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March 2016

ADEQUACY OF THE GLOBAL FINANCIAL SAFETY NET

IMF staff regularly produces papers proposing new IMF policies, exploring options for reform, or reviewing existing IMF policies and operations. The following document has been released and is included in this package:

Informal Session to Engage: Adequacy of the Global Financial Safety Net

The report prepared by IMF staff was discussed with Executive Directors in the informal session on March 23, 2016. Such informal sessions are used to brief Executive Directors on policy issues and to receive feedback from them. No decisions are taken at these informal sessions. The views expressed in this paper are those of the IMF staff and do not necessarily represent the views of the IMF's Executive Board.

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**International Monetary Fund
Washington, D.C.**



March 10, 2016

ADEQUACY OF THE GLOBAL FINANCIAL SAFETY NET

EXECUTIVE SUMMARY

Context: The GFSN has undergone some significant reforms

- The Global Financial Safety Net (GFSN)—comprising international reserves, central bank bilateral swap arrangements (BSAs), regional financing arrangements (RFAs), Fund resources, and market-based instruments—aims to achieve three main objectives: (i) provide insurance for countries against a crisis; (ii) supply financing when crises hit; and (iii) incentivize sound macroeconomic policies.
- The size of the GFSN has expanded significantly since the crisis, and past reforms have strengthened the safety net. The Fund overhauled both its surveillance and lending frameworks. The introduction of the Flexible Credit Line (FCL) and Precautionary and Liquidity Line (PLL) has filled important gaps, but the use of these new instruments has been limited. Further Fund reforms stalled because of the difficulty in building consensus for the broad and complex set of issues.
- The adequacy of the GFSN continues to be a topic of international debate, with little agreement on its respective strengths and weaknesses. The objective of this paper is to build consensus around a common diagnosis to help identify whether and where there is a need for further reform.

Diagnosis: Important gaps remain in the architecture

The GFSN is larger, but more fragmented and with uneven coverage...

- The GFSN has grown significantly since the global financial crisis, reflecting the continued accumulation of reserves and the expansion of the official bilateral and multilateral arrangements. The growing relative importance of BSAs and RFAs—some of which are untested—has led to a more decentralized and uncertain safety net, while the lack of coordination across elements has resulted in fragmentation.
- The coverage of the safety net is also uneven, with sizeable financing gaps in many economies, especially systemic and gatekeeper emerging markets (EMs)—even when assuming full access to all GFSN elements—undermining its effectiveness in preventing contagion.

...and it remains too costly, unreliable, and conducive to moral hazard.

- Most GFSN elements are very costly—either financially (reserves and market-based instruments) or politically (due to stigma—the Fund and, to some extent, RFAs). Some also entail global costs (reserves).
- Inadequate predictability of many GFSN resources (in particular BSAs and RFAs) and the lack of reliable cover for the full duration of shocks (most elements provide time-bound support) incentivize an over accumulation of reserves.
- The GFSN fails to provide appropriate incentives to ensure sound policies due to fragmentation and lack of adequate policy content in most elements, raising the risk of crises and encouraging facility shopping.

Moreover, there are shortcomings for most country groups, for whom coordinating between the different elements remains a challenge.

- Reserve currency-issuing advanced economies (AEs) are best served by the current GFSN, while non-systemic non-gatekeeper EMs are the least adequately served. Systemic and gatekeeper EMs also have inadequate predictability and reliability (from BSAs and RFAs), and high financial costs (from reserve accumulation) or political costs (from stigma associated with Fund financing).
- Most countries would need to use several elements of the safety net to fully cover their financing needs, which could raise coordination issues, in particular for vulnerable EMs and AEs.

Moving forward: Building a new multilateral consensus for reform

- Many weaknesses of the current safety net are longstanding and were starkly revealed during the global financial crisis.
- With ongoing transitions and escalating risks in the global economy, the recent implementation of the 2010 Quota and Governance reforms, and another five years of experience since previous discussions, now is an appropriate time to revisit reforms to strengthen the GFSN.
- Initial reforms could aim to strengthen the Fund and its cooperation with the different elements. Such a system could be more effective globally but would require significant reforms to the Fund.
- As within the Fund, there is increasing attention to these systemic issues from the international community. A follow-up IMF staff paper could help lay out more specific proposals to identify possible avenues for reform.

Approved By
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INTRODUCTION

1. **The Global Financial Safety Net (GFSN) is comprised mainly of countries' own reserves and external public sources of insurance and financing.** The main external official arrangements are central bank bilateral swap arrangements (BSAs), regional financial arrangements (RFAs), and the Fund. The safety net seeks to provide countries with insurance against crises, financing when shocks hit, and incentives for sound macroeconomic policies.
2. **Disagreements exist on the shortcomings of the safety net.** While there is general consensus that there is something wrong with the GFSN, no one agrees on what is actually wrong or what needs to be done, partly because the safety net serves different purposes for different groups of countries. For some, the problem is the accumulation of reserves and their resulting adverse impact on global macroeconomic outcomes. For others, it is the inadequate size or coverage of the GFSN. Many of these issues are longstanding, but the lack of agreement on needed reforms has so far impeded taking major steps toward improving the system.
3. **The Fund accelerated efforts to reform after the global financial crisis, but the reforms were only partially successful.** A wide range of solutions were proposed following the global financial crisis (GFC) in response to a renewed push to strengthen and reform the GFSN, including the Fund. The Fund overhauled its surveillance and policy tools, approved significant changes to its governance, increased its size, and introduced new crisis prevention instruments with ex-ante conditionality (FCL and PLL) (IMF, 2016). Reforms to Fund's lending framework reflected efforts to provide insurance for countries in light of the changing nature of risks and their transmission across borders while maintaining conditionality standards and adequate safeguards for Fund resources. Experience to date has shown that the FCL and PLL were important reforms to the GFSN, but their use has been limited. Other past proposals (e.g., to improve global coordination and provide rapid short-term liquidity to countries with sound fundamentals in the event of a systemic crisis) received only limited support. Some countries were concerned about moral hazard issues and saw the need to delay further reforms until the impact of the post-crisis reforms could be reviewed and an assessment made on whether any gaps in the GFSN remained. Others asked for progress on quota and governance reform before considering further Fund reforms.
4. **Difficult conditions going forward are likely to increase demand for strengthening the GFSN, especially against the backdrop of more limited policy space.** The global economy is facing a prolonged period of uncertainty caused by ongoing structural shifts. China is transitioning. Commodity prices have experienced an unprecedented decline. Monetary policies are diverging in the main reserve currency countries. As a result, tighter and more volatile global financial conditions are likely to persist. Moreover, the policy space to adjust to potential shocks is more limited now compared to the time of the GFC; public debt has increased, policy rates are near the lower bound, and political support for difficult structural reforms is waning as social issues come to the fore. These issues are all likely to manifest themselves in increasing demand for a strong GFSN to minimize crisis risks, reduce contagion, and provide support for adjustment.

5. Now is the right time to re-assess the adequacy of the safety net and reach agreement on future reform priorities. The experience of more than five years since the passage of the earlier reforms, the recent implementation of the 2010 Quota and Governance reforms, as well as the ongoing transitions and escalating risks in the global economy, suggest that now is an opportune time to reassess the adequacy of the GFSN. The purpose of this paper is to build consensus around a common diagnosis to help clarify the potential gains from further reform. Section II of this paper provides context: The global economy has become more integrated necessitating a properly functioning GFSN and stronger surveillance. In response, the current GFSN has expanded but at the cost of more fragmentation, and remains underused. Section III then provides a diagnosis, first, of the GFSN elements, and second, collectively of the entire system. Section IV provides the outline of a reform agenda. A follow up paper could lay out in more detail possible reform options.

INTEGRATION AND FRAGMENTATION

A. A More Integrated Global Economy

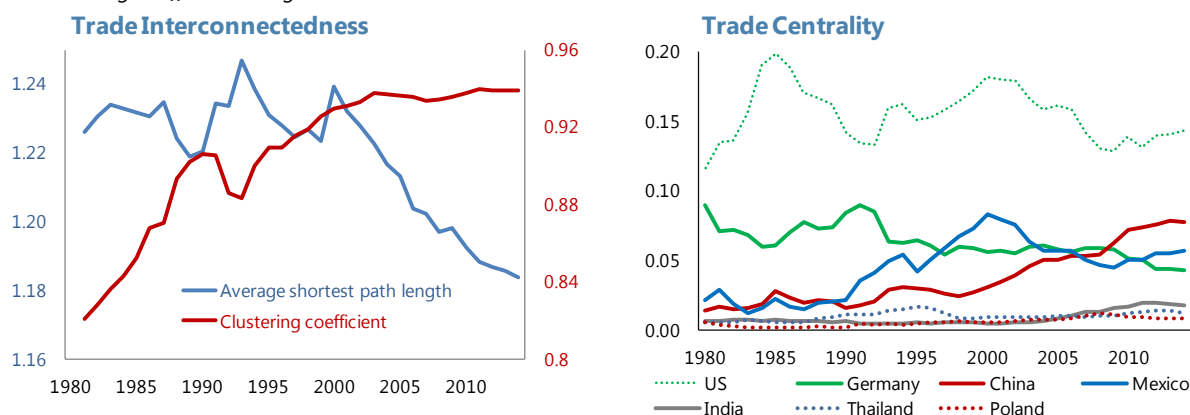
6. Sustained growth in emerging market economies is transforming the global economy. Robust growth rates over a prolonged period in Emerging Markets and Developing Countries (EMDCs) have contributed to an increase in their share of the global economic activity. EMDCs are now home to 85 percent of the world's population and produce 40 percent of global GDP (at market prices).

7. Against this backdrop, trade integration has proceeded at a rapid pace, resulting in a more multi-polar supply network, with the hubs of the networks moving over time from AEs to EMs. The global trade network has become more interconnected through both an increase in the number of links among countries and more country clustering (Figure 1). These trends have partly reflected the rapid integration of the EMDCs, with China now accounting for 10 percent of global trade and EMDCs representing 38 percent (up by 16 percentage points since 2000). More generally, the development of supply chains in Southeast Asia, Eastern Europe, and North America have led to a more integrated and complex global trade network.

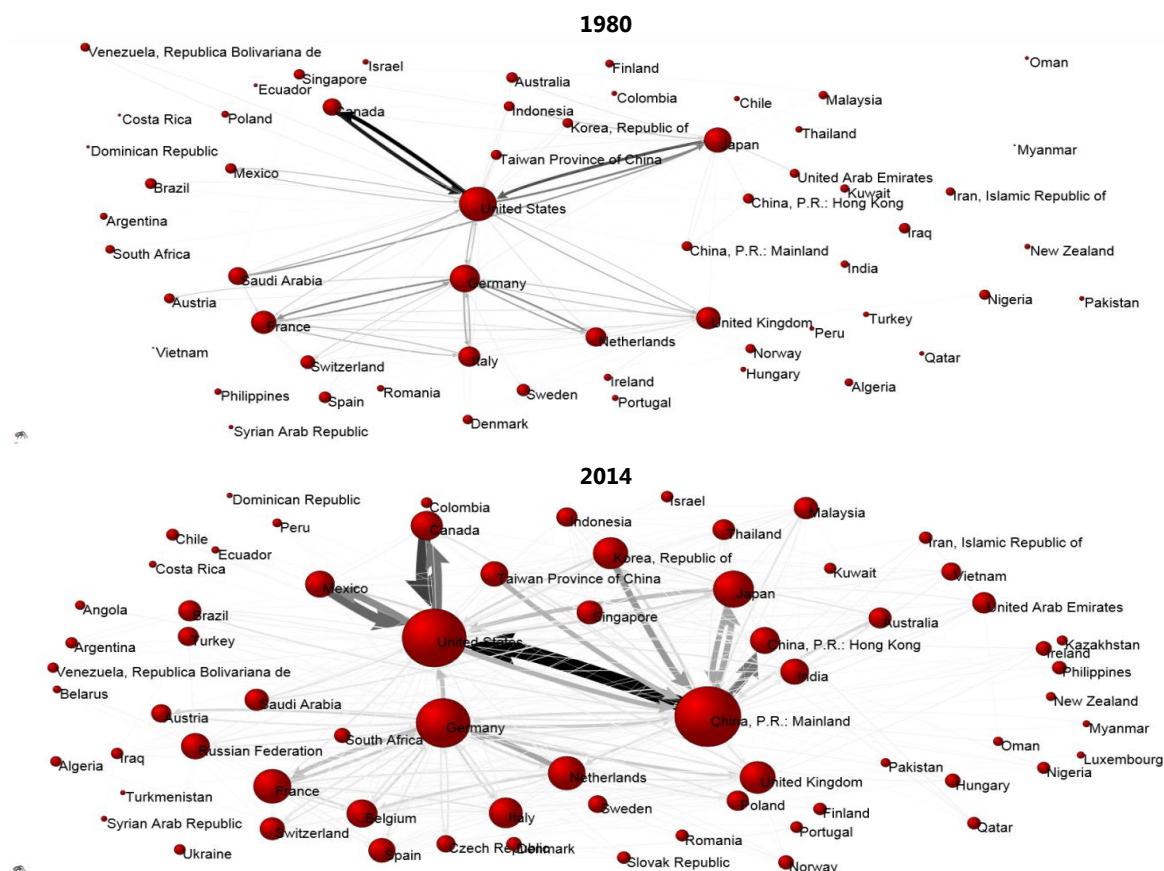
Figure 1. Trade Integration

The global trade network has become more interconnected, with the average path length falling and the clustering coefficient rising.

This reflects largely the rising importance of emerging markets, like China and Mexico.



The emergence of the EM trade hubs and associated multi-polarization is also confirmed by network analysis.



