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The Role of IMF Arrangements in Restoring Access to International Capital Markets

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ABSTRACT: Using a database of emerging market fundamentals and bond index spreads across 56 frontier and emerging market countries rated below investment grade during the period 2002-22, we assess whether IMF arrangements can restore access to international capital markets (ICM) for countries in distress through liquidity and conditionality channels. We find that global financial conditions and debt/GDP are the most important determinants of access to ICM within the horizon of a typical IMF arrangement. Using an event study methodology, we show that spreads increase prior to the start of an IMF arrangement and then decrease gradually. By exploiting different characteristics of IMF arrangements, we find evidence that the reforms implemented under the IMF arrangement, as measured by rounds of successful IMF reviews, matter more in the medium term than the IMF's role as a liquidity provider. These results are consistent with our analysis of 55 credit rating upgrades to ICM access levels, which suggests that debt reduction plays the largest role and that IMF arrangements lend credibility to reforms.

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I.   Introduction

Vast shifts in the set of countries that enjoy access to international capital markets (ICM) make questions about its determinants particularly timely. Access to ICM for frontier markets expanded significantly after the Global Financial Crisis but then receded again after the COVID-19 pandemic, due to higher debt levels and tighter global financial conditions.[2] According to our calculations, as of mid-March 2024, there were 15 countries with spreads above 700 bp and 10 countries with spreads above 1,000 bp,[3] levels at which issuing new bonds in ICM would no longer be feasible. How to support so many countries that cannot roll over their debt is an important challenge for multilaterals.

Even in less turbulent times, the concept of access to ICM plays an important role in guiding IMF lending, including in determining whether it can lend, the amount it can lend, and the financial terms under which it can lend. Even how the IMF analyzes debt sustainability depends in part on access to ICM. Annex I explains how the IMF applies the access to ICM concept for risk mitigation and signaling, with references to the relevant policies.

This paper uses bond spread data, supplemented by qualitative analysis of credit rating upgrades, to analyze how the IMF helps countries restore access to ICM. We find that the most important determinants of access to ICM during the three-year horizon of many IMF arrangements are global financial conditions and debt ratios. We also find that spreads tend to compress in the four years following IMF Board approval of an IMF arrangement and that spread compression is particularly significant during successful arrangements—those where most reviews were completed. Our analysis suggests that it is the conditionality around IMF arrangements rather than IMF's role as a lender of last resort that is most useful for restoring access to ICM.

This analysis fills a recent void in the literature. While some research exists on the determinants of access to ICM, there is almost no research to inform IMF predictions on the resumption of access to ICM during an IMF arrangement.[4] We are aware of only a handful of recent studies that consider the role of the IMF at all. In some of those papers, the existence of an IMF arrangement is just one of many control variables. These studies do not consider the dynamic effect of an IMF arrangement over time, nor do they investigate the channels through which the IMF arrangement may impact access to ICM; perhaps consequently, results are mixed and inconclusive. There is little in this literature to guide stakeholders in predicting the resumption of access to ICM and in designing IMF arrangements that improve prospects for regaining access to ICM.

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[2] For example, during the pre-COVID-19 period between 2015 and 2019, access to ICM for frontier markets expanded significantly. On average, 14 countries rated single B or lower issued bonds annually during this period, according to Bond Radar's database. In comparison, only five similarly rated countries per year issued international bonds between 2003 and 2007. Access to ICM expanded to these countries either because investors were more willing to move down the credit spectrum or because some low-income countries were receiving debt relief from the Heavily Indebted Poor Countries Initiative and the Multilateral Debt Relief Initiative in the 2000s, creating borrowing space for bond issuance later.

[3] Our database tracks USD or euro-denominated bonds issued under foreign governing law with an amount outstanding greater than $250 million, minimum pricing quality, one-year remaining maturity, and no external guarantees, based on data from Bloomberg Back Office (a product of Bloomberg LLC). Calculation as of March 15, 2024.

[4] While the present study focuses on IMF arrangements, the IMF's core surveillance mandate to conduct regular policy assessments and provide policy advice, including through technical assistance, may also play a role in countries' access to ICM. An investigation into the broader effect of the IMF's work on access to ICM is beyond the scope of the present research.

