Reducing systemic risks in Asia through greater integration

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Abstract

Increased integration is often considered to be the cause of systemic risk rather than a solution to it. This paper argues that deepening integration in Asia of regional and global financing arrangements, development banks, central bank swap lines and foreign exchange reserves – collectively referred to as the 'Asian financial safety net' – will not only reduce systemic risk but also promote broader integration between Asian countries in other areas. The paper shows how systemic risks have increased significantly in Asia over recent decades through more integrated financial systems and supply-chains and also through indirect financial systemic risks which include pandemics and health risks, infrastructure risks and ecological and environmental risks. The paper calculates the size of the Asian financial safety net and shows that it is not equipped to respond should these risks materialise. It shows that if the Asian financial crisis was to occur today, the safety would be too small to provide the same level of liquidity support that was provided in 1999. The rise of Asia, particularly China, challenges the safety net to incorporate more systemically significant countries, causing it to fragment through the expansion of regional, bilateral and unilateral alternatives. The paper proposes practical policy responses to remedy this situation and bolster the Asian financial safety net.

1. Introduction

Asian integration has delivered substantial benefits for the region and the world. Integration of financial systems has meant a lower cost of capital, greater investment opportunities, higher growth and increased living standards. Integration in trade and supply-chains has meant increased productivity, cheaper goods and services, more variety in the things we consume and larger markets for trade and commerce. And greater integration of people has meant richer cultural and social experiences, stronger cooperation and a greater sharing of knowledge, skills and ideas.

But Asian integration also involves costs. One of the most significant costs is the increase in systemic risk that comes with greater integration. Integration in financial systems means that risks which materialise in one Asian country can be transmitted more easily into others, and risks that materialise globally can be transmitted more easily into Asia. Integration in trade and supply-chains means that a problem in one country or in one 'link of the chain' can paralyse the entire system. And integration

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of people means the transmission of infectious diseases, along with their substantial financial and economic consequences, is easier than ever.

But integration is not only the cause of increased systemic risk it is also the solution to it. This paper argues that Asian integration has been asymmetric. While efforts have focused on integration in financial systems, supply-chains, the movement of people and other areas, there has been less focus on the integration of the institutions and mechanisms that are designated to respond when a financial or economic crisis occurs.

The Asian financial safety net consists of global institutions like the IMF, World Bank and Bank for International Settlements, regional institutions like the Chiang Mai Initiative Multilateralisation and the BRICS currency reserve pool, bilateral mechanisms like currency swap lines and unilateral instruments such as foreign exchange reserves. Collectively, these are the institutions and mechanisms we rely upon to respond to financial and economic crises when they occur and to prevent those crisis from spreading from one country to the next. In short, we rely on the Asian financial safety net to prevent the materialisation of systemic risks.

Systemic risk refers to the prospect of a breakdown in the entire system, as opposed to the breakdown of individual parts of that system. By its nature, international cooperation is required. In the same way that an insurance company cannot withstand the materialisation of a system-wide risk, neither too can individual countries. But while Asian countries have integrated their financial systems, supply chains and flows of people – which themselves have created systemic risk – they have not adequately focused their efforts on better integrating the safety net.

This paper is structured as follows. Section 2 surveys the relevant literature. It shows that although many authors have looked at the adequacy of the global financial safety net, few have looked at it from the perspective of Asia. This is the critical way in which this paper distinguishes itself from the literature.

Section 3 shows the significant increase in systemic risk in Asia that has emerged through the integration of financial systems, supply chains as well as 'indirect financial and economic systemic risks' – these are areas often overlooked by economists but include pandemics and health risks, infrastructure risks and ecological and environmental risks.

Section 4 quantifies the size of the Asian financial safety net and shows that if the Asian financial crisis was to occur today, the safety would be too small to provide the same level of liquidity support that was provided in 1999. It also shows that the safety net's increased fragmentation means that some countries are more vulnerable than others because the size of the safety net depends entirely on the country in

question. Fragmentation has also reduced the safety net's speed and consistency in responding to crises.

Section 5 explores the drivers of the safety net's weakening over time and suggests some practical policy responses for how to strengthen it. It shows that, crucially, policy responses need to address the root causes of the safety net's fragmentation, looking specifically at the need for IMF reform, increasing the size of the safety net, making the safety net more flexible and responsive, strengthening cooperation between the different components of the safety net and building an institutional framework around the increasing use of currency swap lines.

2. Literature review

The adequacy of the global financial safety net has attracted much attention in the literature, particularly after the global financial crisis when both the size of the safety net and the global economy's reliance on it increased significantly (IMF, 2016). Fewer authors, however, have looked at the safety net exclusively from the Asian perspective. This is the critical way in which this paper distinguishes itself from the broader literature.

Before the crisis, the dominant view was that the safety net had largely fallen into disuse, evidenced by the steady decline in its resource base (Hawkins et al, 2014). This view was effectively summarised by Rose (2006) who argued there was no role for the IMF in the new global system that had developed post-Bretton Woods. This new global system, he argued, was characterised by inflation-targeting and independent and transparent central banks with predominantly floating exchange rates. This produced a durable global system that no longer relied on safety nets or international coordination for its stability.

The global financial crisis saw a marked shift in this view both globally and within Asia. The focus was now on whether the safety net was adequate to deal with modern-sized systemic crises and, if not, how it could be strengthened. The focus in the literature on the safety net's adequacy has centred on two key issues: the size of the safety net relative to future financing requirements and the composition of the safety net in terms of the mechanisms and institutions that underpin it. Stemming from these are the related issues of the safety net's speed, coverage and flexibility in responding to crises.

2.1 The size of the safety net

The most comprehensive study to date looking at the global financial safety net is that by the IMF in March 2016. It suggested the global safety net (it did not provide an estimate for Asia) was around US$3.7 trillion in size. It concluded that the safety net would not be sufficient at an aggregate level under a widespread shock. It also noted that the assumption that all components of the safety net could be accessed

and coordinated at once was a "very strong assumption". A less comprehensive study by the IMF (2011) found the safety net to be around US$2.7 trillion in size. This was around the same figure found by Hawkins et al (2014).

Outside of these papers, the literature's methodology tends to be qualitative, rather than quantitative. It is more likely to consider broad strategic factors, rule-of-thumb benchmarks and the general trends that impact on the adequacy of the safety net rather than seeking to quantify how big the safety net is or how big it ought to be.

In assessing whether the size of the global financial safety net is adequate, most papers will look solely at the IMF's resources, and sometimes include the European Stability Mechanism, Chiang Mai Initiative Multilateralization and an estimate for swap lines, and compare this to general proxies such as the growth rate of GDP, capital flows, trade flows, public and private debt and the general increase in global interconnectedness (see IMF, 2011; Pickford, 2011; Bank of England, 2015; Hawkins et al, 2014). IMF Managing Director Christine Lagarde (2016), for example, noted that the size of the global safety net and the IMF's resources had not kept up with the 25-fold increase in global capital flows from 1980 to 2007.

Although this is a convenient short-hand approach, it ignores key components, institutions and arrangements that have historically played an important role in the safety net. It also provides little insight into how large the safety net ought to be. Truman (2015) is a partial exception. He recommends an increase in IMF permanent resources of at least $500 billion to a total of $1.25 trillion, if not a doubling of resources to $1.5 trillion as a conservative estimate of what will be necessary to carry the IMF through the next decade. This, however, does not appear to be based on estimates of demand for IMF resources or calculations as to the efficient size of the safety net or IMF resources specifically.