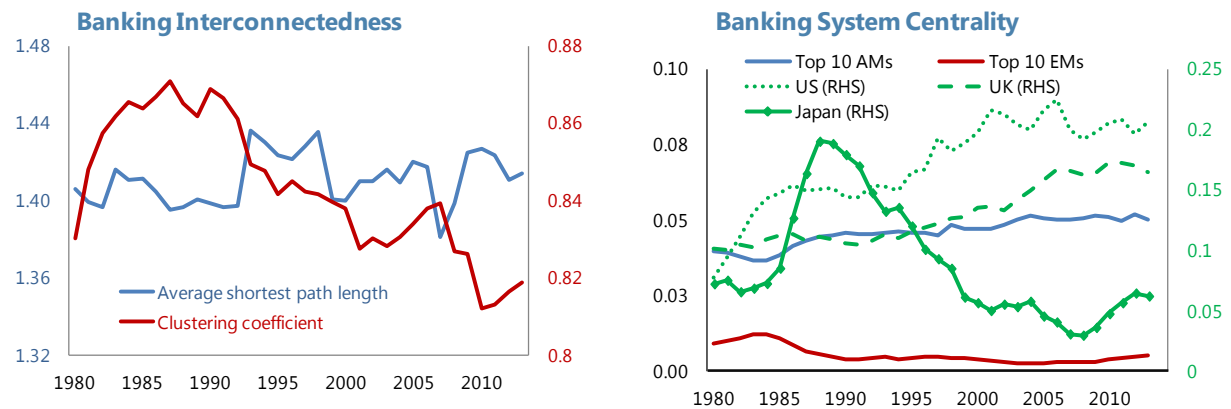
Note: The **shortest path length** measures how many steps are needed to reach one country from another. A more connected network will have most countries directly connected with each other, with the shortest path length tending to 1. The **clustering coefficient** measures the number of observed complete transitive relations (triplets of countries that are connected) divided by number of all ones, e.g., it measures the proportion of any country's partners who are partners amongst themselves. A country's importance in the network is measured by its **eigenvector centrality**, normalized to sum to 1. In the network charts, the **size of the links** is proportional to the US dollar value of the real cross-border trade flows deflated by US CPI, and the **size of the node** is proportional to the size of the country's exports and imports. Connections smaller than US\$3 billion are dropped in the 2014 network for ease of exposition.

Sources: DOTS; Pajek; and IMF staff estimates.

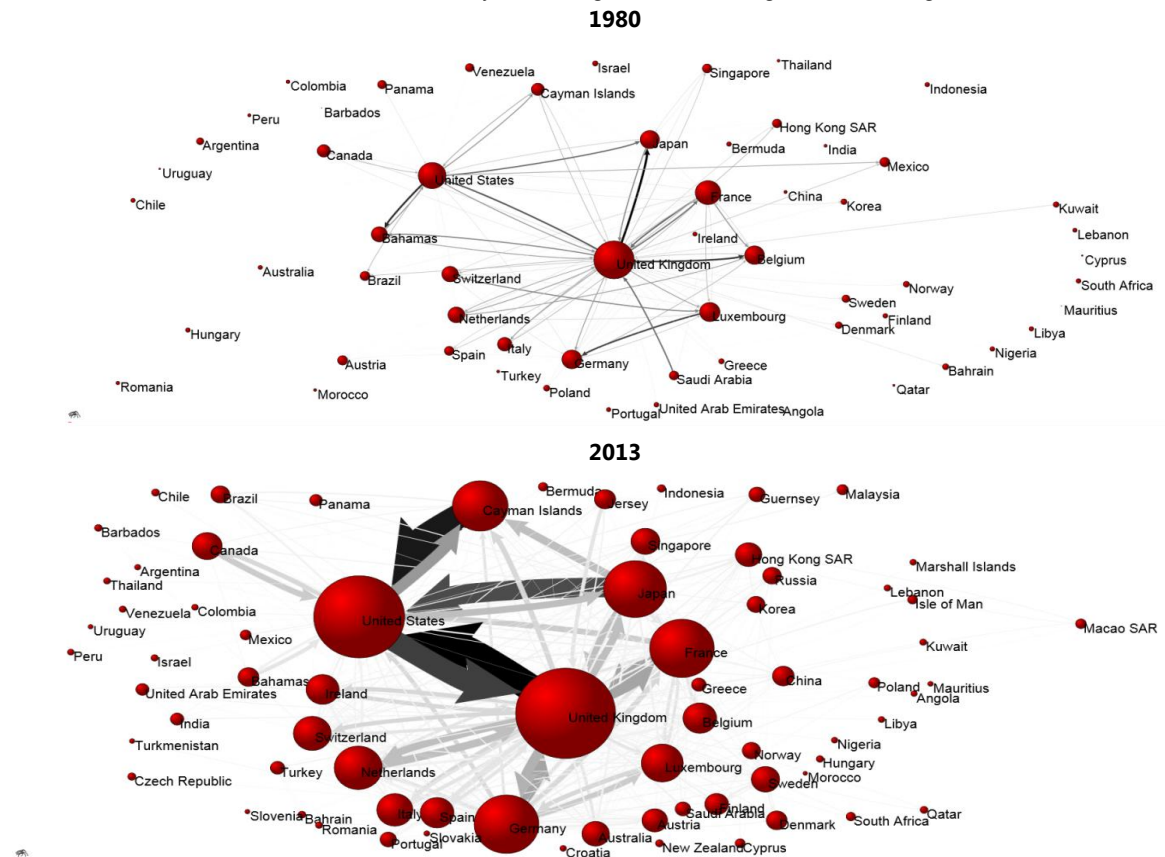
Figure 2. Banking Integration

While the global banking network has not become more interconnected in terms of the number and configuration of links...

...key advanced markets have become even more central...



...and the size of these links has risen dramatically, increasing the risk and magnitude of contagion.



Notes: The **shortest path length** measures how many steps are needed to reach one country from another. A more connected network will have most countries directly connected with each other, with the shortest path length tending to 1. The **clustering coefficient** measures the number of observed complete transitive relations (triplets of countries that are connected) divided by number of all ones, e.g., it measures the proportion of any country's partners who are partners amongst themselves. A country's importance in the network is measured by its **eigenvector centrality**, normalized to sum to 1. In the network charts, the **size of the links** is proportional to the US dollar value of the real cross-border BIS asset and liability positions deflated by US CPI and the **size of the node** is proportional to the size of the country's bank cross-border assets and liabilities. Connections smaller than US\$3 billion are dropped in the 2013 network for ease of exposition.

Sources: BIS; Pajek; and IMF staff estimates.

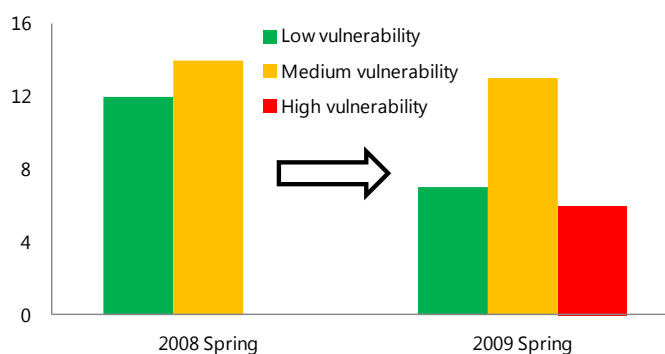
8. Global financial integration has also increased, but mainly reflecting larger exposures, with the advanced economies remaining at the center of the network. Unlike the trade network, the global banking network has not become more interconnected in terms of the number and configuration of links, and the EMs have not taken on a larger role. But the average size of the network links has more than doubled (in real terms) since the 1980s, while the size of the largest link has increased more than tenfold (Figure 2). Advanced economies (AEs) largely dominate the banking network, with key advanced economies (e.g., the US and the UK) becoming even more “central”. The connectivity of the global banking network has tended to rise prior to financial crises (and fall after crises).¹ There has been also a shift in private financing—particularly debt financing—from banks to (less regulated) nonbanks, for both AEs and EMDCs. The share of cross-border liabilities intermediated by nonbanks rose to more than half by end-2014, generating new risks (IMF, 2016).

9. Higher trade and financial integration raise the risk of systemic liquidity crises.

When there is a need for foreign currency liquidity, which a domestic central bank cannot print, governments’ ability to provide liquidity to markets (through foreign exchange intervention) or directly to market participants (as in an emergency loan to a bank) is constrained by its access to the GFSN (Obstfeld, 2011). Moreover, a large number of gatekeeper and systemic countries increases the potential transmission channels for large spillovers and systemic events (Box 1).

10. Without prompt liquidity provision, innocent bystanders can quickly become vulnerable during systemic crises. Countries with relatively strong fundamentals (innocent bystanders) are not exempted from liquidity shocks, as a rise in global risk aversion can prompt investors to deleverage across the board. For example, among all the EM innocent bystanders at the beginning of the global financial crisis, the number of countries with low vulnerabilities was almost halved within one year, and a third of the original innocent bystanders became highly vulnerable one year into the crisis.²

EM “Innocent Bystanders” Affected by the Global Financial Crisis



Source: IMF (2011b).

¹ Minoiu and Reyes (2013) also provide evidence of repeated structural breaks around waves of capital flows.

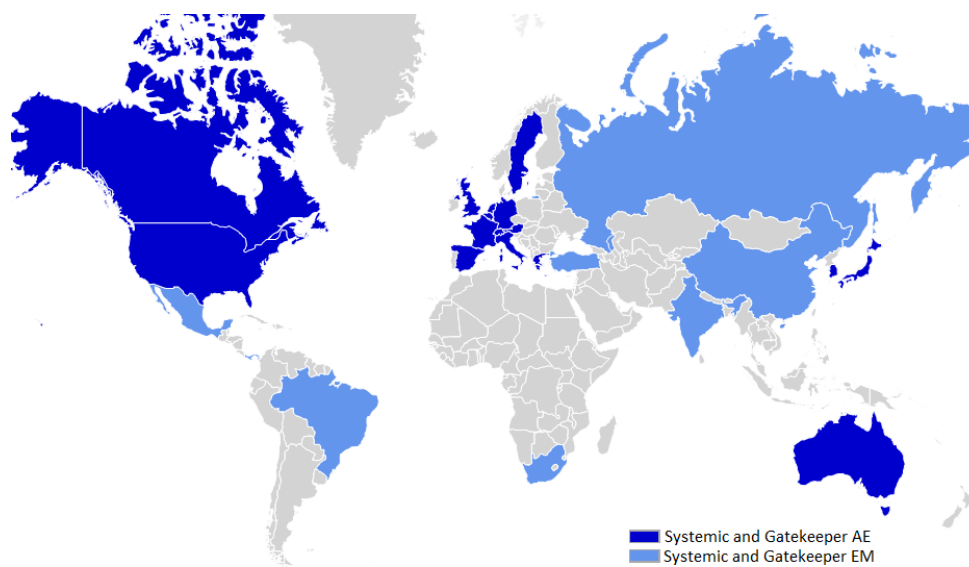
² Innocent bystanders are defined as countries that had low or medium vulnerability ratings (based on the Vulnerability Exercise; See IMF, 2010b) but were nonetheless affected—with significant financial stress or output loss—in a systemic event. Innocent bystanders can include both AEs and EMDCs, but vulnerability ratings for AEs and DCs are only available after the eruption of the GFC. Due to this data limitation, the text figure includes only EM innocent bystanders. The list of countries affected by the global financial crisis is from IMF (2011b). All countries moved by at most one notch, that is, no country moved from low to high vulnerability within one year.

Box 1. Systemic and Gatekeeper Economies

We define two categories of countries—systemic and gatekeeper countries—that are potentially important in transmitting spillovers and systemic events (see map below and Annex I).

Systemic countries are economies with significant contributions to the global trade and financial networks. More precisely, countries are ranked based on an index which takes into account, at equal weights, the size of countries' contributions to the global markets (trade or financial, the latter measured in terms of bank credit and portfolio investment) and their centrality in the respective network (measured by the eigenvector centrality, which captures how connected the country is by giving a higher weight to connections to more connected counterparties). If a country is in the top 25 countries for each year during 2011–14 for trade, and either each year during 2011–13 for bank credit or each year during 2011–14 for portfolio investment, then it is defined as a systemic country. Systemic AEs comprise Australia, Belgium, Canada, France, Germany, Italy, Japan, Korea, Netherlands, Singapore, Spain, Switzerland, the UK, and the US. Systemic EMs comprise Brazil, China, India, Mexico, and Russia.

Gatekeeper countries are economies that belong to multiple clusters and can act as transmitters of shocks between clusters. Gatekeepers are identified following the methodology in IMF (2012a-b) using global trade and financial data for 2011–13, where financial data comprises asset and liability positions using BIS locational and consolidated bank credit, FDI, and portfolio data. The analysis is done on an aggregate network, which consolidates these five networks, after dropping insignificant links that blur the network. The pruning threshold is determined for each year to maximize the number of non-overlapping clusters, and is broadly stable at 12.3 (out of a range of 0–100). The aggregate link between country pairs is defined as a geometric average of the link weights that are above the threshold, unless the difference between the smallest and largest link weight is greater than 50, in which case the largest weight is used. This is done to preserve countries that are, for example, particularly important in the financial networks, but are negligible in the trade network (e.g., Cyprus and Luxembourg). Clique Percolation Method then identifies a number of potentially overlapping clusters with varied membership size. Country groups which are interconnected are considered “clustered.” Gatekeepers are countries that belong to multiple clusters, and thus act as links through which trade or financial conditions can be transmitted from one cluster to another. Gatekeeper AEs comprise Austria, Germany, Greece, Italy, Japan, Singapore, Spain, Sweden, Switzerland, the UK, and the US; most of these countries are also systemic. Gatekeeper EMs are Brazil, China, Panama, South Africa, and Turkey.



Source: IMF staff estimates.

11. Countries have responded by building reserves, with implications for the global economy. EMDCs, in particular, have more than doubled their foreign exchange reserve holdings as percent of GDP since the beginning of the 1990s.³ This self-insurance is not only very costly for the countries accumulating reserves, but it also entails potential systemic costs and coordination problems that can undermine the resilience of the international monetary system and reduce global demand (Obstfeld, 2011).

12. Strong domestic policies, global policy coordination, and higher reliance on market-based instruments can help reduce the need for reserve accumulation. For example, enhanced exchange rate flexibility, global financial regulation, including coordination of regulatory measures between source and recipient countries, and better regulation and management of capital flows could help reduce the demand for reserves. The need for additional official resources could also be reduced through sovereign debt restructurings (IMF, 2016) or private sector liquidity support (e.g., explicit private sector commitments to maintain exposures, such as the European Bank Coordination Initiative during the GFC). Moreover, market-based contingent financial instruments could be used to insure against adverse macroeconomic shocks. By transferring risks to private capital markets, these instruments (e.g., commodity price hedges, catastrophe bonds, and GDP-linked bonds) can provide policy space to sovereigns under specific adverse shocks and help prevent liquidity crises.⁴ Their use, however, remains limited at present due to market distortions (Box 2).

13. But there is no substitute for a strong GFSN to support the global economy. While global policy coordination and market-based instruments are helpful in containing the demand for financial safety net resources, they are unlikely to fully substitute the public safety net. A strong GFSN, in addition to its main objectives, would also help reduce reserve accumulation and lower sovereign risk premiums, which in turn will help reallocate capital to where it would be most productive, raising global investment and productivity. These benefits, combined with the GFSN's role of a lender-of-last resort, make a compelling argument for a strong global safety net to support the global economy.