Defining and measuring access to ICM is difficult, and this paper adopts an approach that facilitates an investigation of its determinants. IMF policies characterize access to ICM as "the ability of a country to tap international capital on a sustained basis through the contracting of loans and/or issuance of securities across a range of maturities, regardless of the currency denomination of the instruments, and at reasonable interest rates."[5] While some observers have interpreted access to ICM as a binary variable—either a country has access to ICM or it does not—it is arguably a multidimensional and continuous concept covering the price, tenor, and amount of financing a country can secure from different sources in ICM. In this paper, we focus on access to ICM rather than access to all capital markets,[6] because it is relevant to the IMF's mission of providing temporary balance of payments support and is not affected by the financial repression prevalent in the domestic markets of some countries. We also look only at the Eurobond market, both because this market has played a larger role in recent decades and because it provides better and more frequent secondary market data.[7]

We use two proxies for the complex concept of access to ICM. First, our case studies use credit ratings, because credit rating agencies can act as gatekeepers for access to ICM. A sovereign rating of B-/B3 is often viewed as the minimum threshold for access to ICM, and it is rare for a sovereign rated below B-/B3 to borrow in ICM, with such issuances having occurred only a few times in the past two decades. Second, our empirical analysis uses bond index spreads. These forward-looking variables reflect the weighted average investor views of creditworthiness. Since emerging market primary issuances in ICM almost always happen at prices that are close to those of secondary markets (Annex II), these index spreads provide important information on not just the secondary market but also the primary market that an issuer would likely face if it sought to issue new bonds. In this paper, we do not try to determine a spread threshold for access to ICM, but rather we treat the spread itself as a continuous measure of access to ICM, as explained in the context of the existing literature in Section II and in the robustness checks in Section VII.

Using these proxies as dependent variables, this paper empirically investigates the role of IMF arrangements in restoring access to ICM. We motivate our analysis with 55 case studies that identify potential drivers of the resumption of access to ICM when a sovereign which had issued bonds in the past is upgraded to B-/B3 based on credit rating agency reports. Then, switching to secondary market spreads as the proxy for access to ICM, we explore the determinants of these spreads for a different sample of 56 noninvestment grade countries during the period 2002-22 using a quarterly dataset.

Our econometric analysis of this dataset has two main parts. First, we identify the determinants of emerging market spreads, including country characteristics and global financial conditions. We go beyond other studies in the literature by assessing empirically which factors can change sufficiently within the three-year horizon of a typical IMF arrangement to have a meaningful effect on spreads. Second, we study the effect of IMF arrangements using an event study framework, where the event is the IMF Board approval of a country arrangement. We have spread data on 87 IMF arrangements across 37 countries. Because arrangements are

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[5] This definition first appears in "Sovereign Debt Restructuring—Recent Development and Implications for the Fund's Legal and Policy Framework," IMF Policy Paper, April 26, 2013, paragraph 11, https://www.imf.org/external/np/pp/eng/2013/042613.pdf. As explained in Annex I, the concept is linked to requirements for exceptional access to IMF financing, and has evolved between 2002 and 2016.

[6] A potential source of external finance not covered in this paper is nonresident inflows into domestic bond markets; however, nonresident inflows to local debt markets play a smaller role for most high-yield sovereigns in our sample.

[7] For example, as of end-2023, there were $507 billion in Eurobonds outstanding but only $70 billion in syndicated loans outstanding for the sample of countries used in this paper, according to Bloomberg and Dealogic.

endogenous, we look for effects both before and after arrangement approval, and we also examine the change in effects at different horizons. We find that IMF arrangements are associated with a reduction in spreads, suggesting they may play a role in restoring access to ICM. Then, we assess empirically why IMF arrangements might influence spreads, distinguishing between the roles of conditionality and liquidity.

These empirical strategies have important limitations. While we employ event study methodologies, IMF arrangements are not exogenous, as only those countries that are (1) in distress, and (2) willing to commit to certain IMF-recommended macroeconomic policies and reforms, would qualify for the types of IMF arrangements we analyze. These factors represent missing variables that would also be correlated with access to ICM. Similarly, characteristics of IMF arrangements, such as the amount of financial support provided, are neither randomly nor exogenously determined, making it difficult to draw conclusions about how these characteristics would affect outcomes. Thus, in some cases, our results should be viewed as evidence for correlation rather than causation. Nevertheless, even these correlations can elucidate the IMF's role in helping countries regain access to ICM.

The rest of the paper is organized as follows: Section II presents a brief review of the literature. Section III explains our ratings-based case studies on the resumption of access to ICM. Section IV describes the data used for the empirical analysis, and Section V covers the econometric methodology. Section VIa is the empirical investigation on the broad determinants of spreads, and Section VIb analyzes the role of IMF arrangements in particular. Section VII covers additional robustness checks, including those related to defaulted bonds and the endogeneity of IMF arrangements. Section VIII concludes by placing the findings in the larger picture of access to ICM and offering suggestions for further research.

II.   Literature review

How can access to ICM be measured? Existing studies, which focus mostly on international rather than domestic markets, use broadly two classes of proxies: quantity measures and price measures. Quantity measures address access to markets directly. If a country issued bonds, then it had access, and a dummy variable can be easily constructed. Some of the quantity measures used in the literature define loss of access to markets as the timing of complete cessation of primary issuance based on a decision rule (Guscina, Malik, and Papaioannou 2017), the first year of a debt distress event (Bassanetti, Cottarelli, and Presbitero 2016), and the period up to four quarters prior to designated episodes (Zigraiova, Erce, and Jiang 2020).[8] Other quantity measures include the frequency of access to ICM (Gelos, Sahay, and Sandleris 2011)[9] and primary gross issuance as a share of GDP (Fostel and Kaminsky 2007).

