RFAs' Financial Structures and Lending Capacities: a Statutory, Accounting and Credit Rating Perspective

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Abstract

This paper documents the diverse financial structures – including capital structures and funding strategies – of Regional Financing Arrangements (RFAs) and offers an analysis of RFAs' lending capacity from a statutory, accounting and credit rating perspective. Using credit rating agencies' methodologies, the paper presents the dynamic relationship between RFAs' financial structures, the support from their member states and their resulting creditworthiness. A stylized model is developed to demonstrate how the relative size of an institution's paid-in compared with its callable capital, together with its member states' support, could have an impact on the overall credit rating and lending capacity of an RFA. This paper contributes to the growing policy discussions on the heterogeneity of RFAs and their rising importance in the Global Financial Safety Net.

Keywords: Regional Financing Arrangements, IMF, Credit rating, Capital, Lending Capacity, Global Financial Safety Net

JEL classifications: F33; F34; F53; F55; G24

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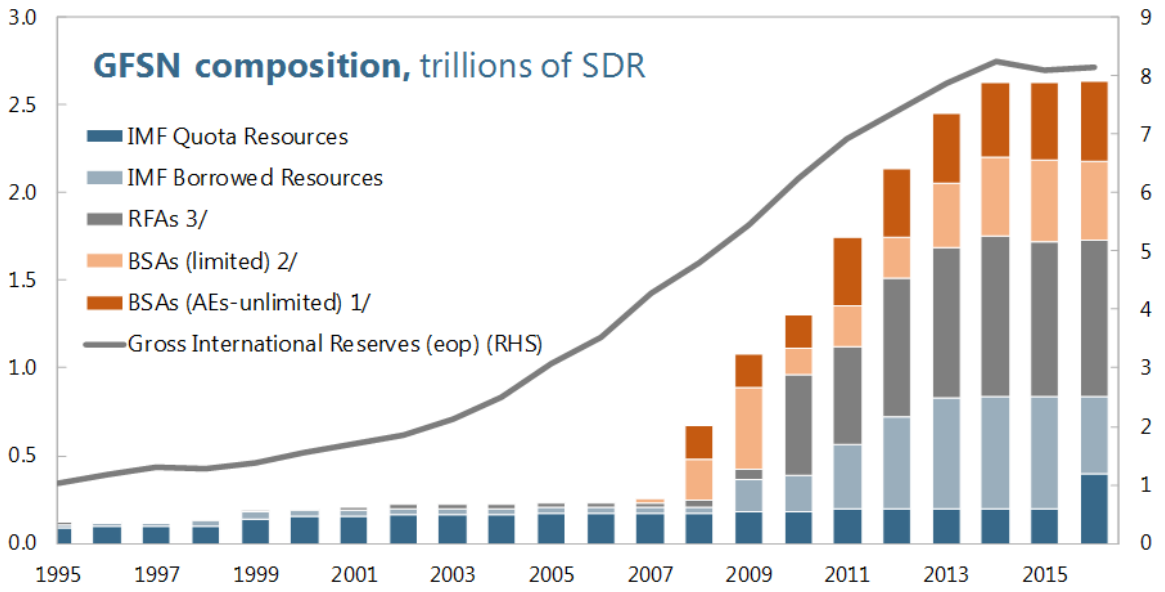
1 INTRODUCTION

The Global Financial Crisis and the subsequent euro area debt crisis have highlighted once again the importance to secure sufficient liquidity resources for sovereign states under financial strains. In view of enhancing the emergency liquidity supply in the International Monetary System, a large number of countries, in particular the Group of Twenty major economies (G20), have acted quickly and proposed a series of reforms at the height of the crises. As Cheng (2016) documents, the G20 countries successfully pushed for replenishing financial resources and renewing instruments for emergency liquidity provision at the World Bank and the International Monetary Fund (IMF). In addition, a number of new Regional Financing Arrangements (RFAs) were also created and a few other existing RFAs were further strengthened institutionally and financially. Therefore, the overall lending capacity of the Global Financial Safety Net has been very much reinforced. For instance, besides the surge in reserve accumulation from 2007 to end 2016 (which reached $10,715 billion, above 8 trillion SDR as indicated in **Figure *1***), the sum of the three other layers – bilateral swap arrangements (BSA), resources available from RFAs and the IMF – rose from merely $400 billion to $3,800 billion during the same period.

Figure 1 Evolution of the multi-layered GFSN



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 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.

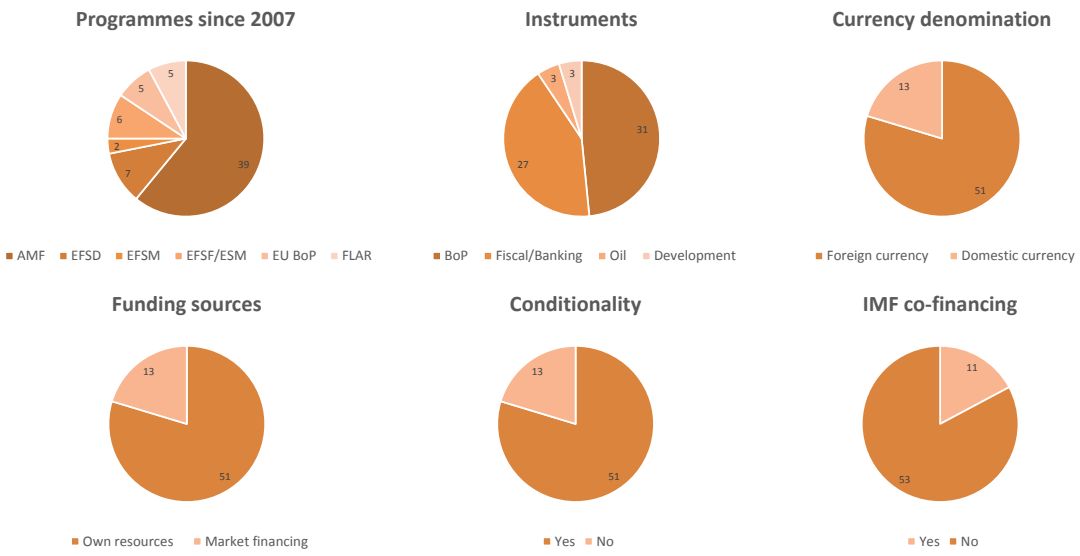
Source: IMF (2016), p.9.

Among the different layers of the safety net, RFAs remain the least known. They only entered the policy debate in recent years, thanks to RFAs' own effort (AMRO, ESM, and FLAR, 2017) and the IMF's works (IMF (2013), IMF (2016), and IMF (2017)). It is important to highlight that RFAs are heterogeneous, mainly because of their history, origin and types of crises they are mandated to deal with. The diversity of RFAs is a key feature that policy discussions have been emphasising, especially

in view of finding appropriate modalities for enhanced cooperation between the IMF and RFAs, which must fully recognise and embody this heterogeneity.

Based on recent financial assistance programmes, **Figure 2** illustrates the heterogeneity of RFAs in a number of dimensions. Mandated to deal with different shocks, RFAs are equipped with different instruments (e.g., swap lines or loans), provide assistance in domestic or foreign currency, have different funding sources (e.g., self-funded or market-funded) and they also design programmes differently (e.g., whether with conditionality or in co-financing with the IMF).

Figure 2 The diversity of RFAs through the prism of recent operations



Source: Own calculations. NB: 64 total programmes since 2007.

Our current study aims to document the heterogeneity among RFAs and focuses on their capital structure and funding strategies, which are also closely related with the overall size of an RFA's lending capacity. The capital structure and any other funding structure of an RFA are in fact crucial to ensure sustained funding for its main activity, i.e., to provide crisis liquidity with favourable financial conditions to a member state under financial strains. In addition, market participants – particularly credit rating agencies – also carefully examine RFAs' financial structures especially when they raise funds by issuing securities.

Our paper provides three sets of exercises. First, we document the maximum lending capacity from both a statutory and accounting perspective. A scrutiny of the founding legal texts identifies whether there are legal caps on the maximum lending capacity in a given RFA while the accounting analysis can provide a picture of the actual use of RFAs' resources and their remaining capacity to provide assistance give a given point in time. Our approach, therefore, contributes to the research efforts to estimate the size of the emergency liquidity available in the Global Financial Safety Net. For instance, Scheubel and Stracca (2016) estimate the size of RFAs by the disbursed loans from RFAs in the past as a continuous variable or the RFA membership as a dummy variable. The first variable only indicates the actual use of RFAs' resources and fails to capture the potential size of RFAs' financing; neither does the second dummy variable. Our second exercise, which analyses RFAs' actual lending capacities and creditworthiness using the prevailing methodologies used by credit rating agencies to rate

supranational entities, allows us to understand RFAs' potential lending capacity from a market perspective. This exercise illustrates the interdependence between an RFA's creditworthiness and its leverage to tap financial markets when it is allowed. Finally, using a stylised model, we will shed light on possible interactions between a RFA's capital structure (i.e., the share of the paid-in and callable capital or guarantees), shareholder strength and the RFA's own creditworthiness and lending capacity. This provides some insight on key institutional and governance aspects of these regional institutions.

Our paper is related to a growing academic literature on the evolution, adequacy and composition of the GFSN.[1] Cheng (2016) builds on the G20 official documents to trace the G20 reform proposals related to strengthening of the GFSN from 2009 to 2014. He finds that reforms aimed at enhancing financial resources and renewing instruments for emergency liquidity provision in the GFSN were substantially implemented. However, institutional reforms concerning the governing structure of International Financial Institutions were delayed. Scheubel and Stracca (2016) offer a comprehensive reading of the rationale, the actual use and the potential adequacy of the GFSN. Based on a novel database the authors have constructed, they also present some interesting stylised facts about the evolution of the GFSN. As the global layer of protection in the GFSN, the IMF has also written a series of policy papers on the adequacy of resources available in the system. IMF (2016) assesses the different layers of the safety net using a scorecard of five dimensions: predictability, speed of activation, reliability, financial and political cost and incentives for policy correction. The paper concludes that most GFSN elements are very costly, either financially or politically. Inadequate predictability of many GFSN resources, together with the lack of reliable coverage for the full duration of shocks, have led to an over reliance on foreign exchange reserves. IMF (2017) proposes principles and modalities to guide the collaboration between the IMF and RFAs.