³ Reserve accumulation has been uneven across countries (Figure 3), and has also served other purposes, such as exchange rate management and intergenerational wealth transfer.

⁴ Such instruments may not be able to provide adequate support for systemic liquidity crises, if their predefined underlying state is not triggered.

Box 2. Market-based Financial Instruments

Sovereigns can utilize a broad range of market-based contingent financial instruments to insure against specific risks. These instruments can be customizable and are based on a price mechanism that can help limit moral hazard in the system. However, several structural and technical impediments have inhibited their wider use.

Market-based contingent financial instruments can help sovereign issuers insure against adverse shocks, providing countercyclical policy space. Sovereigns can use several types of financial contracts—e.g., hedging instruments, catastrophe (cat) bonds, or GDP-linked securities—to explicitly transfer risks to private capital markets by paying a premium in “good times”.¹ This gives resilience to government repayment capacity, reducing the need for procyclical fiscal tightening and providing policy space in “bad times”. Annex II provides some examples of such instruments in recent use.

Several structural and technical impediments could explain the limited use of such instruments.

- *Adverse selection and first-mover issues.* On the demand side, because inherently riskier sovereigns are most likely to insure, negative signaling effects make potential holders reluctant to hold these ostensibly risky instruments. On the supply side, the upfront costs from being the first mover are high while the benefits are non-excludable, which disincentivizes sovereigns from issuing altogether, delaying the development of a critical, sufficiently liquid market mass. Consider the current challenge to GDP-linked bond markets: the first issuer would issue into a nearly incomplete market, making the instrument unattractive for holders seeking to diversify risk; however each successive sovereign issuer would face increasingly lower costs as the potential marginal benefit from diversification to the holder increases. IFIs could play a supportive role in mediating these issues, such as by providing guarantees or promoting greater coordination among issuers.²
- *Insufficient market architecture.* The lack of standard pricing models for these often complex instruments pose challenges, including difficulties in estimating event probabilities *ex ante*. The lack of sufficiently-developed regulatory and statistical frameworks can hamper market efficiency and further limit such instruments’ widespread use by increasing transaction costs; IMF (2011b) estimates that approximately 35 percent of sovereign risk insurance premium paid by DCs relative to middle income countries is attributable to transaction costs.³
- *Political economy considerations.* Issuers and holders of contingent instruments could be optimizing over different time horizons, as holders participate for a share of the issuer’s long-term upside potential, while issuers, often facing shorter-term electoral cycles, attach little weight to benefits realized in the future. For a market to be made, issuers should be more optimistic than holders on long-term outcomes.

^{1/} Risks can similarly be transferred via risk pooling mechanisms to other sovereigns.

^{2/} The World Bank has participated in the issuance of cat bonds, such as the 2014 cat bond for the Caribbean Catastrophe Risk Insurance Facility, covering 16 Caribbean countries.

^{3/} These include costs associated with data availability, in addition to equipment availability, portfolio size, and regulatory compliance. Ibid.

B. A Larger but More Fragmented GFSN

14. The GFSN comprises international reserves, official arrangements, and market-based instruments through which countries have access to insurance and financing. At the country level, foreign exchange reserves are an important source of self-insurance. External public sources of insurance and financing include central bank BSAs, RFAs, and Fund resources.⁵ From the wide range of market-based instruments, we only assess commodity price hedges, as most other instruments are still insufficiently developed and used (Box 2 and Annex II).

15. The objectives of the GFSN are three-fold: (i) to provide *insurance* against idiosyncratic and systemic crises, including to stem contagion and ring-fence innocent bystanders; (ii) to supply *financing*, when shocks hit, supporting smooth policy adjustment and an appropriate mix between financing and adjustment; and (iii) to incentivize sound macroeconomic *policies* to prevent a build-up of external imbalances (and minimize crisis risks), and support the adjustment of external imbalances.

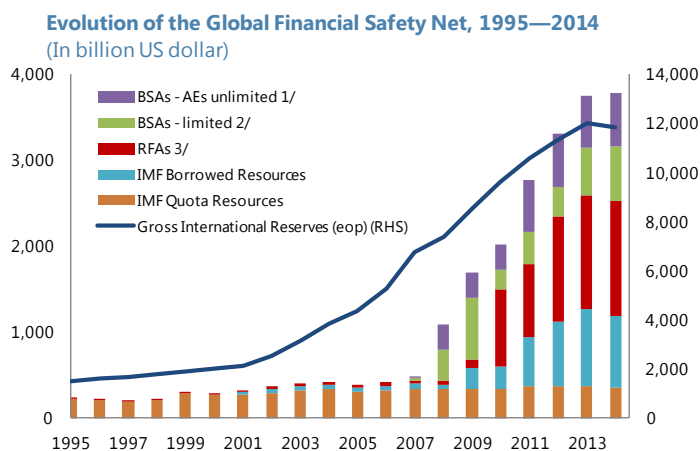
16. Prompt provision of liquidity is particularly important for ring-fencing innocent bystanders and limiting contagion. The quick transformation of innocent bystanders into vulnerable countries during the GFC was not only due to the severity of shocks, but also to the inadequacy of the GFSN.⁶ In practice, however, it is often difficult to clearly distinguish between liquidity and solvency problems; as extensively documented in the literature, the former could quickly turn into the latter. This calls for flexibility in providing different types of support and in changing the balance between financing and adjustment as circumstances change.

⁵ Compared to IMF (2011b), we exclude from the definition of the GFSN other multilateral institutions, such as multilateral and regional development banks, which are largely concerned with the provision of development financing. However, while these institutions are not included in the overall assessment of the safety net, they are mentioned in the discussion of the safety net for DCs. Also, we include market-based instruments such as commodity price hedges, but exclude other forms of private sector liquidity support (e.g., support provided by banks, discussed in the global economy section).

⁶ Access to central bank swaps was very limited, especially for EMs; European firewalls were non-existent and other RFAs were small and largely untested; and while countries could tap Fund financing, only around 40 percent of the innocent bystanders obtained Fund arrangements. Countries that sought Fund assistance promptly managed to maintain their vulnerability ratings one year into the global financial crisis.

A Larger GFSN

17. The size of the safety net has expanded significantly since the global crisis. This reflects continued accumulation of reserves and an expansion of all its public elements (BSAs, RFAs, and the Fund).⁷ Given overlaps between some of the elements, for example, reserves and some RFAs, simply adding the size of the individual layers of the GFSN overstates its overall size. Nevertheless, the safety net has substantially expanded since 2007. The use of market-based instruments (commodity price hedges) has remained limited, although it has picked up in response to the increased volatility in commodity prices since mid-2000.



1/ Unlimited swap arrangements are estimated based on known past usage or, if undrawn, on average past maximum drawings of the remaining central bank members in the network. Two-way arrangements are only counted once.

2/ Limited-value swap lines include all arrangements with an explicit value limit and exclude all CMIM and NAFA arrangements, which are included under RFAs. Two-way arrangements are only counted once.

3/ Based on explicit lending capacity/limit where available, committed resources, or estimated lending capacity based on country access limits and paid-in capital (see Figure 5).

Sources: Bank of England; Central Bank websites; and IMF staff estimates.

Reserves

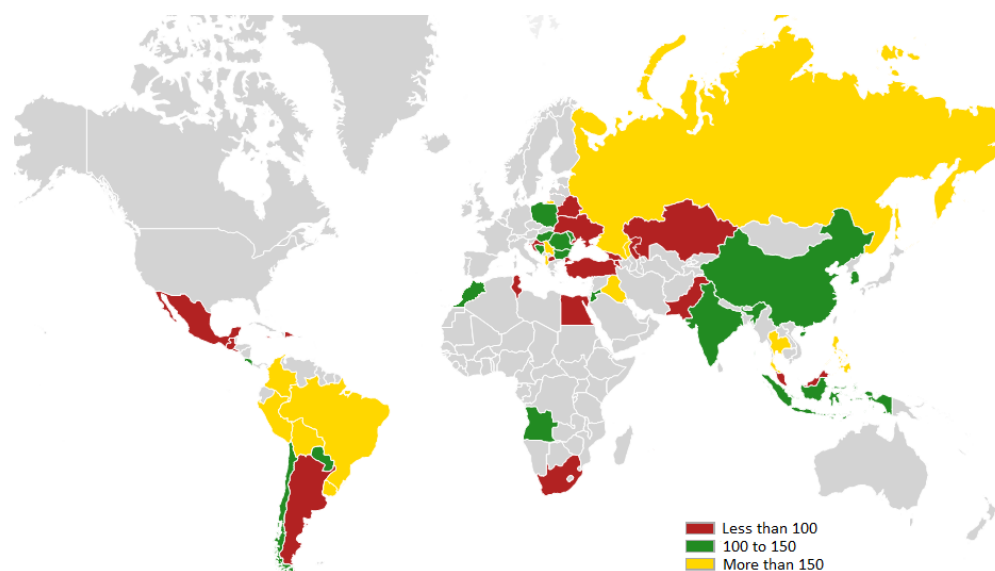
18. The period of rapid global reserve accumulation that began in the early-2000s continued through the crisis. Reserves grew from about US\$2 trillion in 2000 to about US\$12 trillion by end-2013, two thirds of which are held by EMs. Reserves (in U.S. dollar terms) declined somewhat in 2014, reflecting valuation changes and their use to contain exchange rate pressures (in some pegged or managed exchange rate regime countries) and to mitigate the decline in oil revenues (for some oil exporters, e.g., Russia and Saudi Arabia).

19. Reserve coverage varies widely across countries. According to the Fund's ARA metric, many EMs fall short of the 100–150 percent adequacy range (Figure 3). Notably, there is significant regional variation, with some countries in Eastern Europe and Latin America assessed to be under-insured. However, a number of countries across several regions have accumulated excessive reserves.⁸

⁷ For the purposes of this paper, the swap arrangements under the Chiang Mai Initiative (CMI), Chiang Mai Initiative Multilateralization (CMIM), and North American Framework Agreement (NAFA) are included in the RFA element of the GFSN, rather than the BSA element.

⁸ The metric adjusts for exchange rate regimes, since countries with fixed exchange rate regimes are likely to need substantially more reserves than those with flexible exchange rate regimes. However, it does not account for non-precautionary factors behind accumulating reserves, e.g., savings for intergenerational equity, notably for countries endowed with non-renewable resources, or export-led growth strategies.

Figure 3. Foreign Exchange Reserve Coverage for Emerging Markets, end-2015
(Reserves in percent of ARA metric)



Source: IMF staff estimates.

Bilateral Swap Arrangements

20. Bilateral swap lines between central banks expanded dramatically during the crisis.

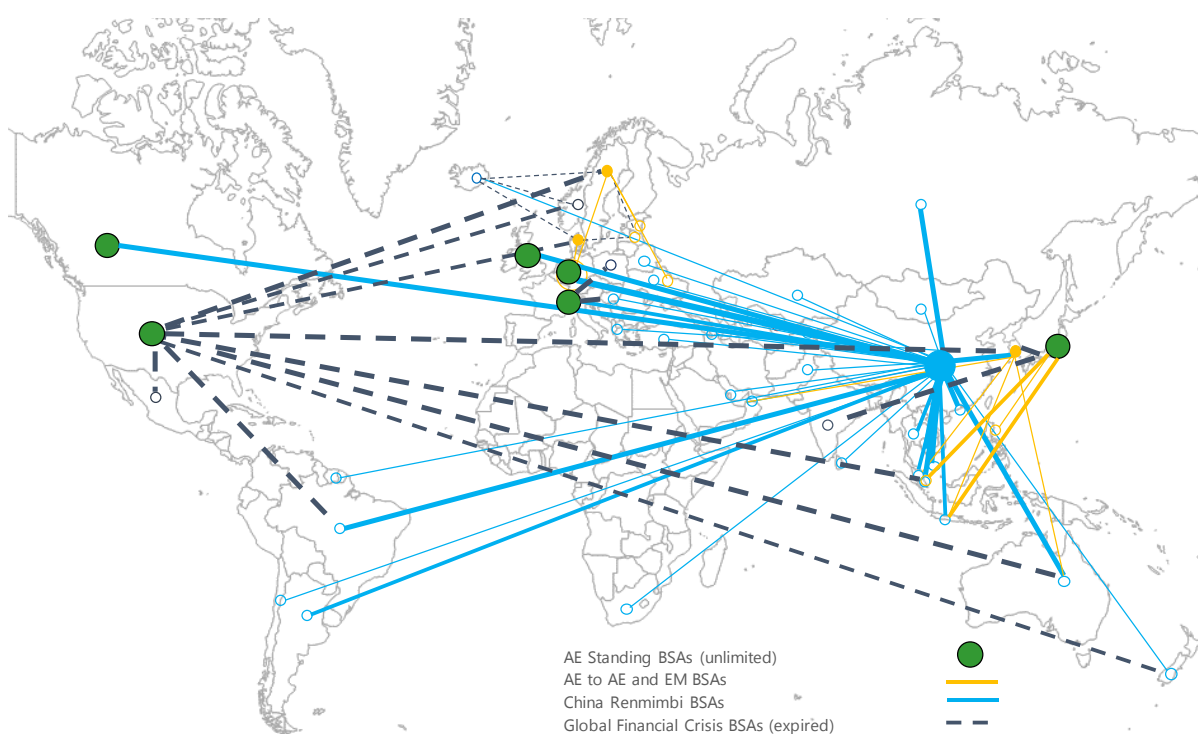
The number of arrangements increased from a few at the beginning of 2007 to around 40 by end-2009 (Figure 4). Two distinct groups of swaps emerged: (i) a small number of large or unlimited agreements between the six reserve currency-issuer AE central banks—the European Central Bank (ECB), the Federal Reserve Bank (Fed), Bank of Canada (BoC), Bank of England (BoE), Bank of Japan (BoJ), and the Swiss National Bank (SNB); and (ii) agreements between reserve currency central banks and a limited number of other AE and EM central banks, for example, the Fed dollar swaps to Brazil, South Korea, and Singapore, and the ECB euro swaps/repurchase agreements with Hungary, Latvia, and Poland. The objective of these swaps was to support financial institutions by addressing elevated pressures in dollar and other reserve currency funding markets.