2.2 The composition of the safety net

As a consequence of the literature's largely qualitative approach, most papers will focus more on the composition of the safety net rather than its size. The dominant view in the literature is that the safety net has become too fragmented through its increased reliance on domestic, bilateral and regional initiatives that are increasingly decoupled from multilateral initiatives, namely the IMF (see IMF, 2016). As put by Christine Lagarde (2016) "while the safety net has expanded in size since the financial crisis, it has also become more fragmented and asymmetric".

The IMF's 2016 paper warns that the safety net's coverage is patchy. While it serves reserve-currency advanced economies well, non-systemic non-gatekeeper[2] emerging market and developing economies are the least adequately served. It finds that systemic and gatekeeper emerging markets also have inadequate predictability and reliability (from their reliance on swap lines and regional arrangements), and high

[2] Non-gatekeeper means the economy is unable to transmit systemic shocks.

financial costs (from reserve accumulation) or political costs (from stigma associated with IMF financing).

In the lead-up to Australia's G20 host year, the Australian Treasury (Hawkins et al, 2014) published a comprehensive analysis of the safety net. They warned that the safety net is approaching a tipping point in terms of its fragmentation which, without intervention by policymakers, puts at risk the appropriate role of the safety net and global economic stability. They argued the expansion of regional, bilateral and domestic resources that are unlinked with the IMF, as well as slow progress in reforming the institution, are seeing the IMF's role being displaced.

Rhee et al (2013) analyse the relationships between global and regional financial safety nets, particularly in Asia, and explore the potential tensions and operational challenges associated with the involvement of several institutional players with potentially different interests, analytical biases and governance. It proposes changes to the IMF articles of agreement to allow for lending or guarantees to regional arrangements directly and it establishes some key desirable features and practices of regional mechanisms that should be adopted everywhere to ensure some global consistency, particularly in the field of macroeconomic surveillance, programme design and conditionality.

Hawkins et al (2014) assert there is no substitute for the IMF given its near-universal membership, its unique focus on addressing systemic issues facing the international monetary system, its expertise and global surveillance activities and its relative autonomy and independence. Although regional arrangements may have regional expertise and complement the safety net through increased resources, imposing conditionality on regional allies and trading partners is politically difficult, moral hazard is greater, the resource base is far narrower, the costs of raising capital far greater and surveillance is less effective and not global in character.

Analysis from the Bank of England (2015) reached similar conclusions. The Bank of England (2015) argued the safety net was suboptimal and resembled 'more of a patchwork than a safety net'. It argued the safety net was fragile, costly and inefficient. The Bank of England (2015) warned the IMF's funding is too reliant on temporary resources like bilateral loans, rather than through permanent quota funding. Like Lagarde (2016), it noted that the reliance on unilateral reserves is costly and inefficient. It estimates that the accumulation of foreign exchange reserves by emerging market economies costs them 0.5 per cent of GDP annually.

Pickford (2011) argued the global safety net has inadequate 'fire-power' to provide sufficient liquidity to offset private outflows and reassure markets, and it was insufficient in terms of the flexibility and speed through which it could distribute funds. Pickford noted that liquidity problems, if not addressed, turn into solvency problems, increasing the amount of external assistance that is ultimately required.

The literature identifies a range of reasons why this fragmentation has occurred, discussed in more detail in Section 5. One reason is the demand among economies, particularly in Asia, for instruments which have greater flexibility and speed in responding to crises, such as bilateral swaps (see Lagarde, 2016 and IMF, 2011). Fragmentation is also the product of emerging markets wanting a greater say in how the safety net is governed, particularly the IMF. Fragmentation is also the consequence of insufficient IMF resources which encourages countries to rely on domestic, bilateral and regional buffers (IMF, 2016 and Pickford, 2011). Finally, the literature proposes a range of policy proposals to strengthen the safety net. These are discussed in detail in Section 5 but include:

- Reforming the IMF's financing facilities to have a greater focus on precautionary financing (see Lagarde, 2016 and Bank of England, 2015)
- Further reforms to the IMF's quota system, quota formula and Executive Board to give a greater say to emerging market and developing economies (see Hawkins et al, 2014 and Pickford, 2011)
- Creating pre-qualification procedures for IMF financing, perhaps through existing Article 4 consultations (see Pickford, 2011; Truman, 2010; Cordella and Levy-Yeyati (2010) and Fernández-Arias and Levy-Yeyati, 2010)
- Formalising guidelines on how IMF-RFA cooperation would take place at a time of crisis (see IMF, 2011; IMF, 2013 and Pisani-Ferry, 2013)
- Giving large RFA's voting power within the IMF, potentially with a seat on the Executive Board (see Lamberte and Morgan, 2012)
- Increased conditionality on RFA financing such that countries must already be approved for an IMF program (see IMF, 2013)
- Coordinating currency swap lines through IMF facilities, potentially linked to IMF precautionary facilities (see Hawkins et al, 2014 and Obstfeld, 2009)
- Developing the IMF into an international lender of last resort, or creating a new organisation to perform this role (See Obstfeld, 2009; Fischer, 1999; Calvo 2010; and Fernández-Arias and Levy-Yeyati, 2010).

3. Increasing systemic risks in Asia

Asia faces increasing risks and increasing systemic risks.

Asia's increasing risks are widely reported. They include slowing growth, headwinds from a still weak global recovery, subdued external demand, the short- to medium-term impact of China's growth transition and a range of long-run structural reform challenges (see IMF, 2016a). Of critical importance, however, is the interaction

between these more recent risks and the broader systemic risks which have been developing over many years.

'Systemic risk' refers to the prospect of a breakdown in the entire system, as opposed to the breakdown of its individual parts. These risks become more prominent in systems as linkages grow, unless something is done to mitigate them (Goldin and Mariathasan, 2014, p. 27).

Goldin and Mariathasan (2014, p.27) argue that systemic risks manifest in three ways: (1) a large or 'macroshock' triggered when relatively modest tipping points, breaking points or regime shifts hit their thresholds and produce large, cascading failures; (2) a shock propagated through a network via risk sharing (transferring risk) or contagion (transmission and amplification of risk); and (3) a common shock which is the result not of direct causation but of indirect effects.

