Unequal Access to The Global Financial Safety Net: An Index for the Quality of Crisis Finance[1]

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Paper for the
FMM conference October 2022

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Abstract

The Global Financial Safety Net (GFSN) – the institutions and arrangements that provide short-term crisis finance – has turned into a highly complex, uncoordinated system of global, multilateral, and bilateral instruments. The literature concedes that the GFSN is not adequately prepared to respond to a systemic crisis. Scholars have primarily assessed each GFSN element separately. In contrast, this analysis provides a more comprehensive analysis of the consequences of the increasingly complex instruments of crisis liquidity provided in the GFSN. To analyze the preparedness of the GFSN for countries in financial distress, in a first step, we build a composite GFSN index that captures the qualitative differences of different instruments of short-term liquidity provision. In a second step, we employ the GFSN index for empirical analysis and visualization of the GFSN access of 192 UN member countries as of December 2021.

With a more detailed analysis, supported by novel graphical ways of displaying data, we provide new insights into this GFSN hierarchy: We find a hierarchy of access to crisis finance in the GFSN: First, particularly the majority of low-income countries range at the bottom of the hierarchy with access to IMF standard conditional crisis finance only. The temporary reform of IMF unconditional lending during the COVID-19 pandemic created an intermittent improvement in those countries' position in the GFSN hierarchy though. Second, we find that the provision of bilateral swaps as crisis finance instruments deepens the GFSN hierarchy dramatically.

The GFSN index is the first of its kind that measures the vulnerability and resilience of individual countries to financial crises based on access to short-term liquidity. This is relevant information to be added to existing financial vulnerability indices based on debt measures since the degree to which countries can access adequate emergency liquidity is decisive for the capacity to prevent and mitigate financial crises and to engage in social cohesion and climate policy. In order to increase the crisis prevention and mitigation capacity of low- and middle-income countries, we need continued access to IMF unconditional finance and an expansion of regional financial arrangements. In order to flatten the hierarchy, GFSN elements need to be coordinated, including the central banks of the continuously increasing currency swap network.

[1] The authors thank Özlem Albayrak for extremely valuable research assistance.
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1. Introduction: The diversified global financial safety net: Beyond an institutional view

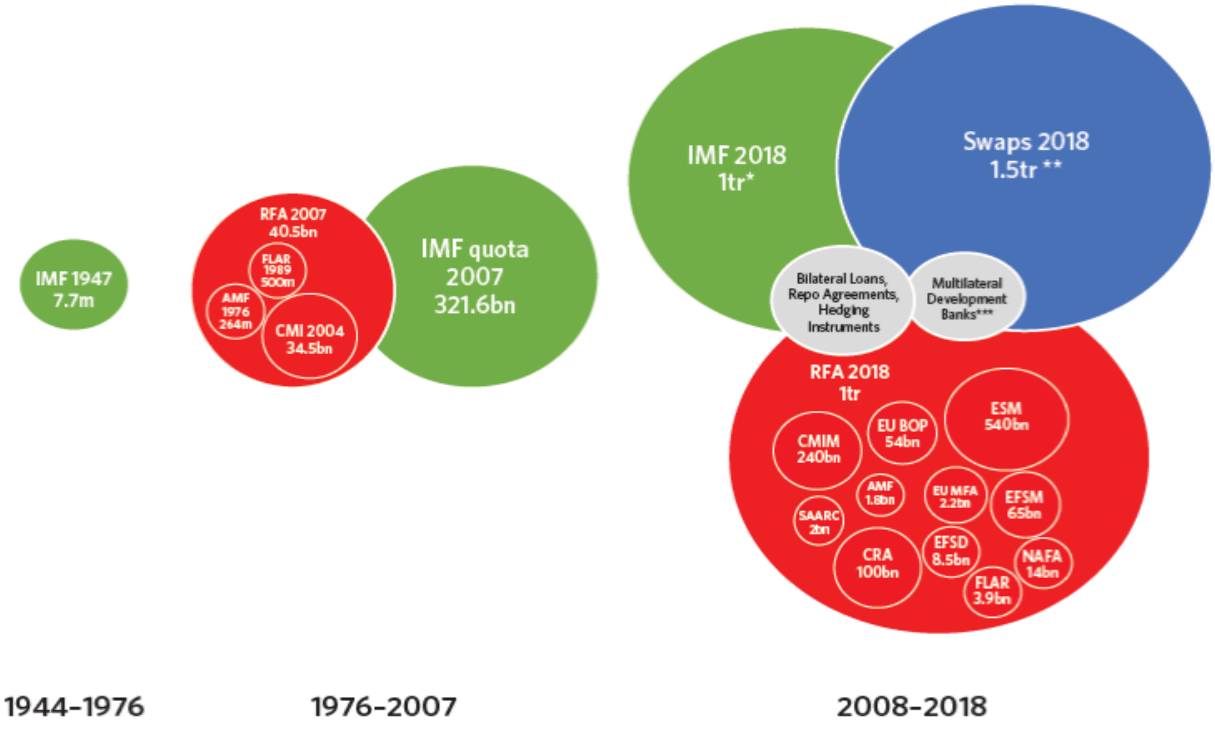
With the COVID-19 pandemic, the world economy is challenged with multiple crises. At the same time, policy-makers have a broader range of institutions to draw on for international liquidity support than before the global financial crisis 2008/09. Since the 2008/09 crisis, the so-called Global Financial Safety Net (GFSN) of institutions and arrangements for short-term finance has evolved tremendously. What used to be the IMF as the only crisis finance institution after the end of the Bretton Woods system is today a complex system of global, regional, and bilateral sources of support. The GFSN is called into question because it lacks coordination (ESM 2018) and it lacks the adequate resources to prevent and mitigate the kinds of financial instability we are witnessing since the onset of the COVID-19 pandemic in 2020 (Mühlich et al. 2020; 2021; Stubbs et al. 2021).

In particular, new lending institutions and mechanisms have been developed; lending instruments have diversified, and there has been a dramatic increase in resources. Today, the GFSN is comprised of the International Monetary Fund (IMF), regional financial arrangements (RFAs), and bilateral currency swaps between central banks. Prior to these changes, the IMF was the largest crisis finance institution and it was accompanied by a handful of regional financial arrangements (RFAs) that were either very small or untested. Today, the GFSN has an unprecedented capacity for crisis prevention and liquidity support via emergency financing institutions and arrangements at the bilateral, regional, and global levels. In total, the collective lending capacity of the GFSN is at least US$ 3.5 trillion (see figure 1). This represents a more than tenfold increase in available short-term liquidity compared to before the global financial crisis and the COVID-19 pandemic.[2]

Since 1976, the GFSN had been dominated for decades by the IMF and a few small regional financial arrangements (RFAs) that were set up as institutionalized jointly-administered regional funds, such as the Arab Monetary Fund (AMF; founded in 1976) and the Latin American Reserve Fund (FLAR, according to its Spanish acronym; 1978). With the Asian financial crisis and particularly the global financial crisis, new, more voluminous RFAs were created, such as the Chiang Mai Initiative (CMI; 2001), later the Chiang Mai Initiative Multilateralization (CMIM; 2010), the Eurasian Fund for Stabilization and Development (EFSD; 2009), the swap arrangement of the South Asian Association for Regional Cooperation (SAARC; 2012), and the BRICS Contingent Reserve Arrangement (CRA; 2014), the latter being the first trans-regional RFA. The complexity of the GFSN additionally increased with the emergence of numerous voluminous bilateral currency swap arrangements. With the global financial crisis, all GFSN elements considerably expanded their lending capacity.

[2] Beyond these commonly named core elements, crisis lending by multilateral development banks, bilateral short-term government loans, and special drawing rights (SDRs) holdings in the IMF as well as national foreign exchange reserve holdings are mentioned by some authors as part of the GFSN (see for example Vinokurov and Levenkov 2021; Scheubel and Stracca 2019) but are not within the scope of this analysis.

Figure 1: Institutions and lending capacity in the global financial safety net over time (USD)



Source: Mühlich et al. (2020).

As the Covid-19 pandemic took hold, the potential need for liquidity resources was estimated to exceed US$ 2.5 trillion (UNCTAD 2020). This presented a great opportunity for the expanded and more robust GFSN to be put to the test during a truly global crisis. However, Mühlich et al. 2021 based on data in Kring et al. 2022 have worked out that liquidity provision during COVID-19 is strongly skewed towards higher-income countries. Additional to this structural inequality, the authors find geographical inequalities in the coverage and in the utilization of the GFSN.

