pursuing a stable exchange rate and monetary autonomy may try to liberalize cross-border financial transactions while simultaneously deciding not to give up current levels of

⁸ The sample of “Asian Emerging Market Economies” include China, Hong Kong, Indonesia, Rep. of Korea, Malaysia, Philippines, Singapore, Thailand, and Vietnam.

exchange rate stability and monetary autonomy. This sort of policy combination, however, could lead the monetary authorities to hold a sizeable amount of IR so that they can stabilize the exchange rate movement while retaining monetary autonomy.⁹

The “diamond charts” in Figure 5 trace the changing patterns of the trilemma configurations while incorporating IR holding. In each “diamond,” four vertices measure monetary independence, exchange rate stability, IR/GDP ratio, and financial integration with the origin normalized so as to represent zero monetary independence, pure float, zero international reserves, and financial autarky. We present the diamond charts for the original 12 euro countries, emerging Asian economies, China, and Latin American economies.

In Figure 5, we see that again Asian emerging economies have not experienced the divergence of the trilemma configurations over the years as has happened for industrial economies, especially for the euro member countries—that is, a move toward deeper financial integration, greater exchange-rate stability, and weaker monetary independence (Figure 5 (a)). Asian EMEs are distinct from the other groups of economies in having a middle-ground convergence of trilemma policy convergence; the three indexes have been clustered around the middle range. Interestingly, however, in recent years, both the extent of monetary independence and the level of IR holding has risen while financial openness and exchange rate stability have been inching down. Also, while the extent of monetary independence has been cyclically changing over years, the levels of IR holding has been steadily increasing, making one suspect the potential implications of such holdings on trilemma policy choices and macroeconomic performances. These characterizations are not applicable to Latin American economies (and other country groups though not reported).

3 Vulnerability to the Center

3.1 Connectivity with the Center Economies

Recently, a number of researchers have argued that financial globalization has made domestic asset prices and interest rates more vulnerable to developments in capital markets abroad. The most representative work of this view is the paper by Rey (2013), who argues that financial globalization has made countries’ macroeconomic conditions more sensitive to the

⁹ Aizenman, et al. (2010, 2011) show the macroeconomic impact of trilemma policy configurations can depend upon the level of IR holding.

“global financial cycle” in capital flows, asset prices, and credit growth. In the markets where capital is freely mobile, Rey continues, the center country’s monetary policy influences other countries’ national monetary policies through capital flows, credit growth, and bank leverages, thus determining the global financial cycle.

Let us see if global shocks or monetary shocks of the center country—i.e., the U.S.—affect the ebb and flow of cross-border capital movements, especially in small open economies. Figure 7 displays the development of the VIX index that measures the implied volatility of S&P 500 Index options as well as the development of net capital flows to EMEs. The VIX index is a measure of uncertainty or risk aversion of the markets, thus its scale (on the right-hand side) is reversed so to be seen as a measure of investor risk appetite. From the figure, we can see that the volumes of capital flows to EMEs tend to rise when the risk appetite is higher. We can also see that prior to the 2008 GFC, a large volume of capital flowed into emerging markets, though this was followed by massive capital outflows once the crisis broke out. However, the capital flow became reversed with massive capital flowing back to EMEs again once advanced economies implemented zero, or extremely low, interest policies to fight recessionary situations.

This generalization applies well to the group of Asian EMEs in terms of ebb-and-flow volumes and patterns. Although Latin American EMEs also experienced an influx of capital in the post-GFC period, not as much capital flowed to these economies before the crisis. In contrast, Eastern or Central European EMEs experienced massive capital inflows before the crisis, but capital inflows did not resume to the pre-crisis level in the post-crisis period. Furthermore, both the full EME sample and the subsample of Asian EMEs show massive capital outflows once the U.S. started downsizing its unconventional monetary policy in 2014.

Figure 8 (a) illustrates the 36-month rolling correlations of domestic money market rates with the U.S. money market rate for different country groups, including Asian EMEs, and China. The figure shows that from 2003 through 2012, in Asian EMEs and China, the correlation between domestic and the U.S. interest rates oscillates at relatively high levels except in 2005 and 2008.¹⁰ In the last few years, however, the correlations have been negative, mainly reflecting the unconventional monetary policies taken by the U.S.

¹⁰ The two dips in the correlations correspond to the time when the U.S. Federal Reserve changed its policy rate rapidly. The Federal Reserve started raising the federal fund rate target from 1.00% in June 2004 to 5.25% in June 2006. It started lowering the target from 5.25% in September 2007 all the way essentially to the 0.00-0.25 by December 2008.

Figure 8 (b) recreates the long-term interest rates. The long-term interest rates of the Asian EMEs are highly correlated with that of the U.S. for much of the last decade and a half. Since 2005, the correlation has been on a rising trend despite the GFC and the rapid decline in the correlations of the short-term interest rates we saw in Panel (a). In the late few years of the sample period, short- and long-term interest rates have been decoupled, which may suggest that policy makers find it difficult to control macroeconomic and financial conditions through maneuvering short-term interest rates.

Figure 8 (c) illustrates the correlations of stock market price indexes with the U.S. index for the same subsamples and China. Since the early 2000s up until 2012 or so, all of the country groups had maintained high levels of correlations of stock market price indexes with the U.S. stock market. Since the GFC, the correlation has been declining for all of the groups, but only to a lesser extent for emerging Asian economies.

3.2 Does Asia Continue to be Vulnerable as It Was in the 1990s?

In the aftermath of the EME crises in the late 1990s and the early 2000s, many of the EMEs, whether they experienced the crisis or not, started rapidly increasing their IR holdings. However, ironically, this active IR accumulation, in retrospect, sowed the seeds for the world economy to provide ample liquidity for advanced and profligate economies that eventually led to those economies' bubbles and bust in the late 2000s. In other words, it was a self-fulfilling prophecy that EMEs' efforts to hold IR to ensure self-insurance or protection ended up creating an environment for which these economies needed insurance or protection.

Asian EMEs are expected to continue to face challenges from increasing connectivity because, although they are already exposed to risks from the center economies, they are still on their way to further financial opening. The panels of Figure 9 compare the developments of financial openness in terms of both de jure (Panel (a)) and de facto (Panel (b)) measures among the groups of (ex-China) emerging market economies in East Asia, Latin America, and Eastern and Central Europe along with Japan and China.¹¹ The figure shows that by international comparison, financial openness has progressed only moderately over the years for Asian EMEs,

¹¹ The de jure measure is the Chinn-Ito index (2006, 2008). The de facto measure is created by normalizing the sum of external assets and liabilities, from the database compiled by Lane and Milesi-Ferretti (2006, 2007, and updates), by GDP. For comparison of different types of indexes that measure the extent of financial market openness or capital controls, refer to Quinn et al. (2011).

which is somewhat surprising given their high degree of trade openness and susceptibility to U.S. shocks. Clearly, there is still much room for further financial openings for Asian EMEs, including China.

Chinn and Ito (2006) and Aizenman and Noy (2009) show that trade openness is a prerequisite for capital account liberalization. As in the European region where most of the economies are highly open to international trade, Asian economies can be expected to become even more open toward financial asset trade.

Additionally, many of the economies in the region, namely Japan, China, and Korea, have been experiencing, or are expected to experience, a rapidly aging population and a shrinkage of labor population. These types of demographic changes will probably make these economies become capital importers and therefore necessitate the further development of domestic financial markets. Considering that domestic financial development happens hand-in-hand with financial liberalization, the Asian economies can become more open to cross-border financial transactions.

Borensztein and Loungani (2011) show that Asian economies are considerably integrated with major economies outside rather than inside their regions. Hence, intra-Asia trade of financial assets is also expected to expand, which is another potential for further financial openings by the economies in the region.

With this undeniable trend for further financial openings, the trilemma hypothesis suggests that economies in the region will have to decide whether to retain monetary autonomy but give up pursuing exchange rate stability, or to pursue exchange rate stability but subject their monetary policies to those of the center economies. Either way, these economies will become more exposed to external shocks.

Now, the question is, are the economies in the Asian region facing a situation that is vulnerable to external shocks as they were before the Asian financial crisis of 1997–1998? Figure 10 can help us answer this question as it presents the development of the key economic variables that illustrate different aspects of vulnerability, namely, (a) the index for exchange rate stability; (b) IR holding as a share of GDP; (c) international debt securities as a ratio to gross national income (GNI); (d) short-term liability to foreign banks as a ratio to GNI; (e) “credit gap”

as a measure of credit excesses or “credit booms”; and (f) the exchange market pressure (EMP) index.¹²

We note several interesting observations. First, all of the economies in the region, with the exception of China, are now pursuing higher levels of exchange rate *flexibility* unlike the time right before the breakout of the Asian crisis. In particular, Korea, Indonesia, and Thailand, all of which experienced currency crises in 1997–1998, aborted pegged exchange rate policies. Thus, major Asian EMEs, except for China, are not constrained by exchange rate rigidities at this moment. Second, mainly because of the harsh experience of the crisis economies in the 1990s, all of the economies shown in Figure 10 (b), with the exception of Indonesia, increased their levels of IR holdings. Apparently, these economies believe that holding IR will provide a buffer to external financial shocks.