21. Since the crisis, the network of swap arrangements has further evolved. In 2011, the core AE central banks formalized their internal network of swaps, and in 2013, announced that they would remain in place indefinitely as a backstop for easing future strains in financial markets.⁹ In contrast, most of the similar swaps to other (non-core) AEs and EMs expired. A small number of swap lines remain in place for short-term liquidity provision in the event of capital outflows (e.g., Bank of Japan's arrangement with Bank of Indonesia). However, the global

⁹ There are currently unlimited standing BSAs between the ECB, the Fed, BoC, BoE, BoJ, and the SNB; for further details, see <http://www.federalreserve.gov/newsevents/press/monetary/20131031a.htm>.

network is now dominated by China's extensive network of renmimbi swap lines, with over 30 lines in place at end-2015, equivalent to around US\$500 billion (Figure 4). These arrangements account for around three quarters of all limited-value global bilateral swaps and around 85 percent of their total value. The stated intention of these swaps is to support trade and investment, and promote the international use of renmimbi.¹⁰ Their duration is typically of about 3 years, and their size varies from the equivalent of a few billion US dollars to up to US\$60 billion.

Figure 4. Bilateral Swap Arrangement Coverage by Country, end-2015



Note: The Global Financial Crisis BSAs denote swaps established or expanded during the 2008-09 period, which have subsequently expired and have not been replaced. For all the limited-value BSAs, line thickness denotes the maximum size of the arrangement in U.S. dollar terms.

Sources: Bank of England; and IMF staff estimates.

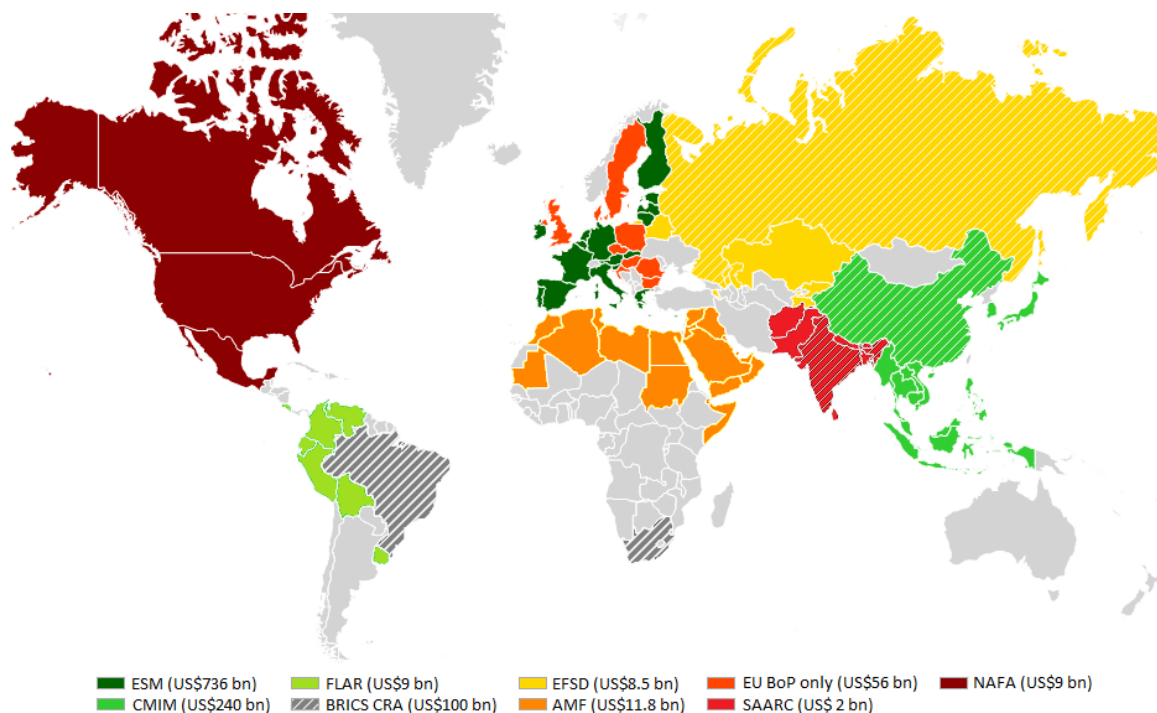
¹⁰ The swaps play the role of facilitating additional trade once the official limits on the renminbi available for trade settlements have been met.

Regional Financial Arrangements

22. Since the crisis, new arrangements/facilities have been established and resources under the existing RFAs have been increased (Figure 5):¹¹

- The new facilities introduced in Europe were: (i) the European Financial Stabilisation Mechanism (EFSM), with a lending capacity of €60 billion, to mirror the existing BoP assistance facility for all EU member states; and (ii) the temporary European Financial Stability Facility (EFSF) and, its successor, the permanent European Stability Mechanism (ESM), with a combined lending capacity of about €700 billion for crisis resolution in the euro area. The ESM is an important component of the comprehensive strategy designed to safeguard financial stability within the currency union—currently the only RFA of this kind.
- The Chiang Mai Initiative (CMI), comprising a network of bilateral swaps, was reformed in 2010, to become the Chiang Mai Initiative Multilateralization (CMIM)—a multilateral currency swap arrangement aiming to provide regional short-term liquidity, address balance of payments difficulties, and supplement existing international arrangements. The resources of the CMIM were doubled to US\$240 billion, effective from 2014.
- While not strictly a “regional” financing arrangement, the BRICs have also established their own multilateral Contingent Reserve Arrangement (CRA), with total committed resources of US\$100 billion to meet balance of payments pressures, provide mutual support, and strengthen financial stability. The CRA provides support through liquidity and precautionary instruments in response to actual or potential short-term balance of payments pressures.
- The Eurasian Fund for Stabilization and Development (EFSD) was established in 2009 with budgetary contributions of US\$8.5 billion, to assist its members overcome the consequences of the GFC. The EFSD provides financial credits, loans and grants to ensure the long-run economic stability of its members and foster their economic integration.
- Members’ financial contributions to the Arab Monetary Fund (AMF) and the Latin American Reserve Fund (FLAR) have also roughly doubled since the crisis.

¹¹ RFAs are broadly 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, 2013a). RFAs at end-2015 comprised the Arab Monetary Fund (AMF), BRICS Contingent Reserve Arrangement (CRA), Chiang Mai Initiative Multilateralization (CMIM), Eurasian Fund for Stabilization and Development (EFSD), European Stability Mechanism (ESM), European Union (EU) BoP assistance facility, Fondo Latinoamericano de Reservas (FLAR), North American Framework Agreement (NAFA), and South Asian Association for Regional Cooperation (SAARC).

Figure 5. Regional Financial Arrangement Coverage by Country, end-2015

Note: The lending capacity of the RFAs (indicated in brackets) is the explicit capacity/limit where available (euro area and EU facilities, CMIM, NAFA, and SAARC), committed resources (BRICS CRA), or estimated capacity based on country access limits and paid-in capital (AMF, EFSD, and FLAR). The ESM figure also includes outstanding loans under the EFSF. RFAs are ranked based on their average coverage, measured as the RFA lending capacity in percent of the RFA GDP, from high coverage (dark green) to low coverage (dark red).

Source: IMF staff estimates.

The Fund

23. Since the crisis, the availability of and access to Fund resources has also been significantly enhanced, including through:

- a general and a special SDR allocation, totaling more than US\$280 billion in 2009—a near tenfold increase in SDRs. Since SDR allocations are based on quota size, most SDRs were allocated to larger economies. However, EMDCs still received over US\$100 billion, with around US\$20 billion going to DCs, representing, on average, a 20 percent increase in their own reserves;
- increased resources, including through a US\$500 billion expansion of the New Arrangements to Borrow (NAB) and bilateral borrowing agreements of about US\$400 billion. The ratification of the 14th General Review of Quotas has now doubled the Fund's permanent resources to US\$660 billion, resulting in a corresponding rollback in the NAB;

- the overhauling of the lending framework, in particular, the doubling of access limits, streamlining of conditionality, and introduction of new financing instruments that can be treated as precautionary—the FCL and PLL—and for rapid financial assistance—the Rapid Financing Instrument (RFI) and Rapid Credit Facility (RCF). The lending architecture for DCs was revamped in 2010, with new facilities tailored to their needs and a doubling of access limits; access limits were raised again in 2015 (IMF, 2015).

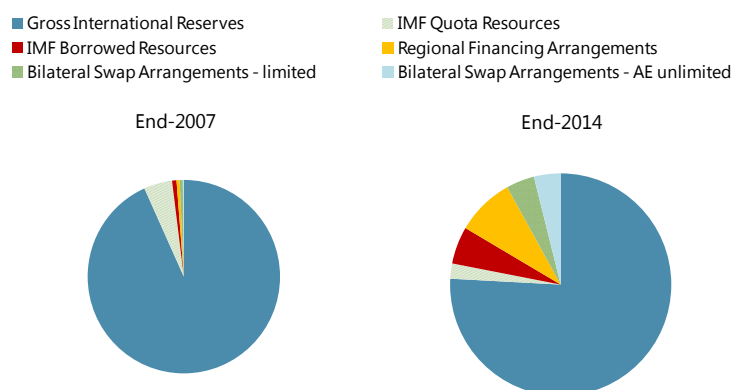
Hedging Instruments

24. Though still sporadic, the use of commodity hedging by sovereigns has grown since mid-2000 in response to increased volatility in commodity prices. Commodity price hedges have been used by both commodity importers (e.g., Morocco and Panama for oil) and exporters (Mexico for oil, Ghana for cocoa, South Africa for gold, and Zambia for copper). In addition to the conventional international commodity exchanges in Chicago, London, and New York, these hedges have been traded on exchanges in Asia and Latin America (established in the 1990s) and, to a more limited extent, in Africa (in Kenya, Mauritius, and South Africa).

A More Fragmented GFSN

25. While reserves still dominate the safety net, the contributions of the public elements, in particular RFAs and BSAs, have increased. The share of international reserves in the total safety net resources has fallen since 2007, but reserves remain the largest component by far. The IMF, the second largest component pre-crisis, has increased its share only marginally, falling behind the RFAs and BSAs. The RFAs and BSAs have expanded the most.¹² The decentralization of the safety net combined with lack of coordination between the various elements has led to an

GFSN Fragmentation



Note: The size of the pie charts reflects the size of the overall safety net.
Sources: Bank of England; and Fund staff estimates.

¹² These calculations are based on the lending capacity of the RFAs, which is substantially higher than the paid-in capital, and include estimates of the limited and unlimited BSAs, with the latter derived based on past usage and unused capacity.

increasingly fragmented safety net.¹³ In addition, the proliferation of the RFAs and BSAs—mostly untested and less predictable sources of financing—has likely increased uncertainty in the system as a whole. These developments are raising concerns about the adequacy and certainty of the safety net’s coverage.

26. The high fragmentation, uneven coverage, and reliance on uncertain resources are also evident at the country level.

Increasing fragmentation has also led to a highly uneven coverage of the GFSN, with some countries having access to unlimited resources (e.g., reserve

currency-issuing AEs), while others can only rely on limited reserves and the Fund (e.g., most DCs).

Coverage across systemic and gatekeeper

economies is also

uneven, with some

having significantly lower

access to GFSN resources

than others. Moreover,

“uncertain” resources

(dashed bars in text figure) are a substantial

portion of the overall

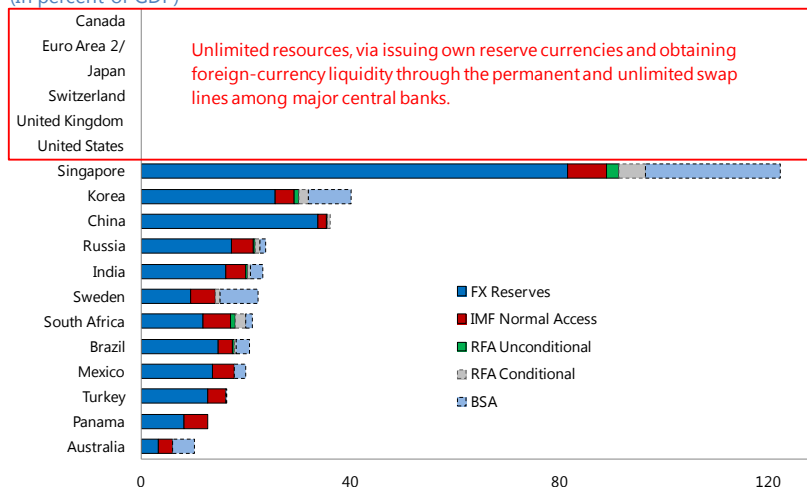
resources available in

some countries, such as

smaller systemic and gatekeeper AEs. A diagnosis is needed to assess how well the current GFSN meets the needs of the global economy.

GFSN Resources for Systemic and Gatekeeper Economies 1/

(In percent of GDP)



1/ The chart shows normal access to Fund resources for all countries—it does not take into account existing Fund arrangements with some of these countries.

2/ The ESM is currently limited and access to ECB liquidity support is subject to certain rules.

Source: IMF staff estimates.

DIAGNOSIS OF THE SAFETY NET

27. The diagnosis provides an assessment of the GFSN’s size and coverage, individual elements, and the overall system—the latter from a borrower’s perspective, as well as a global perspective. It comprises three parts:

- First, we assess the **size and coverage** of the safety net. Is the current size of the GFSN sufficient to meet potential or actual financing needs? Is the coverage adequate, and are all systemic economies and gatekeepers covered?

¹³ Efforts have been made to strengthen the links between some layers of the GFSN, for example, the adoption in 2011 of the G20 Principles for Cooperation between the IMF and RFAs. However, in general, progress in coordinating the different layers remains limited and untested.

- Second, we assess each **element** of the safety net based on five criteria, in line with the GFSN's main objectives. Will resources be available and accessible, and can their terms and conditions be anticipated (**predictability**)? How quickly can resources be activated and disbursed (**speed**)? Do resources provide coverage for the entire duration of the shock? That is, are they state-contingent, or, if time-bound, are they easy to renew or extend as needed throughout the shock period (**reliability**)? What are the financial and political costs (including stigma) of the resources (**costs**)? Do policies associated with the various elements provide the right incentives to prevent a build-up of external imbalances ex-ante and the appropriate correction of imbalances ex-post (**policies**)?
- Third, we provide a diagnosis of the **system** as a whole, first from a **borrower's perspective**, based on the predictability, speed, reliability, and cost criteria, and taking into account the combination of the elements within the safety net, and then from a **global perspective**, based on the same criteria, as well as incentives from policies associated with the various elements. Overall, is the GFSN effective in insuring against risks and limiting contagion, providing financing for crisis resolution, and ensuring sound policies in both crisis and non-crisis times?