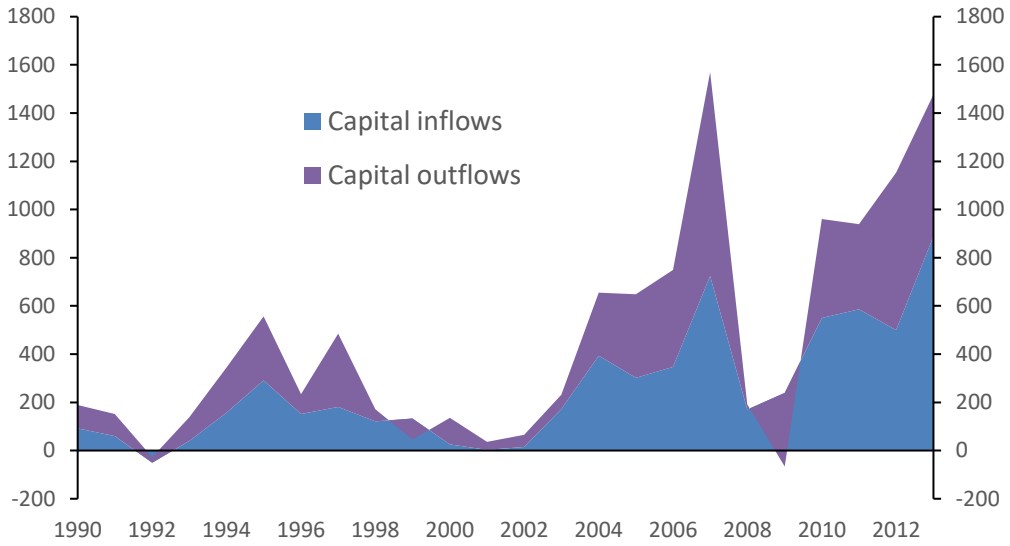
This section argues that the systemic risks which have grown significantly in Asia have three critical sources: increased integration of Asia's financial systems, increased integration of Asia's supply-chains and the growth of 'indirect financial and economic systemic risks' which include pandemics and health risks, infrastructure risks and ecological and environmental risks. The analysis that follows draws heavily on the substantial body of work of Goldin and Mariathasan (2014) who develop a guiding framework for thinking about the increase in global systemic risk that has occurred over the last few decades.

Systemic risks in Asian financial systems

A critical source of systemic risk in Asia is the increasing interconnectedness of its financial systems, both within Asia and between Asia and the rest of the world. Through greater financial intermediation, this interconnectedness means increased liquidity and a lower cost of capital which, all else equal, means higher growth and living standards. But it also means that risks which materialise in one Asian country can be transmitted more easily into other Asian economies, or risks that materialise globally can be transmitted more easily into Asia.

One example of this growing interconnectedness is the significant increase in cross-border capital flows into and out of Asia. Since 1990, capital inflows into Asia have increased by 870 per cent and capital outflows from Asia have increased by 504 per cent (Figure 1). Even as a per cent of GDP these flows have more than doubled (Villafuerte and Yap, 2015). This means Asian economies are more exposed to international financial volatility and international financial shocks which can have significant implications for macro-financial stability, liquidity, investment, savings and exchange rates.

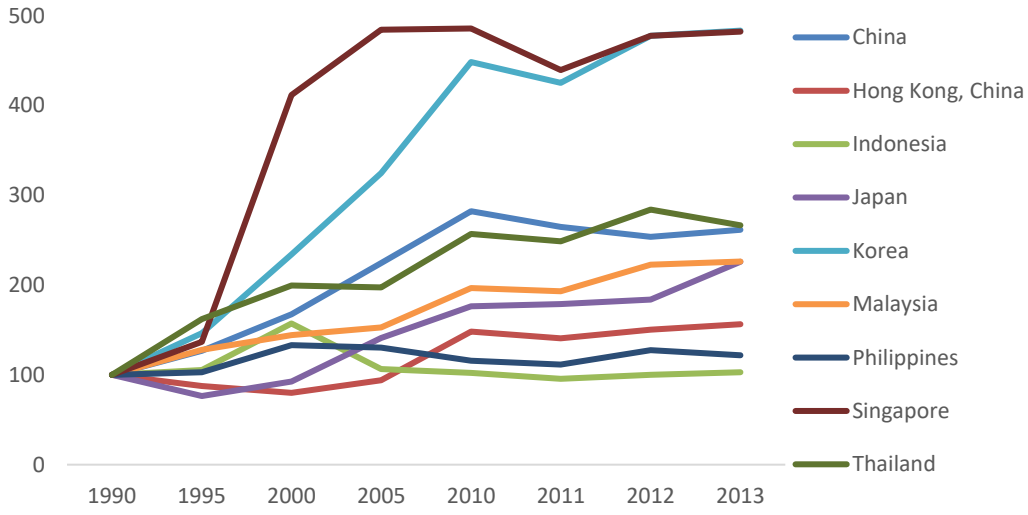
Figure 1: Capital inflows and capital outflows in ASEAN+3 countries (US dollars)



Source: Data from Villafuerte and Yap (2015) from the Asian Development Bank who use data from the IMF, International Finance Statistics; World Bank Development Indicators and the CEIC database and national sources.

Consistent with this increase in capital flows, Asian economies are also much more financially open than they previously were. The average total stock of foreign assets and liabilities held in Asian economies as a per cent of GDP has more than doubled since 1990 (Figure 2). Similarly, more and more of Asia's debt is being financed by other countries. According to the IMF, the stock of Asia's debt which is held externally has increased 830 per cent since 1990 (IMF, 2016b). Both these changes make Asian economies more susceptible to regional and global shocks.

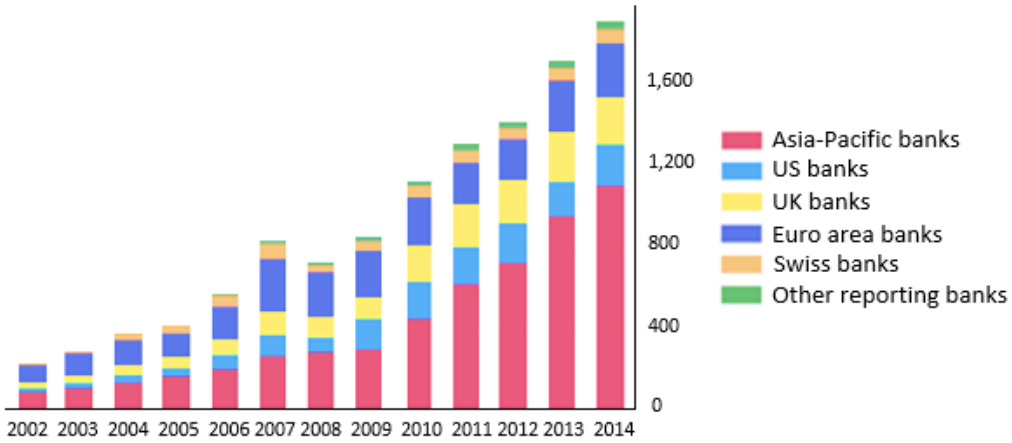
Figure 2: The average total stock of foreign assets and liabilities held in Asian economies as a per cent of GDP (1990=100)



Source: Data from Villafuerte and Yap (2015) from the Asian Development Bank, using the Updated and Extended 'External Wealth of Nations" Dataset, 1970-2011 and the CEIC database from 2012-13 data following the International Investments Position reports of respective economies.

But more importantly when considering systemic risk within Asia, much of the financial interconnectedness we observe in the data is within Asia itself. This means that Asian financial systems are increasingly dependent and connected to other Asian financial systems, not just the rest of the world. Data from the Bank for International Settlements shows that the vast majority of lending to Asian economies is from other Asian economies (Figure 3, from Remolona and Shim, 2015). Financial systems are also growing as a share of the overall economy and implicit funding guarantees are acting as a transmission mechanism between the balance sheets of financial institutions and the balance sheets of governments (see Schich and Lindh, 2012).