There have also been a few authors who concentrate their analysis on the regional line of defence, i.e., RFAs. Hill and Menon (2012) and Rhee et al. (2013) are among the first to have discussed the set-up of the Asian and European RFAs as a response to the Asian and the Global Financial Crises respectively. They also examine the relationships between global and regional financial safety nets, and uncover the potential tensions and operational challenges associated with the involvement of several institutional players for the International Monetary System. Eichengreen (2010) and Eichengreen (2012) provide an assessment of the size of RFAs, in comparison with the IMF's lending capacity and the potential need to prevent balance-of-payment difficulties. Eichengreen (2010) argues that most of RFAs are small and lack independent and proper surveillance capacities. Cheng et al. (2018) present a dataset on RFA assistance events and shed light on the complementarity between the IMF's and RFAs' financing.

In what will follow, Section 2 classifies existing RFAs based on their funding strategies and provides an analysis of their lending capacity from both a legal and an accounting perspective. Section 3 examines the potential size and the creditworthiness of the selected RFAs. This section also presents a stylised model to illustrate the dynamic relationship between an RFA's financial structure, shareholder strength, and its own credit strength. Section 4 concludes.

[1] The short literature review focuses on the regional layer of the safety net. The literature on other layers, i.e., foreign reserves and bilateral swap lines is extensive. This is mainly because foreign reserves and swap lines have long been stand-alone buffer stocks against foreign-currency liquidity shocks. More on foreign reserves and bilateral swap lines, please refer to Aizenman and Lee (2007), Obstfeld (2009), IMF (2013), and Bussière et al. (2015), to name a few.

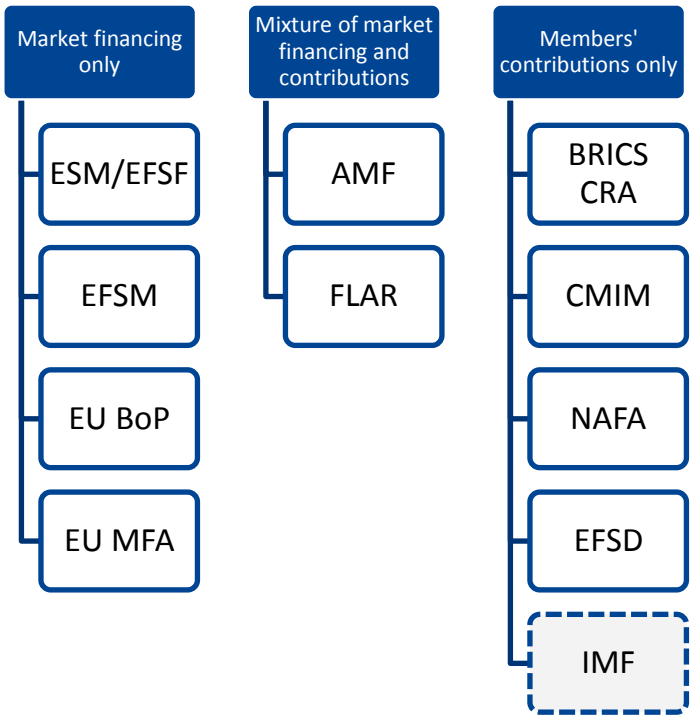
2 RFAs' DIVERSE FINANCIAL STRUCTURES AND LENDING CAPACITY

In this section, we present the different mechanisms through which RFAs secure funds for their crisis resolution activities. We will use the term "capital structure" loosely, to designate any form of financial contributions from an RFA's member states, equivalent to the notion of equity. The term "funding strategy" will refer to market financing operations of some RFAs, which includes issuing securities or receiving deposits. The term "financial structure" will be used to designate both capital structures and funding strategies.

2.1 Classification of RFAs' funding strategy

Based on where an RFA gets resources to finance its financial assistance programmes, we can broadly divide RFAs into three categories, as shown in **Figure 3**. There is a group of RFAs – exclusively in Europe – which are active issuers of securities and only use market funding for liquidity provision. On the opposite side of the spectrum, some RFAs can only rely on member states' financial commitments and contributions. Finally, there are RFAs that fall in between these two extreme cases. They mainly use members' contributions but can also raise funds from other market-based channels. We will examine these three types of funding strategies in turn. For comparative purposes, we also include the IMF[2] as a reference.

Figure 3 Typology of RFAs by Financing Strategy



NB: European Stability Mechanism (ESM), European Financial Stability Facility (EFSF), European Financial Stabilisation Mechanism (EFSM), European Union Balance of Payments Facility (EU BoP), Arab Monetary Fund (AMF), Eurasian Fund for Stabilization and Development (EFSD), Fondo Latinoamericano de Reservas (FLAR), BRICS Contingent Reserve Arrangement (BRICS CRA), Chiang Mai Initiative Multilateralisation (CMIM), North American Financial Arrangement (NAFA).

Source: Own depiction.

[2] As the IMF's General Department and Concessional Lending and Debt Relief Trusts function differently, we will examine both accounts when looking at the IMF.

2.1.1 Active market issuers

The first group of RFAs tap financial markets by issuing bills and bonds and only channel market financing to their assistance programmes. In a sense, they serve as an intermediary between financial markets and any requesting member states that need affordable financing. The capacity of this group of RFAs to leverage on financial markets comes from the contributions of their member states, either in the form of capital contributions (paid-in or callable) or guarantees. All the crisis resolution mechanisms in Europe fall into this category.

The European Stability Mechanism (ESM) is the permanent crisis resolution mechanism for euro area countries. The ESM and its predecessor the European Financial Stability Facility (EFSF) have a fully-fledged funding team and issue debt securities that fall under the category of Sovereign, Supranational, Agency (SSA) issuance. The ESM has built a complete yield curve ranging from 1 to 45 years. The market financing allows the ESM/EFSF to leverage on market financing in order to provide financial assistance, which largely exceeds the normal and exceptional access limit of IMF programmes. Based on the ESM's capital structure and the EFSF's guarantee scheme, both institutions benefit from very high rating assessments by rating agencies and can thus tap financial markets at the most favourable rates. The leverage ratio – defined as the ratio between paid-in capital and the outstanding amount of ESM issuances (Article 41 of the ESM Treaty) – is set at a minimum 15%. ESM securities are also classified as high-quality liquid assets by the Basel Committee on Banking Supervision.

The European Commission also administers two support arrangements that preceded and now complement the euro area crisis resolution mechanisms: European Union Balance of Payment Facility (EU BoP) and the European Financial Stabilisation Mechanism (EFSM).[3] To finance any programmes, the European Commission is empowered by the EU Treaty to borrow from the international capital markets, on behalf of the European Union. Backed by the EU budget which in turn is backed by the highly rated member states and their strong commitment to ensure the EU's sound finances, the Commission's bond issuances benefit from AAA-rates which it then passes on to the beneficiary member states. The EU BoP facility covers EU member states not having accepted the euro as their currency and can borrow up to €50 billion for financial assistance programmes. The EFSM, which is supposed to be functional only in exceptional circumstances for euro area countries after the creation of the ESM, covers all the 28 EU member states and has a lending capacity of €60 billion. In recent years, the EU BoP raised funds to support Hungary, Latvia, and Romania while the EFSM taped markets to assist Ireland (€22.5 billion in 2010), Portugal (€24.3 billion in 2011) and Greece[4] (€7.16 billion in 2015).

2.1.2 RFAs with member states' contributions only

A number of RFAs can only use member states' financial contributions for crisis liquidity provision. This is the case for RFAs operating with swap or credit lines, such as the BRICS Contingent Reserve

[3] Please note that the European Commission has another assistance programme, named Macro-Financial Assistance (MFA), which is dedicated to non-EU partner countries. It covers non-EU partner countries defined in the European Neighbourhood Policy functions. As the arrangement is defined on a case-by-case basis and it provides assistance beyond a strictly "regional" scope, we decide not to include it in the current analysis. For record, the MFA provided assistance to Armenia, Georgia, Jordan, Kyrgyz Republic, Lebanon, Moldova, Tunisia, and Ukraine in recent years.

[4] This EFSM loan was of an exceptional nature, to provide a short-term financing to Greece to bridge the gap and the financing need of the country when it was transiting from an EFSF programme (the 2nd Greek programme) to an ESM programme (the 3rd Greek programme).

Arrangement (BRICS CRA), the Chiang Mai Initiative Multilateralisation (CMIM) and the North American Financial Arrangement (NAFA). The Eurasian Fund for Stabilization and Development (EFSD) also only channels its members' contributions to different programmes. One crucial difference between the RFAs operating with swap lines and the EFSD is that members' contributions take the form of a commitment for the former but they are actually paid in for the EFSD.

CMIM has a total financial commitment of $240 billion from 14 members (ASEAN+3 countries plus Hong Kong). The contribution commitment to the CMIM does not involve an outright transfer of the committed amount but is instead in the form of a commitment letter. In case of an emergency, the central banks/monetary authorities of participating countries in the CMIM issue a promissory note in the amount equivalent to their committed contribution. Under this arrangement, the management and custody of committed reserves remain with the central banks until a swap request is approved. In case of a swap request, the amount to be provided by each CMIM party will only be proportionate to its respective contribution to the CMIM. BRICS CRA functions in a similar way as CMIM among its five founding members (Brazil, Russia, India, China and South Africa). The initial total committed resources of the BRICS CRA – in the form of currency swaps – were set at $100 billion.

NAFA is a financial adjunct to the North American Free Trade Agreement. It encompasses three existing bilateral swap agreements between the United States, Canada and Mexico.[5] Compared with other RFAs, it is a much less structured form of regional mutual assistance.

EFSD has a total subscribed capital of $8.153 billion from six member states, of which $3.059 billion is paid in. The decision to channel market financing depends very much on the instrument that EFSD uses to provide financing to a requesting member state. EFSD would use member states' contributions to provide "Financial Credits" used to support members' national budgets and the balance of payments. EFSD, mostly backed by its two biggest shareholders (Russia and Kazakhstan), could also play the role of a financial intermediary by raising funds in financial markets when "Investment Loans" are provided.