In contrast, price measures are indirect indicators of access. Markets are willing to price anything, but it would not be sensible for countries to issue bonds at unreasonably high interest rates. When spreads are above a

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[8] Zigraiova, Erce, and Jiang (2020) define loss of market episodes as: (1) ESM/IMF arrangement dates; (2) periods identified by Guscina, Malik, and Papaioannou (2017); and (3) periods when the 10-year spread to Germany is above the 90th percentile of spread distribution for the full sample (around 350 basis points).

[9] Gelos, Sahay, and Sandleris (2011) define access to ICM as PPG international bond issuance or borrowing through a private syndicated bank loan occurring in a year when the country's indebtedness increases. They measure the frequency of access to ICM as the ratio of number of country-years accessing international credit markets to total number of country-years, as well as with an access to ICM dummy variable.

certain threshold—1,000 bp is a common rule of thumb cited by market participants (see histogram of primary issuance in Annex III)—we can assume no access to ICM. Pinning down the exact threshold is difficult, both because access to ICM may be a continuous rather than a binary concept and because we have found that the relevant thresholds may vary with global financial conditions and country-specific fundamentals; we can be sure, nevertheless, that the higher the spread the less likely the country is to have access to ICM over time. Price measures include hard-currency spreads (EMBIG) (Goel and Papageorgiou 2021; Jaramillo and Tejada 2011), as well as sovereign spreads relative to Germany (Bobetko, Dumicic, and Funda 2013; Attinasi, Checherita, and Nickel 2009). Finally, there are studies that use a mix of quantity and price measures of access to ICM. Presbitero et al. (2015) examine both the binary likelihood of a sovereign bond issuance in global markets and the primary spread on the sovereign bond. Da Silva, Antoun de Almeida, and Singh (2021) use three measures of access to ICM: (1) outstanding public and publicly guaranteed (PPG) bond stock to GDP ratio; (2) probability of PPG bond issuance as a dummy variable; and (3) EMBIG spreads.

We prefer price measures of access to ICM for this study because quantity/volume measures are harder to construct and are subjective, requiring judgment on the reasons for the lack of issuance. Simple quantity measures cannot properly distinguish between the loss of the ability to issue and alternatives, such as the availability of cheaper nonmarket sources of financing or smaller financing needs. At the start of an IMF arrangement, there is typically no issuance, because most external financing needs are covered by other sources, including IMF lending, and because the arrangement may limit the government's issuance of new non-concessional debt. It is perhaps for these reasons that the IMF's definition of access to ICM focuses on the ability to borrow rather than the amount of actual borrowing. Quantity measures would provide little information on the ability to issue during an IMF arrangement, the period of most interest.

In addition, quantity measures may be less applicable to smaller countries that do not issue in international markets with high frequency, as they provide no means of precisely identifying when such an infrequent issuer regained access to ICM. Finally, because they are often expressed as binary variables, quantity measures only allow for the application of a limited set of econometric techniques. In contrast, price measures are forward-looking continuous variables, often available with daily updates. Refining indicators of access to ICM is not the focus of this study; however, we provide some considerations for doing so, based on the IMF's approach in Box 1.

Box 1. A methodological framework for determining access to ICM

- Indicator selection: Choosing relevant indicators such as sovereign bond spreads, credit ratings, and nonresident holdings of government debt. Multiple indicators need to be combined to improve prediction accuracy.
- Threshold identification: Setting thresholds for these indicators to signal potential loss of access to ICM (LMA).
- Historical analysis: Examining past instances of LMA and the behavior of indicators during these periods.
- Current assessment: Comparing current data with historical trends to assess the risk of LMA.
- Temporary vs. structural LMA: Determining whether LMA is a short-term issue or a reflection of deeper structural problems.
- Policy implications: Evaluating the necessary fiscal and monetary policies required to address or prevent LMA.
- Continuous monitoring: Regularly updating this assessment as new data become available.

Source: Guscina, A., S. Malik, and M. Papaioannou. 2017. "Assessing Loss of Market Access: Conceptual and Operational Issues." IMF Working Paper 246. International Monetary Fund, Washington, DC.