Two strands of literature on the GFSN exist: Economic scholars concentrate on whether the GFSN has the appropriate financing capacity to respond to different types of shocks or crises (Scheubel and Stracca 2019; Essers and Vincent 2017; Denbee et al. 2016). Political economy scholars analyse the complexities and crisis finance options in the GFSN from an institutional perspective of the diversifying GFSN. While some have suggested the positive potential for alternative sources of finance (Grabel 2017), others have raised concerns about moral hazard (WederDiMauro and Zettlmeyer 2017) on the one hand and the requirements for coordination of institutionalized GFSN elements on the other hand (McKay et al. 2011).

Even if insightful in terms of identifying inequalities, the political economy perspective widely dismisses capturing the GFSN's diversification dynamics that increase complexity and fragmentation since the onset of the global financial crisis 2008/09 (an exception is Henning 2019). Since then, the diversity of GFSN instruments has grown substantially but literature so far dismisses a comparative analysis of the effects that this diversity has on a country's crisis response capacity.

Central bank currency swaps have been examined with a focus on FED swaps (Aizenman et al. 2021, Perks et al. 2021) and their role for financial crisis response. Yet, to our knowledge, the diversity of central bank currency swaps has not yet been subject to systematic analysis. At first view, these bilateral agreements to swap liquidity in the currencies of two central banks seem to be of better quality than all other options, due to their immediate availability, their absence of conditionality, and their often very large financing volume. However, we observe an increasing diversification over the

last years, where not only the US Fed, and the PBOC offer bilateral support to other central banks in their own currency, but an increasing number of advanced economies' central banks and even emerging economies' central banks engage in bilateral currency swaps as a monetary policy instrument. And we certainly cannot assume that a swap from an EME in its own currency offers the same crisis prevention and backstop quality as unlimited swaps from the Fed, for example.

The increasing diversity and fragmentation of the GFSN not only appears in the new currency swap landscape but also in granular changes in IMF facilities. In particular, the COVID-19 pandemic has provoked reforms of IMF facilities: the Fund introduced new non-conditional credit lines to tackle current emergencies for all member countries in significant volume. These new financing options, in contrast to the standard conditioned support, have been strongly demanded by a large number of emerging and developing economies. As discussed in Mühlich and Fritz (2021), McKay et al. (2011), regional financial arrangements are built in a region-specific way that varies, depending on the necessities of the member countries (see Grabel 2017). Since the global financial crisis, several new RFAs have been created (see above) and existing ones have reformed their facilities in order to provide higher lending volumes, such as FLAR in response to the COVID-19 pandemic, or to provide finance with less policy reform obligations, such as the decoupling of CMIM financing requirements from the IMF. The RFAs' role dynamically evolves and differs according to their respective governance, lending, and surveillance mechanisms.

In response to this research gap, two main research questions guide this paper. First, we ask which GFSN crisis finance options provide better liquidity provision than others, from a country perspective. To order the quality of liquidity provision, we derive a set of variables from the literature. High quality of crisis liquidity is given for example by a sufficient volume of financing, by liquidity denominated in convertible key currencies, and by the absence of policy conditionality. To elaborate an ordinal hierarchy of the quality of GFSN options, we create a multidimensional index for the quality of crisis liquidity provision, or GFSN index, where we grade different crisis finance options offered by the IMF, regional financial arrangements, and central bank currency swaps based on six variables that determine the quality of liquidity provision. In a second step, we ask which countries have access to which level of crisis finance quality in the GFSN, and seek for patterns regarding income country groups or geographic regions.

Gaining more information on the quality of crisis liquidity is relevant both for the financial stability of single countries in distress and for the global financial system. The quality of access to short-term crisis liquidity has a deep impact on the ability to tackle balance-of-payment and related financial crises, both in its prior prevention and later mitigation. If not treated adequately in terms of time, the volume of liquidity and credit conditions, for example, a crisis quickly deepens, thereby getting costlier by the day in economic and in social terms. Eventually, access to adequate crisis finance may decide about a crisis turning into a solvency crisis when not adequality treated. The way a financial crisis is treated, including the conditions creditors do attach to their financial support, is decisive for the ability of countries to set new paths towards economic, social, and ecological sustainability (Obstfeld 1996).

This is especially relevant in the current context where – as a consequence of the pandemic – many EMDCs face rising debt levels and, in an increasing number of cases, debt distress (Georgieva and Pazarbasioglu 2021; World Bank 2022). Current inflationary pressures and devaluation spirals of almost all currencies against the US dollar due to tightening monetary policy stances of the Fed add to raised public debt and expanded private corporate debt, both often denominated in US dollar due to a long period of exceptionally low global interest rates. Recently, the IMF already identified 60

percent of low-income countries as being already either in or at high risk of debt distress (IMF 2022a).

In this current situation of mounting debt distress in many countries of the global South, it is paramount to have full and well-structured information on the vulnerability and capacity of resilience for a maximum of countries. Governments have increasingly turned to new creditors, especially towards China, where information on credit volumes and terms is not always available; and governments, in an effort to shield the private sector from the woes of the pandemic, have offered credit guarantees and other mechanisms which led to a building up of public contingent liabilities mostly not explicitly recorded in the balance sheets. Thus, prominent economists such as Pazarbasioglu and Reinhart (2022) call for efforts to shine a light on debt, and with this on the degree of vulnerability and resilience at the country level. We argue that, even if this is necessary, it is not sufficient. The dimension of crisis finance access, as an important part of crisis resolution, is overlooked in all these approaches. To get a full picture of the degree of vulnerability and resilience of indebted countries, we also need detailed information on their access to sources to tackle financial and debt crises. In the current multipolar world, this requires looking beyond the IMF's capacities and including in this assessment the role regional funds and bilateral central bank agreements can play.

In the second part of this paper, we elaborate on the building of a composite GFSN index, with variables derived from the literature, and the scoring of GFSN instruments, and introduce the data base. The third part empirically applies the GFSN index to the data for GFSN access at the country level. The fourth part concludes.

2. The hierarchy of the GFSN: Building and operationalizing an index for the quality of different options of crisis finance

2.1 Adding to debt vulnerability indices

Against the background of multiple crises that challenge the global economy, several approaches to measure and rate the financial vulnerability of countries have been developed. This is particularly the case for assessments of the intensity of long-term debt distress of countries on which most of the new indices concentrate. For these assessments, the GFSN index provides useful additional information on the financial vulnerability and resilience of a country and hence on the likelihood that a country's short-term liquidity crunch might turn into a full-blown debt crisis.

Most recently, the UN called for the building of a multidimensional vulnerability index that includes climate change and debt indicators, given the world has turned into one of multiple crises (UN s.d. a). The aim of this effort is to build better ways to measure a country's vulnerability to shocks. While the initiative comes from the need to assess the risk situation of the group of Small Island Developing States, the aim is towards building a more general index, applicable to all countries. Based on the so-called Vulnerable Twenty (V20) Group of Finance ministers that include 55 climate-vulnerable economies, authors assess countries' debt profiles (Ramos et al. 2022), based on the variables: external debt stock; debt composition by creditors (where the degree of vulnerability increases with the share of private creditors, due to their pro-cyclical lending behavior); and debt service in the upcoming years, they rank V20 countries according to their debt at risk.

The European Rating Agency Scope (Scope 2022), based on its credit ratings, provides an 'External Vulnerability and Resilience ranking'. Its composite is designed upon several core indicators divided between the dimensions of external vulnerability and of external resilience, capturing a snapshot of crucial elements associated with external-sector risks confronted by varying economies. External

vulnerability is measured as a result of the current account balance plus net foreign direct investment, net portfolio flows and other investment flows, exchange rate volatility, and the net international investment position of a country. Especially relevant for our exercise is the first variable for scoring external resilience: resilience against currency crises (reserve currency status and reserve coverage of short-term external debt)[3].

2.2 The components of the GFSN index

In the following, we develop the foundation and the variables that we consider relevant to comprehensively determine the quality of a certain liquidity provision instrument in the GFSN. Theoretically, the components included in the GFSN index are based on the three generations of balance of payments models that provide insights on how crisis prevention and liquidity backstop should be provided.[4] In particular the second and third-generation of balance of payments crisis models framework is telling for the requirements of crisis finance in a post-Bretton Woods system of flexible exchange rates and free capital movement. The implication in these models is that if a third party – such as one or more of the elements of the GFSN – can guarantee continued access to loans at sensible interest rates, expectations in a 'good' equilibrium will stabilize and a self-fulfilling crisis will not occur. The essential outcome of all generations of balance of payments crisis models is that timeliness and sufficiency of the provided liquidity are the key criteria for the third party to reduce financial vulnerabilities (Obstfeld 1996, Krugman 1999).