As a reference point, the IMF is not allowed to borrow from the market. Quotas, namely member states' contributions, form the first line of resources for the IMF to provide financial assistance. In exceptional cases, such as at the height of the Global Financial Crisis, the IMF can also borrow from its member states via multilateral borrowing arrangements (second line of defence) or bilateral borrowing arrangements (third line of defence).

2.1.3 RFAs that can use both market financing and member states' contributions

Finally, the Arab Monetary Fund (AMF) and the Fondo Latinoamericano de Reservas (FLAR) fall in between the two extreme cases presented above. These RFAs mainly rely on member states' contributions for liquidity provision, but can also use other market-based instruments to raise funds, such as issuing securities or receiving deposits from member states' central banks or other financial

[5] As the NAFA is composed of purely bilateral swap lines, the amount of each line is subject to changes. The latest data available shows a US-Mexico facility of $6 billion, a Canada-Mexico swap of CAN$1 billion and the swap agreement between the US Federal Reserve and Bank of Canada of $2 billion (Henning R. C., 2002).

institutions. The decision which financial resources will be used depends mainly on the size of the financial assistance and/or the type of assistance instruments requested.

The members of the AMF include 22 countries of the Arab League. AMF has a total authorised capital of 1200 million Arab dinar units of account (AAD) and a total subscribed capital of AAD 900 million Arab dinar units of account (equivalent to $3.6 billion) as of end 2017. The subscribed capital is split between paid-in and callable capital from its members. The Article 18 of the Articles of Agreement of the AMF stipulates that the maximum amount of indebtedness of the AMF, including the amounts borrowed and the guarantees issued, is required not to exceed 200% of the total of the authorised capital and the general reserve.[6] Therefore, the maximum lending capacity of the AMF is legally capped at approximately $12bn according to the financial statement data at end 2016.

FLAR saw its overall size of resources increase in 2012 and after the accession of Paraguay on 30 October 2014. The participation of Paraguay raised the total subscribed capital to $3.93 billion of which $2.86 billion is paid in as of December 2016. FLAR's financial structure is a mixture of a "deposit bank" and a "fund". The majority of its liabilities are term deposits by central banks and other official financial institutions of Latin American countries that may or may not be a member of FLAR. Deposits have an average maturity of less than one month. FLAR can also raise short-term funding from markets by issuing medium-term notes. However, in recent years, FLAR did not have outstanding debt nor have plans to issue new debt. FLAR issued its first note in 2003 for $105 million with a 3-year tenor and issued another $250 million floating rate note with a 5-year tenor in 2006. Both notes were fully repaid, explaining the absence of debt instruments in its current balance sheet (see **Figure *4***). In general, the institution's leverage policy requires that maximum indebtedness does not exceed 65% of its paid-in capital.

For further information, the Annex provides a visual representation of RFAs' financial structures.

2.2 Relating RFAs' financial structures to their lending capacity

An RFA's lending capacity and its funding strategy are the two sides of the same coin, the lending capacity of a RFA is conditional either on the institution's capacity to borrow from financial markets or on the capital, thus equity, that member states setting up the institution are committed to put in. In this section, we explore the lending capacity of RFAs by looking at both their founding legal documents and recent balance sheets. A reading of RFAs' founding documents will document any legal constraints on the maximum of member states' contribution or lending capacity of an RFA. On the other hand, a reading of RFAs' financial statements will inform about the size of RFAs' on-going programmes relative to the overall size of their balance sheets.

[6] The general reserve balance reached AAD 214.167 million at the end of 2016 and AAD 191.854 million at the end of 2015 (AMF, 2016). Please note that at the AMF, the general reserve balance is only part of its total reserves, which also include contingency reserve and the reserve for revaluation at fair value for investments classified as available for sale.

2.2.1 RFAs' lending capacity: a statutory approach

To understand the maximum lending volume of an RFA, one can first refer to the founding legal documents of different RFAs, i.e., the treaty or intergovernmental agreement establishing the institution, by-laws, etc.

The European RFAs have each a clearly and legally defined maximum lending volume. The Treaty establishing the ESM stipulates that "the initial maximum lending volume of the ESM is set at EUR 500 000 million, including the outstanding EFSF stability support (preamble (6))." The article 40 of the ESM Treaty further confirms that member states' payment of the initial paid-in capital is "to maintain a minimum 15% ratio between paid-in capital and the outstanding amount of ESM issuances and guarantee a minimum combined lending capacity of the ESM and of the EFSF of EUR 500 000 (paragraph 2, article 41)." Similarly, the EFSM and the EU BoP Facility have a legally fixed cap, at €60 billion and €50 billion respectively. As mentioned earlier, AMF and FLAR have also a legally defined maximum lending capacity relative to the leverage ratio.

For other RFAs, a legally defined concept of the maximum lending volume does not exist, but two other concepts can help us grasp their maximum lending capacity: (1) total subscribed capital or contributions from member states and (2) maximum access rights of individual member states. The total subscribed capital is the total capital the members of an RFA agreed to contribute. In the absence of market-based financing, this can be seen as the maximum liability of an RFA to support regional stability. In some RFAs, maximum access rights for each member state are also defined, as one can see in Annex 2. This concept is in most cases defined as a multiplier of each member country's financial contribution. The sum of all members' maximum access rights gives an idea about the maximum lending capacity of a RFA. However, this metric gives an upward bias, as it is reasonable to assume that not all members of a RFA are expected to draw simultaneously.

Table 1 summaries the legally defined maximum lending capacity, the subscribed capital or commitment, and the sum of member states' maximum access rights from different RFAs when they are available. To facilitate cross-RFA comparison and the subsequent discussions on RFAs' lending capacity, we define a "pseudo statutory lending capacity" to capture the available information as follows. It captures the legally defined maximum lending volume wherever possible (i.e., AMF, FLAR and European RFAs). If this is not defined, and the RFA serves as a financial intermediary between member states and the markets, we take the maximum between its subscribed capital and the sum of individual countries' maximum access rights. Finally, for those RFAs that do not have a legally defined maximum lending capacity nor access to financial markets, we use its subscribed capital or member states' contributions as a proxy (i.e., BRICS CRA, CMIM).

Table 1 RFAs' lending capacity from a statutory approach (as of end 2016)

RFA		Legal maximum lending capacity	Subscribed capital/ Commitments	Paid-in	Sum of maximum access rights	Harmmonised statutory lending capacity
Market financing	ESM	550.0	775.3	88.6	-	550.0
	EFSF*	484.0	798.6	-	-	484.0
	EU BoP	55.0	-	-	-	55.0
	EFSM	66.0	-	-	-	66.0
Mixed strategy	AMF**	12.0	4.1	3.7	6.9	12.0
	FLAR	4.9	3.9	3.0	6.6	4.9
Contributions only	EFSD	-	8.5	3.1	8.5	8.5
	BRICS	-	100.0	-	84.5	100.0
	CMIM	-	240.0	-	243.5	240.0

* EFSF ceased to provide new loans after the set-up of the ESM. EFSF's commitments include over-guarantees of 165%.

** AMF's maximum lending capacity is calculated using end-2016 data on its general reserve balance as indicated in footnote 6.

Source: RFAs' legal documents and own calculation.

2.2.2 RFAs' lending capacity: an accounting perspective

After a statutory reading of RFAs' lending capacity, we now turn to an analysis of RFAs' balance sheets, which will allow us to understand the effective use of RFAs' resources.

For this purpose, we gathered financial statement information of the following RFAs from their annual reports: AMF, EFSD, EFSF and ESM, and FLAR. Once again, the IMF[7] is used as a reference for comparison purposes. BRICS CRA, CMIM, NAFA, EFSM, and EU BoP Facility are excluded as no balance-sheet information is available.[8] For consistency, we use end-year 2016 as a cut-off date for all financial statement data.[9] To facilitate comparison, we also harmonised and simplified the balance sheet items. On the asset side, we are mainly interested in the relative size of assistance programmes and that of asset investment (including cash holding and other investment). On the liability side, we focus on the size of capital[10]/financial contribution brought in by member states and any other funding sources (e.g., market borrowing, deposits, etc.). Capital also includes retained earnings or reserves.

Figure 4 presents the simplified balance sheets of the selected RFAs, which confirm our classification of RFAs above based on the reading of RFAs' legal documents: there are RFAs that solely rely on market funding or members' contributions while others adopt a mixed funding strategy. The EFSF – also by definition – is the most leveraged RFA. The resources for assistance come exclusively from market borrowing. This is also the case for the ESM. Even if almost half of ESM's total liabilities are paid-in capital, the capital cannot be used to provide assistance programmes and is entirely invested in highly secured securities (explaining the high ratio of investment of 57% in the ESM's balance sheet). AMF and FLAR have both deposits and member states' paid-in capital as liabilities. Most of them are re-invested in trading securities or held as cash as of end 2016. EFSD also has exclusively used its capital to provide assistance programmes so far.

[7] For the IMF, we distinguish the General Resources Account from its Poverty Reduction and Growth Trust-related accounts, as they have very different financial features.

[8] The first three RFAs in this group are fully funded by member states' contributions and do not publish financial statements. The two other European RFAs are administered by the European Commission on a "need-to-fund" basis with the EU budget as guarantees, therefore standard balance-sheet information is not available.

[9] Due to its financial reporting cycle, the IMF's financial statement information is as of end January 2017.

[10] Capital also includes retained earnings or reserves, wherever relevant.

Figure 4 Simplified balance sheet of selected RFAs (as of end 2016)

AMF

Assets		Liabilities	
Investment	79%	Deposits	63%
Assistance	19%	Other liabilities	5%
Other assets	2%	Capital	32%
Total	100%	**Total**	100%
Total Nominal		AAD 3744 million	

EFSD

Assets		Liabilities	
Investment	23%	Other liabilities	0.1%
Assistance	77%	Capital	99.9%
Total	100%	**Total**	100%
Total Nominal		USD 3504 million	

EFSF

Assets		Liabilities	
Investment	3%	Mkt borrowing	98.9%
		Other liabilities	0.7%
Assistance	97%	Capital	0.4%
Total	100%	**Total**	100%
Total Nominal		EUR 188244 million	

ESM

Assets		Liabilities	
Investment	57%	Mkt borrowing	51.1%
Assistance	43%	Capital	48.9%
Total	100%	**Total**	100%
Total Nominal		EUR 168576 million	

FLAR

Assets		Liabilities	
Investment	89.5%	Deposits	53.8%
Assistance	10.5%	Capital	46.2%
Total	100%	**Total**	100%
Total Nominal		USD 6801 million	

Source: RFAs' annual reports and the authors' calculation.