Figure 3: International claims on emerging Asia-Pacific countries (US billions)



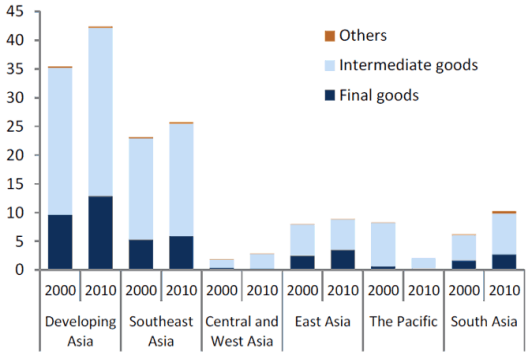
Source: Remolona and Shim (2015)

Systemic risks in Asian supply chains

Systemic risks are also growing within the real economies of Asian countries, not just financial systems. The most notable example of this is through the integration of supply-chains. Like financial integration, the integration of supply-chains carries significant benefits for Asian countries but also creates risks through increased susceptibility to supply-chain shocks. This was highlighted during the Thailand floods in 2011 which triggered a 28 per cent drop in the production of hard disk drives worldwide. These disruptions stalled the regional and global production of, among other things, notebooks, digital imaging systems and digital video recorders, highlighting the increased susceptibility that has emerged within regional supply chains.

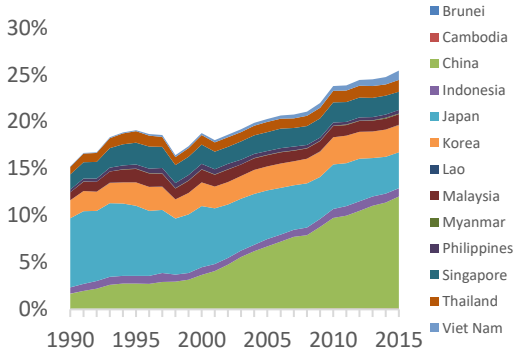
The growth in Asian regional production networks can be seen in Figures 4 and 5. Figure 4 shows the significant growth in both intra-regional trade within Asia and the growing share of intra-regional trade which is represented by intermediate goods. Figure 5 shows the outcome of this process: the significant growth in the share of total world trade which is now held by ASEAN+3 countries.

Figure 4: Intra-regional trade in developing Asia (%), 2000 to 2010



Source: Asia Regional Integration Centre, Asian Development Bank, 2011

Figure 5: ASEAN+3 share of total world trade, 1990 to 2015



Source: Date from World Trade Organisation, Trade Statistics, 2015

Goldin and Mariathasan (2014) note that a key risk with integrated supply chains is not just things like natural disasters but also that many firms, particularly in Asia, have adopted a 'lean management' approach. This means firms are holding fewer buffers, particularly in inventories, which increases the systemic risk associated with having more integrated supply chains. Goldin and Mariathasan (2014) also warn of how political conflicts can complicate these supply-chains, such as China using its dominance in the supply of rare-earths – a crucial input in the production of many 21st Century technologies – during a maritime dispute with Japan in 2012 (see Goldin and Mariathasan, 2014, p.71).

Systemic risks through 'indirect systemic financial risks' in Asia

'Indirect' systemic financial risks refer to risks which are not initially financial or economic in nature but can quickly become so if they materialise. These include risks from pandemics and health risks, infrastructure risks and ecological and environmental risks – all of which are more prevalent today because of increased Asian integration.

Globalisation, population growth and urbanisation have facilitated the transmission of infectious diseases and international travel means that any 'patient zero' is now but a few degrees of separation from formerly isolated communities (Goldin and Mariathasan, 2014, p.144). More than 30 new disease-causing organisms have appeared in just the past two decades. In the first 10 years of the 21st Century the world has already been hit by three major pandemics, the first two of which originated in Asia: SARS, H5N1 (bird flu) and H1N1 (swine flu).

Analysis by Lee and McKibbin (2003) showed how health crises can quickly become economic crises, often with severe consequences. In modelling the consequences of SARS, they find that the impact on the Chinese economy could be between 1.05 and 2.34 per cent depending on whether the shock is temporary or persistent. This is through short-term impacts such as reduced demand for travel

and other services, increased costs in service industries, loss of confidence and increased medical expenses, as well we longer-term impacts such as decreased human capital and increased fiscal deficits.

More alarmingly, McKibbin and Sidorenko (2006) model the macroeconomic consequences of pandemic influenza ranked from mild, moderate, severe to ultra in its severity (where mild is similar to Hong Kong in 1968-69 and severe is similar to the Spanish influenza of 1918-19). Under the 'ultra' scenario, they find that reductions in real GDP could be as catastrophic as 53.5 per cent in Hong Kong, 37.8 per cent in the Philippines, 21.7 per cent in Singapore, 18 per cent in Indonesia and 15 per cent in Japan and Korea.

Systemic risks in infrastructure can also have substantial economic and financial consequences. These can flow from a collapse of systemically important infrastructure such as in energy, the internet, roads, bridges, airports and ports. Analysis by Goldin and Mariathasan (2014, p.100) shows how an electrical glitch can lead to a financial collapse, an airport closure can disrupt a global supply chain and an internet crash can destroy communications arrays. Increased interconnectedness means these infrastructure collapses can quickly cascade across borders, particularly as they relate to international trade, finance and commerce.

Finally, ecological and environmental risks have become more global and systemic in nature, driven in particular by increased integration. Natural disasters such as the 2011 floods in Thailand and the volcanic eruptions in Iceland and Indonesia have shown how susceptible supply chains, international trade and finance are to these events. Through increased economic activity, globalisation has also contributed to climate change – an issue which crosses all borders and requires an international response. Pollution such as peat fires in Indonesia also create regional challenges in health, but also in its disruptions to international trade and commerce.

4. An inadequate safety net facilitating systemic risk

It is worth reiterating than economic integration has delivered substantial benefits to the people of Asia in raising the living standards of billions of people. But as the above section outlines, it has also resulted in an increase in economic and financial systemic risk. However, as this section explains, these risks can be effectively mitigated through appropriate policy responses. In fact, it is through more integration, not less, that these systemic risks can be reduced without the need of sacrificing the substantially improved living standards that have flowed from greater integration. While there are many ways that the abovementioned risks can be mitigated, the focus of this section is on just one, but one which is substantial and cross-cutting: strengthening the Asian financial safety net.

The Asian financial safety net (from here on 'the safety net') refers to the institutions and resources designated to fight economic and financial crises and

prevent their contagion from one country to another. When a country faces a financial or economic crisis – regardless of whether it is caused by financial collapse, supply-chain malfunction or things like disease, infrastructure collapse or environmental crises – the safety net provides the liquidity which is needed to support economic activity, prevent the crises from becoming worse and prevent the crisis from engulfing the entire Asian region.

From the perspective of ASEAN+6 countries, the safety net has three, perhaps four, components: multilateral, regional, bilateral and unilateral.

Multilaterally, the safety net consists predominantly of resources mobilised through the IMF but also potentially the World Bank and the Bank for International Settlements which have both provided resources into the safety net at different times in the past, such as during the Asian financial crisis.[3]

Regionally, the safety net consists of Regional Financing Arrangements (RFAs)[4] and potentially includes regional development banks. In Asia, these RFAs consist of the Chiang Mai Initiative Multilateralisation (CMIM) and the BRICS currency pool. Regional Development Banks have also contributed resources to the safety net at different times in history.[5] Even when they have not provided direct budgetary or macroeconomic support during times a crisis, their support for development projects nevertheless free up fiscal space which can then be used for liquidity support. The three major development banks in Asia are the Asian Development Bank, the Asian Infrastructure Investment Bank and the New Development Bank.