The GFSN index is based on standard guiding criteria for index building, as listed for example in the UN initiative (UN s.d. b):

- Multidimensionality: Indicators should be drawn from relevant dimensions regarding the quality of crisis liquidity provision.
- Universality: The index should be designed to capture the characteristics of all existing GFSN options, so as to ensure credibility and comparability.
- Exogeneity: The index needs to clearly distinguish between exogenous and inherited factors to ensure compatibility with current performance-based allocation models.
- Availability: The index needs to employ available, recognized, comparable and reliable data, while approximations and imputations may be necessary to avoid inaction.
- Readability: The index's design needs to be clear and easily understood, avoiding redundancy.

Currency denomination of contracts

We base the differentiation of currency denomination of loan contracts on the Keynesian understanding of currencies as assets. According to this theoretical framework, currencies are not perfect substitutes but differ according to their different liquidity premia, saw on market liquidity (Davidson 1992: 46). Cohen (1998; 2004) theorizes the "currency hierarchy" and classifies different currencies according to their market liquidity (see also DePaula et al. 2017; Fritz et al. 2018). At the top, Cohen (1998, 2004) classify very few currencies such as the US dollar and the Euro, Yen, Pound

[3] The other variables are: the share of general government debt held by non-residents, foreign-currency-denominated government debt as a share of government revenue, and foreign-currency-denominated loans (Scope 2022: 3).

[4] Central to these models is the idea that there is a limited stock of any asset, which is depleted by either policy errors or investors' flight, or a combination of both. While the first generation explains attacks on a currency with a fixed exchange rate as the result of inconsistent government policies or the flight out of public bonds under the assumption of rational expectations, second-generation models do not necessarily assume a clear-cut policy failure but include the possibility of multiple equilibria for countries with economic policies that are not clearly unsustainable. This leads to the possibility of a self-fulfilling debt or fiscal crisis. Third-generation models of financial crises surfaced in the context of emerging market crises during the 1990s and reveal the negative consequences of international debt and domestic financial crises.

and Swiss Franc with high market liquidity whereas at the bottom he classifies the numerous currencies that have no or very low market liquidity. Eichengreen et al. (2007: 160) highlights the dominance of the above-mentioned few major currencies in market portfolios. Armijo et al. (2014) empirically systematize the prevailing dominance of a few major currencies.

Furthermore, the 3rd generation of balance of payments crisis models underline the importance of balance sheets effects in aggravating balance of payments problems (Cole and Kehoe 2000). We assume that due to the important role that mismatches in currency denomination, maturities, and interest rates play in financial crises, the currency denomination of the external third-party balance of payments finance plays an important role in the usability of the provided liquidity as well as for the market signal of the crisis finance provided.

We incorporate the currency hierarchy in the GFSN index by considering the currency denomination of different GFSN instruments: Given the US dollar is the key currency in international markets (representing 88% share in trade & financial transactions in 2019, see BIS 2019), we attribute the score 1 (the highest) to contracts denominated in USD. As of December 2021, we found GFSN instruments denominated in 22 different national currencies from developing and advanced countries alike. To operationalize the degree of international liquidity for each currency, we chose a continuous range from 0 to 1, based on information provided in BIS 2019. We use a log scaling, which is a common normalization technique. Accordingly, the USD is assigned with 1 point, the EUR 0.77, the JPY 0.63 and the RMB 0.31 (To see the complete table with scores, see annex 2).

Volume

The 2nd generation balance of payments crisis models (Corsetti et al. 1998; Obstfeld 1996) highlight the importance of voluminous third-party crisis finance if it is to clearly signal the insurance against or backstop of a temporary balance of payment problem. Voluminous crisis insurance and response is key to the effectiveness of the provided crisis finance for market expectations to re-gain confidence and to stabilize the multiple equilibria on the stable side.

Based thereon, and as an approximative measure (see Orzag and Stiglitz 2002 on the difficulty to define a sufficient volume for crisis finance), the GFSN index uses the IMF conditional lines' lending capacity for a country for one year as the threshold to classify the volume of conditional line as 0 (small volume) or 1 (voluminous). This threshold is considered for the IMF conditional lines, and RFAs that offer lines linked to IMF conditionalities (e.g. CRA and CMIM)

For unconditional loans or swaps, similarly, the IMF lending capacity for one year under the reformed catastrophe facilities determines the threshold for a loan to classify as voluminous or of small volume. This includes RFA unconditional loans (FLAR, AMF) or those financing arrangements where no IMF program is involved (CMIM), as well as RFA swap agreements (SAARC).

Unlimited/Limited

In 2013, the Federal Reserve Bank of the US (Fed) together with the European Central Bank (ECB) and the central banks of Japan, UK and Switzerland (in the following, 'the gang of five') decided to make the swap network that was setup in response to Global Financial Crisis 2007 unlimited. The participating central banks can access an unlimited amount of liquidity in one of currencies that the participating central banks issue.

Due to the decisive role that the volume of crisis finance plays for the effectiveness of balance of payments crisis insurance and backstop, the GFSN index additionally considers the limitedness and unlimitedness of the provided short-term loan or central bank currency swap where unlimited crisis finance (the central bank currency swaps of the above-mentioned central banks) rates 1 and limited loans and currency swaps rate 0.

Conditionality

The first generation explains attacks on a currency with a fixed exchange rate as the result of inconsistent government policies or the flight out of public bonds under the assumption of rational expectations (Krugman 1999). In the first-generation models, any liquidity provision from outside must be conditional on an adjustment program to achieve a rebalancing of public finance and prevent moral hazard. In the second- and third-generation models, a shift in expectations can trigger a crisis. In such cases – even without a change in underlying fundamentals – it is difficult to pinpoint one specific reason for the occurrence of a crisis and hence to pinpoint a specific policy reform for adjustment. The balance of payments crisis literature shows that liquidity crises not necessarily relate to policy failures per se. Particularly falsely implemented and crisis-prolonging reform obligations of the IMF have been and continue to be severely criticized (Dreher 2009; Grabel 2017; Stiglitz 2002; Stubbs et al. 2020).

Given the controversial debate on the difficulty of determining the domestic or external explanation for a financial crisis and the risk of prolonging a crisis with falsely implemented reform obligations, the GFSN index rates conditional lending 0 and unconditional lending 1.

We consider the timeliness of liquidity provision that the balance of payments crises models consider critical for effective crisis insurance and backstop to be interlinked with the presence or absence of conditionality: the less reform obligations apply to a loan, the timelier the disbursement since the preparation of the disbursement is less laborious to realize. Speed of access is therefore not included separately in the GFSN index. The explanatory power of the criteria is the same as the one of conditionality.

Predictability

In the 2nd and 3rd balance of payments models, stabilization of multiple equilibria not least depends on the predictive access to third-party finance as an important signal to market expectations (Obstfeld 1996). In the current GFSN, predictive access to crisis finance is an important distinction between multilateral IMF and RFA and bilateral central bank GFSN elements: Predictability of access to third-party crisis finance has become an important element of balance of payments finance in the GFSN since the emergence of ad-hoc bilateral central bank currency swaps. In contrast to multilateral crisis finance whose borrowing volume and conditions are based on rules and predictive conditions of the IMF or the RFA, and in contrast to the above-mentioned not only unlimited but also infinite swap network of the Fed, central banks negotiate volume and purpose and terms of each currency swap individually.

The GFSN index considers predictable lending capacity 1 and ad-hoc liquidity or swap instruments 0.

Market stigma

Scholarly elaboration on IMF market and political stigma has been widely and controversially debated (IMF 2017; Ito 2012; Stiglitz 2002). Based on the experiences of the Latin American debt crisis and the Asian financial crisis and the subsequent utilization of IMF facilities by the affected countries, we assume that market and political stigma attached to borrowing from a GFSN element influences the quality of GFSN access for a country, we include this category. The GFSN index considers market stigma associated with borrowing from the IMF as 0 and the absence of market stigma for all other GFSN elements as 1.

2.3 Data

The database for our analysis is based on the GFSN tracker (Kring et al. 2022; https://gfsntracker.com/). This database covers all UN countries, displaying their access and active

use of the different instruments of the GFSN. The GFSN tracker collects data between March 2020 and June 2022. Here, we use data as of December 2021.