This paper investigates determinants rather than indicators of access to ICM. We examine the robustness of two broad groups of determinants, as found in the literature: country-specific fundamentals and global liquidity factors. Several studies find that both country fundamentals and external determinants matter for access to ICM (IMF 2001, 2005; Fostel and Kaminsky 2007; Bellas, Papaioannou, and Petrova 2010; da Silva, Antoun de Almeida, and Singh 2021; Presbitero et al. 2015). Country fundamentals affecting access to ICM (in order of frequency of significant results of the expected sign across the studies we reviewed) include real GDP growth, public debt, GDP per capita, inflation, reserves, external debt, institutional quality, fiscal primary balance, current account balance, political risk, credit rating, and exchange rate volatility. On fiscal variables specifically, public debt is more often found to be a robust predictor than the primary balance. In fact, some studies do not include fiscal balance and public debt in the same equation, to avoid problems of collinearity (Bobetko, Dumicic, and Funda 2013). Variables that are less often found to be significant determinants of access to ICM are trade openness, terms of trade, unemployment, and population.

Certain measures of global liquidity and risk aversion also influence access to ICM, including global interest rates (e.g., US federal funds rate), VIX, and global (US/G7) growth (Bobetko, Dumicic, and Funda 2013; Goel and Papageorgiou 2021). While global market sentiment is a significant driver of access to ICM in the literature, investors are willing to differentiate among countries in even the tightest financial conditions, with lower external and domestic public debt and higher GDP growth rates helping perceptions (Jaramillo and Tejada 2011). A country-specific financial stress index has also been found to be a significant determinant of spreads, especially in the short run (Bellas, Papaioannou, and Petrova 2010). In our study, we include most of these variables, but we normalize coefficients by how much these variables can change within the horizon of a typical IMF arrangement.

Having established the relevant measure of access to ICM and the potential explanatory variables, we consider the appropriate methodology and data sample. In contrast with other studies whose goal is to understand the determinants of spreads overall, our focus is on the right side of the distribution, where countries lose access to ICM. Thus, we examine only high-yield countries (those rated BB+ or lower at any time during our sample), whereas the literature usually includes both advanced economies and emerging markets (EM) in its samples. For the same reason, spread outliers need to be treated carefully, as loss of access to ICM usually occurs at high spreads.

While there is abundant literature on the impact of IMF arrangements on macroeconomic variables that may affect access to ICM, there are fewer studies that directly examine the role of IMF arrangements in expediting the restoration of access to ICM, and most of those are dated. The IMF offers its members a range of lending windows, including medium-term, episodic short-term, emergency, and precautionary financing, as well as nonfinancial policy support. Different IMF arrangements have different objectives, levels of financing, and conditionality (Bal-Gunduz et al. 2013). Even though the liquidity provided by IMF arrangements has been found to have a positive impact, especially for short-term arrangements, the effect of arrangement-related policy advice and capacity development seems to be more significant. Specifically, IMF assistance in developing consistent macroeconomic frameworks, policy advice and conditionality, capacity building, debt relief as a precondition for an IMF arrangement, and the facilitation of other donor financing ("catalytic effect") are some of the nonfinancial channels through which IMF arrangements have an impact (Bal-Gunduz et al. 2013; Atsebi and Wojnilower 2021). Conditionality is the element we explore in our econometric analysis. It

involves periodic reviews of progress made on prior actions, performance criteria, indicative targets, and structural benchmarks across a potential range of debt, fiscal and monetary issues.[10]

Overall, the literature finds that IMF arrangements are associated with improvements in the country's balance of payments, including recoveries in current account balances or reserve coverage, consistent with the premise of an arrangement. In addition, the literature notes improvements in inflation, growth volatility, the probability of ending a crisis, and in certain cases, also growth, though findings vary depending on the sample periods and countries, as well as the empirical approaches (Bal-Gunduz et al. 2013; IEO 2021; Conway 2000). Alongside these macroeconomic variables, improvements in fiscal deficits are associated with longer-term IMF arrangements (Bal-Gunduz et al. 2013). This is particularly relevant to countries' access to ICM. Recent research finds that fiscal structural conditions are associated with positive impacts on growth during arrangements and in the medium term (Gupta 2021). On the other hand, IMF arrangements have had mixed results on debt sustainability: IMF arrangements with sovereign debt restructuring operations tend to be more successful than those without, but those debt operations are often inadequately timed and sized.

Older literature observed that IMF arrangements facilitated increased capital inflows and helped countries restore access to ICM (Schadler et al. 1995; Dhonte 1997). Rodrik (1995) found that lending from other multilaterals, e.g., the World Bank and regional development banks, had a negative effect on private capital flows, while IMF arrangements had a positive effect. Using econometric analysis, two studies suggested that different IMF arrangements have different effects: Extended Fund Facility (EFF) arrangements had the largest positive impact on access to ICM, both in terms of issuance and spreads, particularly for countries that were poor (Bird and Rowlands 2002) or had intermediate credit ratings (Eichengreen and Mody 2000), while the evidence on the effect of other arrangements, such as Stand-by Arrangements (SBA), Structural Adjustment Facilities (SAF) and Enhanced Structural Adjustment Facilities (ESAF/PRGF), was mixed.[11] However, both studies suggested that prolonged IMF involvement diminished the positive effects (Bird and Rowlands 2002; Eichengreen and Mody 2000). Wälti and Weder (2009) found that IMF arrangements reduce bond market distress, especially in the context of poor domestic policy. In contrast, Richmond and Dias (2009) did not find a significant effect of IMF lending on access to ICM, but they did not control for nonrandom IMF arrangement occurrence. Differences in data samples, econometric approaches, and the design of IMF arrangements all likely account for the differences in results.