Figure 5 presents the simplified balance sheets of the IMF's General Resources Account (GRA) and accounts related to poverty reduction (Poverty Reduction and Growth Trust – PRGT). We observe that the IMF also primarily rely on member states' contribution – quotas – to provide assistance. As the IMF functions as an intermediary between creditor countries (countries with a strong external position, defined every quarter by the so-called Financial Transaction Plan) and programme countries, most of quotas are held as cash (usable currencies) included in the entry "investment". The accounts related to poverty reduction function differently as the IMF borrows from selected creditor countries, which provide subsidies for concessional lending channelled by the IMF to borrowing countries.

However, both cases – GRA and PRGT, the IMF can only borrow from its member states[11] and market borrowing is not permitted.

Figure 5 Simplified balance sheet of the IMF

IMF General Resources Account

Assets		Liabilities	
Investment	90.5%	Borrowing	6%
Assistance	9.3%		
Other assets	0.2%	Capital	94%
Total	100%	Total	100%
Total Nominal		SDR 527497 million	

IMF Accounts Related to Poverty Reduction

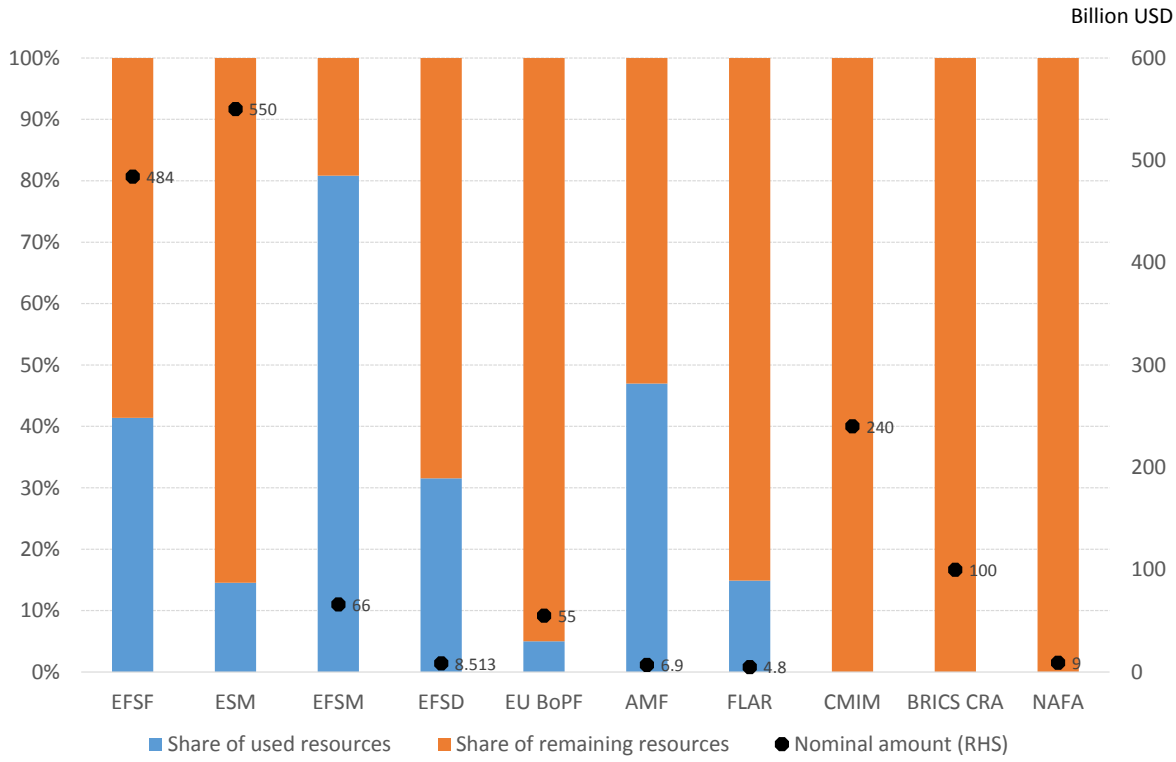
Assets		Liabilities	
Investment	56.9%	Borrowing	47%
Assistance	43.1%	Capital	53%
Total	100%	Total	100%
Total Nominal		SDR 14796 million	

Source: IMF financial statements and own calculation.

When we compare different RFAs together with the IMF, one can see that the share of financial assistance compared to the total size of the balance sheet is highest for EFSF (97%), EFSD (77%) and ESM (43%) as of end 2016. **Figure 6** further provides a graphical representation of RFAs' outstanding loans as of December 2016 relative to their pseudo statutory lending capacity as defined in **Table 1**. Apart from the EFSM, all other RFAs still have more than 50% of their balance sheet unused.

Figure 6 Current outstanding loans vs. maximum lending capacity

[11] Under GRA, the IMF can borrow from selected members under the New Arrangement to Borrow and bilateral borrowing arrangements (as a second line of defence) or General Arrangement to Borrow (third line of defence).



Source: RFAs' annual reports and the authors' calculation. NB. EFSF is not allowed to finance additional programmes.

2.3 Reflections on the relationship between RFAs' financial structures and their lending capacity

Based on the balance sheet information, together with the legal documents of different RFAs, we observe diverse funding strategies among RFAs, which are also directly related to the institutions' lending capacity. The funding strategies vary from one end of the spectrum, member states' contributions only, to the other, market financing backed by a properly designed capital or guarantee structure. Why and how do the institutions choose among different financial structures? What are the pros and cons for own funding and market financing respectively? We offer below some reflections on the trade-offs between different financial structures.

2.3.1 Member states' contributions

Using member states' own contributions is the safest way to insure sustained resources for an RFA's core function. There is no uncertainty about their maximum lending capacity. The contributions are, in most cases, determined by unanimity among member states even before the institutions are up and running. And in any case, RFAs' legal documents often also have provisions about how to increase initial contributions in the face of rising need for assistance. During the Global Financial Crisis for instance, a number of RFAs, including AMF, CMIM, FLAR, significantly increased their initial capital or contributions.

Regarding the downside of this funding strategy, the IMF comes in as a good illustration. A rich political economy literature on IMF lending points to the influence of the US – the biggest single-country shareholder and financial contributor – on the lending decision and conditions for the borrowing

country.[12] Similarly, even if having some big shareholders as permanent creditors can enhance the stability and credibility of an RFA, big member states may also have different economic principles and ideology from small members and influence the latter through their weight in deciding for an assistance programme. In addition, relying exclusively on paid-in capital to finance financial assistance necessarily misses the opportunity to leverage on private and market resources, which are often ampler and more flexible to mobilise in the face of a large shock.

2.3.2 Market financing

Allowing RFAs to leverage on market financing is a way to secure private-sector contributions. This helps to raise a large amount of funds with only limited paid-in capital. However, this strategy exposes an RFA to financial cycles and market volatilities. The financial environment in the past few years with low interest rates globally were favourable for this funding strategy. There could be more challenges in the future when interest rates normalise as by their mandate RFAs need to provide their member states with facilities at low cost.

Therefore, RFAs adopting a market funding strategy – especially those which solely rely on it – needs to have a very strong capital or guarantee structure. In addition, to sustain low-cost financing from markets to beneficiary members, RFAs need to carefully design their funding plan, decide when and with which instruments to avoid competition with peer supranational issuers for instance. In addition, RFAs can also consider entering into interest rate swaps with other financial institutions to lock cheap financing. For instance, as part of the EFSF/ESM funding strategy to reduce interest rate risks for Greece, the ESM swapped floating for fixed interest rate cash flows with some counterparties so that Greece could have more certainty and predictability on the future stream of interest rates it must pay.

In addition, credit rating agencies will also scrutiny these institutions' governance, portfolios and management in order to assign proper ratings. To secure and maintain top-notch creditworthiness is key to ensure low funding costs. In what follows, we will describe and analyse the methodologies used by credit rating agencies to assign ratings to supranational institutions. This exercise – against the background of our understanding of RFAs' governance structure – will help us understand the market perspective of RFAs' creditworthiness and lending capacity.

Please note that although a purely market-based financing with member states' contributions as a guarantee or capital structure may be rare among RFAs, it is a common financial structure adopted by Multilateral Development Banks (MDBs). Therefore, how to reconcile the need to maintain the highest credit ratings while providing financial assistance to member states – often the less developed ones that may also be considered as riskier – is an issue of common interest among a number of International Financial Institutions (IFIs).

[12] For the literature on this topic, please refer to Oatley and Yackee (2004), Dreher et al. (2009), and Copelovitch (2010).

3 RFAs' LENDING CAPACITY FROM A CREDIT RATING PERSPECTIVE

In Section 2, we documented the financial structure and lending capacity of different RFAs from both a statutory and accounting perspective. We learned that some RFAs purely rely on their member states' financial contributions while others are allowed to tap financial markets to support their lending operations. In this section, we will scrutinise RFAs' lending capacities from a market perspective. For this, we turn to the credit rating agencies' methodologies on supranational entities and MDBs to infer the leverage capacity and creditworthiness of RFAs. Here, we will mainly focus on RFAs that are legally allowed to raise funds from financial markets, e.g., AMF, the European RFAs, and FLAR, plus EFSD.

In what follows, we will first compare the actual lending capacity of RFAs with a counterfactual lending capacity based on a leverage factor, which builds either on RFAs' paid-in or callable capital. Second, we will approximate a credit rating for the RFAs based on the credit strength of their respective shareholders, which should be seen as a minimum, or floor rating, as it ignores possible intrinsic factor strengths. Finally, using a stylised model, we provide some reflections on the interaction between RFAs' capital structure, lending capacity, and member states' creditworthiness and support.