The Institute for Latin American Studies of Freie Universität Berlin and the Global Economic Governance Initiative (GEGI) at the Global Development Policy Center of Boston University together with the United Nations Conference on Trade and Development (UNCTAD) developed the database that tracks lending activities in the global financial safety net (GFSN) during the COVID-19 pandemic.

Data on loan agreements with the IMF are taken from the IMF member's financial data by country tables and from the IMF COVID-19 lending tracker. Unconditional IMF loans include the Rapid Finance Instrument (RFI) and the Rapid Credit Facility (RCF); a sub-group of unconditional lending, the so-called pre-conditional loan agreements accessible only for countries with sound macroeconomic fundamentals: the Flexible Credit Line (FCL), the Precautionary and Liquidity Line (PLL), and the Short-term Liquidity Line (SLL). Conditional IMF loans include the Stand-By Arrangements (SBA), the Extended Fund Facility (EFF), the Catastrophe Containment and Relief Trust (CCR), and the Extended Credit Facility (ECF).

In regional financial arrangements (RFAs), balance of payments financing is realized either through loan agreements (as in ESM, AMF, FLAR) or through central bank currency swaps that can be activated (as in CMIM, CRA, NAFA, SAARC). Data on realized RFA loan arrangements (ESM, AMF, FLAR, EFSD) or swap agreements (CMIM; see ASEAN+3 Macroeconomic Research Office; CRA, see New Development Bank; SAARC, see Indian Reserve Bank) are taken from the RFA's websites.

Currency swap data are collected from the countries' central bank websites and media reports. Data on PBOC currency swaps are taken from the RMB internationalization reports. Data on FED currency swaps are taken from the FED website. The GFSN tracker counts bilateral currency swaps between emerging and developing economies and bilateral currency swaps between advanced economies twice. The assumption is that those currency swaps between countries of the same country group classification are of mutual use. The GFSN tracker counts bilateral currency swaps between emerging or developing economies and advanced economies once. The assumption is that those currency swaps between countries of different country group classifications are of unidirectional purpose with the beneficiary being an emerging or developing economy. Furthermore, bilateral currency swaps of emerging or developing economies with the Peoples Bank of China (PBOC) are also counted once in accordance with the latter assumption of unidirectional purpose and the beneficiary being an emerging or developing economy.

In our analysis, we exclude the United States. As the issuer of the major key currency (see Armijo et al. 2017), we assume that the US does not have any need to access the GFSN.

2.4 Index scoring method and scoring

Table 1 gives some examples of how we construct our index. For the six variables, we selected (see part 2.3), we give a score from zero to 1. Hence, individual arrangements can score a maximum of 6 points.

Table 1: Index scoring method: Examples

	Currency (USD=1)	**Volume (High=1)**	**Market Stigma (No stigma= 1)**	**Unlimited/Limited (Unlimited=1)**	**Conditionality (no conditionality=1)**	**Predictability (perpetual=1)**	**TOTAL**
FED Swap to ECB	1	1	1	1	1	1	**6**
China SWAP to Lao	0.31	1	1	0	1	0	**3.31**
IMF Conditional line	1	1	0	0	0	1	**3**
CMIM (IMF linked)	1	1-0 (depending on country size)	0	0	0	1	**2-3**

Source: Authors.

The Fed swap to the ECB for example scores six points, the highest possible score in our index. This is because this agreement is denominated in USD. As this is the currency with the highest level of liquidity in the current global financial system, we score this condition as 1. It has a high volume because the volume is above the threshold of 100% of IMF quota. As there is no stigma associated with accessing of a Fed swap, it gains another point. As this agreement is unlimited (countries can withdraw resources as much as they need), it also scores one in this dimension. Then, swap agreements do not have conditionality, which gives it another score of 1, and finally, it has no expiration date, giving it the 6th score point.

As another example, a swap from China totals 3.31 points. First, the currency of this swap agreement is not the dollar, but RMB. As explained above, we score the Chinese currency as 0.31. Volume in this case is also high, giving a score of one. There is also no market stigma, but it is a limited swap agreement, with a high maximum value that a country could withdraw from this agreement. The absence of conditionality gives one point, but as a non-perpetual agreement, with an expiration date, in this dimension, it scores zero. As a result, a Chinese swap agreement scores significantly lower than a Fed unlimited swap agreement, with 3.3 points.

With three points, our methodology scores an IMF standard conditional credit facility only somewhat lower than a Chinese swap, because it is in USD, it has a high volume and it is also predictable. The last example is the CMIM. Although it is denominated in USD, it has a market stigma associated because this RFA is linked to IMF conditionality. It is limited in volume, and it has conditionality, but it is also perpetual. Depending on the relative lending volume for the member countries, the score for small members (with lending volume available at the CMIM above 100% of the country's quota in the IMF) is three, and for bigger countries (with potential lending volume smaller than their quota in the IMF), it scores only 2 points.

3. Empirical analysis

Based on the framework presented above, we apply our score method to analyse the status of the GFSN as of December 2021, using data compiled by Kring et al. (2022). Apart from assessing the number of instruments available to countries and the hierarchy of GFSN individual instruments, we also identify relationships of the index scores with explanatory variables such as country income groups and geographical regions.

3.1. Frequency and hierarchy of GFSN instruments

We begin the analysis by identifying the instrument and attributing a score for each individual GFSN instrument as of December 2021, we identified 759 instruments that could be potentially utilized by countries. As figure 2 demonstrates, roughly half of the instruments are provided by the IMF (188 instruments conditional and the remaining 188 unconditional). 14% of the arrangements (108) refer to RFA and the remaining 35% of instruments are swap lines. FED unlimited swaps represent 3% of the total GFSN instruments, while other unlimited non-USD swaps (from BoC, BoE, SNB, BoJ and ECB) represent 12%. Finally, there are 56 swaps offered by China (7% of total GFSN instruments), and the remaining 99 limited swaps are denominated in domestic currencies and offered by AE and EMDE alike.