Some recent literature addresses the role of IMF arrangements in restoring access to ICM, but in a cursory manner and not as the focus of research, and finds mixed results. In these studies, IMF arrangements are generally included as dummy variables representing just one of many explanatory variables. First, Gelos, Sahay, and Sandleris (2011) find that IMF arrangements, denoted by the start of a SBA, EFF, or Poverty Reduction and Growth Trust (PRGT) arrangement, do not have an additional positive effect on access to ICM when measured with a quantity indicator and once perceived policies are controlled for; the coefficient on the EFF arrangement dummy variable is even significant with the wrong sign. Second, and in contrast with this result, Presbitero et al. (2015) suggest that IMF-supported lending arrangements in the previous three years have a catalytic effect on the probability of issuance, a quantity measure. However, the effect on secondary spreads, a price measure, loses significance when controlling for institutional quality and other indicators. Third,

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[10] The purpose of IMF arrangement conditionality is to safeguard the IMF's resources by ensuring that the borrowing country can repay the loan while achieving medium-term external viability and "fostering sustainable economic growth."

[11] A good reference on IMF lending arrangements and their acronyms can be found at https://www.imf.org/en/About/Factsheets/IMF-Lending. SAF and ESAF arrangements are no longer offered by the IMF.

da Silva, Antoun de Almeida, and Singh (2021) observe that narrower spreads, a price measure, are associated with an Extended Credit Facility (ECF) arrangement in place; yet, both Stand-by Credit Facility (SCF) and ECF arrangements are related to a lower probability of issuance and a SCF arrangement is related to lower outstanding bond stock, both quantity measures of access to ICM. Besides the different country and time samples, another reason these studies show mixed results is that they employ both quantity and price measures. While an IMF arrangement may lower the price at which a sovereign can issue bonds in ICM, it may also decrease the need to issue, as the IMF arrangement itself provides financing, catalyzes additional financing from other official creditors, and often includes reforms aimed at lowering external financing needs over time.

Two additional studies published in recent years consider specifically how the terms of official lending—interest rates and seniority—can affect access to ICM. Corsetti, Erce and Uy (2020) distinguish between European Stability Mechanism (ESM) and IMF loans to the Euro area, finding that the more generous terms of the former exert stronger downward pressure on market yields. Krahnke (2023) finds that the catalytic effect of IMF arrangements, as measured by gross capital inflows, is weakened and even reversed when the arrangement exceeds a certain size because large IMF financing combined with the IMF's preferred creditor status could crowd out private investors by increasing their loss in a future debt crisis.

Our analysis goes beyond recent studies in assessing the contribution of IMF arrangements to restoring access to ICM. Specifically, we quantify the impact of changes in different explanatory variables within the timeframe of an IMF arrangement. Dynamic event studies help determine how long it takes an IMF arrangement to restore market confidence. In addition, we examine why IMF involvement might help restore access to ICM, contrasting liquidity provision related to the IMF's role as lender of last resort with conditionality related to the policy reform measures implemented under an IMF-supported arrangement.

III. Observations from credit rating upgrades

Sovereign credit rating reports contain a wealth of historical information on the determinants of creditworthiness in sovereign bonds. Because ratings are designed to be an input to investment decisions, we employ the sovereign rating as a proxy for access to ICM. A sovereign with a high rating, such as any rating in the investment-grade range,[12] often has more opportunities to access the market in terms of issuance amount, tenor, and cost. AAA-rated sovereigns can issue super-long tenors and finance themselves at smaller spreads than lower-rated issuers, regardless of market conditions. A sovereign rating of B-/B3 is often considered the minimum threshold for access to ICM.[13] It is rare for a sovereign rated below B-/B3 to access ICM, with such issuances having occurred only a few times in the past two decades. One reason for that threshold is that many fixed-income investors and fund managers have internal investment rules requiring a rating B-/B3 or better for new investments, though a B-/B3 rating is only a necessary but not a sufficient condition for access to ICM. Thus, an interesting question is what factors are most important for a country to regain access to ICM, as measured by a credit rating upgrade from CCC or below to B-.

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[12] "Investment grade" refers to sovereigns with a credit rating of BBB- or above (S&P and Fitch) and Baa3 or above (Moody's). Bonds issued by countries with ratings below that threshold are in the speculative grade and are also referred to as "high-yield," "non-investment-grade," or "junk" bonds.

[13] Among all 493 sovereign Eurobond issuances from January 2003 to December 2021, there was only one issuance with a Caa1 rating (Maldives 2021 of $200 million) and only six issuances with a split rating of Caa1/B.