Bilaterally, the safety net consists of currency swap arrangements between central banks where one central bank exchanges its currency for that of another, usually subject to conditions. For ASEAN+6 countries, the primary swap lines outside of the CMIM are the swap lines they have with China, the unlimited swap line between the Bank of Japan and the US Federal Reserve and the temporary (now expired) swap lines between the US Federal Reserve and Korea, Singapore, Australia and New Zealand.

Unilaterally, foreign exchange reserves are often included as a fourth component of the safety net, but it can be argued these are no more part of the Asian financial safety net than a country's macroeconomic policy space in general (see Hawkins et

[3] The World Bank provided US$12 billion to support Argentina's banking system during the 1994 Tequila crisis, US$5 billion to Turkey in 2001, US$750 million to Chile in 1982 and more than US$20 billion to support Thailand, Indonesia and Korea during the Asian Financial Crisis (see Montiel, 2014). The Bank for International Settlements has historically played an important role in the safety net by providing financial resources directly in response to crises, such as the US$10 billion it provided in response to the Mexican 'Tequila Crisis' in 1994 (see Lustig, 1995).

[4] Defined as a financing mechanism through which a group of countries in a region pledges financial support to members that are experiencing, or might experience, a liquidity shortage or balance of payments difficulties (IMF, 2013).

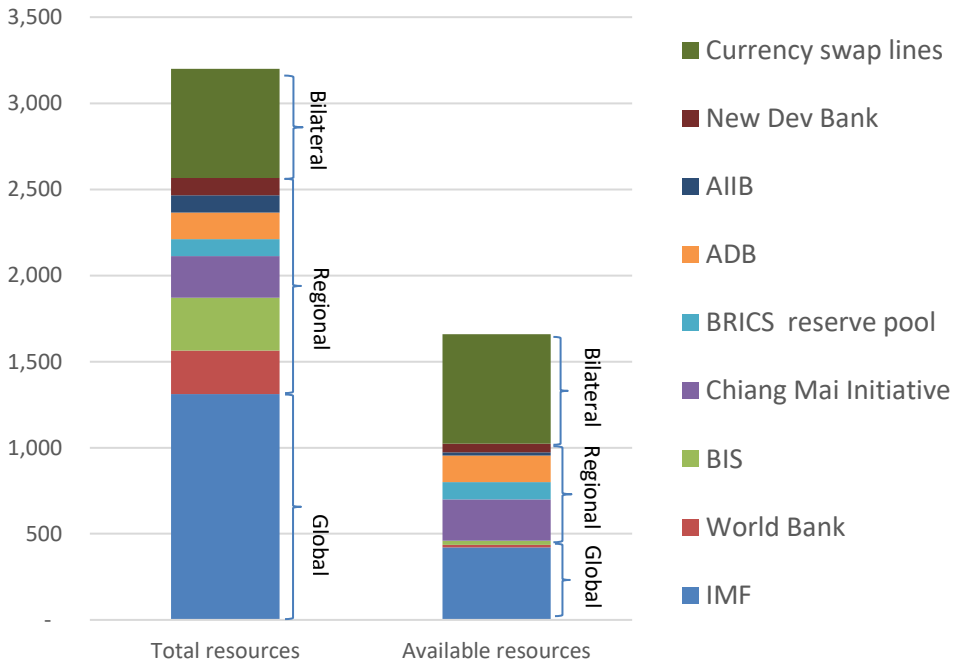
[5] For example, the Asian Development Bank provided funding to Thailand, Indonesia and others during the Asian Financial Crisis (see Montiel, 2014)

al, 2014 for a discussion). These reserves, like a country's fiscal and monetary policy tools, are the first line of defence and are only relevant to the regional safety net to the extent they relate to a bilateral, regional or multilateral arrangement.

Adding-up these different components (excluding foreign exchange reserves for the time being), the Asian financial safety net is US$3.2 trillion in size (Figure 6). The global component represents 58 per cent of the safety net while the regional and bilateral[6] components represent 22 and 20 per cent, respectively. If foreign exchange reserves are included, the safety net is much larger, at around US$6.03 trillion in size where foreign exchange reserves account for 65 per cent of the safety net and the global, regional and bilateral components account for 20, 8 and 7 per cent of the safety net, respectively.

However these figures can be misleading because not all of the safety net's total resources are paid-in and many of these resources are already tied-up in existing programs. As a result, not all of these resources are immediately available in times of crisis. The schedule on the right of Figure 6 therefore shows available resources, which takes into account resources that have not been paid-in or are already tied-up in existing programs. It shows that the safety net falls from US$3.2 trillion to US$1.66 trillion (again, not accounting for foreign exchange reserves).

Figure 6: Quantifying the size of the Asian financial safety net (US billions)



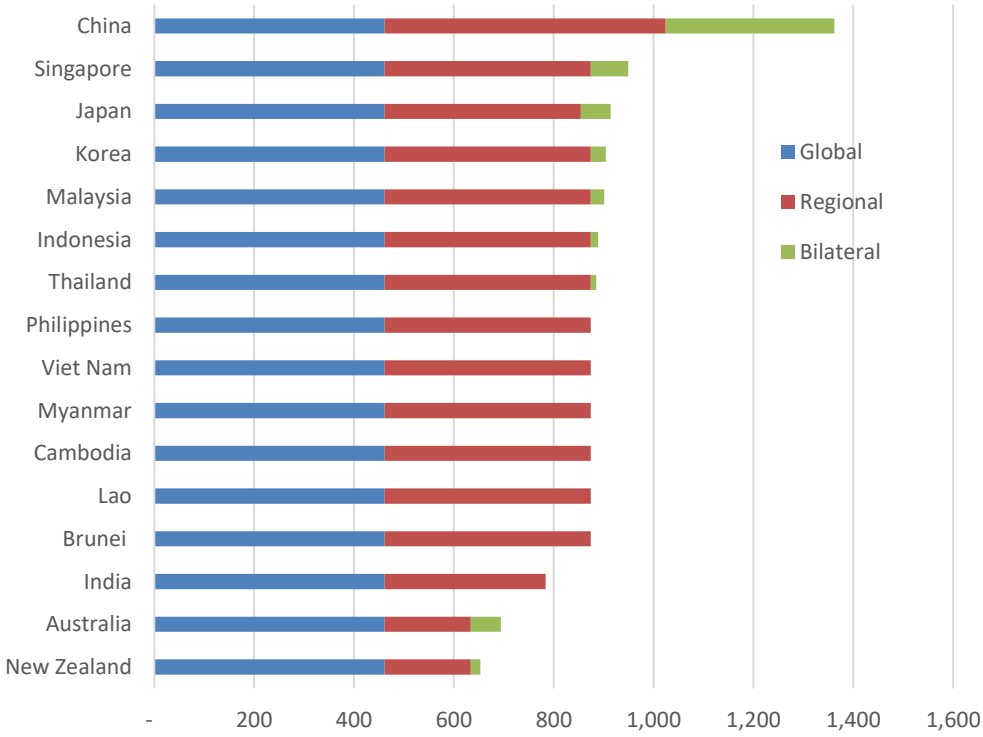
Source: Authors calculations based on data from the annual reports of each institution, US Federal Reserve press releases, the Council on Foreign Relations, 2015 and the CIA World Factbook, 2016

[6] In this analysis, currency swap lines include the temporary facilities between some ASEAN+6 countries and the US Federal Reserve (which are indicative of what we could expect to see during crisis) and uses the size of the Japan-US swap line before it became unlimited so as to provide a quantifiable figure.