Figure 2: Number of arrangements by type

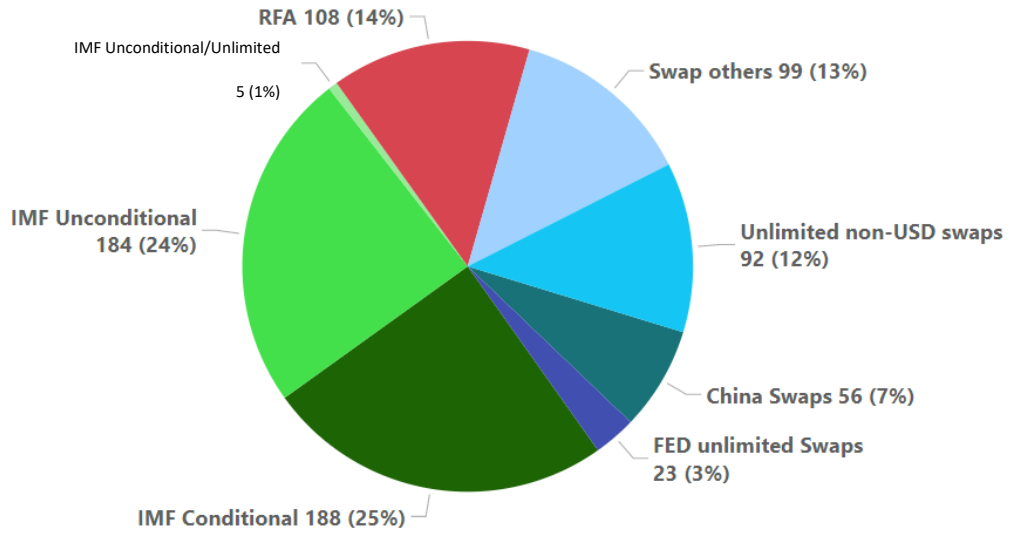


Figure 3: GFSN hierarchy: Frequency of arrangements ordered by index

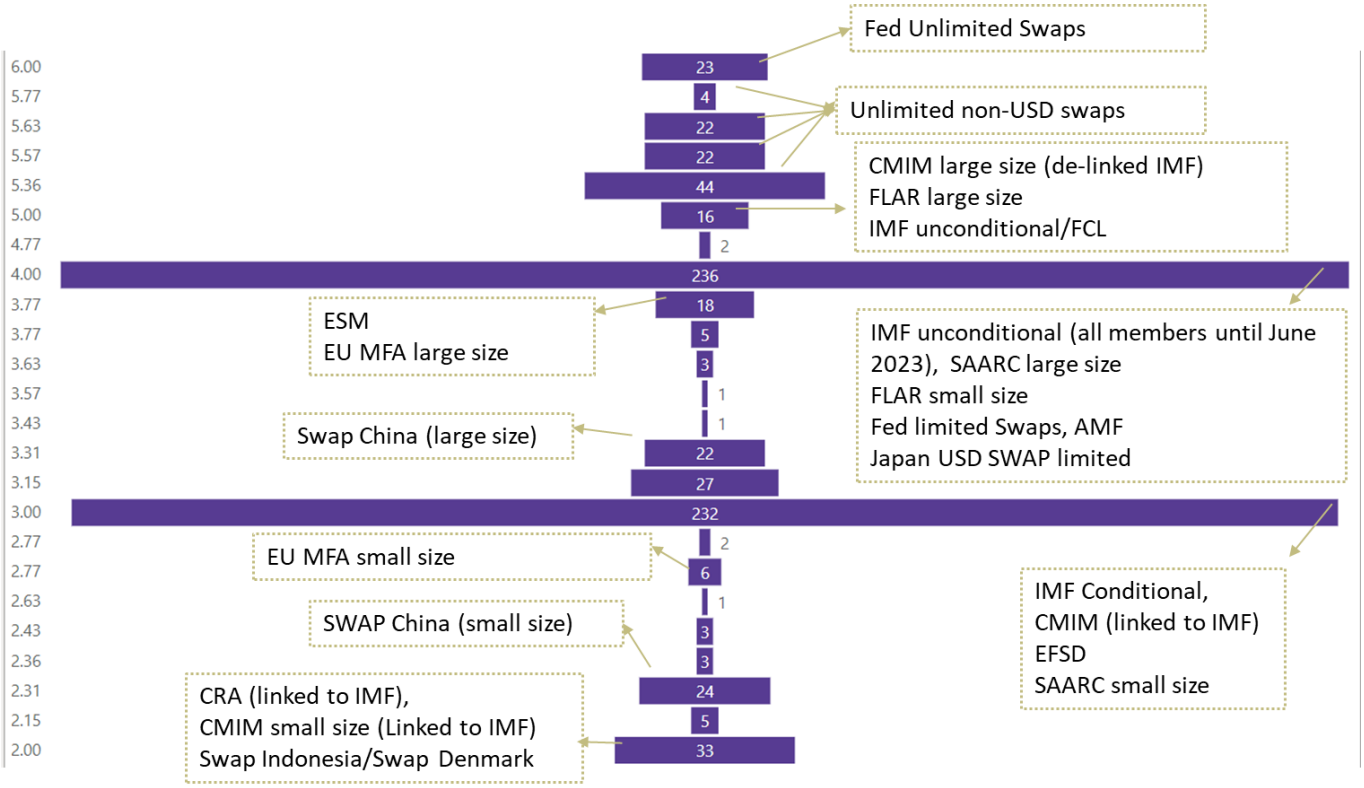


Figure 3 also illustrates the hierarchy of the GFSN instruments. At the top score of 6, we find FED swap agreements offered to the "gang of five" (The Bank of England, the Bank of Japan, the European Central Bank, Swiss National Bank, and Bank of Canada; Luongo 2022) with the highest score six.

In the 5 to 5.99 range, there are agreements offered by the "gang of five" amongst themselves. These swap agreements are also unlimited, but unlike the FED agreements, they are not denominated in USD, but in currencies with high liquidity in international markets, such as the euro and Japanese yen. Depending on the liquidity of these currencies in international markets, these swap agreements score from 5.36 to 5.77 points. In the same 5 to 5.99 range, we also find arrangements with the FLAR and the CMIM that are voluminous in relation to the debtor country that has access to those arrangements. The high score of these RFA agreements is justified by the de-facto lack of conditionalities and/or, respectively, the large volume of funds available to some of their members (e.g. Bolivia in FLAR, Vietnam in the CMIM). However, the cap on possible volume withdraws results in 5 points. The IMF FCL (Flexible Credit Line) also belongs to this group (5 points). Apart from being unconditional, this instrument is unlimited as "there is no cap on access to IMF resources" (IMF 2021). However, only 5 countries are eligible to this credit line (Chile, Colombia, Mexico, Peru and Poland) as of December 2021.

Most instruments are in the range of 4 to 4.99. These comprise mainly IMF temporarily unconditional instruments, together with volume-limited swap agreements by advanced economies, and some RFA instruments (such as voluminous SAARC arrangements and small FLAR arrangements). There are different combinations of characteristics that result in a 4 points instrument. For the case of IMF temporary lines and the SAARC, the lack of predictability and the existence of a maximum volume for withdrawal results in 4 points. But for the FLAR, for instance, 4 points is justified by the limit on withdrawable resources and the overall relatively low volume available to members (e.g. for Colombia) The observable high frequency of rather high-score instruments at four scores for now is

only of temporary nature. The large majority of IMF unconditional facilities are temporarily opened up to all member countries as *ad hoc* catastrophe facilities to tame the consequences of the COVID-19 pandemic (the Rapid Financing Instrument and the Rapid Credit Facility). Their access is planned to end in June 2023 (IMF 2022b). In case their access for all IMF member countries ends in 2023 without providing alternatives of similar non-conditional IMF credit options, the number of countries with access to GFSN liquidity with a score of four points will decrease significantly. This would then lead to a much steeper hierarchy of the GFSN, similar to the situation before the pandemic. In the 4 to 4.99 range, beyond the aforementioned IMF *ad hoc* unconditional lines, some other examples are the Fed limited and temporary agreements, i.e. with Norway or the dollar-denominated agreement by Japan to Indonesia. SAARC swaps and AMF loans score 4 points. Economically large member countries of FLAR (e.g, Peru) have access to a comparatively small crisis finance volume in FLAR. Hence, for those countries, FLAR scores at 4 points.

In the range of 3 to, 3.99 we have several swap agreements from China, but also from New Zealand, Korea, Malaysia, and Sweden. The scores are justified, on the one hand, by the lower global liquidity of the currencies in the contract, and on the other hand, by the high volume of the agreement. In this range, we have IMF conditional arrangements but also swap agreements from Qatar, Denmark, and other countries. moreover, CMIM linked to IMF conditionalities scores 3 points.

Finally, at the bottom of this pyramid, with arrangements scoring from 2 to 2.99 points, we have small-size swap agreements offered by China, Korea, and Indonesia, among others. At the bottom, we find mostly RFA instruments that are conditional and relatively small in size for the majority of their member countries, such as the AMF (for more examples of the GFSN instrument hierarchy, see annex 1).

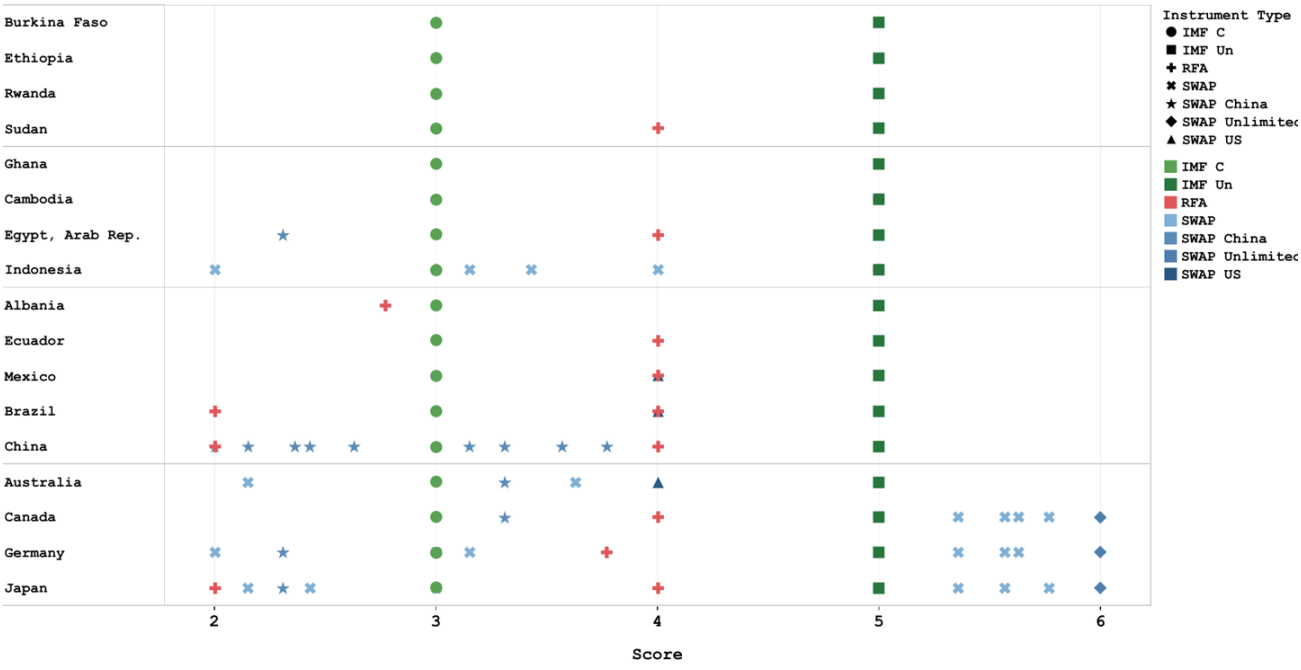
3.2. Aggregate scores: the country level

Now, we turn our analysis to the country level. The access to the GFSN instruments varies widely. Very few countries do not have access to any instrument[5], while others have access to multiple instruments[6]. Figure 4 illustrates the unequal access to the GFSN instruments considering exemplar cases.