In our sample from 2000 to 2022, there were 55 such upgrades covering 33 countries.[14] As a sovereign is upgraded from no access to ICM (Caa/CCC or below) to potential access to ICM (B-/B3), it crosses a key milestone. Rating reports by the top three rating agencies (Fitch, Moody's, S&P) explain the upgrade. A credit rating report often succinctly lists the top three reasons for the rating upgrade in the first paragraph and discusses these reasons in greater detail in one or two pages. Applying a text mining exercise, we track these rationales for each case, assessing their relative importance for rating actions based on the frequency of their appearance among the top three.

Fiscal sustainability, external funding, and political and macroeconomic stability are among the key factors that lead to an upgrade to B-/B3 (Table 3.1). Fiscal indicators such as debt/GDP and fiscal surplus are the most frequently mentioned. Debt reduction (stock treatment of debt) is mentioned in more than half of cases (51%), as debt restructuring via bilateral debt relief, debt exchange, and reprofiling can reduce insolvency risk and liquidity risk and thus contributes the most to access to ICM. Fiscal consolidation through revenue or expenditure measures is the second most important factor, mentioned in 16 out of 55 cases (29%). Next, the rebound of commodity prices (e.g., oil, copper) can improve the balance of payments and the fiscal position for those commodity exporters and was mentioned 25% of the time as a key factor. Approval of a new IMF arrangement also helps to trigger rating upgrades, appearing in 20% of cases. Improvements in political stability (such as an end to civil war or fair elections) enhance access to ICM in 13% of cases. In contrast, monetary and external account adjustments that are commonly found in IMF arrangements such as tight monetary policy, flexible market-based exchange rates, and adequate FX reserve levels can lead to an upgrade, but they appear less often and less prominently in the rating reports. Other factors such as structural reforms (e.g., state-owned enterprise reform, trade liberalization, labor market and product market reform) also appear infrequently, perhaps because these growth enhancement measures take a long time.

Table 3.1. Factors behind sovereign rating upgrade to B-/B3 from below (55 country cases, 2000-22)

Rating factors	Cases mentioned	Frequency mentioned
Debt reduction (restructuring, exchange, relief)	28	51%
Fiscal consolidation	16	29%
Commodity price rebound	14	25%
IMF arrangement	11	20%
Political stability and institutional improvements	7	13%
Various other policy reforms (monetary, FX and structural)	9	16%

Sources: Authors' review of rating reports by Fitch, Moody's, S&P, 2000-22.

Looking closely at the 11 cases where an IMF arrangement is mentioned as one of the key factors justifying the upgrade, we notice an important pattern. As shown in Figure 3.1, IMF arrangements are never mentioned on their own. Instead, out of the 11 cases that highlight an IMF arrangement, 8 cases mention key reforms normally associated with IMF arrangements; that is, 3 cases also mention debt reduction, 3 cases coincide with fiscal consolidation, and 2 cases mention other stabilization measures. The 3 remaining cases happen together with a commodity price rebound, which is of course an external factor outside of the IMF's control. Both policy

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[14] There are no first-time issuers in this sample of upgrades—all these countries had issued in the past. A first-time issuer is unlikely to pay for a rating below B- since it could not issue at that rating.

reforms (especially the fiscal and debt measures) and IMF funding are factors behind the rating upgrades. Thus, according to the rating agencies, the value of an IMF arrangement may not be solely in the additional external resources provided through its lending but also in the policy reforms—especially debt and fiscal measures—that accompany such lending.

Figure 3.1. Intersection of IMF arrangements and access to ICM—key factors
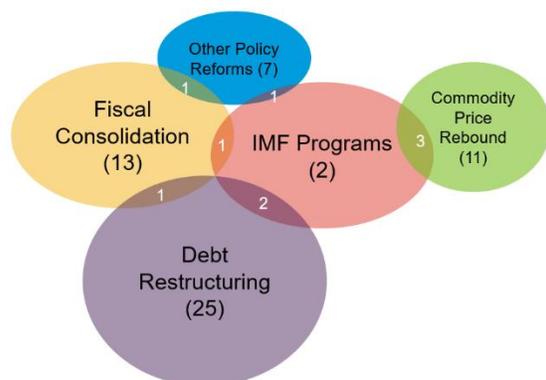
Note: The numbers in white show the overlap of IMF arrangements with other drivers of access to ICM. Among the 11 cases where IMF arrangements are mentioned as a key factor for regaining access to ICM, 2 cases also mention debt restructuring, 1 case mentions fiscal consolidation, 1 case mentions both debt restructuring and fiscal consolidation, 3 cases mention a commodity price rebound, 1 case mentions other policy reforms, and 1 case mentions fiscal consolidation and other policy reforms; the remaining 2 cases of IMF arrangements, shown in parenthesis, happen together with other stabilization measures.