A. Size and Coverage

28. Resources under the GFSN would not be sufficient at an aggregate level under a widespread shock. To gauge the size and coverage of the current GFSN, scenario analyses are used to calculate potential financing gaps for each country, defined as the difference between financing needs and total available financing sources (see Annex III for more details on the methodology, assumptions and results).¹⁴ Under a widespread shock¹⁵ and current access levels for the GFSN elements, financing gaps would arise. The GFSN resources, however, would be just sufficient to cover the aggregate financing gap *under very strong assumptions* of full access to all GFSN elements, including that: (i) resources are unlimited under the ESM, and used all the way up to the maximum access limits for the other RFAs; (ii) all active swap lines can be tapped, and all historical lines, especially those extended during the global financial crisis but discontinued after, can be renewed with the same amounts; and (iii) the entire lending capacity of the Fund is deployed (including both the current forward commitment capacity and bilateral loans).

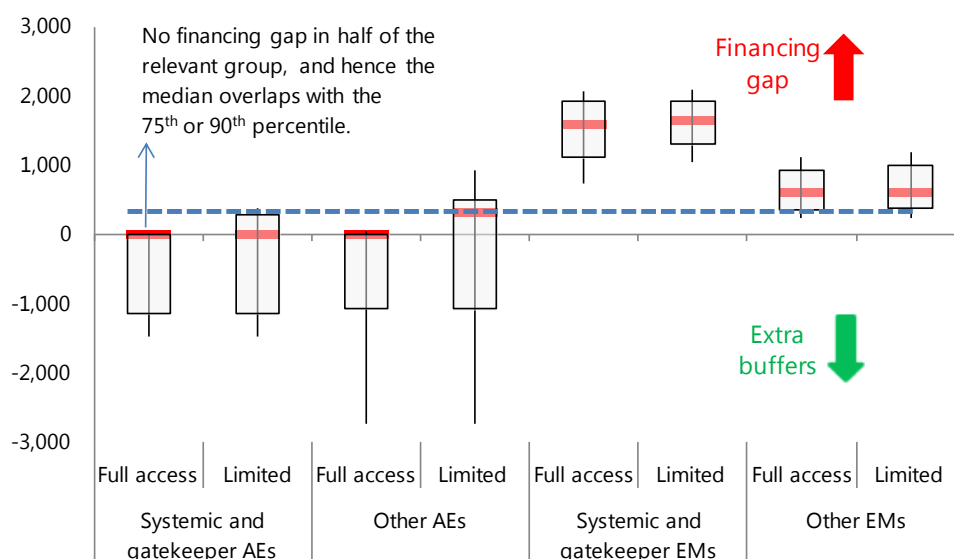
¹⁴ The global shock scenarios and methodology used to estimate country-level and global financing needs is in line with that used for similar analyses in other Board papers on Fund resource needs. The most recent analysis on Fund resources focuses on four scenarios, which differ among each other in two dimensions: the prevalence of shocks and the severity of shocks. The prevalence of shocks is assumed to range from very pervasive (with a crisis probability threshold of 3 percent) to pervasive (with a crisis probability threshold of 5 percent), and the severity of shocks ranges from 75th to 85th percentile of the distribution of shocks based on historical systemic crises. Our assumptions on the supply of financing from the GFSN differ somewhat from previous analyses, as our purpose is to test the adequacy of the GFSN under different assumptions of access to each GFSN element. See Annex III for details.

¹⁵ This is the shock with a crisis probability of 3 percent and a severity corresponding to the 85th percentile of the distribution.

29. Moreover, the coverage of the safety net is uneven and systemic and gatekeeper EMs are insufficiently covered. Under the full access scenario—including unlimited access to the ESM—almost all AEs in the country sample are fully covered by the GFSN or have more than adequate financing resources. In contrast, all EMs but one have financing gaps (before potential Fund engagement), which are particularly large for systemic and gatekeeper EMs (Figure 6). If we assume no swap lines and limited RFA financing, financing gaps would also emerge in some AEs, mainly in the euro area.

Figure 6. Distribution of Financing Gaps by Country Group

(In percent of quota)



Note: The figure depicts the distribution of financing gaps (a positive number indicates a financing gap) before potential Fund engagement (calculated in percent of new quotas), by major country groups, under a widespread crisis scenario, comparing full versus limited access to GFSN elements (Annex III). Only countries with a crisis probability above the 3 percent threshold are shocked and shown in the figure. The boxes and whiskers refer to the 25–75 percentiles and 10–90 percentiles of the distribution, respectively. Red lines depict the median. When the majority of countries in the relevant group have no financing gaps, the median overlaps with the 75th or 90th percentile. The blue dotted line indicates the new cumulative normal access limit of 435 percent of quota.

Source: IMF staff estimates.

B. Diagnosis of the Elements

30. Most elements of the safety net do relatively well in terms of speed and predictability, but less so on reliability, and poorly on cost and policies. Individually, each layer of the GFSN has its own strengths and weaknesses, but none score well against all criteria (Table 1). For example, reserves are predictable but costly, while BSAs can be less predictable but also less costly. RFA resources are in general neither predictable nor reliable, and can take a long time to deploy. Whereas market-based hedging instruments are quick and predictable, they

cannot directly enforce policy commitment. The Fund has important shortcomings on speed and reliability, despite scoring highly on policies.¹⁶ Perhaps most significantly, nearly all GFSN elements score poorly against the cost and policies criteria, highlighting important global inadequacies, which are discussed further under global implications.

Table 1. Characteristics of the Elements

Characteristics	Reserves	Swaps	IMF	RFAs	Hedging
Predictability	2	1	2	1	2
Speed	2	2	1	0	2
Reliability	1	1	1	1	1
Cost	0	2	0	1	0
Policies	0	1	2	1	0

Red (0) = Limited/insufficient, Yellow (1) = Some, Green (2) = Extensive/adequate

Note: While a finer scoring system (e.g., with five or more steps) can better reflect the differences across the GFSN elements, it is also more subjective as the dividing lines between steps are more blurred. To limit subjectivity, a three-step scoring system is used, but the same scores for two elements do not mean that they are exactly the same along that criterion—they just belong to the same broad category. In other words, the scoring is not a relative ranking across the elements; rather it is against some absolute standard of “sufficient” and “insufficient”.

Source: IMF staff estimates.

Predictability

The predictability of the different GFSN components varies from almost certain (reserves, Fund, and market-based insurance) to somewhat certain (BSAs and RFAs). Reserves are readily available and freely useable, while Fund resources are made available subject to access limits and relevant qualification criteria and conditionality. BSAs, however, are increasingly heterogeneous in nature and difficult to predict ex-ante, while RFAs are largely untested.

- **Reserves** are the most predictable source of insurance and financing. Central banks can access them with certainty and flexibility, and deploy them to meet a range of policy objectives (e.g., dampen exchange rate volatility, offset capital outflows, or provide foreign currency to the government or the private sector).
- **BSAs** between reserve currency AEs have predictable access to resources (as central banks can create their own currency reserves on demand) and terms. All other arrangements have formal expiration dates, usually no longer than a few years, and limited access; future access is thus uncertain, and dependent on the domestic policy

¹⁶ The Fund provides financing to its members “temporarily” and under “safeguards”, in order to provide them with the opportunity to correct balance of payments maladjustments without resorting to measures destructive of national or international prosperity. This in turn gives rise to conditioning Fund financing on policy implementation and safeguards, thus preserving the revolving nature of Fund’s limited resources and members’ capacity to repay the Fund.

- considerations of and the non-transparent ex-ante screening by the liquidity-providing central banks.¹⁷
- **Fund** financing instruments used for crisis prevention and resolution purposes are accessible to the near-universal membership, with varying access limits and requirements. The availability of different arrangements that can be treated as precautionary (FCL/PLL arrangements, and Stand-by Arrangements, SBAs) depends on the fulfillment of specific criteria, and access normally varies from 435 percent of quota, net of scheduled repurchases (cumulative access limit for the life of an SBA treated as precautionary) to no cap in access limit (FCL). The Fund may approve financing under various financing instruments (most commonly the SBA) subject to normal access limits, conditionality, and other requirements, while access in excess of normal limits may be approved subject to additional substantive and procedural criteria. Overall, the size of Fund arrangements relative to individual country GDP has grown much larger since the crisis, largely reflecting the impact of the FCL and PLL, but also an increase in the size of SBAs.¹⁸
 - **RFAs** are very heterogeneous with large variation in the availability of resources and less predictable access. Most RFA resources are concentrated within Europe and Asia, and do not cover many EMs, so access is generally more limited. Assistance can also take different forms,¹⁹ and many of these instruments have not yet been tested. Access in some cases depends on the existence of a parallel Fund-supported program (BRICs CRA, CMIM, and to some extent ESM).²⁰
 - **Hedging instruments** for commodity prices are generally available, supported by a well-established market for private sector issuers; however, they are currently used only by a few sovereigns.

¹⁷ Credit risk is managed through ex-ante screening of borrowers by the lending central bank, with criteria varying from institution to institution. While there is no transparent/publicly available information regarding qualification, it is assumed that criteria tend to focus on the strength of a borrower's macroeconomic fundamentals and the perceived repayment risk. The size and duration of arrangements are also important tools to manage credit risk.

¹⁸ For the top ten borrowers in 2012, average Fund credit outstanding amounted to over 7 percent of the country's GDP, compared to 5.7 percent in 2003 and 4.3 percent in 1998.

¹⁹ E.g., loans to members facing balance of payments or other financing needs, currency swaps (e.g., NAFA and CMIM), purchases of member bonds, loans for recapitalization of member banking systems (e.g., ESM) and precautionary insurance (e.g., BRICs CRA, CMIM, and ESM). See IMF (2014a).

²⁰ CMIM and the BRICs CRA require a Fund program to access financing above 30 percent of the access limits.

Speed

Reserves, swaps, and market-based insurance generally deliver rapid deployment of resources in the event of a shock, while the RFAs tend to be slow. The disbursement of Fund resources, meanwhile, is often delayed as parties need to agree on the terms of the financing.

- **Reserves** are the most rapid financing option, consisting of highly liquid securities, which can be accessed and deployed almost immediately by central banks.²¹
- **BSAs**, once established, can provide relatively fast access to resources, in particular for reserve currencies. The speed of activation, however, can vary, depending on the approval procedures of the liquidity-providing central bank. Moreover, swap lines in non-reserve currencies may need to be converted, which could result in further delays.
- **Fund** resources under financing instruments that can be treated as precautionary, such as the FCL and PLL, can be made available relatively quickly, provided that the relevant qualification criteria have been met and commitment fees paid.²² However, in the case of Fund financing in crisis resolution cases, there are often significant lags before the Fund and member countries seeking financing reach understandings on the terms and conditions of a Fund-supported program. These delays are necessary to help set appropriate program conditionality. Moreover, some countries remain reluctant to seek financial support from the Fund early, partly because of stigma, and partly because of their reluctance to adjust. The overall rating in Table 1 reflects the combination of precautionary instruments—relatively quick but not automatic—and financing instruments—slower as appropriate conditionality is set.
- **RFA** resources are generally more difficult to unlock, though speed of access can vary across arrangement and from case to case. Delays in disbursement often occur, due to complex and protracted negotiations to balance borrowers' conditionality and member states' responsibilities to domestic taxpayers (e.g., ESM). Also, stigma could lead to delays in requesting and disbursing assistance, particularly when RFA resources are made available contingent on a Fund arrangement (e.g., BRICs CRA and CMIM to some extent).
- **Hedging instruments** can provide immediate relief in the event of a shock to commodity prices, conditional on the contract design, ensuring a smoothing of export income and reducing the need to use the public safety net.

²¹ According to the latest COFER survey data from Q3 2015, about 60 percent of recorded reserves are denominated in US dollars.

²² Countries with existing precautionary arrangements can immediately access resources.

Reliability

All elements provide only limited coverage for more prolonged crises, with most instruments continuing to be time-bound rather than state-dependent. More specifically, it is unknown ex-ante if the time-bound period of the instruments will correspond to the state-dependent nature of the crisis, with Fund, BSA, and RFA resources requiring renewal or approval of a successor arrangement over the course of the crisis period. In the case of Fund's FCL and PLL, the state of external risks are taken into account in discussions of financing requests and exit from existing arrangements.

- **Reserves** are generally a reliable source of financing, but with diminishing benefits. In EMs, higher reserves have been associated with lower risks of currency crises or liquidity shortages in foreign exchange markets, more space for countercyclical policies during crisis episodes, as well as a more stable consumption path. However, these benefits diminish beyond a certain reserve level (IMF, 2010c, IMF, 2011a, and IMF, 2013b). Reserves have been also proven less reliable for longer shocks, as many countries focus on maintaining reserve levels relative to peers, and are reluctant to use more than about 25 percent of their reserves, given concerns that a large decline in reserves could by itself trigger a crisis (Aizenman and Yi, 2009).
- **BSAs** are typically of short duration and renewable for a further fixed period of time. The renewal of swaps during a crisis can be more than just a formality, especially for the non-reserve currency AE swaps, as liquidity-providing central banks have veto powers, and must ensure that swaps remain consistent with their own mandate and that credit risk is manageable.²³
- **Fund** resources are more reliable than other elements but provide only limited coverage for prolonged shocks. Fund arrangements that can be treated as precautionary are of relatively short duration (i.e., typically 6 months to 3 years, unless a successor arrangement is approved) and subject to periodic reviews (quarterly or semi-annually for SBAs treated as precautionary, semi-annually for PLLs and annually for two-year FCLs), which involve a reassessment of qualification (FCL and PLL) and in some cases ex-post conditionality (PLL and SBA treated as precautionary) that can imply less certainty of completing reviews. Fund arrangements for crisis resolution purposes are typically of longer duration (3 to 4 years), but availability of financing is phased throughout the arrangement dependent on meeting conditionality and completing regular reviews. The Fund has been financing member needs for longer periods since the global crisis, but this reflects the reliance on successor SBAs and extended arrangements under the Extended

²³ Central banks mandates are generally focused on domestic monetary and financial objectives. BSAs to other countries must be justified by the risk of inward economic or financial spillovers from the recipient to the lending economy, to the extent that they jeopardize the lending central bank's ability to deliver its domestic objectives. For example, the U.S. Fed explicitly stated that swaps extended during the crisis were aimed to "improve liquidity in global money markets and to minimize the risk that strains abroad could spread to U.S. markets". (See http://www.federalreserve.gov/monetarypolicy/bst_swapfaq.htm#5613).