[5] For instance, Cuba, Liechtenstein, Monaco, and Dem. People's Rep. Korea are no member of the IMF or any RFA and does not have access to swap agreements.

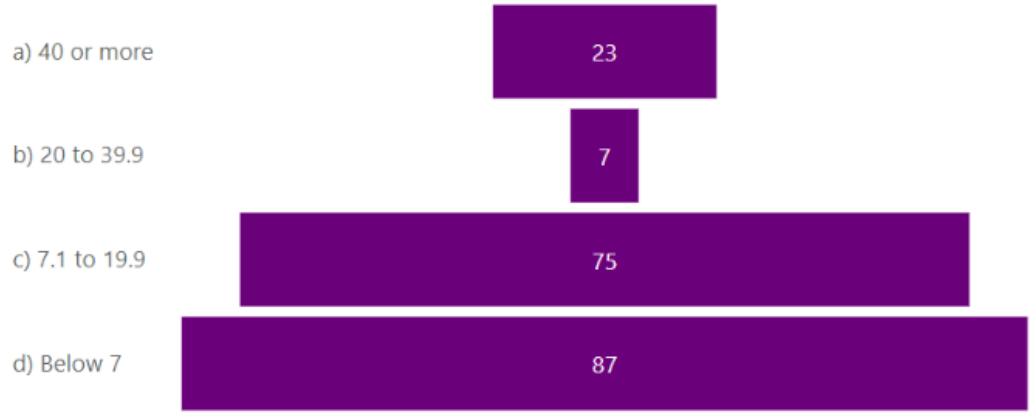
[6] For instance, China has access to 12 swap agreements, IMF conditional and unconditional lines, as well as 2 RFAs.

Figure 4: Access to the GFSN instruments, selected cases



Source: Authors.

Figure 5: Aggregate access to the GFSN



Source: Authors.

Summing up the score attributed to individual agreements (Figure 5), we calculated an aggregate score for GFSN quality to each country. As figure 5 shows, we found that 23 countries scored over 40 points. Japan stands out as the country with the highest aggregate score (52 points). The highest number of countries score below the aggregate of 7 points. These countries rely exclusively on IMF lending (83 countries) or have no access at all to the GFSN (score 0, 4 countries). Other countries have access to a mix of instruments, including the IMF, and one or more options from volume-limited, domestic currency-denominated swaps and or RFA access of differing relative volume. This means that, in total, 85% of all countries range at the lower half of the aggregate average GFSN index scores, below 20 points.

3.3. Quality of GFSN access by Income groups and regions

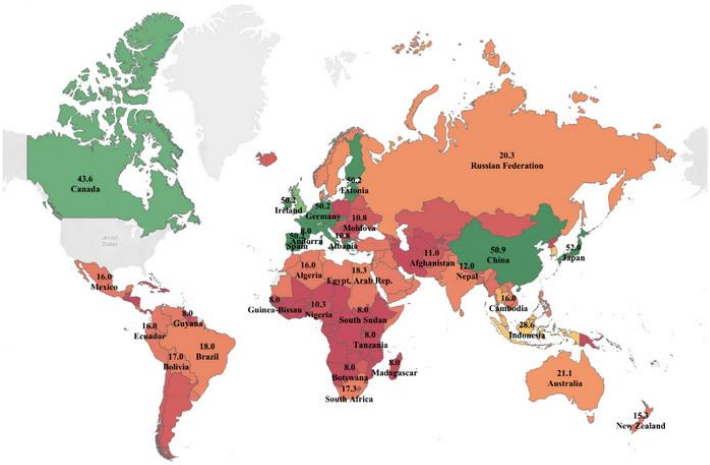
Figure 6.a. further breaks down the aggregate scores discussed above into structural and geographical groups. Figure 6.b. fans out individual country-level scores of the GFSN index. This country-level perspective is the first mapping of its kind that comprehensively visualizes the quality of GFSN access that a country has to prevent and backstop balance of payment distress.

Figure 6.: Aggregate GFSN index score by region and income

Figure 6 a: Matrix

	Income group			
	High income	Upper middle income	Lower middle income	Low income
North America	43.6			
Europe	35.1	10.5	10.8	
Middle East & North Africa	20.5	16.7	15.5	16.0
East Asia & Pacific	21.6	19.3	12.5	8.0
South Asia		12.0	14.4	11.0
Central Asia		12.1	10.0	
Latin America & Caribbean	9.6	11.7	9.5	
Sub-Saharan Africa	8.0	9.6	9.2	8.7

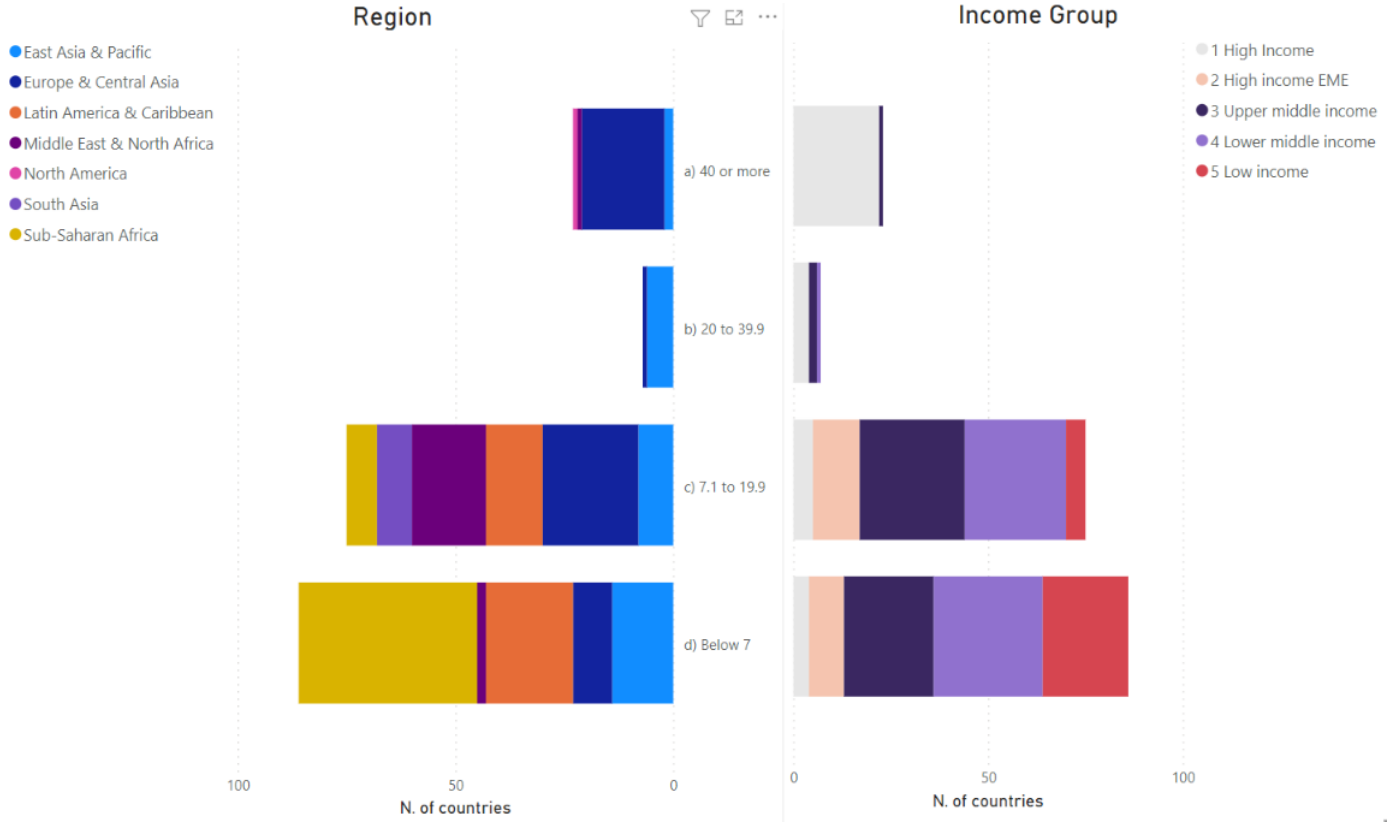
Figure 6 b: Map



Source: Authors.
Note: North America includes only Canada.