Sources: S&P, Moody's, Fitch, MONA and IMF staff calculations.

This analysis also raises several questions, which we seek to answer in our subsequent investigation. What types of policy reforms matter the most? Debt reduction, fiscal consolidation, institutional quality, and structural reforms anecdotally all have an impact, but which should we focus on if access to ICM is of concern? Do credit rating agencies and investors really care about IMF arrangements, and if so, why do they care?

For the remainder of the study, we use spreads rather than credit ratings, as they are a continuous, more direct proxy for access to ICM than credit ratings. Spreads bring together views on creditworthiness from all market participants, whereas credit ratings are an opinion from just one analyst or organization. Moreover, spreads are naturally forward-looking, while some academic literature has found sovereign credit ratings to be lagging indicators. For example, a debt restructuring may automatically trigger a downgrade, because it is classified as a distressed exchange, even as it improves the outlook. Most importantly, an IMF arrangement is not built around credit rating targets but macroeconomic targets.

IV. Data description

The dataset used in the remaining sections comprises economic and financial sector variables for 56 noninvestment-grade economies on a quarterly frequency from 2002Q4 to 2022Q4, a period of exactly 20 years after taking into account the use of 1-period lags in the regression. Our country selection is based on Bond Radar, which is the leading resource used by market participants to track emerging market bond issuances in ICM. As noted, we focus on noninvestment-grade economies, either those whose sovereign ratings at the time of any primary issuance in ICM were BB+ or below according to at least one of the major credit rating agencies (Moody's, S&P, and Fitch) between 2002 and 2022 or those that issued only at investment grade but were downgraded to noninvestment grade sometime during 2002-22. Thus, a country that issued bonds and had a non-investment grade rating at any time during this period would be included for the entire period. Five countries were excluded from the study due to the lack of data on spreads. Table 4.1 lists the countries in the sample.

Table 4.1 Country sample

Countries	EMBIG spread	Credit Ratings (2000Q1 to 2022Q3)
Angola, Argentina, Bahrain, Belarus, Bolivia, Brazil, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, Egypt, El Salvador, Gabon, Georgia, Ghana, Guatemala, Honduras, Hungary, Indonesia, Iraq, Jamaica, Jordan, Kenya, Lebanon, Mongolia, Nigeria, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Russia, Rwanda, Senegal, Serbia, South Africa, Sri Lanka, Suriname, Tajikistan, Türkye, Ukraine, Uruguay, Uzbekistan, Venezuela, Vietnam, and Zambia	Yes	BB+ or below at time of issuance
Azerbaijan, Barbados, Kazakhstan, Morocco, Namibia, Oman, and Tunisia	Yes	BB+ or below after issuance (droppers)
Bahamas, Cameroon, Fiji, Latvia, and Seychelles	No	BB+ and below

The analysis uses spreads from JP Morgan's EMBIG Diversified ex-Quasi Sovereign Index, an index based on USD-denominated sovereign emerging markets bonds, as a proxy for access to ICM. Unlike the more widely used EMBIG Diversified Index, the ex-Quasi Index excludes quasi-sovereign bonds. Because bonds of state-owned enterprises (SOE) generally trade at spreads higher than those of their sovereign owners and only some countries have SOE bonds, excluding SOEs to focus on sovereigns ensures comparability across countries.

Table 4.2 describes the set of explanatory variables used in the estimations. Most of the country-specific macroeconomic data were sourced from IMF's *World Economic Outlook* (WEO) and Haver Analytics, including FX exchange rates, gross international reserves, inflation, overall fiscal balance, current account balance, and real GDP growth. In several countries where quarterly data was not available for certain macroeconomic variables, linear interpolation of annual data was used to complete the dataset. In addition, the strength of public institutions was proxied by the World Bank's government effectiveness index from the Worldwide Governance Indicators (WGI) dataset. The indicator uses a standard normal distribution and ranges from approximately -2.5 to 2.5, with higher values indicating better governance. Since WGI data are only collected annually, we replicate the annual values in our dataset among the corresponding quarters.

Data on IMF arrangements come from the MONA database[15] combined with other internal sources. Our study includes most lending arrangements provided by the IMF except for Flexible Credit Lines (FCL) and Precautionary and Liquidity Lines (PLL), as these arrangements are offered to countries with sound policies and in that sense, differ significantly from other IMF arrangements. We also exclude emergency financing instruments under the Rapid Credit Facility (RCF) and Rapid Financing Instrument (RFI), which do not come with conditionality and, unlike other arrangements, are not designed to resolve underlying balance of payments problems. We do consider arrangements categorized by the IMF as "precautionary," as these arrangements include conditionality. The arrangement's start date is recorded as the date when the IMF Board approves an arrangement, which is a prerequisite for any disbursements and typically happens several months after the

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[15] More information about the Monitoring of Fund Arrangements (MONA) database is available at
https://www.imf.org/external/np/pdr/mona/index.aspx.

publicly announced staff-level agreement.[16] For simplicity of analysis and avoidance of subjectivity, we treat all arrangements as independent, even if one arrangement follows closely after another.