Third, many major Asian economies experienced a rapid increase in external debt around the end of the 1990s, but the debt level of these economies is lower at present. The only exception is Korea. Panel (c) illustrates that the size of outstanding international debt securities for the Philippines and Malaysia was almost as high as 25% of their GNI in the late 1990s, but it is now around 13–14%. The size of short-term liability to foreign banks (as a share of GNI) was almost 30% of GNI for Thailand and Indonesia at that time, but it is now as low as 7–8% (Panel (d)). The only concern is Korea. Both outstanding international debt securities and short-term liability to foreign banks declined in most of the 2000s. However, they went up at the end of the 2000s, hovering around the same level as during the Asian crisis period.

Last, Asian economies are not facing both internal and external pressure in the financial sector. Panel (e) of Figure 10 illustrates the development of “credit gap” or “credit excesses,” which is the deviation of private credit creation from its long-term trend. When the gap is in positive territory, we can think of that as a sign of overheating in the financial sector. Although we observed an influx of capital once advanced economies implemented zero, or extremely low,

¹² For exchange rate stability, we use the index from the trilemma indexes (Aizenman, et al. 2008, 2010, and updates). The index ranges between zero and one, with its higher value indicating more exchange rate stability. The data for international debt securities are extracted from the Bank for International Settlements (BIS) website. The data for short-term liability to banks are from the Joint External Debt Hub (JEDH). We define “credit gap” as the gap between private credit creation (as a share of GDP) and its long-term trend measured by HP-filtered series. The EMP index is constructed following the oft-used methodology introduced by Eichengreen et al. (1995, 1996), that is as a weighted average of monthly changes in the nominal exchange rate (i.e., the rate of depreciation), the international reserve loss in percentage, and the change in the nominal interest rate with all in respect to the base country in the sense Aizenman, et al. (2013) do to construct the trilemma indexes. The weights are inversely related to each country’s variances of each of the changes in the three components.

interest rate policies in the aftermath of the GFC, we do not observe large-scale positive credit gaps in the 2010s. Around the same time period, the EMP index, a proxy for stress levels in the foreign exchange market, does not appear high, except in Malaysia. Exchange rate flexibility seems to be absorbing stress in the foreign exchange market. Hence, major Asian economies are not exposed to high levels of internal or external financial pressure.

4 Exposure to the Dollar

Although we have shown that major Asian economies are not vulnerable to financial shocks internally or externally, it does not mean these economies are not exposed to financial risks outside their economies. We have observed that while the level of financial openness of Asian economies is not the fullest, capital flows into and out of the region have been significantly affected by the global economic climate. As the wind-down of unconventional monetary policy by the U.S. has changed the direction and volumes of capital flows for many EMEs, especially those in Asia. Furthermore, until China replaced its role, the U.S. had been the largest trading partner for many of the economies in the region. Thus, the U.S. influence has been dominant, which is also true for bigger economies such as Japan, China, and Korea.

More strictly speaking, however, it is not (just) the U.S. that has so much significant influence on the economies in the region, it is the dollar that has been overwhelmingly important for these economies. Since the beginning of the new millennium, there have been webs of extensive and intensive supply chain networks in the Asian region. Most of these networks are aimed at the U.S. as the final export destination. That is reflected as high levels of reliance on the dollar as a trade invoicing or settlement currency. In Korea, Thailand, and Indonesia, for which longer time series are available, 80% or more of the countries' exports are invoiced or settled in the dollar. Even in Korea, the largest economy after China and Japan in the region, the dollar share is about 85%. Japan has half of its exports invoiced in the dollar despite its long-time efforts to make its currency, the yen, one of the major international currencies.¹³

¹³ India, another economic giant in the greater Asian region, has more than 88% of its exports invoiced in the dollar. China discloses information only on the share of RMB settlement in total trade (which is around 20% in 2014). However, it has been speculated that more than 95% of China-U.S. trade is denominated in the dollar. This casts a stark contrast with intra-regional trade in Europe where the presence of the dollar is smaller and the euro, the domestic currency for the euro member countries, plays a much bigger role. For comparison, refer to Ito and Kawai (2016).

The high reliance on the dollar for trade invoicing or settlement is also reflected in the weight of the currencies included in the implicit currency basket on which policy makers base their exchange rate or monetary policy decisions. Using the methodology popularized by Frankel and Wei (1996), we estimate the weights of the dollar, the euro (or the German deutsche mark and the French franc before the introduction of the euro in 1999), the yen, and the British sterling with a rolling window of 36 months.¹⁴ Figure 11(b) illustrates the development of the estimated dollar weights for the major EMEs in Asia. In the figure, we can see that, with the exception of Korea and Malaysia in recent years, Asian EMEs have had high weights in their implicit currency baskets. In other words, these economies can be categorized as economies in the “dollar zone” to which the monetary and financial conditions of the dollar matter the most. For such economies, higher dollar weights facilitate dollar invoicing, though causality can go the other way around.

Another dimension that can be added is that these economies are also reliant on the dollar to issue international debt securities. According to Figure 11(c), which shows the shares of dollar-denominated international debt securities for Asian EMEs, in all of the major Asian EMEs, with the exception of China, the dollar share as the currency for debt denomination is high, greater than 75%.¹⁵ In other words, the “original sin” phenomenon—developing countries often cannot issue debt in international markets unless they issue debt in a major hard currency such as the dollar—is applicable to Asian emerging markets. Interestingly, although currency mismatch was one of the biggest problems faced by the economies that experienced the currency crisis in 1997–1998, the extent of the reliance on the dollar for debt issuance has not changed much since the late 1990s.¹⁶

Despite this constant reliance, Figure 12 (a) shows that the share of the U.S. as an export destination has been in a declining trend for most of the major Asian emerging market economies (with the notable except of Vietnam whose trade with the U.S. dramatically increased

¹⁴ The basic assumption of this exercise is that monetary authorities use an implicit basket of currencies as the portfolio of official foreign exchange reserves, but that the extent of response to the change in the value of the entire basket should vary over time and across countries. If the authorities want to maintain a certain level of exchange rate stability, whether against a single currency or a basket of several currencies, they should allow the currency value to adjust only in accordance with the change in the *entire* value of the basket of major currencies.

¹⁵ The volume of international debt securities China issues is small, however.

¹⁶ “Currency mismatch” means that borrowing in a hard currency (e.g., the dollar) and investing domestically with the domestic currency can create liquidity shortage, making it harder to repay the debt when the domestic currency depreciate sharply against the hard currency.

after a trade relationship with the U.S. was normalized in 2001). In contrast, and not surprisingly, the share of China as an export destination has been a rising trend. Again, this does not mean that the U.S. is becoming less influential on Asian economies; it is the dollar that continues to have great influence on the economies in the Asian region.

We can interpret the estimated weights of the four major currencies in the currency basket that we estimated previously as the extent of belonging to each of the four currency zones.¹⁷ Using the four currency weights as well as the data on the volume of trade with each of the four currency issuers, we can estimate the share of trade (i.e., exports plus imports) for each of the four currency zones.¹⁸

Figure 12 (c) illustrates the shares of trade with the economies that belong to the dollar zone for Japan and Asian EMEs. Interestingly, for most of the economies, the share of trade with the dollar-zone economies has been quite stable over time, ranging from 50% to 70% across countries. The share of dollar-zone trade for Japan has been quite high, ranging from 62% to almost 80%, though the country is an issuer of one of the four major currencies. Although we have seen that Asian EMEs have managed to achieve intermediate levels of exchange rate stability, we can now see that they have maintained stable ties with the dollar. While many Asian economies are experiencing a declining share of trade with the U.S., the figure shows that the dollar continues to be influential for the economies in the region. This is probably the reason why Asian EMEs are susceptible to shocks arising in the U.S. financial markets even though their levels of financial openness are still intermediate.

The continuing importance of the dollar is partly driven by the fact that China is quite a dollar-oriented economy. We saw in Figures 12 (a) and (b) that China's increasing presence as a trading partner for Asian economies has replaced some of the U.S. presence. Thus, if China succeeded in "internationalizing" its currency *yuan* (RMB) and forming its own currency zone, the picture in Figure 12 (c) would change significantly.

Now that China has replaced the U.S. as the largest trading partner in the Asian region, will it also succeed the U.S. as the issuer of the most dominant currency in the region?

¹⁷ Before the introduction of the euro in 1999, we combine the estimated weights for the German deutsche mark and the French franc and treat it as the euro weight. Hence, we have four currency zones: the dollar, euro, yen, and pound zones.