Fund Facility (EFF), rather than an increase in the maximum length permitted for Fund arrangements.²⁴

- **RFA** resource reliability varies significantly across arrangements and types of instruments, and is largely untested. For example, NAFA swaps are available for 90 days and can be renewed up to one year, while CMIM swaps are available for 6 months or one year, and can be renewed up to two years or three years, respectively. In contrast, EU lending instruments have no specific maturity limits; the ESM has provided financing with long maturities (up to 20 and 30 years). Except for the ESM, the reliability of RFAs for continued support through a longer crisis remains untested. Moreover, RFA financing is less dependable in the event of region- or system-wide shocks that impact a large share of their membership.
- **Hedging instruments** in practice have typically involved short-term contracts (i.e., between 1 and 2 years), due in part to the recent increase in commodity price volatility. They are likely to be less liquid and more costly for longer maturities, depending on the commodity shock being hedged.

Cost

Most elements have significant financial costs (reserves and market-based insurance) or political costs (IMF, market-based insurance, and to some extent RFAs) for borrowers. The financial costs of reserves are usually deemed high, although there is no single measure to assess them. Whereas market-based instruments more broadly tend to be prohibitively expensive due to the complexity of the instruments and the nascent market structure, financial costs for more developed commodity hedges tend to be relatively lower, but these could be compounded by political costs. Fund resources have a relatively low financial cost, but often entail significant political costs ("stigma"). RFA resources tend to have low financial costs, but some political costs—although less than the Fund—from stigma.

- **Reserves** are the most financially costly for non-reserve currency issuers. The marginal opportunity cost of accumulating reserves differs from country to country, and depends on a number of factors, in particular, the level of reserves and external debt. While there is no consensus on the most appropriate single measure of cost, the net financial cost, defined as the spread between the interest rate paid on sterilization instruments and the interest received on reserve assets, is often seen to be the best proxy. Fund analysis suggests that the median cost for EMs averaged around 200 bps during 2001–09.²⁵ Moreover, sterilization costs increase with higher reserve levels (IMF, 2013b). This cost can be compounded, in the case of faster growing economies that experience exchange

²⁴ The average maturity of GRA credit outstanding has increased sharply since 2000, from 4 years to 6.5 years.

²⁵ See IMF (2011a). This cost estimate is net of any impact on sovereign spreads.

rate appreciation, by the cost associated with the falling value of interest rate payments received and capital losses on the reserve stock.

- **BSAs** are typically the cheapest form of FX liquidity insurance, with reserve-currency swap arrangements carrying no commitment costs, and borrowing costs averaging 20–50 bps over a reference interest rate. However, other currency swap lines are typically more expensive.
- **Fund** resources are available at a relatively low financial cost. Commitment fees for arrangements treated as precautionary are on a sliding scale up to 60 bps. Lending rates include a basic rate of charge (the market-determined SDR interest rate, plus a margin currently set at 100 bps) and surcharges, which depend on the level and duration of credit outstanding.²⁶ However, there is often a significant associated political cost ("stigma"), which delays or prevents members from requesting Fund support. Stigma is partly due to the lingering effects of past financial engagement, and partly to Fund conditionality (see policies).
- **RFAs** are typically more cost effective than individual reserve accumulation because of reserve pooling and the avoidance of fiscal costs associated with sterilization. Lending rates are often unspecified, but tend to be low; for example, the ESM has been charging around 100bps. RFA support can also be subject to political stigma-related costs, particularly when closely tied to Fund financing. Some have argued that Fund conditionality and political stigma had prevented the CMI swaps from being activated during the global financial crisis (Kawai, 2009).
- **Hedging instruments**, supported by established commodity market exchanges, could be less prohibitively expensive than other market-based instruments; the latter would be characterized by excessively high risk premia due to complexity of the instruments, market distortions and underdeveloped markets. But political economy considerations (e.g., powerful disincentives for policymakers, Box 2) may pose additional costs; if shocks do not materialize, the costs of hedging may be more visible than for other forms of insurance, such as reserves.

Policies

Strong policy incentives can help mitigate the potential for moral hazard in the GFSN, prevent crises and encourage faster adjustment. But of the available elements, only the Fund has an established conditionality framework, which is regularly and transparently reviewed and updated. Most other elements have limited requirements, ranging from ex-ante screening (some BSAs) and

²⁶ A surcharge of 200bps is paid on credit outstanding above 187.5 percent of quota, and the surcharge rises to 300 bps if credit remains above this level after three years for SBAs or 51 months for EFFs.

reliance on the Fund's conditionality (some RFAs) to no explicit requirements (reserves, market-based instruments, and other BSAs and RFAs).

31. The availability of a global safety net could lead to moral hazard by providing negative incentives to potential borrowers, creditors, and reserve currency issuers. For example, borrowers may accumulate excessive imbalances, particularly during episodes of capital inflows, and avoid needed adjustment after a crisis; creditors may be more willing to lend to indebted countries under expectations of a bail-out, leading to an underpricing of risk; and reserve currency issuers may run looser policies when facing a high demand for their assets, with negative global spillovers.

32. Strong policy incentives for macroeconomic stability ex-ante and the appropriate correction of imbalances ex-post could mitigate moral hazard concerns. Surveillance, with varying degrees of leverage, is the primary tool through which the GFSN elements can encourage the adoption of policies to ensure stability and minimize crisis risks. Ex-ante screening or conditionality could provide additional incentives to maintain very strong policies in order to meet qualification criteria and/or have access to certain elements of the safety net. Ex-post financing, combined with policy incentives would help ensure proper adjustment.

33. Policy requirements have been shifting from ex-post to ex-ante since the global financial crisis. Fund surveillance has been strengthened (IMF, 2016). The shift toward more ex-ante conditionality was motivated by increased interconnectedness, the changing nature of global shocks from the current to capital account, and lessons from past crises, which created the need for insurance to limit contagion (IMF 2009a-c). The concern that recent changes in conditionality increase moral hazard does not seem to be supported by the experience of the FCL users.

34. Only the Fund has an established macroeconomic policy framework, which is regularly and transparently reviewed and updated:

- **Reserves** can be accumulated and used without any explicit policy requirements or conditionality. More broadly, however, there are indirect policy considerations related to their accumulation and use in the event of a shock. Countries with weaker policies would face higher costs associated with accumulating reserves, and so the quality of policies is factored into the cost of accumulation, analogous to the pricing of market-based insurance. In countries with misaligned exchange rates or underlying macroeconomic fundamentals that need adjustment, reserves are not effective in alleviating volatility (IMF, 2011a and IMF, 2014a).
- **BSAs** rely mostly on ex-ante screening of borrowers and have limited ex-ante or ex-post policy conditionality. The setting up and maintenance of swap lines also depend on the domestic policy priorities of the provider. Fed swap lines extended during the global financial crisis reflected both US domestic concerns—providing adequate dollar liquidity

to US financial institutions abroad—as well as borrowers’ macroeconomic fundamentals. China’s domestic objectives are broader—including bilateral trade promotion and renminbi internationalization—and borrowers’ macroeconomic fundamentals do not seem to play a significant role. The degree of policy monitoring by the providers of swap

Table 2. Policy Content of the Elements

GFSN Components	Ex-ante Policy	Ex-post Policy	Leverage	Overall Score¹
Reserves	No direct requirements	No direct requirements	None	0
BSAs	Varies by issuer. Ex-ante screening	Limited	None/withdrawal	1
IMF	Ex-ante conditionality for the FCL/PLL; surveillance	Ex-post conditionality (except for the FCL)/review of arrangements	Conditionality for financing only; surveillance	2
RFA s				
<i>i. EU</i>	Surveillance/comprehensive policy requirements at EU level	Ex-post conditionality/ review of arrangements	Strong enforcement rules for surveillance and financing	2
<i>ii. CMIM</i>	Surveillance; IMF policy requirements for access above 30 percent	Surveillance; IMF review of arrangements	Untested	1
<i>iii. BRICs CRA</i>	IMF policy requirements for access above 30 percent	Self-reporting; IMF review of arrangements	Untested	1
Hedging instruments	No direct requirements	None	None	0
¹ Overall score on the level of ex-ante and ex-post policies and leverage of each element. 0 = Limited policies, 1 = Some policies, 2 = Extensive policies.				

lines appears limited, while policy leverage is a binary option (renewal/withdrawal), although the size of the swap line could be adjusted to reflect the credit risk. More importantly, there is no transparent/publicly available information regarding qualification or review process for those countries that have received swap lines, or information on which countries would be eligible in the event of another crisis.

- **The Fund** has a comprehensive set of tools and policies, consisting of surveillance and conditionality for the use of its resources, which are regularly reviewed internally (e.g., regular reviews of surveillance, conditionality, and access policies; crisis program review; and ex-post evaluation of individual country cases entailing exceptional access to Fund resources), and are subject to external review and scrutiny. Fund instruments such as the FCL and PLL have ex-ante conditionality, while most Fund arrangements are subject to ex-post review on a regular basis. Leverage is strong in financing arrangements with

- inadequate policies through delaying reviews or cancelling arrangements, but limited in bilateral and multilateral surveillance.²⁷
- **RFAs'** policy requirements range from a comprehensive own set (EU facilities) to reliance on the Fund (CMIM and BRICs CRA above a certain access threshold) to none (FLAR). The EU member states have a broad set of policy requirements, with additional obligations for euro area members, of which fiscal policy rules, competition policy, financial sector supervision, and structural policies are most relevant to the operation of the ESM. Surveillance is extensive and treaty-enforced for fiscal policy. However, the implementation of these enforcement mechanisms has been mixed in the past. Ex-post conditionality is enforced similarly to the Fund, although it is arguably subject to greater political influence as it requires approval by parliaments of member states.²⁸ CMIM is developing its surveillance by assessing macroeconomic developments and policies in member countries but provides limited policy advice. Access below 30 percent of the maximum to the short term liquidity swap line and the precautionary instruments of the BRICs CRA requires a small set of conditions and safeguards,²⁹ as well as the agreement of creditor countries. Financing above 30 percent of maximum access for both CMIM and CRA is subject to the existence of a Fund-supported program and therefore reliant on Fund conditionality and review process. So far there has been no drawing of either the CMIM or the CRA, and so leverage cannot be assessed. Other RFAs have either lower levels of policy conditionality or none, in the case of FLAR.
 - **Hedging instruments** have no explicit policy requirements. Similar to reserves, countries which may have weaker policies or are assessed by markets to be in need of adjustment would likely face higher costs, but there are no direct ex-ante and ex-post policy requirements and enforcement.

C. Diagnosis of the System

35. While the current GFSN serves reserve currency-issuing AEs well, it has serious shortcomings for all other groups of borrowers, and might not be effective in preventing global spillovers and contagion (Table 3). Systemic and gatekeeper EMs have inadequate predictability and reliability (from BSAs) and high financial costs (from reserve accumulation) or political costs (from Fund stigma). Most countries would need to use several elements of the

²⁷ Conditionality associated with Fund arrangements, despite its political stigma, is found to have significant economic benefit by helping boost market confidence and allowing the Fund to play a catalytic role, and thus reducing the likelihood of a full-blown crisis (IMF, 2008).

²⁸ For financial arrangements, a euro area member state requesting assistance from ESM is also expected to address, wherever possible, a similar request to the Fund. Fund policies are restricted to macroeconomic critical areas, while EU conditionality is further reaching and more comprehensive (IMF, 2015, and Bruegel, 2014).

²⁹ These include data provision; no arrears to the other members, public institutions, multinational and regional investment banks; and compliance with surveillance and information provision obligations of the Fund.

safety net to fully cover their financing needs, which could raise coordination issues. From a global perspective, the GFSN fails to deliver on providing appropriate policy incentives and on cost, while insufficient predictability and reliability of resources lead to over accumulation of reserves.

Table 3. Characteristics of the System by Country Group

Characteristics	Reserve currency AEs	Other AEs	Systemic and gate keeper EMs	Other EMs	DCs
Predictability	2	1	1	1	2
Speed	2	2	2	1	1
Reliability	2	1	1	0	1
Cost	2	1	0	0	0
Policies	0	1	1	1	1

Source: IMF staff estimates.

36. This section assesses the adequacy and effectiveness of the entire system from a borrower's perspective, as well as a global perspective. The GFSN elements have different characteristics and deliver different outcomes, and their combinations affect not only a country's welfare, but also the global allocation of resources and risks. The section starts with a discussion of which GFSN elements are available for different country groups, how effective these elements are in helping them achieve their objectives, what the "best available" combinations for each country group would be, and what is still missing even under the best available options. It then focuses on the global perspective, and discusses how these combinations would also affect the effectiveness of the GFSN in limiting contagion, allocating resources efficiently across countries, and ensuring multilaterally consistent policies.

Best Available Composition from a Borrower's Perspective

37. Reserve currency-issuing AEs are best served, and other EMs worst served, by the current GFSN, with other AEs, systemic/gatekeeper EMs, and DCs in between. To reflect different countries' access to and preferences for different GFSN elements, we split countries into five groups (reserve currency-issuing AEs, other AEs, systemic and gatekeeper EMs, other EMs, and DCs), and evaluate the effectiveness of each GFSN element for each group according to the first four criteria (predictability, speed, reliability, and cost). We then build on the assessment of the GFSN elements, while further investigating their heterogeneity across country groups.

- Reserve currency-issuing AEs.** Although the majority of the GFSN elements are likely inadequate (Fund, RFAs) or irrelevant (commodity price hedging), the remaining two—reserves (which can be printed on demand) and BSAs (unlimited both in size and time)—are sufficient to cover their needs. Euro Area countries

Reserve currency AEs	Reserves	Swaps	IMF	RFAs	Hedging
Predictability	2	2	N/A	N/A	2
Speed	2	2	N/A	N/A	2
Reliability	2	2	N/A	N/A	1
Cost	2	2	N/A	N/A	0

are a specific case, as “printing reserves” can only be relied upon in the case of a shock affecting the entire currency union area; idiosyncratic shocks would have to be dealt with by other means (i.e., a euro area country facing an idiosyncratic shock faces the same options as “Other AEs”, discussed below).