3.1 An assessment of RFAs' lending capacity from the rating agencies' perspective

Credit rating agencies assess RFAs' lending capacity in the context of their ability and willingness to honour their debt in full and on time. They use quantitative metrics and qualitative factors to inform the decision of a Rating Committee, which determines the final rating. Overall, their analytical approach combines the assessment of the entities' intrinsic strengths and the strength of the support they obtain from their shareholders. In what follows, we abstract from the qualitative judgements, which are unobservable *ex ante*, and instead focus exclusively on the quantitative credit metrics cited in the agencies' methodologies. The relevant metrics, our assumptions and results are explained below.

3.1.1 Methodology and assumptions

In a nutshell, the three US credit rating agencies – Moody's, Standard & Poor's, and Fitch – estimate the RFAs' lending capacity by relating their paid-in or callable capital either to their risk-weighted assets (financial assistance programmes) or market debt, although exact ratios differ across agencies.

With regard to the paid-in capital metrics, the supranational methodology used by Moody's (2016) provides two metrics that we can use to estimate and assess the RFAs' maximum lending capacity, namely, its asset coverage and leverage ratios.

First, the *Asset Coverage Ratio* compares the entity's usable equity (total shareholders' equity excluding callable capital) to the assets that can incur losses. For the ESM, Moody's includes the risk-weighted paid-in capital[13] in the numerator and all programme loans and possible equity operations in the denominator. For simplicity and for comparison across institutions, we will use unweighted RFAs' paid-in capital[14] in the numerator and the outstanding loans of financial assistance in the

[13] The usable equity or paid-in capital is risk-weighted by the five-year expected loss associated with their rating.

[14] Otherwise, we would have to make assumptions about the investment strategies of the RFAs, and in any case, applied risk-weights only marginally affect this metric. For instance, investing € 20bn in Aa3 as opposed to Aa2 rated assets, increases the risk-weights to € 16mn from € 7mn.

denominator. Second, the *Leverage Ratio* is measured by dividing an entity's market debt by its equity, i.e., paid-in capital in our analysis. Then, Moody's maps both ratios into a five-point scale from "Very High" to "Very Low" quality as shown below:

Moody's Asset Coverage Ratio				
Very High	High	Medium	Low	Very Low
> 50%	25% < X ≤ 50%	10% < X ≤ 25%	5% < X ≤ 10%	≤ 5%

Moody's Leverage Ratio				
Very High	High	Medium	Low	Very Low
0% < X ≤ 150%	150% < X ≤ 300%	300% < X ≤ 500%	500% < X ≤ 800%	> 800%

Source: Moody's

Similarly, Fitch (2018) uses the *Capital Ratio*, which compares an entity's shareholder's equity (i.e. RFAs' paid-in capital) with its assets net of the fair value of derivative instruments recorded on balance sheet (i.e., financial assistance programmes). This metric is used as part of Fitch's intrinsic strength assessment. Fitch's four-point scale is provided below:

Fitch's Capital Ratio			
> 25%	15% to 25%	8% to 15%	< 8%
Excellent	Strong	Moderate	Weak

Source: Fitch

Finally, according to S&P's (2017) *Risk-Adjusted Capital Ratio (RAC)* assesses the extent to which capital and earnings would cover losses by comparing an entity's capital (i.e., paid-in capital and earnings) to its risk-weighted assets (i.e., programme loans). S&P's seven-point scale is provided below:

S&P's Risk Adjusted Capital Ratio						
> 23%	15% - 23%	10% - 15%	7% - 10%	5% - 7%	3% - 5%	< 3%
Extremely Strong	Very Strong	Strong	Adequate	Moderate	Weak	Very Weak

Source: S&P

With regard to the callable capital metrics, Moody's uses its *Contractual Support* assessment, which divides an entity's outstanding debt by the discounted callable capital of its investment-grade rated shareholders only, computed as the product of the callable capital amount and the idealised expected loss at a 30-year horizon. The table below gives the range of Moody's Contractual Support:

Moody's Contractual Support				
Very High	High	Medium	Low	Very Low
0% < X ≤ 150%	150% < X ≤ 300%	300% < X ≤ 600%	600% < X ≤ 1000%	> 1000%

Source: Moody's

Fitch's assessment of the strength of shareholder support calculates the rating of callable capital covering net debt. This refers to the rating of the lowest-rated shareholder whose callable capital, when added to that of the higher-rated shareholders, ensures full coverage of outstanding net debt, defined as outstanding debt minus liquid assets rated AA- or above.

S&P assesses the likelihood of extraordinary shareholder support, by adjusting the abovementioned RAC ratio by adding to the numerator the callable capital from all shareholders that have foreign

currency ratings equal to or higher than the issuer credit rating of the entity. This reflects the positive impact of the callable capital on the entity's creditworthiness.

In sum, as detailed in each of the three agencies' methodologies, for comparison across different institutions and given the slightly different definitions for the credit metrics, we have to take some simplifying assumptions. Specifically, our main assumption is to equate a RFA's total financial assistance with its 'assets that can incur losses' (Moody's), 'outstanding debt' (Moody's), 'assets adjusted for the net fair value of derivative instruments' (Fitch) and 'risk-weighted assets' (S&P). Similarly, we equate a RFA's paid-in capital with its 'usable equity' or 'capital'. We also ignore possible adjustments for Preferred Creditor Treatment and diversification/concentration.

3.1.2 Results

Based on these metrics and our abovementioned simplifying assumptions, we can estimate the RFAs' maximum lending capacity commensurate with the highest assessments by the rating agencies. **Table 2** summarizes our results for each RFA for all possible approaches. Overall, these results need to be interpreted with maximum caution given that rating agencies base their assessments on a combination of several quantitative and qualitative factors, as opposed to one variable as depicted in this exercise. However, these metrics show clearly the link and hypothetical size of the maximum lending capacity of RFAs financing themselves on the market for a given rating level.

The estimates based on paid-in capital ratios are only useful for the ESM, FLAR, AMF and EFSD. Using the rating agencies' metrics, and applying the leverage factors consistent with the strongest credit assessments, results in a lending capacity ranging between $147 billion and $653.5 billion (**Table 2**, upper panel, last two columns). This compares to an actual total paid-in capital of $98 billion from the above-mentioned four RFAs (**Table 2**, upper panel, column 4). We note that the pseudo statutory limit above $1.5 trillion necessarily points to the need to assess the maximum lending capacity of RFAs not just based on paid-in but also callable capital.

In fact, the callable capital metrics point to much greater lending capacities, reflecting the fact that callable capital rated AA- or above amounts to around $827.6 billion for our selected sample of RFAs. Notably, callable capital rated BBB- or above exceeds $1 trillion (**Table 2**, lower panel, columns 5 and 6). Again, this compares to $98 billion of paid-in capital. As a result, lending capacities based on these metrics are much larger. For instance, using Moody's metrics for assessing the strength of "contractual support", which relies on investment-grade rated callable capital only, shows that a 1.5 leverage factor, resulting in a combined total lending capacity of around $1.9 trillion would still be assessed as "Very High". The "High" assessment, which is consistent with a 3.0 leverage factor would result in a doubling of the maximum lending capacity of around $3.8 trillion. The metrics of Fitch and S&P also point to the link between the quality of callable capital and the lending capacity. For instance, based on S&P's metrics, if all RFAs were to be rated at AA-, and thus callable capital rated at AA- or above were to be included in the RAC calculation, the combined maximum lending capacity of above $4 trillion would still be assessed as 'extremely strong'. The lower the rating, the higher the lending capacity. If all RFAs were to be rated at BBB-, the lending capacity would increase to around $9 trillion. However, it is unclear, if not unlikely, that a lower-rated RFA would be able to act as a stabilizing force during times of crises, and in addition, fund itself on favourable conditions in a sustainable way.

Table 2 Estimates for RFAs' Maximum Lending Capacity (based on Paid-in and Callable Capital Metrics of Rating Agencies' Supranational Methodologies)

Maximum Lending Capacity Estimates based on Paid-in Capital (USD bn)				Moody's				Fitch		S&P		Estimated Range	
				Asset Coverage Ratio		Leverage Ratio		Capitalisation Ratio		Risk-Adjusted Capital Ratio			
RFA Type		Pseudo statutory lending capacity	Paid-in Capital	> 50% Very High	25% < X ≤ 50% High	0% < X ≤ 150% Very High	150% < X ≤ 300% High	> 25% Excellent	15% to 25% Strong	> 23% Extremely Strong	15% - 23% Very Strong	Min	Max
Market financing only	ESM	550.0	88.6	177.2	354.4	132.9	265.8	354.4	590.7	385.2	590.7	132.9	590.7
	EFSF*	484.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EU BoP	55.0	0.0	--	--	--	--	--	--	--	--	--	--
	EFSM	66.0	0.0	--	--	--	--	--	--	--	--	--	--
Mixed funding strategy	AMF**	12.0	3.5	7.0	14.0	5.3	10.5	14.0	23.3	15.2	23.3	5.3	23.3
	FLAR	4.8	2.9	5.7	11.4	4.3	8.6	11.4	19.1	12.4	19.1	4.3	19.1
	EFSD	8.5	3.1	6.1	12.2	4.6	9.2	12.2	20.4	13.3	20.4	4.6	20.4
Members' Contributions Only	BRICS	100.0	0.0										
	CMIM	240.0	0.0										
	NAFA	9.0	0.0										
Total		**1,529.3**	**98.0**	**196.0**	**392.1**	**147.0**	**294.1**	**392.1**	**653.5**	**426.2**	**653.5**	**147.0**	**653.5**