A critical challenge facing the safety net is its increasing fragmentation over time (see IMF, 2016). While the safety net previously consisted almost entirely of the IMF and the World Bank, today it consists of a large number of regional institutions, bilateral swap lines and a significant increase in foreign exchange reserves (see IMF, 2016). A consequence of this fragmentation is that the size of the safety net depends on entirely on the country in question. For countries who participate in regional initiatives and have many bilateral swap lines, the safety net is quite large. But for those who do not participate in such initiatives the safety net is much smaller. When it comes to systemic risk, the patchy coverage of the safety net is of critical importance.

This patchy coverage can be seen in Figure 7 which shows the size of the safety net from the perspective of each ASEAN+6 country based on their participation in global, regional and bilateral initiatives.[7] It shows that for China the safety net is around US$1.4 trillion in size while for New Zealand it is only US$653 billion in size. Figure 8 shows this same information but includes foreign currency reserves. This has the effect of further exacerbating the safety net's patchy coverage. When including foreign exchange reserves, the safety net for China is almost US$4.6 trillion in size while the safety net for New Zealand is only $671 billion in size.

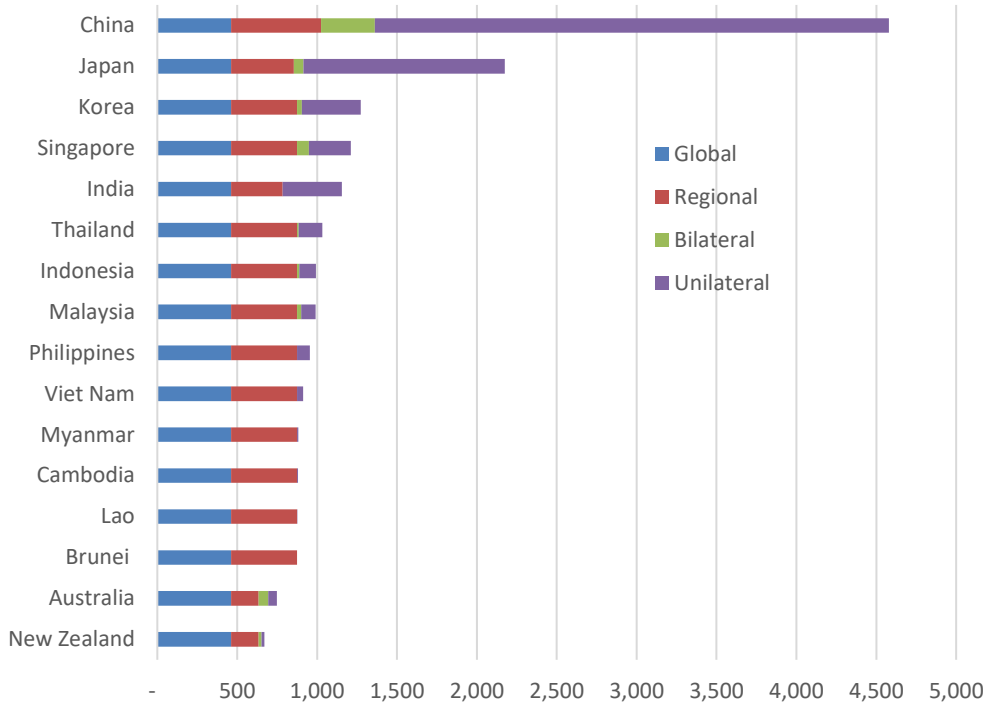
Figure 7: The size of the safety net for each ASEAN+6 country (US billions)



Source: Authors calculations based on data from the annual reports of each institution, US Federal Reserve press releases, the Council on Foreign Relations, 2015 and the CIA World Factbook, 2016

[7] For global and regional initiatives this is based on available resources rather than total resources (see Figure 6).

Figure 8: The size of the safety net for each ASEAN+6 country including foreign exchange reserves (US billions)



Source: Authors calculations based on data from the annual reports of each institution, US Federal Reserve press releases, the Council on Foreign Relations, 2015 and the CIA World Factbook, 2016

The more difficult question is whether the safety net is large enough. Looking globally, analysis by the IMF (2016) concluded that the global financial safety net was too small to deal with a major crisis. It also noted that the safety net's patchy coverage introduced an unacceptable level of systemic risk and that it was a 'strong assumption' to assume that the different components of the safety net could be coordinated during a time of crisis.

In the context of Asia, the inadequacy of the safety net can be illustrated by comparing it to the cost of external support during the Asian financial crisis. Using data from Montiel (2014) (which I have converted into 2016 dollars) the cost of the external support to Thailand, Indonesia and Korea from the IMF, World Bank, Bank for International Settlements and Asian Development Bank totalled US$226 billion.

On first glance, it would appear that a safety net of US$1.66 trillion could easily absorb this. But remember that since 1999 the real GDP of emerging and developing Asia has grown by four-fold, gross debt stocks have also grown by 4-fold and capital inflows have grown eight-fold. Based on these measures, the cost of external support for the Asian financial crisis today could be between US$900 billion and US$1.808 trillion. Even the lower estimate of US$900 billion (which is based solely on GDP growth) exhausts more than half of the entire Asian financial safety net, which includes global institutions like the IMF. This is also assuming that

all components of the safety net could be coordinated at the same time and these calculations also do not account for the increase in systemic risk since 1999, such as in supply chains, which means any shock today would be transmitted more easily.

However, as highlighted by Lagarde (2016) and IMF (2011), growth in capital flows is the better benchmark in assessing how large the safety net should be. Capital flows represent the potential financing shortfall that a country or region would face in the event of a 'sudden stop'. On this measure, the entire Asian financial safety net would be exhausted if the Asian financial crisis occurred today, leaving a shortfall of around US$200 billion. It should also be noted that the size of the safety net is subject to double-counting because the CMIM, non-CMIM currency swap lines and foreign exchange reserves often relate to the same pool of resources within each country.

Another cause for concern is that, through its increased fragmentation, the safety net is becoming increasing decoupled from the IMF and is increasingly reliant on weaker alternatives. The CMIM is an example of this decoupling. The CMIM has gradually raised the IMF-delinked portion to 30 per cent, meaning members can draw up to 30 per cent of their maximum borrowing amount without requiring IMF lending conditions. ASEAN is now considering raising this to 40 per cent (see Pitakdumrongkit, 2015 for a discussion).

In regards to weaker alternatives to the IMF, issuing high-yielding local currency debt to purchase foreign exchange reserves is a costly exercise which, according to the Bank of England, results in an annual cost to emerging economies of around 0.5 per cent of GDP (Bank of England, 2015). Bilateral swaps, while more flexible than institutional arrangements, are also highly selective in which countries receive them, raise moral hazard problems and are less effective when crises afflict multiple countries in the region. And regional arrangements like the CMIM make imposing conditionality on neighbouring countries politically difficult. Their resource base is far narrower than global institutions, the cost of raising capital is greater, moral hazard is more perverse and their surveillance is less effective (see Sterland, 2014).