- **Other AEs** cannot issue reserve currencies and do not have unlimited swap lines with major central banks. Based on past experience though, these countries have a good probability of securing a

BSA from a reserve currency central bank in case of a global shock (although not necessarily in case of a regional

Other AEs	Reserves	Swaps	IMF	RFAs	Hedging
Predictability	2	1	2	1	2
Speed	2	2	1	0	2
Reliability	1	1	1	1	1
Cost	1	2	0	1	0

shock), but these resources are less predictable and reliable than for the previous group. Potential contribution and parameters of Fund financing can be anticipated somewhat accurately within normal access limits, but FCL/PLL qualifications and approval of successor arrangements—as well as arrangements entailing exceptional access—are associated with uncertainty. Support from RFAs is likely less predictable but also has lower political (stigma) costs. Finally, commodity price hedging can be a meaningful instrument for a subset of AEs. Self-insurance through reserves is used less than in EMs, as exchange rate volatility is less damaging for both price stability and balance sheets considerations.

- **Systemic and gatekeeper EMs.** As for other AEs, BSAs from major central bank are neither predictable nor reliable; they may be extended during a global shock but also discontinued after the peak of the crisis. Even within this group, there is large heterogeneity in terms of access to BSAs—larger economies have a much

Systemic and gatekeeper EMs	Reserves	Swaps	IMF	RFAs	Hedging
Predictability	2	1	2	1	2
Speed	2	2	1	0	2
Reliability	1	1	1	1	1
Cost	0	2	0	1	0

better chance than smaller ones to access reserve currency BSAs, as evidenced by the swap lines extended by the Fed during the GFC. The BSAs established among systemic and gatekeeper EMs (most of them involving China on one side) may take longer to activate. RFAs are unlikely to provide meaningful assistance to those systemic and gatekeeper EMs who are net creditors within the respective arrangements. Stigma associated with the Fund suggests that countries would be reluctant to seek Fund assistance, including through FCL/PLL. Commodity price hedging can be a relevant tool for commodity-exporting countries, but the financial costs are high.

- Other EMs.** Compared to systemic and gatekeeper EMs, other EMs have a near-zero probability of obtaining a reserve currency swap line, while BSAs from major trading partners might restrict financing to trade. Many EMs in this group are part of RFAs, but most of them are poorly tested, and so have lower reliability and speed of deployment. The Fund, however, offers good predictability (again, within normal access limits), and a known timeline; stigma can be less of a problem for this group, although this varies by region and may depend on past experiences.

Other EMs	Reserves	Swaps	IMF	RFAs	Hedging
Predictability	2	0	2	1	2
Speed	2	2	1	0	2
Reliability	1	0	1	1	1
Cost	0	2	0	1	0
- DCs.** This group has the most limited set of available options. Most BSAs are not an option; swap lines from major trading partners are neither predictable nor reliable, and potential conversion costs/delays limit their use. Very few DCs are members of RFAs, de facto leaving reserves, the Fund, and the development banks as the sole available options.³⁰ Self-insurance, however, is particularly expensive, given the high opportunity cost in light of large development needs. The Fund is the most predictable, reliable and affordable option, especially given that it generally carries limited stigma—in fact, managing to secure a program is often viewed as a success for this group. However, the Fund does not currently have an FCL or PLL-type instrument specifically for DCs. For commodity exporters (which includes most frontier markets), commodity price hedging is thus a particularly attractive option but with a hefty financial cost.

DCs	Reserves	Swaps	IMF	RFAs	Hedging
Predictability	2	N/A	2	N/A	2
Speed	2	N/A	1	N/A	2
Reliability	1	N/A	1	N/A	1
Cost	0	N/A	1	N/A	0

38. Most countries would need to use several elements of the safety net to fully cover their financing needs, which will likely raise coordination issues, in particular for vulnerable EMs and AEs. The “best available” combination for each country group is identified by first ranking the GFSN instruments based on their characteristics, and then determining, from the highest- to lowest-ranked instruments, how far down the list the country group would need to go to fully cover their financing needs (i.e., for the median financing gap within that group to

³⁰ Members of the CFA Franc zone—comprising of 14 sub-Saharan African countries in two economic and monetary unions—are an exception. These countries benefit from a guarantee from the French treasury to convert the CFA Franc into the euro or any other currency. A set of legal, institutional and policy requirements are in place to ensure the sustainability of the arrangement, including policy rules to deliver adjustment in case the guarantee is called.

be zero in the full access scenario).³¹ Table 4 shows the ranking for each group, with the “best available” combinations highlighted.³² In sum:

- **Reserve currency-issuing AEs** can fully rely on reserves and swap lines in the event of a systemic crisis.³³
- **Other AEs** can mostly rely on swap lines and own reserves, but the more vulnerable ones would have a remaining financing gap, making it necessary to access financing from either the Fund or the RFA (or co-financing).
- **Systemic and gatekeeper EMs** would need to tap into swap lines if they are made available, run down reserves, and also obtain a Fund arrangement. The more vulnerable countries would require Fund arrangements entailing exceptional access.
- **Other EMs** would have to run down reserves, tap into swap lines where they are available, and obtain a Fund arrangement, often entailing exceptional access (or co-financing with an RFA).
- **DCs** have fewer options; they would need to fully rely on the Fund and own reserves, with potential support from (largely unpredictable) other bilateral or multilateral creditors.
- Coordination could be an issue; the more GFSN elements to tap on, the more challenging it will be to ensure timely provision of resources, especially when official creditors are involved. Coordination challenges could be high, particularly for vulnerable EMs and AEs, who might have to rely on IMF/RFA co-financing—with both creditors having conditionality on overlapping macro critical issues but different rules and objectives.³⁴

39. The set of available GFSN elements can be further restricted by borrowers’ domestic policies and the nature of shocks. Countries in need of policy adjustment to address existing vulnerabilities are less likely to obtain a BSA or an FCL/PLL arrangement. Even though

³¹ The ranking assumes that all criteria are equally important and adds up all scores for each GFSN element (provided that it is available to the relevant country group). This assumption is quite strong; some criteria could be more important than the others depending on country groups and purposes (insurance vs. financing vs. policies). The ordering is relatively robust to different assumptions about weights, and broadly matches current usage within the GFSN.

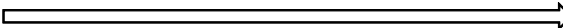
³² For commodity dependent economies, commodity price hedging can always be a helpful complement to other official resources, but since their size is difficult to predict, it is not included in the “best available” combination.

³³ As discussed above, individual euro area countries facing idiosyncratic shocks have the same “best available” combination as “Other AEs”.

³⁴ Coordination challenges also exist—albeit to a less extent—when a DC combines a Fund-supported program with support from other development partners. Many bilateral donors rely on the Fund to set policy adjustment conditionality, while other multilateral creditors, such as the World Bank, have a somewhat different focus than the Fund on policy adjustments.

these countries can still self insure via accumulating reserves or access a precautionary SBA from the Fund, these options are more costly financially and politically, respectively, than for innocent bystanders. The nature of the shock is also important—for example, swap lines are not useful in financing protracted shocks or sovereign crises, while commodity price hedging provides insurance only against terms of trade shocks—but the country grouping maps neatly into main shocks.³⁵

Table 4. Ranking of Elements by Country Group

	Most preferable  Least preferable			
Reserve currency AEs	Reserves/own currencies Swaps	Hedging		
Other AEs	Reserves Swaps	Hedging	IMF	RFAs
Systemic and gate keeper EMs	Swaps	Reserves Hedging	IMF	RFAs
Other EMs	Reserves Hedging	Swaps	IMF	RFAs
DCs	Reserves IMF Hedging			

Note: GFSN elements are ranked from most preferred to least preferred for each country grouping. Country groupings may need to access multiple elements (marked in blue) to fully meet their financing needs. Hedging instruments, although preferred to other elements by some country groupings, are largely unavailable, and indicated as such.

Source: IMF staff estimates.

40. To sum up, the current GFSN fails to deliver in some key dimensions for all country groups except reserve currency-issuing AEs. While other AEs seem to have some access to most elements, nothing is adequate, except speed of deploying financing, for those with access to swap lines. Systemic and gatekeeper EMs do not have adequate predictability, reliability, and face high costs—high financial costs of accumulating reserves and very high political cost if they need to access the Fund. Other EMs are the worst-off group: they do not have access to sufficiently reliable sources to last through a prolonged shock period, and they also face very high costs. Without access to swap lines, systemic and gatekeeper EMs would face a similar dilemma to other EMs. DCs are somewhat better off than other EMs as they can rely on the Fund (together with other development partners) at a lower political cost (though the financial cost of reserve accumulation is even higher).

³⁵ E.g., reserve currency AEs are most likely to suffer from banking sector liquidity crises, other AEs are subject to banking liquidity shocks and sovereign debt crises, EMs to capital flow shocks, and DCs to trade shocks.

Global Implications

41. From a global perspective, ensuring sound policies is a key objective of the GFSN, but this is where the current GFSN fails the most. The current configuration of the GFSN fails to deliver adequate policy incentives in all country groups, especially in reserve currency-issuing AEs, which could generate global spillovers (Table 3). These countries' ability to "print their way out of a crisis" and the demand for safe haven assets by non-reserve currency issuers reduce their impetus to improve policies, while other central banks are likely to extend them and maintain swap lines out of self-preservation, even if counterparty policies are weak. Limited policy incentives in all other groups could also increase the frequency and severity of both idiosyncratic and systemic crises. The lack of adequate ex-ante policy incentives results in the need for a larger GFSN to meet financing needs in a crisis, but this is an inefficient use of resources. A better option would be to incentivize countries to adopt sound policies to prevent the build-up of imbalances and lower the demand for GFSN resources.

42. The failure to ensure sound policies stems from the fragmentation of the current system and the lack of adequate policy incentives in most GFSN elements. The availability of resources through different institutions and instruments with varying policy requirements create the risk of arbitrage and facility shopping. Countries' most preferred GFSN elements tend to have inadequate or no policy content (Table 4). In a crisis or near-crisis situation where there are significant uncertainties regarding the impact of the shock and the financing need, a country is likely to resort to resources with few requirements first and delay its engagement with institutions that would condition support on specific policy adjustment. Such delays can worsen the impact of the shock in the country and exacerbate contagion across countries.

43. Moreover, the need to access multiple GFSN elements to fully cover financing gaps creates paramount coordination challenges. In particular, in a program co-financed by the Fund and an RFA (e.g., for a vulnerable other AE or EM), differences in objectives and rules, as well as in policy frameworks (e.g., in assessing debt sustainability and need for debt restructuring), often result in protracted program discussions, which can delay the availability of financing and affect the quality of policy adjustment.³⁶ The need to settle differences at a higher (political) level can further prolong and complicate program discussions. Differences in the pricing of instruments may result in cross-subsidization and a shift in the burden of risk across institutions, which may not be desirable from a creditor point of view, hence reducing incentives to provide financing.

³⁶ In the context of the cooperation between the Fund and the European RFAs, access to additional financing from the RFAs has, however, alleviated financing constraints, allowing for a more gradual approach compared to previous crises, while the lack of an overarching framework for cooperation has allowed for some flexibility in program design and monitoring (IMF, 2016).

44. The current GFSN also fails to deliver on cost. The best available combination for each country group involves reserve accumulation, which is a financially costly form of self-insurance and is associated with negative externalities (see below). A more efficient global system would enable reserve pooling and risk sharing; however, market distortions and technical constraints have raised the cost of risk transfer. Also, institutions that provide financing at low financial costs are often associated with high political cost, which in many cases delays proper crisis prevention or resolution, limiting the effectiveness of the GFSN in containing contagion. Therefore, reducing political costs is as important as, if not more than, reducing financial costs.

45. While somewhat better than policies and cost, predictability and reliability are still inadequate under the current GFSN, leading to over accumulation of reserves and ineffectiveness in curtailing contagion. Limited predictability as to whether sufficient resources would be available in a crisis leads to rapid reserve accumulation, especially in some systemic and gatekeeper EMs, where the political cost of accessing Fund resources is high. Moreover, as markets often evaluate a country's reserve adequacy against reserves in peer countries rather than economic fundamentals, there is competition across countries, especially EMs, in accumulating reserves. Incentives for such over accumulation lead to global imbalances and a diversion of resources from more productive investments. Therefore, global reserve pooling can not only reduce cost, but also improve resource allocation globally. Finally, reliability is a universal problem for all countries except reserve currency-issuing AEs, particularly during a prolonged shock period. Limited predictability (for ex-ante crisis prevention) and limited reliability (for ex-post crisis resolution) suggest that the current GFSN is not effective in limiting contagion and ring-fencing innocent bystanders.

46. While the current GFSN delivers relatively well on speed, not all country groups can benefit from it. Thanks to reserve accumulation and the expansion of swap lines, the speed of deploying resources is adequate for the majority of country groups, except other EMs and DCs, which have been either excluded from the swap networks, or have only access to untested swap lines. It is unlikely that swap lines and RFAs would expand in the future to adequately cover and serve these groups, which may not be systemically important to meet the relevant domestic or regional mandates.

CONCLUSION

47. The diagnosis has shown that there is scope for improving the safety net. The current configuration is too costly and creates the conditions for moral hazard. Coverage is uneven across countries and worsens when the uncertain elements of the safety net are not available. Many of the elements of protection are costly for borrowers—either from a financial perspective (reserves, commodity hedging), or from a political perspective (the Fund)—and

globally (reserves), impeding the effectiveness of the system. Adequate incentives to implement sound policies are often not in place. Moreover, most country groupings remain underserved by the system, with systemic and gatekeeper EMs, importantly, not having adequate access to reliable and predictable funding. Finally, coordination between the different elements remains a recurring problem.

48. These weaknesses can be traced back largely to the GFSN fragmentation.

Fragmentation leads to: (i) uneven coverage across countries and sizeable financing gaps in several key systemic and gatekeeper countries, which worsen when the uncertain elements of the safety net are not available, reducing the effectiveness of the GFSN in limiting contagion; (ii) coordination challenges from the need to access multiple GFSN elements to fully cover financing needs; and (iii) facility shopping, which further leads to inadequate incentives for sound policies, increasing the frequency and severity of crises.

49. The Fund could be improved to better deliver on cost and reliability, and to some extent on speed. Countries remain reluctant to approach the Fund partly due to political costs (stigma), and partly due to their reluctance to adjust. Moreover, compared to reserves and BSAs, Fund financing may be relatively slow to be approved and made available in a crisis due to the need to discuss program-related conditions, while the duration of individual arrangements is limited in time, with a need for the Fund to discuss and approve any successor arrangements.

50. Moreover, expanding and improving the fragmented system, as occurred after the global financial crisis, has not been fully successful. Most country groupings remain underserved by the current system, with systemic and gatekeeper EMs, importantly, not having adequate access to reliable and predictable funding. Expanding the core BSAs and making them permanent seem unlikely. Other currency swaps have proliferated in recent years, but they are primarily for BOP support rather than liquidity crises. RFAs, meanwhile, remain largely untested, and interest in expanding their size and scope is limited. As a result, many countries have continued to rely on self-insurance, which is not only very costly for those countries accumulating reserves, but can also entail systemic costs with implications for the resilience of the international monetary and financial system.