¹⁸ To calculate the share of trade with the 'euro' currency zone before 1999, we use the volume of trade with the 12 original euro countries.

The rising Chinese income level and the country's role as a major global trading country will help the RMB to become more widely used as an international currency.¹⁹ However, two uncertainties warrant attention regarding the future of the RMB as a dominant, key international currency.

First, it is uncertain whether China will proceed with a smooth financial liberalization and deregulation, although economists agree that financial development and liberalization are necessary conditions for a currency to become a major international currency (Ito and Chinn, 2015; Ito and Kawai, 2016). The fact that the Chinese economy started slowing down in 2014 has made policy makers in Beijing more cautious about further liberalization. Further, the slump of China's financial markets, following the economic slowdown, has led Chinese financial authorities to become more active to intervene in financial markets. The future of the liberalization efforts is not yet known.

Second, as we have seen, countries that belong to the dollar block surround China. Ito and Kawai (2016) find that the extent to which a country belongs to one of the major currency zones affects its decision to use that currency for trade invoicing. This explains why the Japanese yen has not been used as a trade invoicing currency not just by Japan but also by neighboring economies: almost all of Japan's neighboring countries belong to the dollar zone.²⁰ China will face the same challenge. The number of China's neighboring Asian countries that will break away from the dollar block and start using the RMB for international trade and financial activity is an important key to the RMB's further internationalization.

Ito and McCauley (2016) show that capital flows to the dollar zone would change if China becomes less of a dollar-zone country. Hence, the map of capital flows and exchange rate arrangements in Asia could very much depend on how much RMB internationalization proceeds. For now, the Asian region's international finance continues to be dollar-centric.

5 Concluding Remarks

The economies in Asia are facing the greatest challenge since the Asian financial crisis of 1997–1998. In this paper, we reviewed and assessed the economies' openness to cross-border

¹⁹ For more details on the issue of RMB internationalization, refer to Eichengreen and Kawai (2015), Frankel (2011), Ito (2011), and Ito and Kawai (2016).

²⁰ As of 2014, the share of Japan's exports invoiced in the yen is less than 40%, while that of exports in U.S. dollars is more than 50%. In imports, these shares are 20% and 75%, respectively. See Ito and Kawai (2016).

capital flows and exchange rate arrangements in the region, with the main focus on emerging market economies.

We first evaluated the situation of openness to capital flow and exchange rate regimes from the perspective of the famous “trilemma” hypothesis. Using the “trilemma indexes” developed by Aizenman et al. (2008, 2010, 2011), we trace changing patterns of the trilemma configurations among economies and observe distinct differences between advanced economies, developing countries, and emerging markets. We find convergence of the three policy goals toward a “middle ground”—many emerging markets manage exchange rate flexibility while maintaining medium levels of monetary independence and financial integration. Interestingly, for Asian EMEs, not only does this characterization apply to them, but also convergence is not a recent phenomenon in these economies. As early as the 1980s, the three indexes have been clustered around the middle range, though exchange rate stability has been the most pervasive policy choice. Another more recent development involves the high level of international reserve (IR) holdings—a feature that is known as the most distinct characteristic of Asian EMEs.

Furthermore, financial globalization seems to have made asset prices and interest rates in Asian EMEs more vulnerable to global movements of capital, that is, essentially to the monetary policy of the center country, the United-States. The level of risk appetite and U.S. monetary policy influences the capital flowing into and out of Asian EMEs.

The U.S. presence in trade ties with Asian economies has been declining over the last two decades, whereas China’s has been on a rising trend. However, we found that the share of trade among Asian economies with the dollar zone economies has been quite stable. That means that it the dominant position of the dollar that has been influential in the Asian region. One big dollar-zone economy that has been increasing its presence in Asia is China. However, China has been making efforts to “internationalize” its currency, the *yuan*. Hence, if China succeeds in its internationalization efforts and creates the RMB zone, the dynamics between the U.S. and Asia will most likely change; it is, however, uncertain to what extent the RMB will become an international currency. Recently, Chinese authorities have become more interventionist because of the slowdown of the economy and financial markets. For now, the Asian region’s international finance continues to be dollar-centric.

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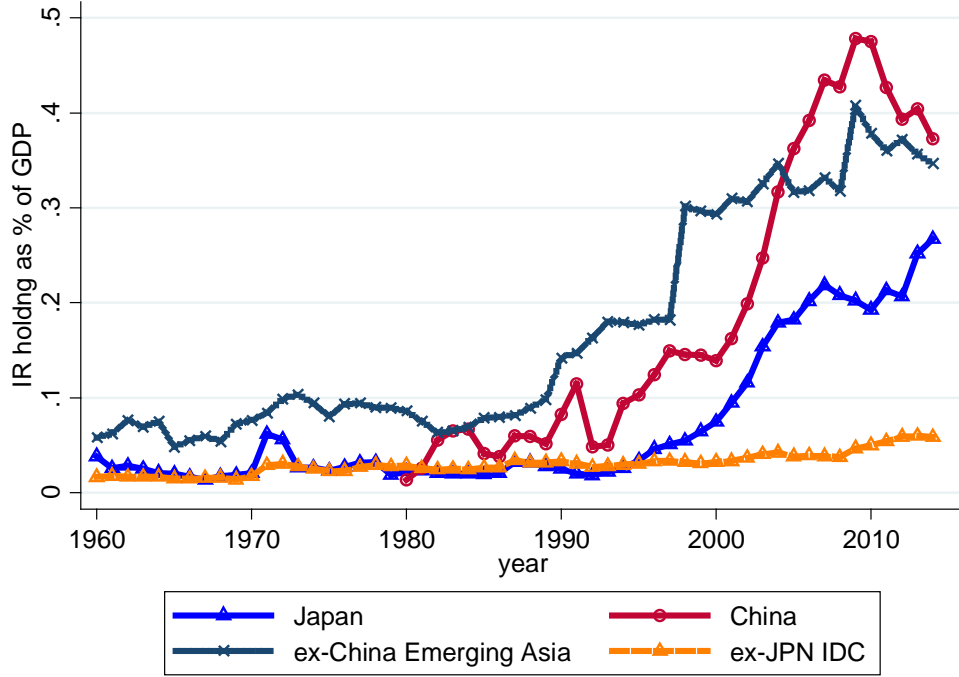
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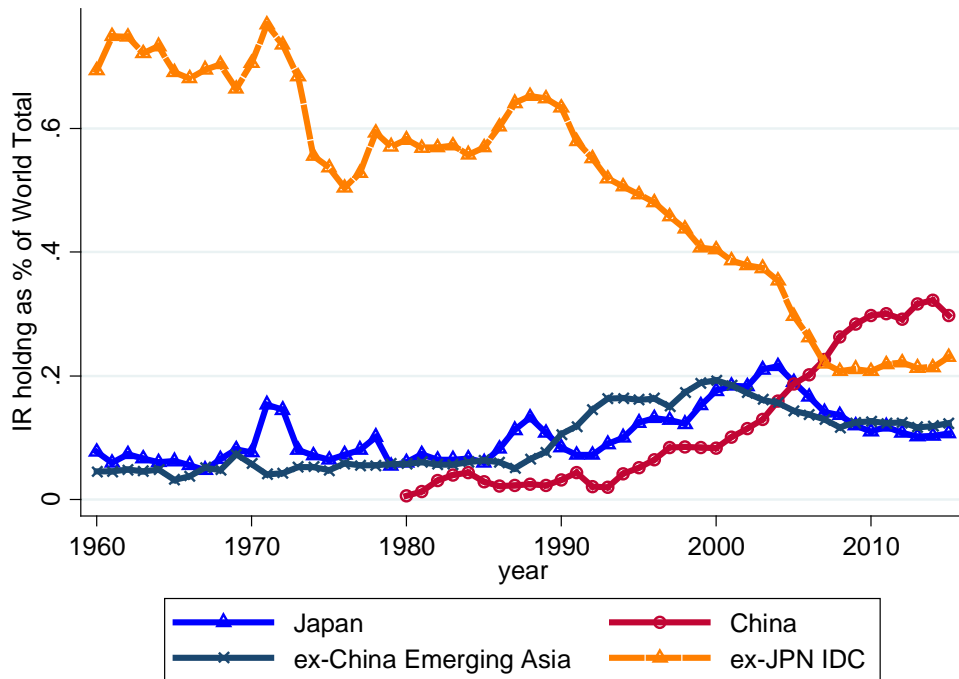
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Figure 1: International Reserve Holdings
(a) As a ratio to GDP



Note: For the country groups, the group's aggregate IR is divided by the group's aggregated GDP

(b) As a ratio to the world total (b)



Note: For the country groups, the group's aggregate IR is divided the world's total IR