Maximum Lending Capacity Estimates based on Callable Capital (USD bn)						Moody's		Fitch			S&P				70% Subscribed Capital	Estimated Range	
						Contractual Support		Callable Capital Net Debt Coverage			Risk-Adjusted Capital Ratio						
											Assuming Rating AA-		Assuming Rating BBB-				
RFA		Pseudo statutory lending capacity	Callable Capital			0% < X ≤ 150%	150% < X ≤ 300%	Latest Average Rating*	Capacity Assuming Rating AA-	Capacity Assuming Rating BBB-	> 23% Extremely Strong	15% - 23% Very Strong	> 23% Extremely Strong	15% - 23% Very Strong		Min	Max
			Total	Rated ≥ AA-	Rated ≥ BBB-	Very High	High										
Market financing only	ESM	550.0	686.7	419.8	649.0	973.5	1,947.0	AA+	508.4	737.6	2,210.5	3,389.5	3,207.0	4,917.4	542.7	508.4	4,917.4
	EFSF*	484.0	484.0	319.7	484.0	726.0	1,452.0	AA	319.7	484.0	1,390.1	2,131.5	2,104.3	3,226.7	338.8	319.7	3,226.7
	EU BoP	55.0	65.9	44.0	63.8	95.8	191.5	AAA	44.0	63.8	191.2	293.2	277.6	425.6	46.1	44.0	425.6
	EFSM	66.0	65.9	44.0	63.8	95.8	191.5	AAA	44.0	63.8	191.2	293.2	277.6	425.6	46.1	44.0	425.6
Mixed funding strategy	AMF**	12.0	0.6	0.1	0.2	0.3	0.7	--	3.7	3.8	15.7	24.1	16.2	24.9	2.9	0.3	24.9
	FLAR	4.8	0.0	0.0	0.0	0.0	0.0	--	3.7	3.8	12.4	19.1	12.4	19.1	2.0	0.0	19.1
	EFSD	8.5	0.0	0.0	0.0	0.0	0.0	BBB	0.8	1.8	13.3	20.4	13.3	20.4	2.1	0.0	20.4
Members' Contributions Only	BRICS	100.0	100.0														
	CMIM	240.0	240.0														
	NAFA	9.0	0.0														
Total		**1,529.3**	**1,643.0**	**827.6**	**1,260.9**	**1,891.4**	**3,782.8**		**924.3**	**1,358.7**	**4,024.5**		**5,908.5**	**9,059.6**	**980.7**	**924.3**	**9,059.6**
					Leverage Factor	1.5	3.0				4.3		6.7				

NB. Moody's contractual support relies on investment-grade rated callable capital only. S&P's risk adjusted capital ratio for support includes callable capital based on an entity's rating (we assume AA- and BBB- for simplicity). We assume EFSF guarantees only (not over-guarantees).

Source: Moody's, Fitch, S&P, RFAs, own calculations.

3.2 RFAs' creditworthiness based on the support from their member states

The previous section provided a simplified framework for estimating the maximum lending capacity of RFAs. It also showed the clear link in the agencies' assessment between an institution's lending capacity, its shareholder strength, capital structure and its own creditworthiness. In this section, we will highlight that RFAs can benefit from several institutional aspects that can enhance their creditworthiness in order to ensure a higher maximum lending capacity while preserving a high-quality rating.

3.2.1 Methodology and assumptions

As explained earlier, while the details of the agencies' rating approaches can differ, they generally assess a supranational institution's creditworthiness based on two main elements: (1) the intrinsic strength, which is related to the capital and liquidity metrics as well as the management of the institutions, and (2) its member states' support, in the form of a capital structure or guarantee scheme. Of course, on top of this quantitative assessment, there is also room for qualitative judgements by the Rating Committees. Once again, we subtract the judgements from our exercise.

As assessing RFAs' intrinsic strength would require extensive financial statement data that are in many cases not publicly available, we base our rating estimate on the support from the RFAs' member states only, which depends on two things: the allocation key used to determine each member state's contribution to an RFA and the ratings of all shareholders. For reference, the elements considered in the intrinsic assessment include, but are not limited to, the asset quality and portfolio diversification, risk management, liquidity and treasury policies, profitability, the operating environment, and governance-related issues. In this context we note that our support assessment can be considered as providing a floor rating for a supranational institution while the intrinsic strength gives additional uplift[15].

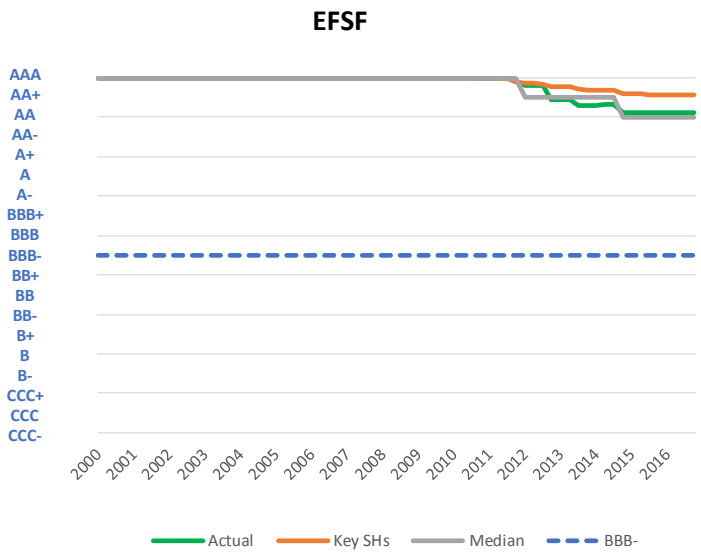
We approximate the rating for each RFA based on the *Average Key Shareholder* from Fitch and the *Median Shareholder Rating* from Moody's. Fitch (2018) uses the metric of *Average Key Shareholder* to assess an entity's capacity to provide support in case it does not have callable capital. This metric is based on the adjusted capital-key weighted rating of the largest shareholders whose cumulative total capital contribution exceeds 50%. Moody's (2016) uses a similar metric – *Median Shareholder Rating* – to assess an entity's extraordinary support, which refers to the capital-key-weighted median shareholder rating.

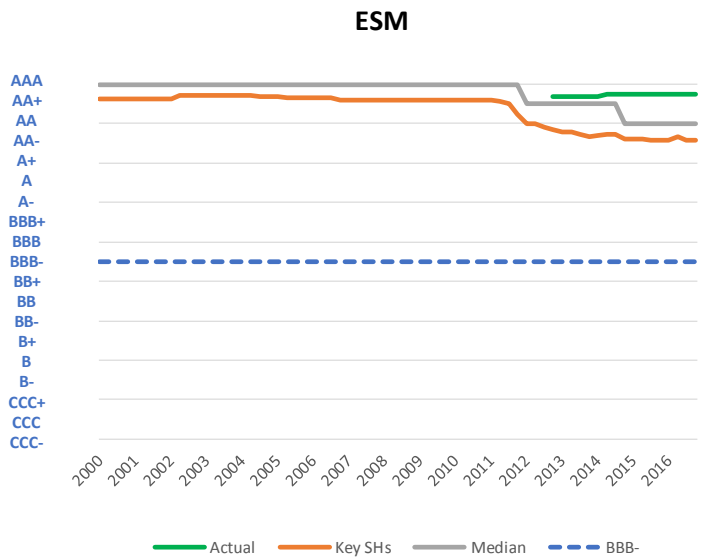
3.2.2 Results

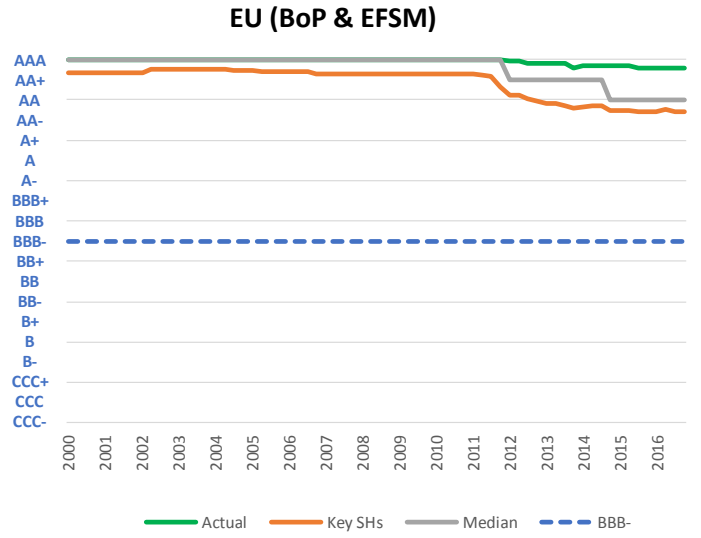
As explained above, our approach to estimate a RFA's creditworthiness is purely based on shareholder support, and thus provides a lower-bound estimate. This is also confirmed when we compare our derived ratings (**Figure 7**, orange and grey lines) with the actual ratings (**Figure 7**, green lines) for the EFSD, EFSF, ESM, and FLAR. We also provide information on the support rating for AMF, BRICS CRA and CMIM even though they are not rated by any agencies and further, both BRICS CRA and CMIM are not allowed to tap financial markets at the current state. For this second group of RFAs, the information provided below serves merely as a counterfactual analysis.

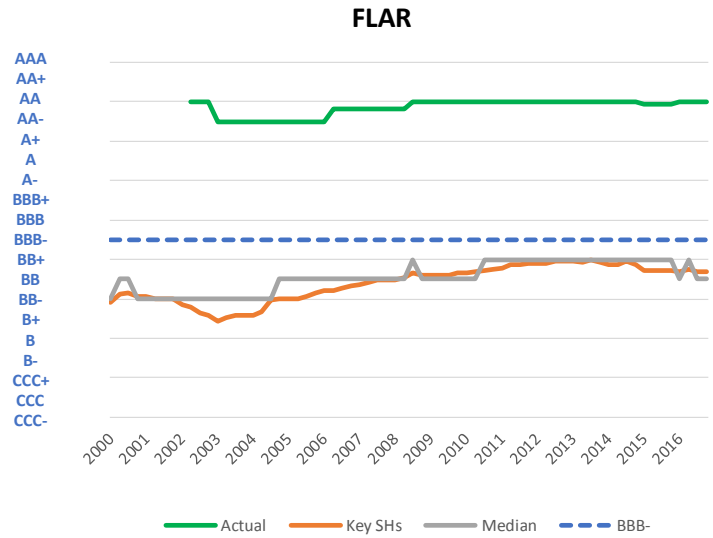
[15] To date the US rating agencies usually start with a fundamental assessment and then provide an uplift based on their assessment of the strength of the shareholder support. The approach of other agencies also includes determining two distinct ratings and choosing the higher of the two.