51. The safety net could be strengthened through reforms of the Fund. The Fund could: (i) provide predictable and reliable financial support for crisis prevention and resolution; (ii) reduce moral hazard in the system by providing the incentives for sound policies, both at country level and globally; (iii) reduce incentives for the over accumulation of reserves and improve cost efficiency with global reserve pooling; (iv) limit coordination problems among the layers; and (v) provide more even coverage across the membership. Reforming the Fund may also contribute to changing the perception of Fund programs from stigma to a signal of strength.

52. Improving the Fund may require revisiting its toolkit. One option would be to provide immediate liquidity support and reliable cover for the full duration of shocks to a wide range of countries to limit the potential for contagion. For example, prequalification could help ensure that funds would be readily available (enhancing speed and predictability) and could

reduce the stigma associated with Fund resources (reducing costs). State-dependency would also help ensure that borrowers could rely on the instrument throughout the turmoil period (strengthening reliability). Another option would be to strengthen cooperation among the different layers of the global financial safety net. Monitoring or policy signaling by the Fund could facilitate such cooperation, enabling creditors to rely on the Fund's expertise in this area, and reducing moral hazard in the system more generally. Finally, the Fund could consider better tailored support for countries hit by specific shocks (e.g., commodity price declines). See also Box 3 for a summary of past proposals and obstacles to those reforms at the time.

53. With the 2010 reforms now successfully implemented, and the increasingly uncertain economic environment ahead, there is a policy window now for improving the GFSN. A follow-up IMF staff paper could help lay out more specific proposals to identify possible avenues for reform.

Box 3. Past Reform Proposals

Achieving consensus on GFSN reform was the result of a long-standing discussion among different country groups. Some of these proposals were implemented (new financing instruments, higher access, streamlining of conditionality), while others were deemed to require further discussion and modifications.

The most recent set of reforms of the GFSN emerged from a wide range of options, many of which had been long debated. The global financial crisis revealed deep weaknesses in the GFSN and stimulated a new push for reform, which resulted in an increase in resources and an overhaul of the lending framework, including the introduction of new precautionary instruments. Following this initial set of reforms, gaps in the GFSN remained and a further set of proposals¹ were called for by the IMFC², which sought to:

- *Sharpen surveillance* of risks, spillovers, financial systems and external positions.
- *Promote crisis prevention and address systemic events* through the provision of shorter term liquidity lines, both bilateral and multilateral (the Global Stabilization Mechanism, GSM), and refinements to the newly introduced precautionary instruments.
- *Enhance global and regional cooperation* with RFAs and reserve pool arrangements.

There was support for further reforms from a mix of AEs, EMs, and DCs. While acknowledging the reforms made to the GFSN following the crisis, this group of countries saw a strong case for further strengthening the Fund's crisis prevention role, particularly in response to a systemic crisis. Proposals included a range of measures to enable enhanced RFA cooperation, unilateral offers of precautionary financing arrangements, stronger global coordination, voluntary private sector involvement, and rapid short term liquidity assistance. By moving towards more ex ante crisis prevention tools, the Fund would be in a position to engage earlier (improve speed and predictability) and support adjustment before the crisis worsened and created the need for more resources. Measures to reduce stigma were also recognized as important reforms to take forward (reduce costs). A few countries welcomed the direction of the reforms but saw a need for implementing quota and governance reform before considering another set of proposals.

A number of countries saw the need for continued discussion of the proposals to limit risks of moral hazard and to allow time to review the impact of the new lending framework. A group of countries consisting mainly of AEs saw merit in some of the proposals but pointed to the adequacy of the revamped toolkit, the existence of the emergency financing mechanism, and the risks of moral hazard. There was some interest in further discussion, particularly once the new lending framework had been implemented and reviewed. (See The Fund's Mandate—The Future Financing Role—Reform Proposals—The Chairman's Summing Up (Aug. 30, 2010))

A more innovative set of proposals—designed to address issues of stigma, speed and moral hazard—were set out for consideration in an earlier Board discussion. There was limited discussion of these more radical proposals as there was little appetite for making the required amendments to the Articles of Agreement or for the mobilization of non-GRA resources (See The Fund's Mandate—Future Financing Role—The Chairman's Summing Up (Apr. 15, 2010)). These proposals were:

- Lending against collateral on a short-term basis as a substitute for policy conditionality where there is no need for policy adjustment.
- Creating instruments for market support during periods of heightened market stress by guaranteeing new sovereign debt issuance and/or automatic purchase of secondary market bonds of pre-qualified countries.
- Catalyzing the market for country insurance instruments such as commodity price hedging, natural disaster insurance, state-contingent bonds or sovereign asset and liability management as a source of insurance.

¹ See "The Fund's Mandate—The Future Financing Role", March 2010; "The Fund's Mandate—Future Financing Role: The Current Lending Toolkit and Innovative Reform Options", March 2010; and "The Fund's Mandate—The Future Financing Role: Reform Proposals", June 2010.

² IMFC Communiqué, Istanbul, October 2009.

ISSUES FOR DISCUSSION

54. Directors may want to consider the following issues:

- Do Directors agree with the conclusions that:
 - The GFSN does not adequately cover all members?
 - The GFSN fails to deliver on cost and policies?
 - Many groups still remain underserved by the current composition of elements, and there is a need to improve predictability and reliability?
 - Better coordination is needed between the various elements?
- Do Directors agree with the need for reforms to strengthen the Fund?

Annex I. Systemic and Gatekeeper Countries

Table 1. Selection of Systemic and Gatekeeper Countries

	Systemic Countries: Top 25 Countries in Each Year (0.5*share in global market + 0.5* centrality)												Gatekeepers		
	Trade				Bank			Portfolio				Global			
	'11	'12	'13	'14	'11	'12	'13	'11	'12	'13	'14	'11	'12	'13	
Advanced Economies															
Australia	x	x	x	x	x	x	x	x	x	x	x		x		
Austria					x	x	x	x	x	x	x	x	x	x	
Belgium	x	x	x	x	x	x	x	x	x	x	x		x		
Canada	x	x	x	x	x	x	x	x	x	x	x	x			
Denmark					x	x	x	x	x	x	x				
Finland					x	x	x	x	x	x	x	x			
France	x	x	x	x	x	x	x	x	x	x	x		x		
Germany	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Greece												x	x	x	
Hong Kong	x	x	x	x	x	x	x	x	x	x	x		x		
Ireland					x	x	x	x	x	x	x		x		
Italy	x	x	x	x	x	x	x					x		x	
Japan	x	x	x	x	x	x	x					x	x		
Korea, Republic of	x	x	x	x	x	x	x						x		
Luxembourg					x	x	x	x	x	x	x		x		
Netherlands	x	x	x	x	x	x	x	x	x	x	x		x		
Norway						x		x	x	x	x				
Portugal					x			x	x	x	x				
Singapore	x	x	x	x	x	x	x	x	x	x	x	x	x		
Spain	x	x	x	x	x	x	x	x	x	x	x		x	x	
Sweden					x	x	x	x	x	x	x	x	x	x	
Switzerland	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
United Kingdom	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
United States	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Emerging markets															
Bahamas, The					x	x	x								
Brazil	x	x	x	x	x	x	x	x	x	x	x		x	x	
China, Mainland	x	x	x	x	x	x	x					x	x		
India	x	x	x	x				x	x	x	x				
Indonesia	x	x	x												
Malaysia	x	x	x	x											
Mexico	x	x	x	x				x	x	x	x				
Panama												x	x	x	
Russian Federation	x	x	x	x			x	x	x	x	x				
Saudi Arabia	x	x	x	x											
South Africa								x	x	x	x		x		
Thailand	x	x	x	x											
Turkey				x									x		
U.A.E.	x	x	x	x											

Notes: Systemic countries are defined as those that rank in the top 25 in each year on the joint measure of their size and centrality in the respective trade or financial network. The composite systemic measure is calculated as 0.5*share in global market + 0.5*centrality. Share is calculated as the share of the country's exports and imports or respective financial assets and liabilities in the world's total. Centrality is calculated as eigenvector centrality, which measures how connected the country is, giving a higher weight to connections to more connected counterparties. Gatekeepers are identified following the methodology in IMF (2012b-c) with the Clique Percolation Method on the aggregate network using trade, BIS bank credit, FDI, and portfolio data. Country groups which are connected amongst each other are considered "clustered." Gatekeepers are countries that belong to multiple clusters and can act as shock transmitters.

Sources: DOTS, CPIS, CDIS, BIS, and staff estimates.

Annex II. Examples of Market-based Contingent Financial Instruments¹

Instrument	Shock	Background	Trigger and Type	Payment	Outcome
<i>Cat bond</i>	Natural disaster/ weather	Mexico issued a US\$160mn, 3-year cat bond in 2006 to insure against earthquake risk.	Event: An earthquake of magnitude higher than 7.5 or 8.0 hitting specific country zones	Sovereign issuer receives full value of the bonds.	State was not realized for duration of the bond.
<i>Weather-related derivative</i>	Natural disaster/ weather	Malawi purchased weather derivative contracts in 2008-09 and 2009-10 as an option on a rainfall index.	Threshold/Continuous Rainfall significantly below historical average	Issuer receives payout of up to US\$4.39 million, depending on rainfall.	State was not realized for duration of the bond.
<i>Commodity derivative</i>	Terms of trade	In 2005-06, Malawi used a physical call option strategy to have the right to purchase a specified quantity of maize at a prespecified strike price in exchange for an option premium of US\$25 per metric ton.	Threshold/Continuous Strike price set as of September 2005	Implicit saving of current market price and strike price.	The Government of Malawi utilized the strike price shortly after it purchased the option, given the sharp increases in global commodity prices.
<i>GDP warrant</i>	Real	As part of the 2015 sovereign debt restructuring, Ukraine issued 20-year GDP warrants.	Threshold/Continuous 3 percent of GDP; Between 3-4 percent of GDP; 4 percent of GDP.	Implicit saving: issuer transfers a payment to the holder of 15 percent of GDP growth exceeding 3 percent, and 40 percent of GDP growth exceeding 4 percent.	State has not been realized.
<i>Commodity warrant</i>	Terms of trade	From 1991, Nigeria began issuing warrants based on an oil-price.	Threshold/Continuous. Trigger oil price of US\$28, capped till a ceiling of US\$43.	Implicit saving of current market price and strike price.	When issued, oil prices were around US\$19 a barrel. Oil prices surged rapidly, however, triggering the warrants, forcing a large-scale buy back operation.

Annex III. Financing Gap Estimates

This annex presents the methodology employed to calculate the potential financing gaps by country discussed in the diagnosis of the size and coverage of the GFSN.

Scenario analysis is used to estimate country-level financing gaps under a systemic crisis. The estimation involves two steps: (i) calculate the demand for financing of each country under a set of plausible shock assumptions, based on historical crisis experiences; and (ii) take into account the supply of financing from all sources—other than the Fund—under the current GFSN. If for a country the demand for financing is larger than the supply, then a financing gap arises, indicating the need for Fund financial engagement. The assumptions under each step are explained below.

Country-level financing needs are estimated based on a set of assumptions on the prevalence and severity of shocks.¹ The *prevalence* of a systemic crisis is captured by a threshold of crisis probability—countries with crisis probability above the threshold are assumed to face funding shocks.² The lower the threshold, the higher the number of countries facing shocks. We assume a 3 percent crisis probability, which represents a highly pervasive systemic crisis scenario. The *severity* of crisis is reflected in the shock assumptions to FDI inflows, rollover rates of short- and medium-term external debt, as well as deposit outflows. These assumptions are based on the Kernel density distribution of past crisis experiences in emerging markets.³ We use a shock size in line with the 85th percentile of the kernel distribution for EMDCs, and a somewhat less severe shock for AEs.⁴ Shocks are applied to a two year period (2016–17). Country-level demand for financing is then estimated as the financing needs arising from the shocks.

Two scenarios are then considered in estimating the supply of financing (before potential Fund engagement) under the current GFSN. The first scenario assumes maximum availability and accessibility of all GFSN elements, while the second assumes limited access to the more uncertain part of the GFSN (the need for Fund resources is presented as a residual financing gap):

- **Full access scenario.** This assumes that countries with adequate reserves (above 100 percent of the ARA metric, or 100 percent of short-term debt where ARA metric is unavailable) run down reserves by a maximum of 25 percent, but not below the reserve adequacy lower bound (100 percent of the ARA metric or short-term debt). Those with a current or historical swap line can immediately deploy (or renew the historical one and deploy) it to meet financing needs. RFA members can access resources up to the maximum access limit (which often requires Fund engagement) and the ESM is assumed to be unlimited—euro area policymakers would flexibly increase the size of euro area firewalls under a euro re-denomination risk scenario (e.g., enhanced burden sharing, OMT activation). This is an admittedly extreme assumption.
- **Limited access scenario.** Two assumptions differ from above. The first one is that all swap lines (current and historical) except the standing ones between the six reserve currency issuing central banks are inaccessible. These are mainly Chinese swap lines, which are largely untested operationally, are often limited to facilitating trade, could take very long to activate and have

high conversion costs. Therefore, they may not be useful in a sudden stop scenario. Renewing historical swap lines is even more uncertain as discussed in the text. The second difference is that ESM is assumed to have its current, rather than unlimited, size—while enhanced burden-sharing may not be totally unrealistic under a tail risk scenario, it would most likely require time.

¹ This approach builds on similar analyses in previous Board papers on Fund resource needs.

² Probabilities of crises are obtained from the underlying estimates of the Fund's Vulnerability Exercise. For AEs, a crisis is defined as a financial crisis as per Laeven and Valencia (2012); for EMs, a crisis is defined as a sudden-stop when there are significant declines in private net capital flows based on the assessment of IMF country desks.

³ IMF (2014b).

⁴ Specifically, in the shock scenario, FDI inflows are assumed to decline by 25 percent from the baseline projections in both 2016 and 2017 for both EMDCs and AEs; short-term debt rollover rate is assumed to be 70 and 88 percent for 2016 and 2017, respectively, for EMDCs, and 85 and 95 percent for 2016 and 2017, respectively, for AEs; medium- and long-term debt rollover rate is assumed to be 50 and 65 percent in 2016 and 2017, respectively, for EMDCs, and 70 and 90 percent in 2016 and 2017, respectively, for AEs.

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