Figure 2: The “Trilemma” Triangle

Freely flexible exchange rate with a
fully open financial market
(e.g. Canada, Japan, United Kingdom)

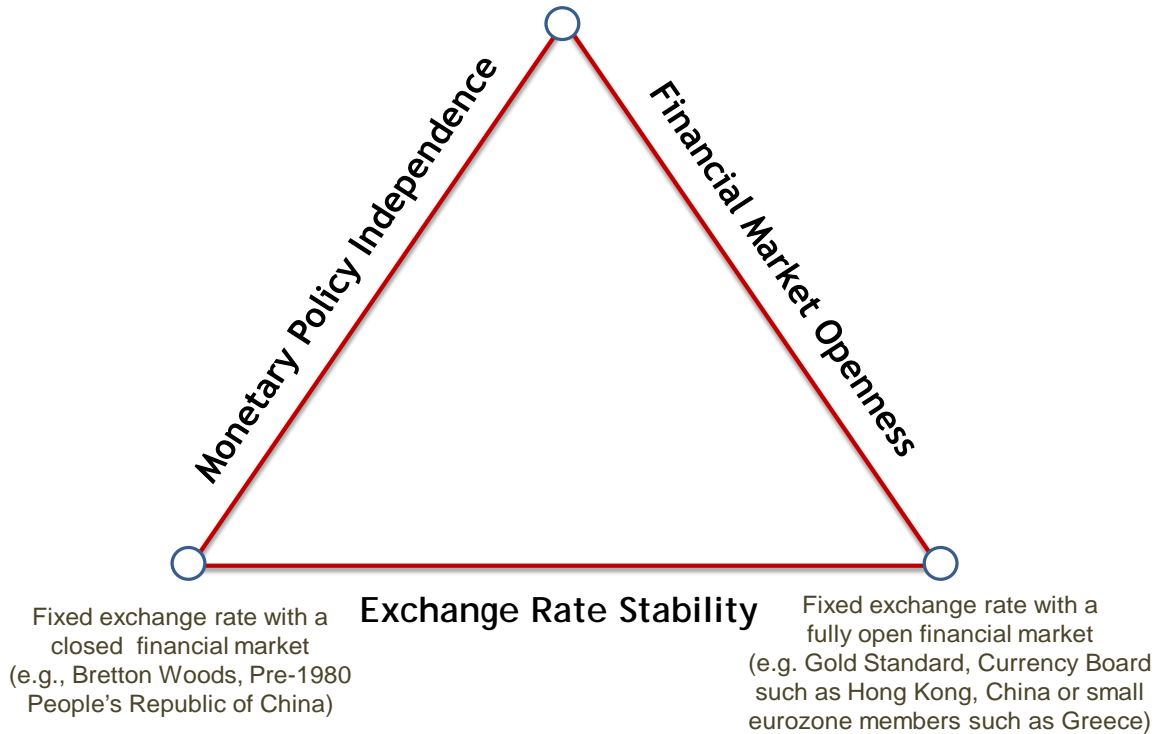
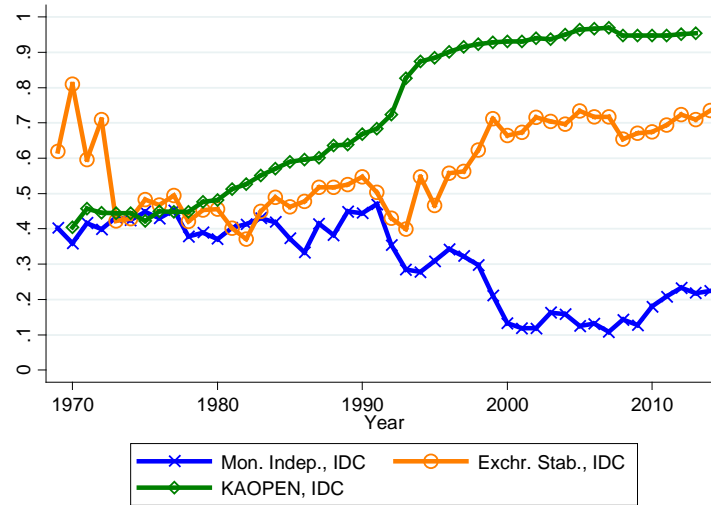
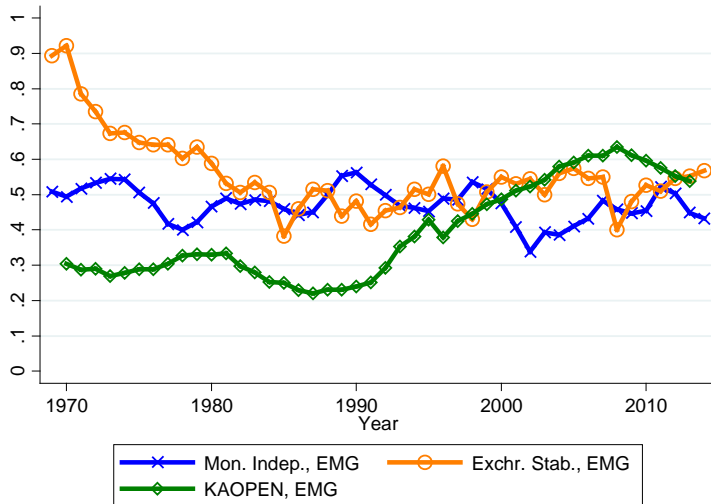


Figure 3: Development of the Trilemma Configurations Over Time

(a) Industrialized Countries



(b) Emerging market economies (EMEs)



(c) Non-EME Developing Countries

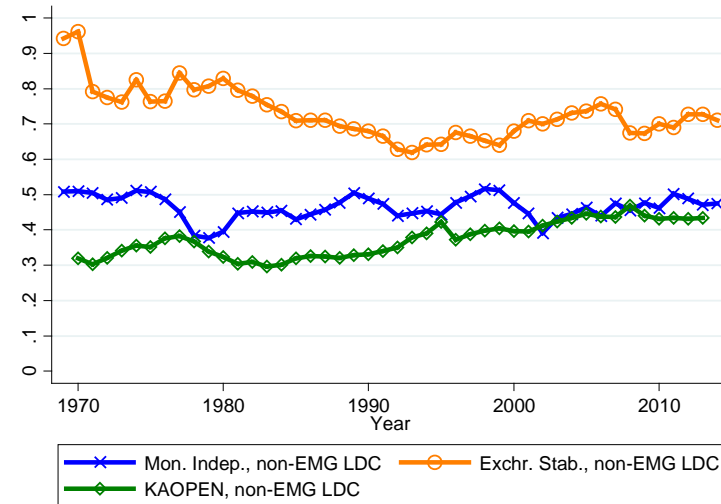
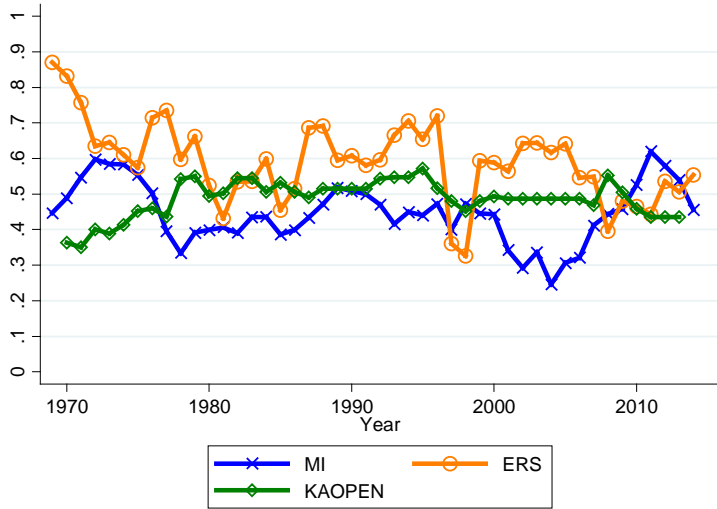
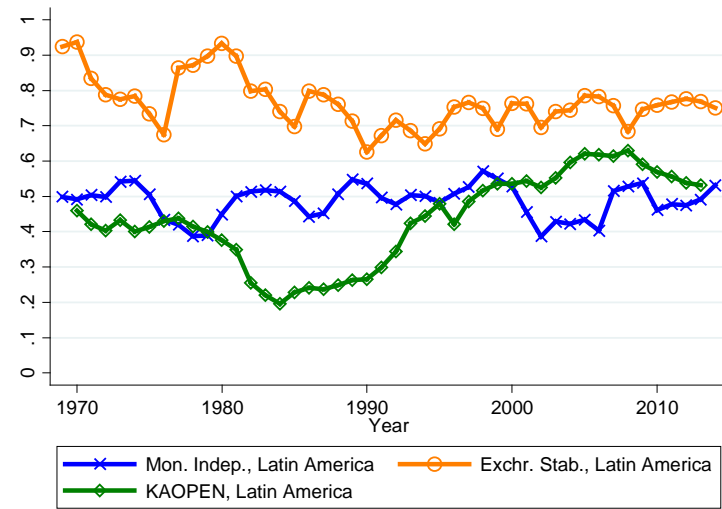