Figure 7 Proxy-Ratings based on Shareholder Support









Source: Own calculations based on the average of the actual ratings of Moody's, Fitch and S&P for each RFA's shareholder.

From this analysis, we confirm that formal arrangements or institutions which go beyond guarantees and credit lines and consequently have their own paid-in capital, conservative investment and liquidity practices, are perceived to be stronger RFAs compared to the ones relying exclusively on shareholder support. This was one of the key lessons from the European crisis.

FLAR's case merits our particular attention. We observe that its actual rating is several notches higher than any support rating from its members (the same applies to EFSD but to a lesser extent). This difference must be attributed to intrinsic factors or qualitative judgements by the agencies on its institutional aspects. In particular, this RFA has a perfect repayment history; none of its members ever defaulted on FLAR's assistance, in part because FLAR programmes are of limited size and have relatively short maturities. In addition, FLAR's maximum lending capacity must not exceed 65% of its paid-in capital, minimizing any potential risk to investors. When a serious crisis hits a member state, FLAR is expected to provide a "bridge financing" while waiting for the IMF to provide an envelope of larger amount and a fully-developed programme. Cheng et al. (2018) provide empirical evidence on this type of financing provided by FLAR.

3.3 The interaction between RFAs' capital structure, creditworthiness and lending capacity

The examination of credit rating agencies shows a dynamic relationship between the creditworthiness and lending capacity of an RFA, the credit quality of its shareholders, the member states' financial support and their relative weight in the total financial contributions. On the one hand, the higher the paid-in capital – which represents a direct transfer from the member states to an RFA – the larger the borrowing capacity of an RFA, and thus the higher its financial assistance capacity. On the other hand, the larger the callable capital, especially when it is associated with the highest rated member states, the higher member states' support is perceived by the markets, the higher the creditworthiness the RFA possesses.

We develop a stylised model below to illustrate this dynamic relationship and to reflect on the key governance decisions an RFA needs to consider should it envisage market financing.

In this stylised model, let us assume that there are only two member states – 1 and 2 – for a model RFA, with the respective key of financial contribution of η_1 and η_2. By definition, $\eta_1 + \eta_2 = 1$. It is also of common understanding that contribution keys are exogenously determined by some fundamental variables, e.g., GDP and population, over which institutions rarely have a control.

We denote the total subscribed capital or financial contribution of the model RFA "SK", which is composed of a paid-in part "PK" and a callable part "CK". As a standard practice, the paid-in capital can be expressed as a ratio of the total subscribed capital, which we denote "ϕ", namely, $PK = \phi SK$. ϕ is normally defined by the governance of an RFA in its founding legal documents and can be changed according to its decision-making procedure. We can thus write the following equations for our model RFA:

$$SK = SK^1 + SK^2 = \eta_1 SK + \eta_2 SK$$

$$PK = \phi SK = \phi\eta_1 SK + \phi\eta_2 SK$$

$$CK = (1-\phi)SK = (1-\phi)\eta_1 SK + (1-\phi)\eta_2 SK$$

We further assume that the model RFA can tap financial markets and can leverage on its paid-in capital and the potential support from the callable capital, in line with the methodology described in Section 3.1.1. The support from the callable capital depends on the creditworthiness of its member states providing it. Only the support from a member state whose creditworthiness is recognised by the markets with a strong rating is considered based on the current practice of the major rating agencies. For simplicity, we also assume that the maximum lending capacity is a linear function of the sum of the paid-in capital and the eligible callable capital. This leads to the following definition of the maximum lending capacity of an RFA (denoted "MaxLC"), which can be understood as if the RFA had its whole balance sheet available for financial assistance: $\mathrm{MaxLC} = (1+\beta)(\sum_{\mathrm{i}} CK + \mathrm{PK})$, where $\sum_{\mathrm{i}} CK$ denotes the part of callable capital considered as credit enhancement (i.e., from country i with sufficiently high credit rating).

We then consider the following three scenarios. (1) When both member states have sufficiently high credit rating, rating agencies will consider both the paid-in capital and the callable capital from the member states to assess the creditworthiness of the model RFA. (2) When only one of the two member states has sufficiently high credit rating, only the callable capital from the high-creditworthy member state will enhance the RFA's rating in addition to the paid-in capital. (3) When neither of both member states has sufficiently credit rating, rating agencies will ignore the support from callable capital, and only consider the paid-in capital in the creditworthiness of the model RFA. We express the maximum lending capacity in a function of the subscribed capital in these three scenarios as follows:

- Scenario 1: both member states have sufficiently high credit rating:

$$MaxLC^1 = \sum_i CK_i + PK = CK_1 + CK_2 + PK = (\eta_1 + \eta_2)SK = SK$$

- Scenario 2: only member state 1 has sufficiently high credit rating:

$$MaxLC^2 = \sum_i CK_i + PK = CK_1 + PK = (\eta_1 + \phi\eta_2)SK = [\eta_1 + (1-\eta_1)\phi]SK$$

- Scenario 3: none of the two member states have sufficiently high credit rating:

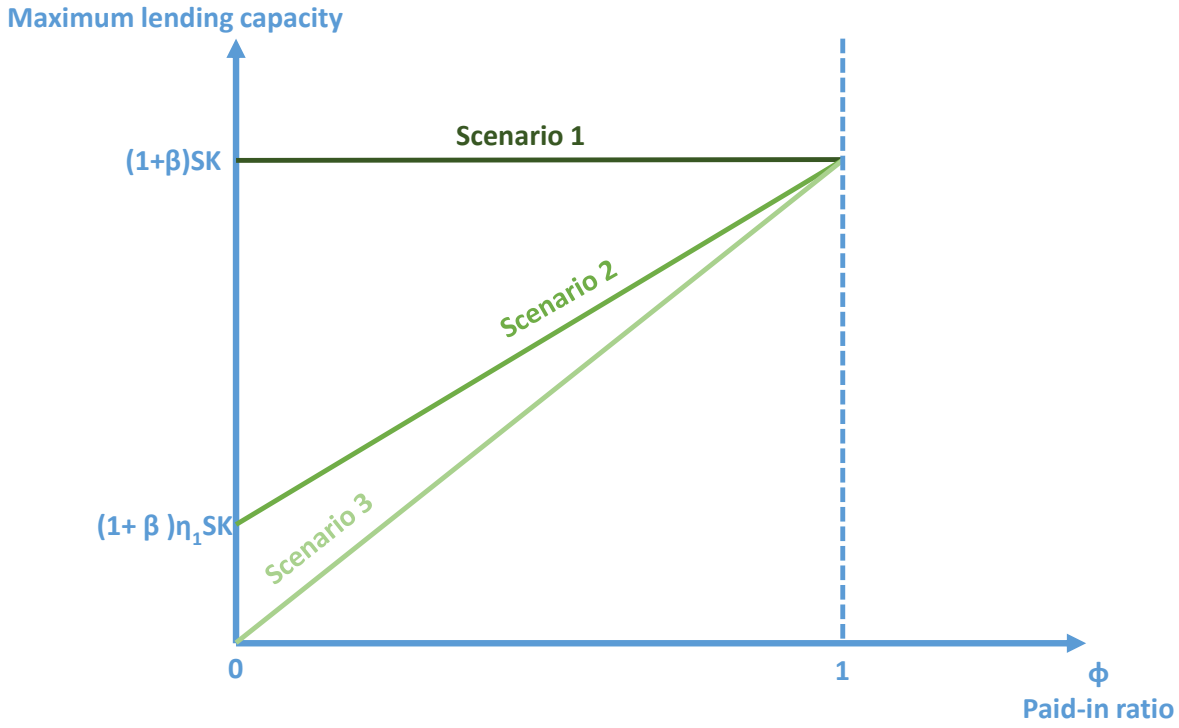
$$MaxLC^3 = \sum_i CK_i + PK = 0 + PK = (\phi\eta_1 + \phi\eta_2)SK = \phi SK$$

Figure 8 graphically shows the dynamic relationship between the paid-in capital ratio, relative contribution key (of the higher rated member state) and the lending capacity of the model RFA. Clearly, when both member states have sufficiently high ratings for the agencies to consider their support to the RFA in terms of callable capital, the RFA reaches the highest lending capacity, which is expressed as a multiplier to the subscribed capital, regardless of the relative contributions of the two member states and the paid-in capital ratio. This is because both paid-in and callable capital are fully taken into account to assess the RFA's creditworthiness. In the opposite extreme scenario (scenario 3), when none of the member states have the sufficiently high credit rating, increasing the share of paid-in capital is the only way to raise the RFA's lending capacity. This is because paid-in capital is the strongest form of member states' commitment. One can think of the example of FLAR, whose members' average rating is under BBB-. The institution has also a very high paid-in capital ratio

(72.5%). Finally, for the intermediate case, the model RFA's lending capacity is increased by either an increase in the share of the contribution from the higher rated member state or the paid-in capital ratio from either member state.

In summary, from a rating agency's perspective, we can conclude that to maximize the lending capacity of an RFA, either member states need to make sure that their own creditworthiness is sufficient to provide a firm support to the institution they create, if not, they should pay their contributions ex ante to ensure the institution's creditworthiness. Stated differently, for a RFA to be credible from a credit and thus funding perspective and thus sever as a stabiliser in the region, it must benefit from either member states contributing a large share to the RFA's capital or guarantee structure having very strong creditworthiness and/ or significant amounts of paid-in capital.

Figure 8 Dynamic relationship between paid-in capital ratio, capital keys and lending capacity



Source: Own calculations.

4 CONCLUSION

This paper provided a detailed account of the financial structures and lending capacity of different RFAs. In particular, it offers a comprehensive review of the issue, from statutory, accounting and credit and rating perspectives.