5. Proposals for reform

There are practical reforms that will strengthen the Asian financial safety net and reduce systemic risk in Asia. The globalised nature of systemic risks and the globalised nature of many of these institutions means the reforms to strengthen the safety net in Asia are inextricably linked to the reforms to strengthen the safety net globally. The growth of China and other emerging market economies has meant a greater burden on the safety net by having more systemically significant countries for it to cover. Many of these economies, particularly China, are not well-integrated within the global financial safety net and this needs to be addressed. With this is mind, the following section considers the causes of safety net fragmentation and

the sections that follow consider some the reforms that could be undertaken to strengthen it.

The causes of safety net fragmentation

Addressing the inadequate safety net in Asia means focusing on the root causes of this fragmentation. Three critical causes of the safety net's fragmentation are that the safety net is too small (prompting the creation of new institutions and arrangements), there is growing dissatisfaction with the governance structure of the IMF and the World Bank and there is growing demand for faster and more flexible instruments in responding to crises.

In terms of the safety net's size, the reason the euro area created the European Stability Mechanism and its predecessor the European Financial Stability Facility was because the IMF did not have adequate resources. Similarly, a critical reason Asian nations created the CMIM, created the BRICS currency reserve pool, began stockpiling foreign exchange reserves and established a network of swap lines outside of the CMIM was because of insufficient funds in the IMF and dissatisfaction with that institution (see Rhee et al, 2013).

This relates to another critical reason for the safety net's fragmentation which is a growing dissatisfaction with the IMF and the World Bank. Emerging and developing economies in Asia want a greater say in how these institutions are governed. The 2010 IMF quota reforms transferred 6 per cent of voting power to the emerging market economies but the implementation of these reforms was very slow due to delays by the US Congress. These reforms were only implemented in 2015. But even with their implementation the emerging market and developing economies remain grossly underrepresented in the IMF relative to their share of global GDP. Furthermore, other IMF reforms agreed by the G20 still remain unimplemented, namely quota formula reform, steps to free-up seats in the Executive Board for emerging market and developing economies and moving to an all-elected Board.

There is also a critical link between making the IMF's governance structure more representative and ensuring the IMF has a large and more permanent funding base. Quota reform will not only give the emerging market and developing economies a greater say in how the IMF is governed, it will also increase the resources available to the IMF meaning that it can rely less on non-permanent sources of funding such as the bilateral loans from G20 countries agreed in 2012.

Fragmentation, particularly the safety net becoming more skewed towards bilateral swap lines, is also because of increased demand among Asian economies for instruments that have greater flexibility and speed in responding to crises. As highlighted earlier, the downside of bilateral swaps is that they are highly selective in which countries receive them, raise moral hazard problems and are less effective

when crises afflict multiple countries in the region. However their key benefit is that they can be delivered quickly and are much more flexible given they do not come with as much (or sometimes any) conditionality attached to them.

Strengthening the safety net through IMF reform

The G20 has taken the lead in pushing for IMF reform, but its progress has been slow and many parts of its agenda remain incomplete. Reforming the IMF is critical to bolstering the safety net because it will increase its permanent funding base and also help reduce the incentive, particularly in Asian countries, to create or increase funding for competing institutions and competing mechanisms like currency swap lines and foreign exchange reserves which act to fragment the safety net.

In 2010 the G20 stressed the importance of "a modernized IMF that better reflects the changes in the world economy through greater representation of dynamic emerging markets and developing countries" (G20, 2010). The package of commitments included:

- A doubling of quotas (with a corresponding rollback of the New Arrangements to Borrow)
- A shift in quota shares of over 6 per cent to emerging market and developing countries
- Steps to improve the voice and representation of the emerging market and developing countries through a review of the IMF's quota formula so that it better reflects the economic weights of these countries
- Freeing-up two chairs on the Executive Board for emerging economies, currently held by advanced European countries
- Moving to an all-elected IMF Board (see G20, 2010)

The 2010 reforms were ratified by all G20 countries by 2015 after years of delay by the US Congress. Despite these reforms, emerging market and developing economies remain grossly underrepresented in the IMF relative to their share of global GDP. The IMF needs to discuss the next stage of quota reform and complete other long-standing pledges such as freeing-up additional seats on the IMF Executive Board for the emerging market and developing economies, completing the 15th General Review of Quotas and reviewing the formula through which country quotas are determined.

Strengthening the safety net by increasing its resource base

A critical reason for the safety net's fragmentation is that the safety net is simply too small. As discussed above, quota reform in the IMF will be a critical component of this. But there are other reforms which could increase the funding base of the IMF and, potentially, regional institutions as well.

An option for increasing the IMF's resources is for the Executive Board to allow the IMF to borrow directly from international capital markets rather than relying solely on funding from its members. The IMF (2011) flagged this as an option and some of its advantages:

> "There may be circumstances where it is either necessary to augment significantly the Fund's own resources. While in 2009–10 it was possible to do so by turning to member countries, the process took time and may not always be politically feasible. Thus, establishing the modalities for the Fund to borrow from the markets at short notice to supplement its existing resources could be worth exploring. This could have the added advantage of offering a relative safe haven asset during times of global market stress."

There is provision for this in the IMF's Articles of Agreement and the G20 has previously agreed to 'consider' market borrowing by the IMF (G20, 2009). The World Bank already uses this option.

This proposal raises several issues. It creates risk in the sense that the IMF would be potentially borrowing and accumulating debt on behalf of its membership. Members would need to have great confidence in the IMF, its lending practices and accountability mechanisms to support this proposal.

This proposal may also have the effect of entrenching the IMF's existing quota shares under which emerging market and developing economies are under-represented. Insufficient IMF resources puts pressure on members to increase their funding which, in turn, puts pressure on members to re-assess the existing quota shares. Removing this pressure could therefore delay future IMF reform.

Making the safety net more flexible

Making the safety net more flexible will help satisfy the demands from many Asian economies which are leading them to become more reliant on currency swap lines and foreign exchange reserves. However this does come at the cost of increased moral hazard.

It is argued that a greater use of precautionary financing makes the safety net faster, more flexible and more responsive. The IMF took a significant step in this direction in developing the Flexible Credit Line (FCL) and Precautionary and Liquidity Line (PLL) in 2010. These facilities are aimed at strongly performing economies hit by external shocks – the 'innocent bystanders'. They provide large-scale access to finance on an as-needed ('precautionary') basis without the need for further approval by the IMF Executive Board to activate lending, after the initial pre-qualification process (Pickford, 2011).

The IMF (2016) has found that without prompt liquidity provision, innocent bystanders can quickly become vulnerable during systemic crises. The IMF (2011)

has found that precautionary financing restores market confidence faster. Its greater use during the global financial crisis helped improve market conditions in less than a year, with stabilization of spreads and net capital inflows to many emerging markets by Spring 2009. By contrast, smaller availability of liquidity at the onset of the Asian financial crisis contributed to market confidence being restored only after almost two years (IMF, 2011).

The IMF has also found that crisis bystanders with precautionary arrangements experienced substantially lower output losses than in past crises and outperformed global developments in real GDP growth (IMF, 2011). However, due to funding constraints, the IMF was limited in how many countries it could assist.

Precautionary financing raises several issues. First, it is more burdensome on IMF resources than other facilities (Hawkins et al, 2014). Under the PLL, for example, countries can access financing up to 10-times their quota share. While precautionary lending has become a bigger part of the IMF's lending toolkit, their use is limited by the IMF's current resourcing (Hawkins et al, 2014).