Figure 4: Regional Comparison of the Development of the Trilemma Configurations

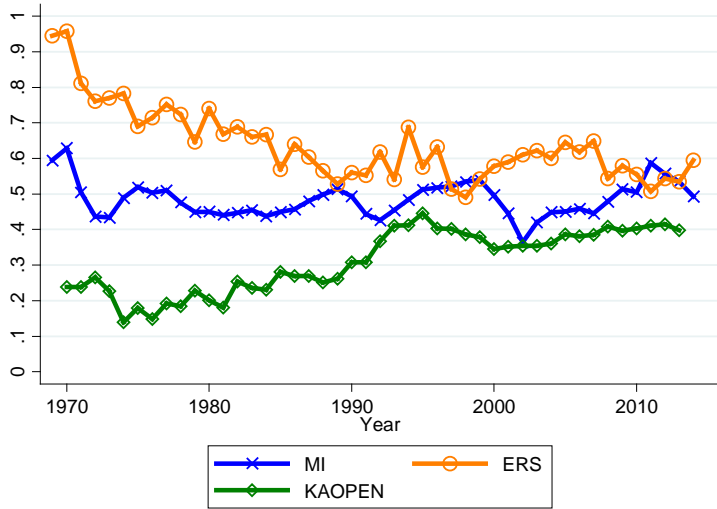
(a) Emerging Market Economies (EMG) in Asia



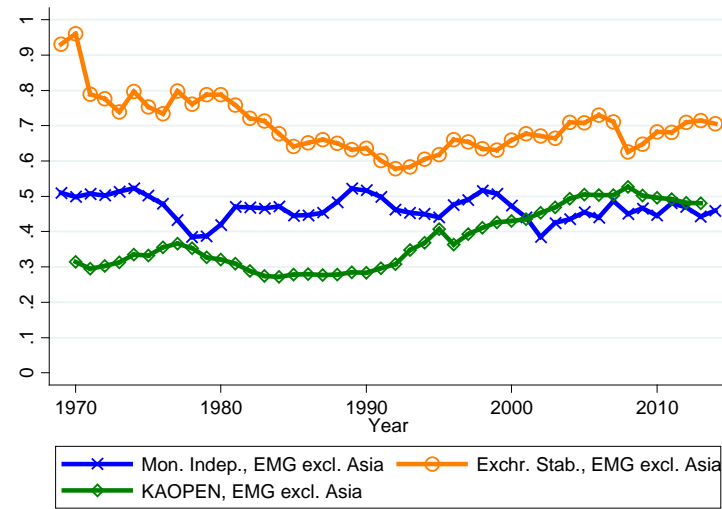
(c) Latin American Countries



(b) Non-EMG, Developing Asia

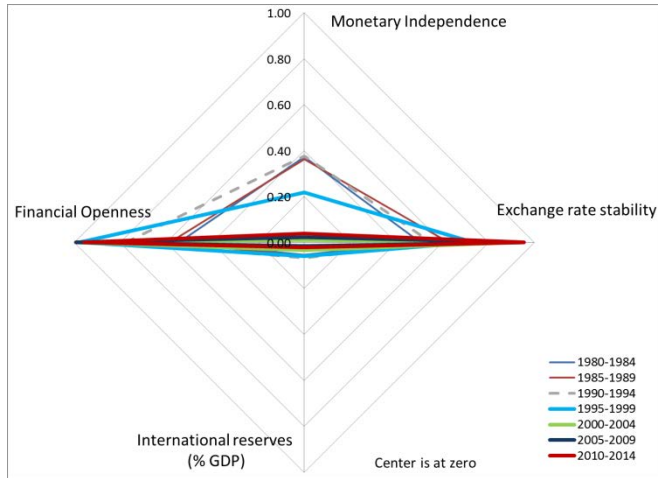


(d) Less Developed Countries (LDC) excluding Asia

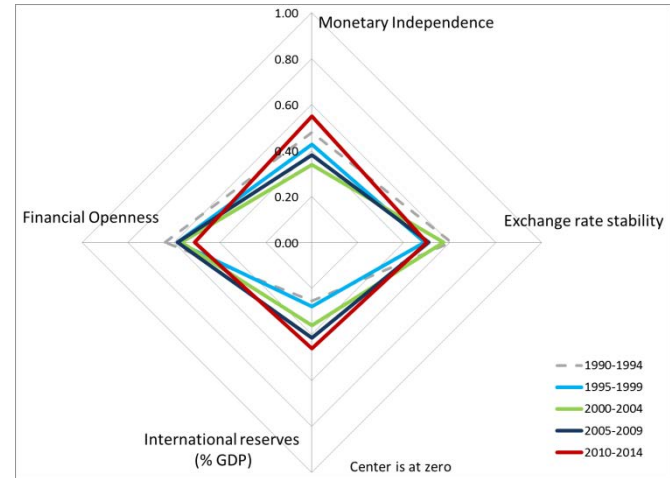


**Figure 5: The “Diamond Charts”:
Variation of the Trilemma and IR Configurations Across Different Country Groups**

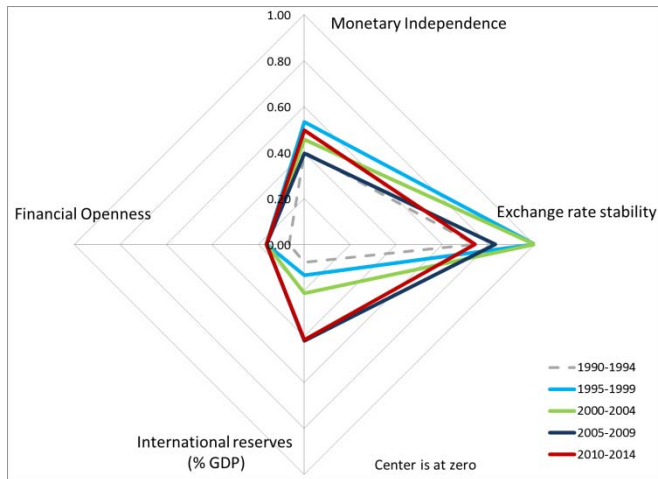
(a) Euro 12 Countries



(b) Emerging Asia



(c) China



(d) Latin America

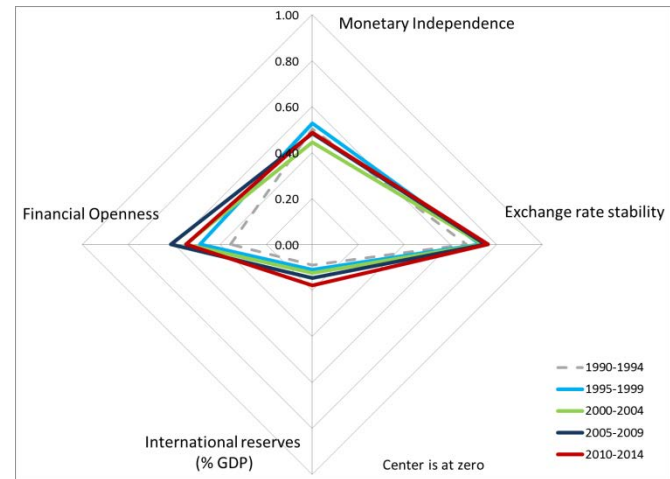
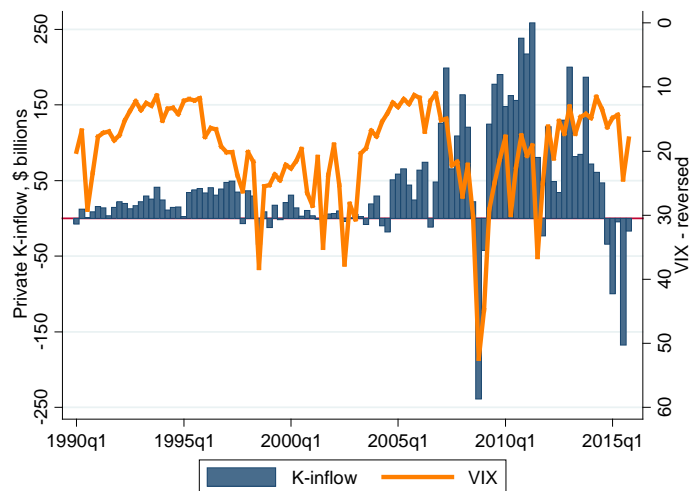
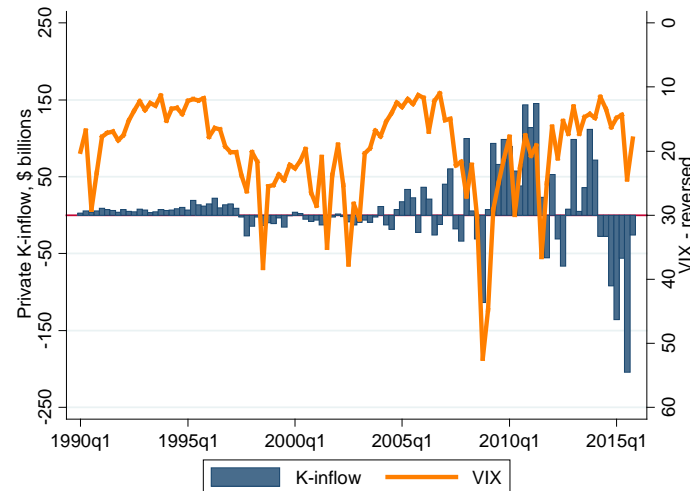