We believe our work provides useful insight for a range of readers and avenues for future analysis. From a policy perspective, our work illustrates the heterogeneity of RFAs and confirms that RFAs vary in terms of their financial structures and maximum lending capacity. Future work could aim to uncover the diversity of this group of institutions from other aspects, e.g. their assistance toolkit, conditionality and existing working relations with the IMF, etc. Second, from an institutional perspective, we illustrate the dynamic relations between an institution's lending capacity, its capital structure (especially, in terms of the relative size of paid-in and callable capital), and the credit support from the member states and the member states' own creditworthiness. Our assessment based on credit rating agencies' methodologies provides a counterfactual floor rating for selective RFAs. This suggests that for RFAs that are allowed to tap financial markets, they could further enhance their creditworthiness by "getting the house in order" to enhance the intrinsic strength. FLAR provides an excellent example with this regard. In addition, for RFAs that are not (regular) market issuers yet, they could take this dynamic relationship into account when deciding to borrow from the markets one day. For any new institutions that could be created in the future, our stylised model could provide useful thoughts on how to best split the paid-in and callable capital. In the future, we can also try to enrich our stylised model with the application of the trade-off theory of capital structure (Modigliani and Miller, 1958 and Miller, 1977) in RFAs' institutional context. Finally, from the rating perspective, one can easily see that different metrics and methodologies used by different agencies lead to a large range of approximated lending capacity of a giving institution. Sometimes, the prevailing methodologies also fail to capture some specific features of these regional crisis funds. How to further improve the methodology to rate supranational agencies and whether agencies should fine-tune their methodologies to distinguish crisis resolution mechanisms from development banks are relevant questions for rating agencies to explore.

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ANNEX – RFAs' FINANCIAL STRUCTURES

We present below RFAs' financial structures as described in their legal documentation.

Arab Monetary Fund

	Authorised and subscribed capital	Shares	paid-in (total)	Basic vote	Contribution adjusted vote	Voting weight
	Million AAD	Unit	Million AAD	Unit	Unit	%
Jordan	14.85	297	13.86	75	372	1.89%
UAE	52.95	1059	49.42	75	1134	5.77%
Bahrain	13.8	276	12.88	75	351	1.79%
Tunisia	19.275	385.5	17.99	75	461	2.34%
Algeria	116.85	2337	109.06	75	2412	12.27%
Saudi Arabia	133.425	2668.5	124.53	75	2744	13.96%
Sudan	27.6	552	23.00	75	627	3.19%
Syria	19.875	397.5	16.56	75	473	2.40%
Somalia	11.025	220.5	9.19	75	296	1.50%
Iraq	116.85	2337	109.06	75	2412	12.27%
Oman	13.8	276	12.88	75	351	1.79%
Qatar	27.6	552	25.76	75	627	3.19%
Kuwait	88.2	1764	82.32	75	1839	9.36%
Lebanon	13.8	276	12.88	75	351	1.79%
Lybia	37.035	740.7	34.57	75	816	4.15%
Egypt	88.2	1764	82.32	75	1839	9.36%
Morocco	41.325	826.5	38.57	75	902	4.59%
Mauritania	13.8	276	12.88	75	351	1.79%
Yemen	42.45	849	36.79	75	924	4.70%
Palestine	5.94	118.8	0.00	75	194	0.99%
Djibouti	0.675	13.5	0.56	75	89	0.45%
Comoros	0.675	13.5	0.56	75	89	0.45%
Total	**900**	**18000**	**825.64**	**1650.00**	**19650**	**100%**

* paid-in capital consists of local currencies, convertible currencies (second largest) and transfer from general reseserve (largest)
* Arab Accounting Dinars = three times IMF SDR

BRICS Contingent Reserve Arrangement

	Contribution	Key	Access multipliers	Max. swap	Basic Votes	Votes based on contributions	Total Voting Power
	USD Bn	%		USD Bn	Votes	Votes	Votes
Brazil	18	18%	1	18	1%	17.10%	18.10%
China	41	41%	0.5	20.5	1%	38.95%	39.95%
India	18	18%	1	18	1%	17.10%	18.10%
Russia	18	18%	1	18	1%	17.10%	18.10%
South Africa	5	5%	2	10	1%	4.75%	5.75%
Total	**100**			**84.5**	**5%**	**95%**	**100%**

Chiang Mai Initiative Multilateralisation

Members		Contribution			Access right			Voting Power		
		Key		Contributions	Purchasing multiple	Max. access	Basic Votes	Votes based on contributions	Total Voting Power	
		(%)	(%)	USD Bn		USD Bn	Votes	Votes	Votes	(%)
China	China(Excl. Hong Kong)	32	28.5	68.4	0.5	34.2	3.2	68.4	71.6	25.43
	Hong Kong		3.5	8.4	0.75	6.3	0	8.4	8.4	2.98
Japan		32		76.8	0.5	38.4	3.2	76.8	80	28.41
Korea		16		38.4	1	38.4	3.2	38.4	41.6	14.77
Plus 3		**80**		**192**		**117.3**	**9.6**	**192**	**201.6**	**71.59**
Indonesia		3.793		9.104	2.5	22.76	3.2	9.104	12.304	4.37
Thailand		3.793		9.104	2.5	22.76	3.2	9.104	12.304	4.37
Malaysia		3.793		9.104	2.5	22.76	3.2	9.104	12.304	4.37
Singapore		3.793		9.104	2.5	22.76	3.2	9.104	12.304	4.37
Philippines		3.793		9.104	2.5	22.76	3.2	9.104	12.304	4.37
Vietnam		0.833		2.000	5	10.00	3.2	2.000	5.200	1.85
Cambodia		0.100		0.24	5	1.20	3.2	0.24	3.44	1.22
Myanmar		0.050		0.12	5	0.60	3.2	0.12	3.32	1.18
Brunei		0.025		0.06	5	0.30	3.2	0.06	3.26	1.16
Lao PDR		0.025		0.06	5	0.30	3.2	0.06	3.26	1.16
ASEAN		**20**		**48**		**126**	**32**	**48**	**80.0**	**28.41**
Total		**100**		**240**		**243.5**	**41.6**	**240**	**281.60**	**100.00**

Eurasian Fund for Stabilization and Development

	Subscribed capital	Votes	Voting power	Paid-in capital	Country access limits	Country access limits
	USD Million		%	USD Million	%	USD Million
Armenia	1	10	0.01%	1	13%	1106.7
Belarus	10	100	0.12%	2	21%	1787.7
Kazakhstan	1000	10000	11.75%	496.785	24%	2043.1
Kyrgyzstan	1	10	0.01%	0.2	3%	255.4
Russia	7500	75000	88.10%	2558	37%	3149.8
Tajikistan	1	10	0.01%	1	2%	170.3
Total	**8513**	**85130**	**100%**	**3058.985**	**100%**	**8513**

* 10% of paid in in cash (USD or Euros), 90% of paid in in the form of simple, non-convertible, non-interest-bearing bill of exchange
* Country access limits determined in proportion to GNI per capita
* If needed for the implementation of major projects, a member state may elect to relocate part of its limits to another MS
* One vote = 100000 USD

European Financial Stability Facility

	Guarantees	Key	Adjsuted guarantees	Adjusted key
	EUR bn	%	EUR bn	%
Austria	21.63919	2.7750%	21.63919	2.9869%
Belgium	27.03199	3.4666%	27.03199	3.7313%
Cyprus	1.52568	0.1957%	0.00000	0.0000%
Estonia	1.99486	0.2558%	1.99486	0.2754%
Finland	13.97403	1.7920%	13.97403	1.9289%
France	158.48753	20.3246%	158.48753	21.8762%
Germany	211.04590	27.0647%	211.04590	29.1309%
Greece	21.89774	2.8082%	0.00000	0.0000%
Ireland	12.37815	1.5874%	0.00000	0.0000%
Italy	139.26781	17.8598%	139.26781	19.2233%
Luxembourg	1.94694	0.2497%	1.94694	0.2687%
Malta	0.70433	0.0903%	0.70433	0.0972%
Netherlands	44.44632	5.6998%	44.44632	6.1350%
Portugal	19.50726	2.5016%	0.00000	0.0000%
Slovak Republic	7.72757	0.9910%	7.72757	1.0666%
Slovenia	3.66430	0.4699%	3.66430	0.5058%
Spain	92.54356	11.8679%	92.54356	12.7739%
Total	**779.78316**	**100%**	**724.47433**	**100%**

NB. Greece, Ireland and Portugal stepped out of the guarantee scheme once their respective programmes started.

European Stability Mechanism

	Contribution	Key	Shares	Voting power
	EUR bn	%	Unit	%
Belgium	24.3397	3.4534%	243397	3.4534%
Germany	190.0248	26.9616%	1900248	26.9616%
Estonia	1.302	0.1847%	13020	0.1847%
Ireland	11.1454	1.5814%	111454	1.5814%
Greece	19.7169	2.7975%	197169	2.7975%
Spain	83.3259	11.8227%	833259	11.8227%
France	142.7013	20.2471%	1427013	20.2471%
Italy	125.3959	17.7917%	1253959	17.7917%
Cyprus	1.3734	0.1949%	13734	0.1949%
Latvia	1.9353	0.2746%	19353	0.2746%
Lithuania	2.8634	0.4063%	28634	0.4063%
Luxembourg	1.7528	0.2487%	17528	0.2487%
Malta	0.5117	0.0726%	5117	0.0726%
Netherlands	40.019	5.6781%	400190	5.6781%
Austria	19.4838	2.7644%	194838	2.7644%
Portugal	17.5644	2.4921%	175644	2.4921%
Slovenia	2.9932	0.4247%	29932	0.4247%
Slovak Republic	5.768	0.8184%	57680	0.8184%
Finland	12.5818	1.7852%	125818	1.7852%
Total	**704.7987**		**7047987**	**100%**

Fondo Latinoamericano de Reservas

	Subscribed capital	Contribution share	Paid-in capital	Max. multiplier	Max. access
	USD bn	%	USD bn		USD Bn
Bolivia	0.3281	8.6%	0.2453	2.6	0.64
Colombia	0.6563	17.2%	0.4906	2.5	1.23
Costa Rica	0.6563	14.0%	0.4020	2.5	1.01
Ecuador	0.3281	8.6%	0.2453	2.6	0.64
Paraguay	0.3281	8.6%	0.2449	2.5	0.61
Peru	0.6563	17.2%	0.4906	2.5	1.23
Uruguay	0.3281	8.6%	0.2458	2.5	0.61
Venezuela	0.6563	17.2%	0.4908	2.5	1.23
Total	**3.9376**	**100%**	**2.8553**		**7.19**