Second, precautionary financing increases the risk of moral hazard. Moral hazard refers to the incentive for the insured to behave more riskily as losses will be borne by the insurer and not by them (Hawkins et al, 2014). For the private sector, an increased safety net could encourage excessive risk taking by investors on the assumption they will be bailed-out in the event of a crisis. For the public sector, the safety net could mean governments avoid undertaking difficult reforms or pursue expansionary policies knowing they will receive assistance if they get into trouble.

There is disagreement on how important the risk of moral hazard is when it comes to enlarging the safety net (see Pickford, 2011 for a discussion). Risky lending and investment behaviour was a hallmark of the global financial crisis and European debt crisis even though the safety net was recognised as being inadequate. Some studies have found that implicit subsidies in IMF lending are not large enough to create serious moral hazard (see Lane and Phillips, 2000 and Jeanne and Zettelmeyer, 2001). Analysis from the IMF (2011) suggests that moral hazard depends on the type of shock (exogenous or idiosyncratic) and the effectiveness of instruments to mitigate the moral hazard behaviour. However the IMF (2016) also notes that safety net fragmentation is increasing the risk of moral hazard through so called 'facility shopping'.

Studies have also shown that moral hazard can be lowered through effective prudential regulation and supervision of the financial sector (Fernández-Arias and Levy-Yeyati, 2010). Kenen (2007) argues that while there is truth to the moral hazard argument, the stigma/political cost of approaching the IMF for support lowers that risk.

Few countries have utilised the FCL or PLL to date.[8] Most suggest this is because of stigma (see Pickford, 2011; IMF, 2011). The Bank of England (2015) argues that pre-qualification, made as automatic as possible, is the best way to reduce this stigma. Pickford (2011) suggests that pre-qualification could be achieved through the IMF's Article IV country-assessment process.

Strengthening cooperation between the safety net's components

Improving cooperation between the IMF and RFAs is one way of overcoming the pitfalls of fragmentation. This was recognised by the G20 in 2011 in developing the set of high-level principles to guide this cooperation, was supported and driven by the IMF's former Managing Director Dominique Straus-Kahn (Straus-Kahn, 2011) and the IMF has since recommended deeper coordination in multiple reports.

In 2013, the IMF undertook a detailed stocktake of all RFAs and the extent of their coordination with the IMF. It concluded that the extent of coordination varies widely, as do the lending frameworks, funding, instruments, terms and conditionality frameworks of RFAs. The IMF warns there is "limited formal guidance on modalities for IMF-RFA coordination" which "risks the perception of uneven treatment and delays in providing financial assistance given different objectives and processes among the different institutions" (IMF, 2013).

The IMF (2013) recommended detailed procedural guidelines be developed on IMF-RFA cooperation, building on the high-level principles developed by the G20. These guidelines would (1) align lending terms; (2) clarify how qualification for precautionary instruments would be applied; (3) establish avenues for regular dialogue between the staffs of the IMF and RFAs outside of crises; and (4) create the expectation that co-financing operations would be subject to certain principles and safeguards similar to the IMF's lending framework, such as debt sustainability, market access, and capacity to repay.

The IMF's recommendation is widely supported in the literature. Pickford (2011) called for guidelines setting out clear modalities for cooperation on program design and co-financing arrangements. He argues "that having the mechanisms fully worked out in advance is preferable to inventing them in the midst of a crisis" and that "coordination between RFAs and the IMF needs to be seamless".

Some authors go further. Lamberte and Morgan (2012) recommend giving large RFA's voting power within the IMF, potentially with a seat on the Executive Board. Rhee et al (2013) suggest that, under certain circumstances, the IMF and RFAs should be able to access each other's funding pools.

[8] Only three countries — Mexico, Poland and Columbia — have used the FCL and two — Macedonia and Morocco — the PLL. In these cases, the IMF has found that these programs have largely met their objectives with bond spreads and exchange rate volatility falling around the time of the arrangements (IMF, 2011).

Coordinating swap lines through the IMF

Coordinating swap lines with the IMF's precautionary facilities could increase the resources available to the IMF, better coordinate components of the safety net, improve flexibility and reduce the moral hazard risk of currency swap lines.

The IMF (2011) notes that while central banks played a key role during the global financial crisis, the lack of clear qualification criteria or trigger conditions on when swap lines will be extended limits the predictable use and availability of such tools in dealing with future crises. The IMF also notes that the narrow use of central bank liquidity to address bank funding problems (and the need to preserve central bank independence) may reduce the efficacy of this instrument to deal with funding problems of foreign governments.

Pickford (2011) suggests a coordinated arrangement could involve ex ante agreements between central banks for a network of swap arrangements, deciding in advance the amounts involved, the range of countries covered, and the conditions under which the arrangements would be activated. This network would then be linked to the IMF. The IMF suggests that, with its global reach and flexible instruments for the use of its resources, it would be well placed to complement these central bank tools during a crisis by standing ready to consider approval of financial assistance that would cover on a broad and even-handed basis its members' liquidity needs, including through pre-qualification, under existing or possibly additional lending facilities (IMF, 2011). Such an arrangement has also been recommended by Obstfeld (2009), Cordella and Levy-Yeyati (2010) and the Palais Royal Initiative (2011).

Strauss-Kahn (2011) notes that his arrangement would require a significant leap in international cooperation and could run afoul of central bank mandates. Weber (2011) warns that it could also interfere with the monetary policy operations of central banks. As discussed above, this proposal could also act to remove pressure for IMF quota reform.

6. Conclusion

This papers contribution to the literature is to highlight the increase in systemic risk in Asia, to quantify the size of the Asian financial safety net and assess its adequacy. It finds that systemic risk in Asia has increased significantly, particularly through the integration of Asian financial systems, the integration of supply chains and the increase in 'indirect financial and economic systemic risks' which include pandemics and health risks, infrastructure risks and ecological and environmental risks.

The paper finds that the Asian financial safety net is US$3.2 trillion in size but that this falls to US$1.66 trillion when we account for resources that are immediately available to respond to a crisis. By calculating the size of the external support

provided during the Asian financial crisis in today's dollars and taking account of the growth in GDP, debt stocks and capital inflows among Asian countries, the paper shows that the safety net would be too small to provide the same level of financial support that was provided in 1999. This introduces an unacceptable level of financial and economic systemic risk into Asian economies.

The paper also showed that the size of the safety net depends entirely on the country in question. For countries such as China which participate in a number of regional financing arrangements and have a large number of currency swap lines, the safety net is much larger than it is for countries that do not participate in such arrangements. When we take foreign exchange reserves into account the patchy coverage of the safety net is even more significant. This further exacerbates systemic risks in Asia.

Three critical reasons for the safety net's fragmentation are that the safety net is too small (prompting the creation of new institutions and arrangements), there is growing dissatisfaction with the governance structure of the IMF and the World Bank and there is growing demand for faster and more flexible instruments in responding to crises. These root causes of the safety net's fragmentation in Asia need to guide the policy reforms that are implemented to strengthen the safety net.

The most effective reforms for addressing the inadequacies of the Asian financial safety net are reforming the IMF, increasing the resource base of the safety net through borrowing from international capital markets, making the safety net more flexible through a greater use of precautionary financing, strengthening cooperation between the different components of the safety net through the development of ex ante guidelines and modalities and better coordinating currency swap lines through the IMF to reduce moral hazard. By focusing on these reform options through regional and global forums such as APEC, ASEAN, EAF and the G20, Asian countries can take important and practical steps in bolstering the safety net and reducing systemic risk in Asia.

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