Figure 7: VIX and Net Capital Flows to EMEs

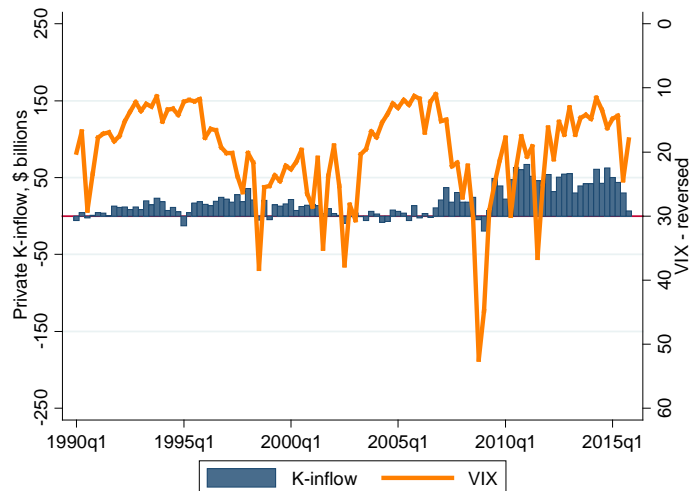
(a) EME Total



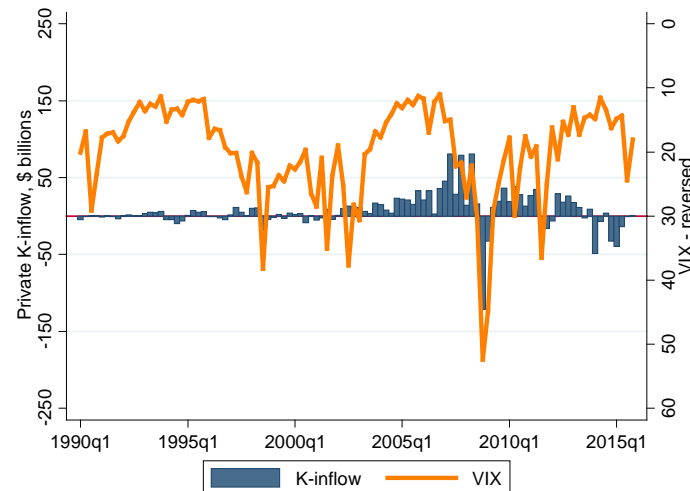
(b) Asian EMEs



(c) Latin American EMEs



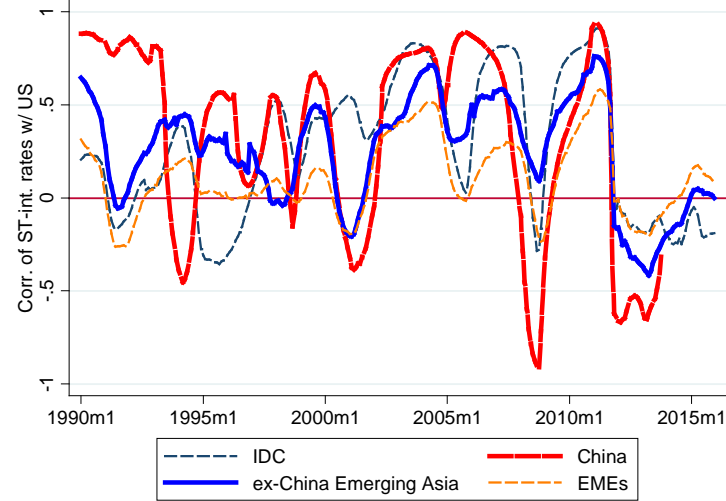
(d) Eastern/Central European EMEs



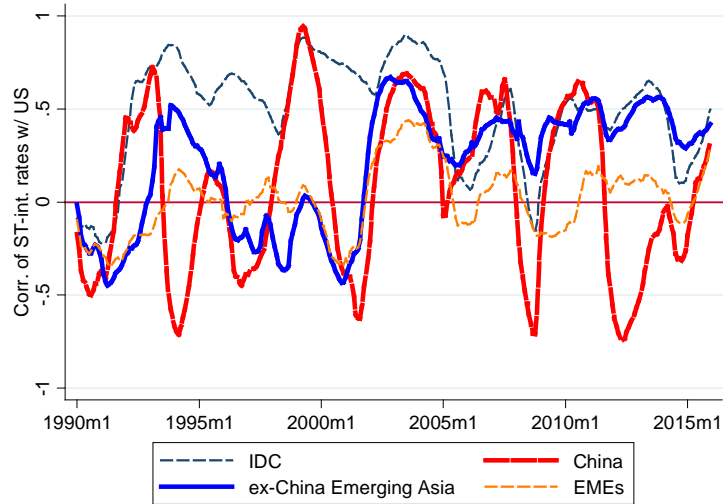
Note: VIX is a measure of the implied volatility of S&P 500 index options. Both VIX and net capital flows are shown as four-months moving averages. The scale for the VIX index (on the right-hand side) is reversed to express the degree of risk appetite.

Figure 8: Connectivity with the U.S.

(a) Short-term interest rate



(b) Long-term interest rate



(c) Stock market price

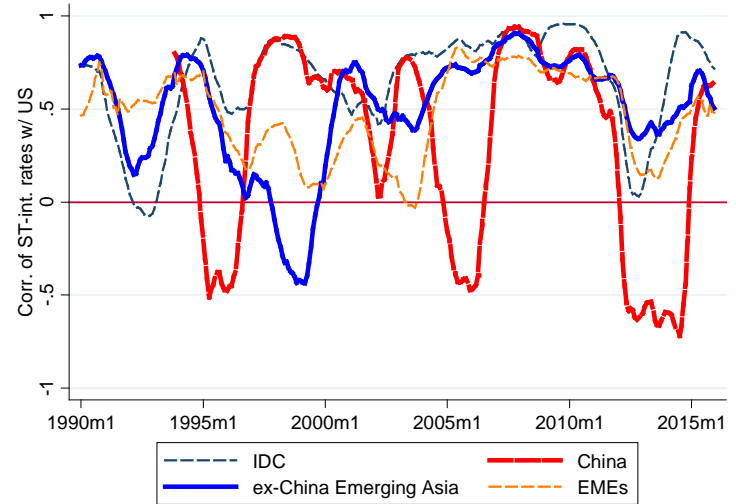
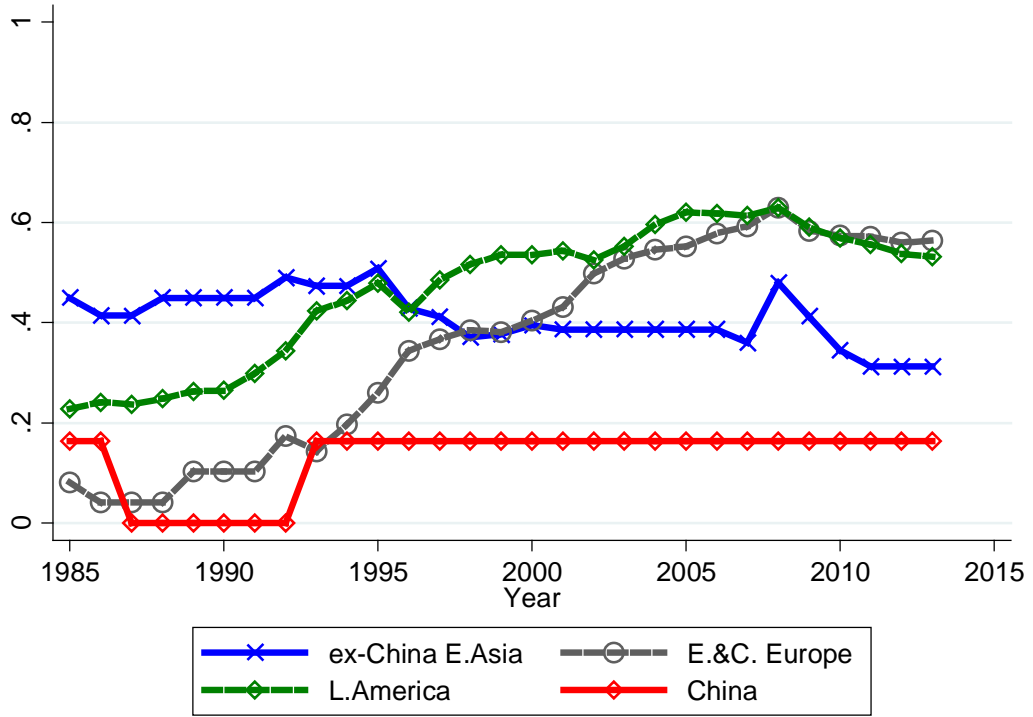