Figure 6.a shows the average aggregate GFSN index score for different income levels and geographical regions. North America (here composed only of Canada since we excluded the US) shows the highest score, followed by the European core countries, mainly because Euro member countries are part of the "gang of five" with unlimited access to FED unlimited infinite currency swaps. East Asia and the Pacific score high because China and Japan are part of that region. Since unweighted averages are used here, the fact that many economically small East Asian high and upper-middle-income countries have access to swaps as their instrument of crisis prevention and backstop, slightly overestimates the level of GFSN access quality. The picture looks different for Latin America and especially for Sub-Saharan Africa, which both show low scores on average. For Latin America, the use of unweighted averages somewhat underestimates the relevance of economically bigger countries like Mexico or Brazil, which have access to limited FED swaps, for example (see figure 6.b).

Figure 7: Accumulated access to the GFSN by income group and region



Source: Authors.

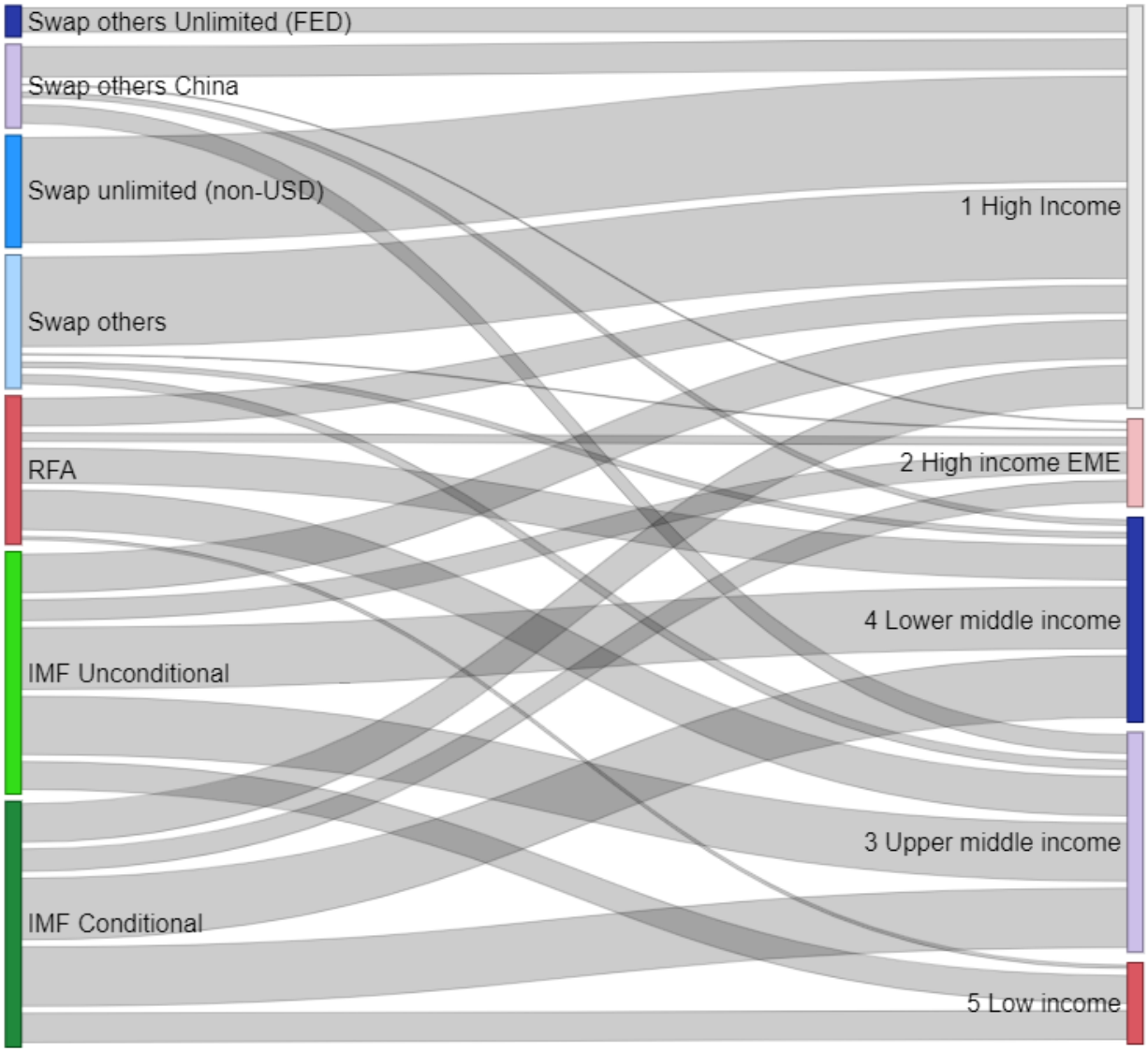
The GFSN index scores suggest a two-dimensional inequality: not only have predominantly low-income countries a low GFSN index score in their access to GFSN crisis finance but also does a country's GFSN access vary with its geographical location. In figure 7, we show the global access to the GFSN by income group and by region by categorizing four different thresholds of the GFSN index scores according to the two explanatory variables of geographical location and income group. The four categories are: above 40 points, between 20 and 39.9 points, between 7.1 and 19.9 points, and finally, below 7 points.

On the right side of the graph, in the group above 40 points, all countries are high-income advanced economies, such as Canada, Japan, and ECB member countries, with the exception of China. The second group ranging from 20 to 39.9 points is comprised of high-income advanced economies outside the Euro area, such as Great Britain, South Korea, Singapore, or Australia, but also some upper middle-income countries like Malaysia, Russia, Thailand, and Indonesia. These countries not only have access to at least one RFA but also to bilateral swap agreements. At the third level (7 to 19.9 points) we see a more diverse group of countries. It is mostly comprised of middle-income countries, but there also are a few high-income advanced economies outside the Euro area, too, such as Denmark, Sweden, Norway, New Zealand, or Iceland. Apart from the IMF, these countries have access to the Fed's temporary volume-limited swaps, or to swaps offered by the PBOC, such as Iceland. The other high-income countries in this group are high-income emerging market economies, predominantly small island developing states. At the bottom of this pyramid-shaped picture of the GFSN, the fourth group of below 7 scores relies exclusively on the IMF. With the exception of a few low-income countries with access to an RFA (Afghanistan, Sudan, Syria, Yemen, and Somalia), all LICs belong to the bottom of the GFSN hierarchy. The fourth group also has the highest share of lower-middle-income. We found that, on average, high-income countries have an aggregate GFSN index score that is more than four times higher than the one of low-income countries.

3.4. Distribution of instruments towards income groups: the steep hierarchy of swaps

Finally, we analyze the destination of specific instruments for the different income groups. This will allow us specially to take a deeper look into the diversity of bilateral currency swaps and their destination.

Figure 8: Source and Destination of GFSN arrangements



Source: Authors.

The most outstanding result of figure 8 is that high-income countries make up the largest group of swap partner countries. Almost all kinds of central bank swaps – be they unlimited, volume-limited, infinite, finite, denominated in USD, or in other currencies – are agreed upon between high-income countries. The Chinese central bank is somehow an exception; around half of its swaps go to middle-income countries. But not even China is offering this instrument to poor countries, despite its intense trade and financial links with many low-income countries. Thus, when central banks engage in this instrument, they mostly address countries of their own income group in the provision of liquidity, usually in their own currency, reproducing and reinforcing global economic inequalities in this relatively new and non-multilateral instrument of crisis liquidity provision.