Figure 9: Financial Openness
 (a) De jure measure (Chinn-Ito index)



(b) De factor measure (sum of external assets and liabilities divided by GDP)

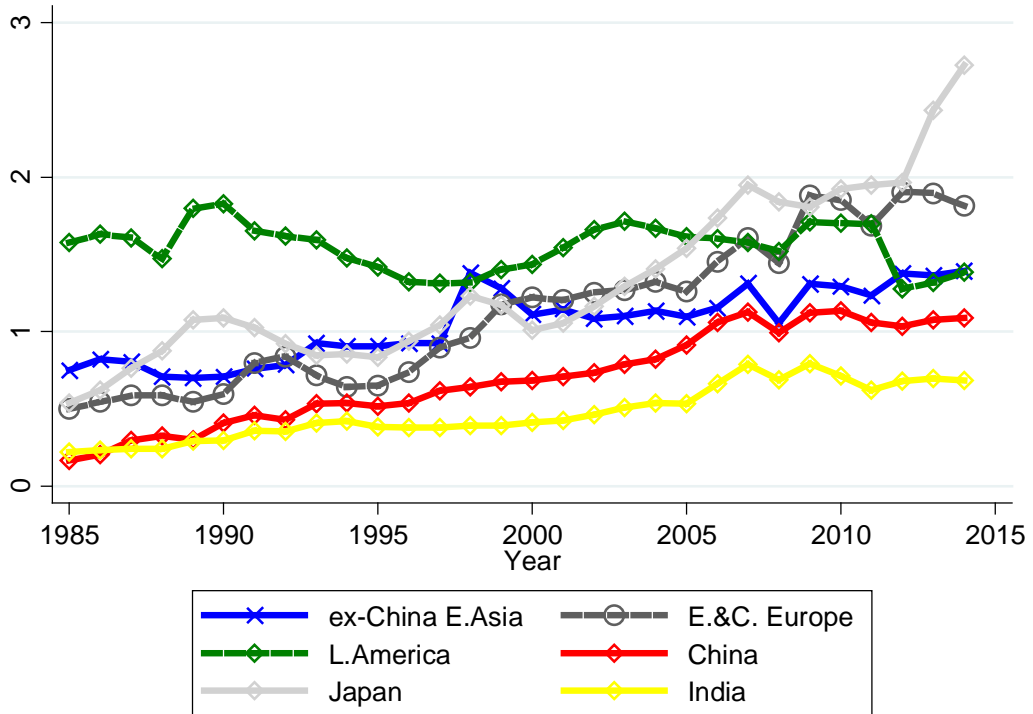
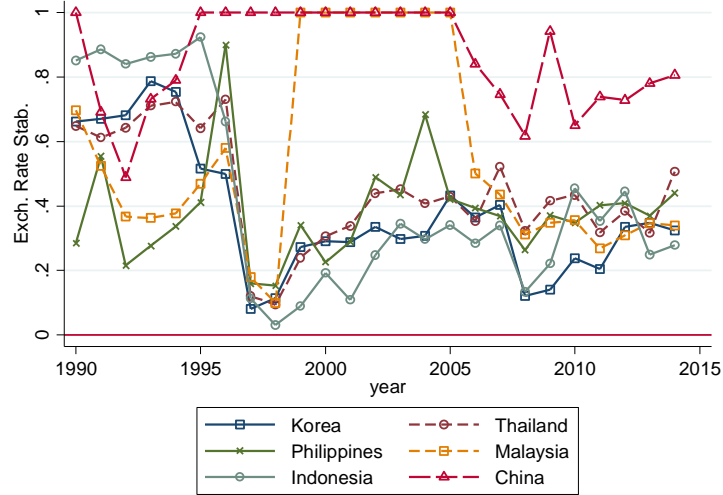
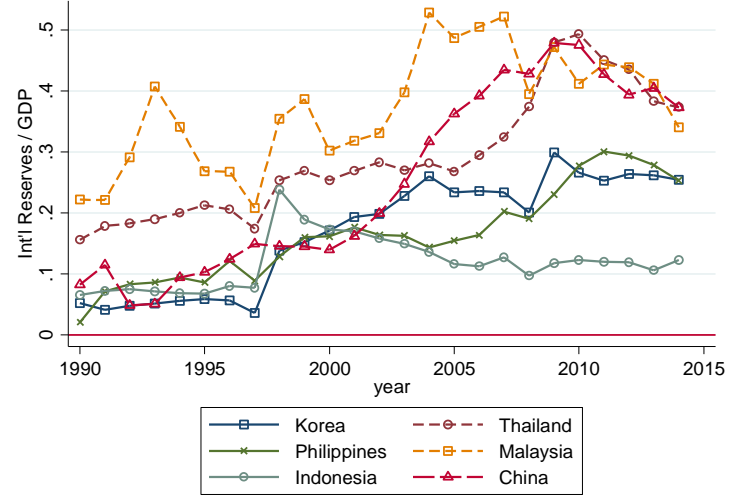


Figure 10: Vulnerability of Asian Economies

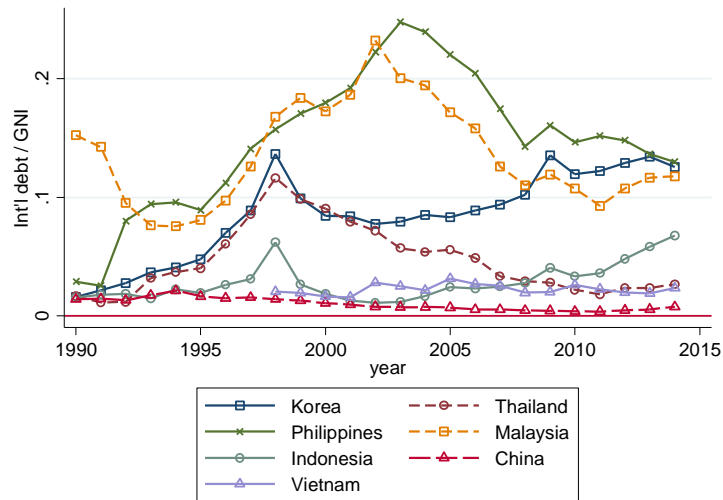
(a) Exchange Rate Stability



(b) International Reserve Holdings



(c) International Debt Securities (% of GNI)



(d) Short-term Liability to Banks (% of GNI)

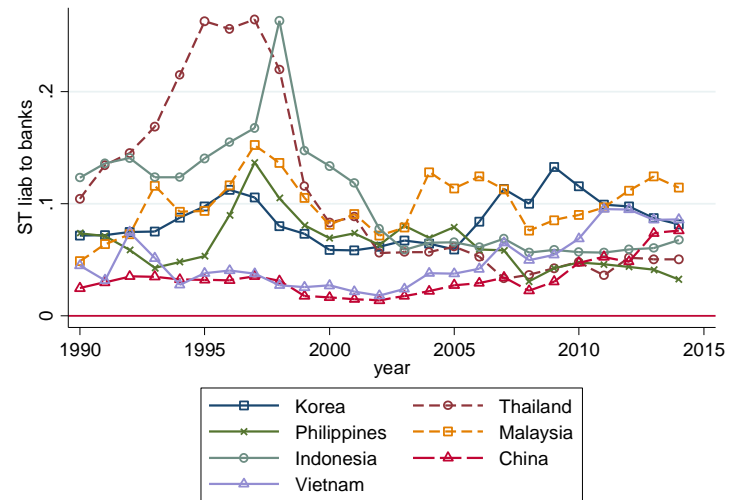
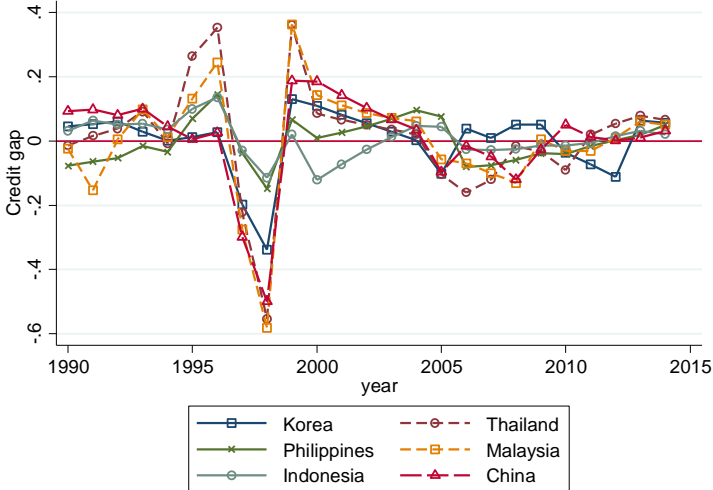


Figure 10 continued:

(e) "Credit Gap"



(f) Exchange Market Pressure

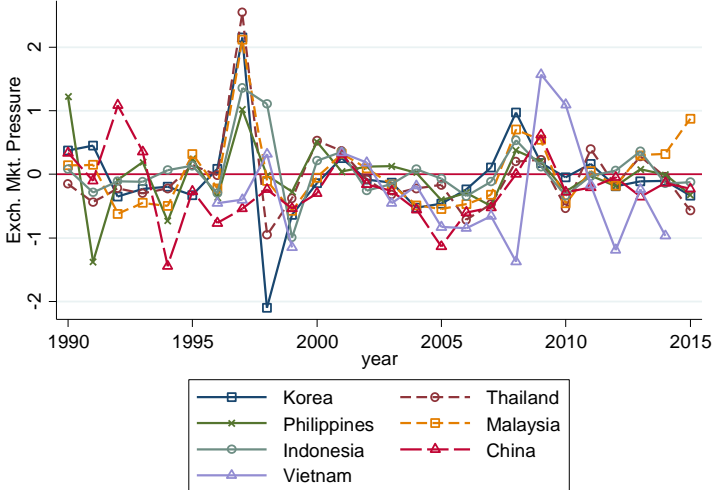
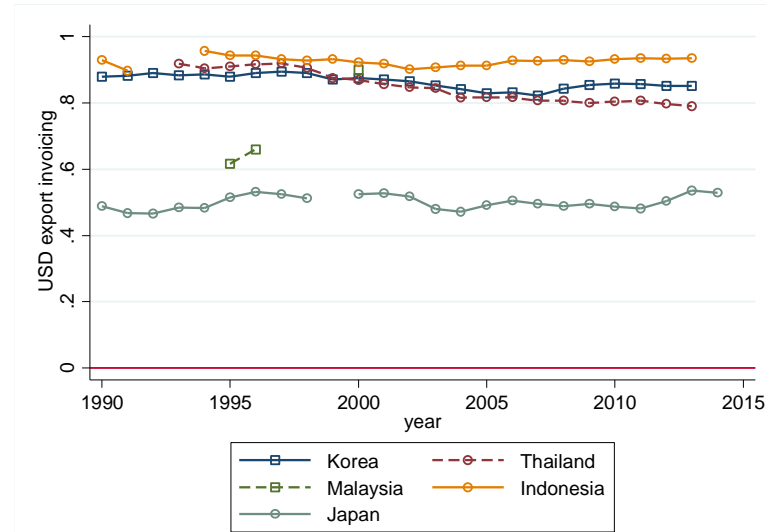
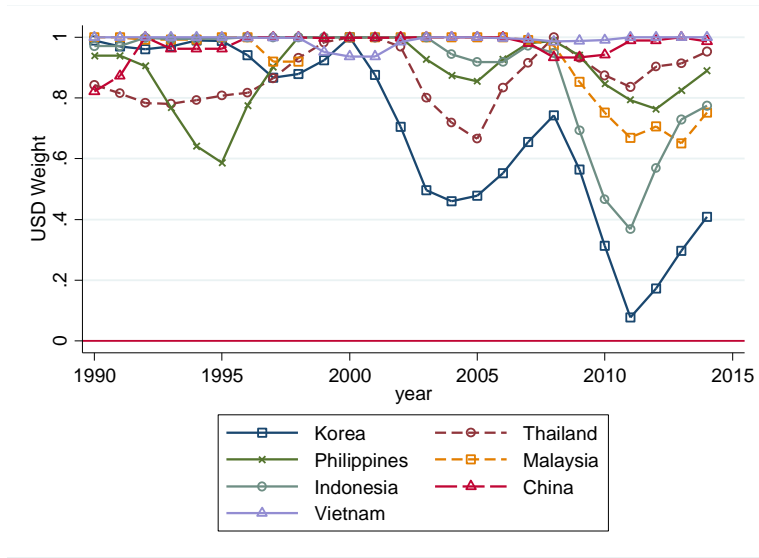


Figure 11: Heavy Reliance on the Dollar

(a) Dollar Share in Export Invoicing



(b) Dollar Weight in Currency Baskets



(c) Dollar Share in International Debt Denomination

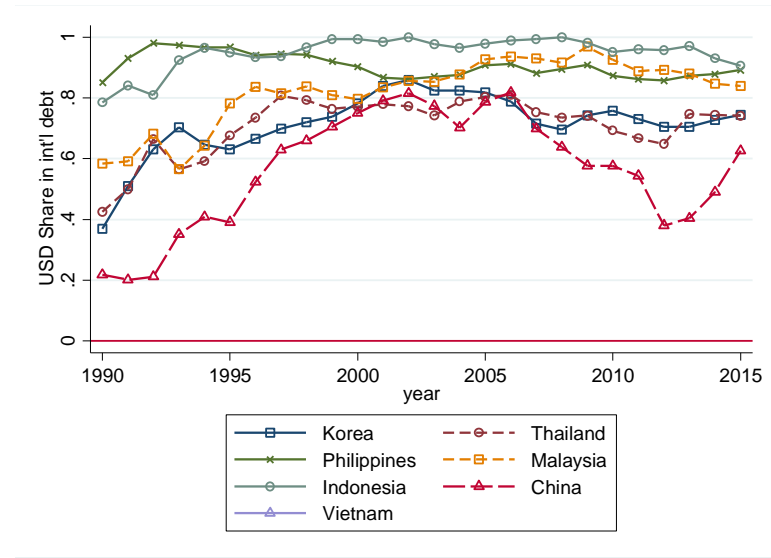
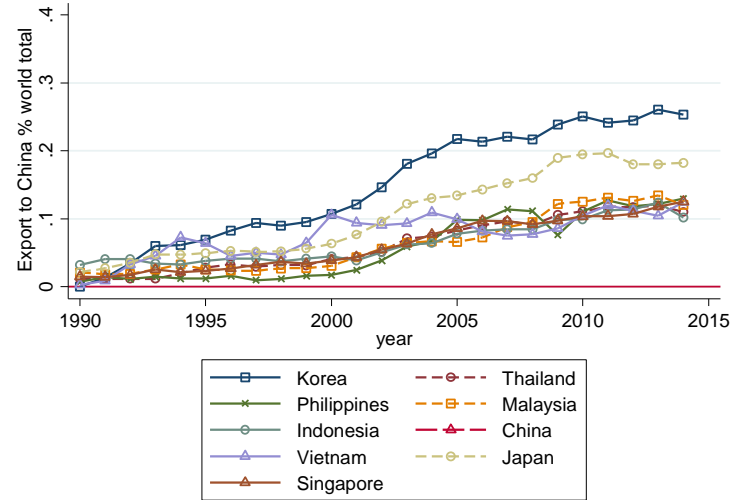
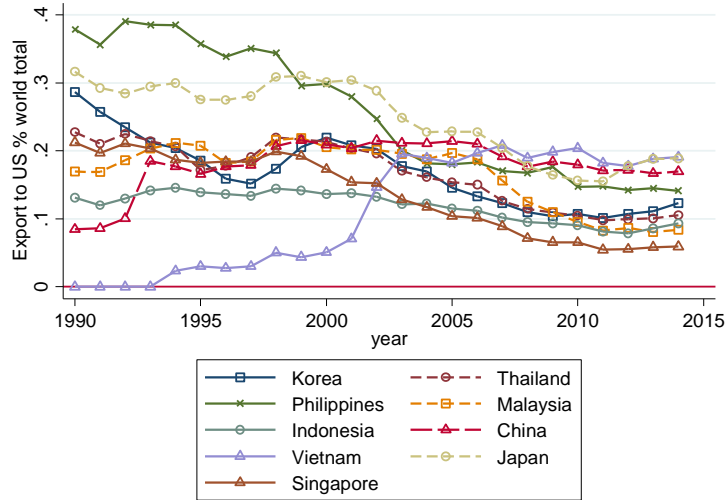


Figure 12: Changing Trade Structure and Stable Reliance on the Dollar

(a) Share of the U.S. as an Export Destination

(b) Share of China as an Export Destination



(c) Share of Trade with Dollar-zone Economies