While most RFAs provide liquidity to low- and middle-income member countries, their contribution especially in terms of volume varies widely; and one of the biggest RFAs, the ESM, addresses European advanced economies. Access to the IMF is by definition the most equally distributed, as it offers crisis liquidity to all members. At the same time, the most relevant IMF unconditional instruments are only temporarily accessible, with specific relevance for the poorer countries.

3. Conclusion

The GFSN index allows confirming previous findings about the skewed nature of the GFSN, and its inappropriateness to respond to the next systemic crises which are on the horizon due to the increased debt vulnerability of so many poorer countries. The GFSN index we developed here allows a new, more precise analysis of the inappropriateness: In contrast to an institutional view that focuses on the differences between IMF, RFAs, and swaps, the scoring of GFSN instruments allows detecting specific inequalities in crisis prevention and mitigation capacities.

What can we learn from this exercise of scoring the quality of GFSN access by an index, that GFSN literature has dismissed so far? The present analysis reveals the GFSN as a hierarchic safety net. We systematize the GFSN hierarchy by an ordinal order that is based on the quality of existing GFSN instruments to tackle financial crises. Thereby the GFSN index reveals that GFSN elements are of different usability in preventing or responding to a financial crisis.

We find that most high-income advanced economies have access to all elements of the GFSN and thus, for these countries, the GFSN index scores are highest. Yet, within this group, we find a hierarchy, with the few advanced economies such as the eurozone members, Canada, and Japan with access to unlimited US central bank swaps, the “gang of five” as the very few countries that have access to the highest quality GFSN instruments. High-income but non-eurozone members have less well GFSN access, except in the Scandinavian countries.

In stark contrast, the vast majority of low-income countries is excluded from almost all GFSN instruments except IMF lending. Higher quality voluminous unconditional IMF lending to these countries is only temporary access during the COVID-19 pandemic. These countries do not have access to any kind of swap, either from the Fed, from China, or from other countries, and most countries are not a member of a regional fund. This represents a twofold exclusion from the GFSN – geographically (non-existence of a regional fund) and structurally (no access to bilateral central bank currency swaps) that makes LICs completely dependent on the IMF.

The GFSN index also allows a better understanding of the network of central bank swap arrangements, which has enormously expanded and diversified since the global financial crisis 2008/09. Their sheer liquidity volume and their immediate disbursement when demanded after the setup of the swap contract make currency swaps a very strong tool for financial crisis response. At the same time, as a bilateral instrument, it allows for circumventing multilateral institutions with their transparent, rule-based, and predictive arrangements that allow access for all countries although at different terms. Swaps allow the currency-swapping central banks to enforce national interests, either related to trade and financial ties, or to geopolitical considerations. This applies to the US and to China in the same manner, even if at different income levels. While the US supports mostly very high-income countries (with few exceptions), China offers swaps mostly to middle-income countries. The financial, trade, and geopolitical interests of central banks that are in the position to offer bilateral currency swaps exclude many middle-income and all low-income countries. Similarly, Africa and Latin America, with few exceptions, remain excluded from the swap network. At the same time, Europe, and also many South East Asian countries are well covered. The GFSN index

thus reveals that bilateral instruments increase the inequality of the GFSN tremendously: we find a much more hierarchic and even exclusive global order of crisis finance than at the onset of the global financial crisis 2008/09.

The GFSN index further shows the huge impact of the IMF's temporary reaction to the COVID-19 pandemic: The Fund's temporary offering of non-conditional loans to all of its members in relevant volume has led to a remarkable reduction of inequality in the GFSN. The quality of GFSN access for LICS, but also for middle-income countries improved considerably, resulting in a reduction of their debt vulnerability.

The scoring of the quality of GFSN access for individual countries provides relevant additional information for the degree of external vulnerability of debtor countries since it shows how well countries are equipped to prevent and backstop a balance of payments crisis. The empirical application of the GFSN index is novel, and at the same time easy to include in any effort of assessing and ranking the external vulnerability and resilience scoring of indebted countries.

To test and to further calibrate our composite index of GFSN quality, the next step would be to run case studies at the country level, to check for irrelevant or omitted variables of our GFSN index, such as the cost of liquidity access, and to include a weighting of the different dimensions of GFSN quality. Country studies also will help to explain if the use and the usefulness of different options of the GFSN vary with the type of crisis or with country characteristics, such as income levels. Another question to tackle is the relationship between country characteristics and the coverage of the currency swap net. While there is already research on the choices the US Fed is making, there is much less analysis for the motives for swap arrangements by other central banks.

Finally, what policy implications can we draw from this analysis for the reforms of the GFSN, to reshape its hierarchical shape? First, there is high urgency to rethink the conditionalities of crisis prevention and backstop, especially for low-income countries. For these, access to similar non- or at least low-conditional funding beyond the current crisis period is key. Today, the need to substantially overhaul IMF conditionalities is more urgent than ever. There is also a need to reform IMF country quota. As long as IMF quota are determined mainly by the economic weight of countries, high-income countries, who have already access to quite highly scoring GFSN elements other than the IMF, will capture a large share of IMF resources. LICs will continue to be left aside with fewer and qualitatively lower crisis response tools. The same applies to a reallocation of SDR. The additional allocation of SDRs requires redistribution in order to reach those countries that are underequipped with crisis finance in the GFSN. For example, the "gang of five", the countries which are partner countries to the unlimited swaps by the FED, are major candidates for such SDR reallocation since there is no need for them to utilize IMF resources.

Furthermore, the bilateral character of the central bank currency swaps gives room for pushing national financial, trade, and geopolitical agendas, exercising what we could call 'liquidity diplomacy' on the back of the financial vulnerabilities of countries. Unilaterally designed liquidity provision is not only unpredictable but also undermines multilateral rule-based and transparent ways of reducing vulnerability for individual countries and increasing resilience against systemic financial crises for all countries. In that sense, central bank swaps are a threat to the global public good of financial stability that needs to be combatted by including central banks in any effort to coordinate GFSN elements.

For increasing the resilience of LICs against liquidity and solvency crisis, reforming the GFSN is most urgent: First, reforming the currently temporarily non-conditional access to IMF facilities into a predictably available non-conditional access to crisis finance is an obvious first step to increasing resilience. Second, the establishment and expansion of regional financial arrangements to include

LICs, in particular in Sub-Saharan Africa, represents an option to increase LICs GFSN access and improve the quality of their crisis prevention and backstop instruments.

Last but not least, the GFSN index shows that, on the regional level, regional financial arrangements make a difference for many countries that have access to a regional fund: there is a need to reshape and reform regional funds and to create new funds in geographic areas that are not yet covered by a regionally set up and governed crisis response tool. This concerns particularly low-income countries in Sub-Saharan Africa. But there is also to need to overhaul the RFA's which currently have a link to the IMF because this makes them much less useful and much of much lower quality for their member countries.

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Annex

GFSN arrangements: example by score

Score	Examples
6	Fed unlimited/permanent swaps to ECB, BoE, BoJ, SNB, BoC
From 5 to 5.99	Swap from ECB unlimited/ perpetual to BoJ (5,77). Swap from Canada unlimited/ perpetual to BoE (5.36) CMIM to Vietnam large size (de-linked from IMF) (5) FLAR to Bolivia (large size) (5)
From 4 to 4.99	Swap temporary from ECB to Croatia (4.77) IMF unconditional (all members until June 2023) (4 points) SAARC to Buthan (large size) (4) FLAR to Peru (small size (4) AMF (4) Swap Japan to Indonesia (4) Swap FED to Norway or Brazil (4)
From 3 to 3.99	ESM (3.77) EU MFA large size (3.77) Swap China to Argentina (3,31) CMIM conditional (3) EFSD (3) IMF conditional (3) SAARC small size (3) Swap Qatar to Turkey (3)
From 2 to 2.99	EU MFA (2.77) small size Swap China to ECB (2.31) Swap Korea to Turkey (2.15) CRA (IMF linked) (2) CMIM (IMF linked) small size (2) Swap Denmark to ECB (2) Swap Indonesia to Malaysia (2)

Market share of top traded currencies in foreign exchange offshore markets in 2019 (%)

Currency	Market share %	Log Scale 1-0
USD	88	1.00
EUR	32	0.77
JPY	17	0.63
GBP	13	0.57
AUD	7	0.43
CAD	5	0.36
CHF	5	0.36
CNY	4	0.31
HKD	4	0.31
NZD	2	0.15
SEK	2	0.15
KRW	2	0.15
SGD	2	0.15
NOK	2	0.15
MXN	2	0.15
INR	2	0.15
Other currencies	-	0