Two characteristics of arrangements are important for our analysis, as they help us to differentiate between the roles of liquidity and conditionality. The arrangement size is the size of the IMF loan approved, inclusive of augmentations and regardless of the amounts actually disbursed, expressed as a percentage of a country's GDP. In contrast, IMF disbursements, which after the initial disbursement can only be made after the successful completion of arrangement-related conditionality, are expressed in cumulative terms as a percentage of approved amounts, inclusive of augmentations, and serve as a proxy for the ultimate success of an arrangement. If the indicator is significantly below 100%, it is considered that the country has not completed the full range of reforms associated with the arrangement.[17] Note that this indicator of disbursements does not change during an arrangement in our dataset—instead, it represents the disbursement percentage following the last observed disbursement for each arrangement. For precautionary arrangements, an alternative indicator is needed, since many countries successfully complete reviews but do not trigger disbursements. For these cases, we manually construct an indicator based on the portion of reviews completed by the end of the arrangement, weighted by the amount of funds contingent on each review.

As a proxy for global liquidity conditions, the paper uses the US Financial Conditions Index (FCI) from the IMF's *Global Financial Stability Report* (GFSR). The US FCI is a composite index that considers real short-term interest rates, interbank spreads, term premia, corporate spreads, equity prices and volatilities, exchange rates, and real house prices. A detailed description of the FCIs can be found in Annex 1 to Chapter 1 of the October 2018 IMF GFSR. The US FCI does not incorporate emerging market spreads in its calculation. The CBOE volatility index (VIX) is included in the model as an alternative measure of financial conditions in the robustness checks.

Table 4.2. Independent and explanatory variables

Independent variable			
Variable	**Unit**	**Frequency**	**Source**
EMBIG Diversified ex-Quasi Sovereign Index	Basis point	Daily	JP Morgan
Country-specific characteristics			
Variable	**Unit**	**Frequency**	**Source**
Real GDP Growth	Percent	Quarterly	Haver Analytics
Real GDP Per Capita	Percent	Quarterly	Haver Analytics
Inflation	Percent	Quarterly	IMF World Economic Outlook (WEO)
Public Debt	Percent of GDP	Quarterly	IMF World Economic Outlook (WEO)
Current Account Balance	Percent of GDP	Quarterly	IMF World Economic Outlook (WEO)
Overall Fiscal Balance	Percent of GDP	Quarterly	IMF World Economic Outlook (WEO)
Reserves	Percent of GDP	Quarterly	IMF World Economic Outlook (WEO)
Institutions–Effectiveness	-2.5 lowest, 2.5 highest	Annual	Worldwide Governance Indicators (WGI)
IMF Arrangements	IMF Board approval date	One-off	MONA and IMF

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[16] A staff-level agreement does not on its own guarantee a disbursement on a particular date. Sometimes conditionalities, referred to as "prior actions," are attached to the arrangement and may delay the Board date. The first disbursement usually happens soon after Board approval.

[17] The determinants of disbursements are complex. Disbursements can proceed if reform implementation is mixed, and arrangement objectives can be substantially revised during reviews. A country could choose to forego disbursements if macroeconomic developments are better than expected. Nevertheless, our proxy captures, in most cases, the extent to which IMF-recommended reforms are implemented.

Arrangement Size	Percent of GDP	One-off	MONA and IMF
Disbursement	Percent of arrangement size	One-off	MONA and IMF
Global financial conditions			
Variable	**Unit**	**Frequency**	**Source**
US Financial Conditions	Standard deviation	Daily	IMF Monetary and Capital Markets Department
Other variables			
Variable	**Time Frame**	**Frequency**	**Source**
Primary Bond Issuance	2002-22	When applicable	Bond Radar
Credit Ratings	2002-22	Quarterly	S&P, Moody's, and Fitch

Our dataset also includes the historical evolution of sovereign credit ratings from S&P, Moody's, and Fitch. We find that the "selective default" rating assigned by S&P is a useful proxy for the presence of defaulted bonds in the country's index.[18] As robustness checks, we run our regressions with and without such defaulted bonds in the sample.

We faced a few data limitations. First, one could argue that the market is forward-looking and uses not just macroeconomic data releases but also forecasts of macrovariables to price bonds. Yet, a historical database of quarterly projections could not be easily assembled for the noninvestment-grade countries in our database. Choosing whose forecast to use and avoiding forecast errors and biases would pose additional challenges. For example, IMF projections may underestimate the effect of fiscal consolidation on economic growth (Blanchard and Leigh 2010). Because macroeconomic data are persistent, the macroeconomic data releases we use should be correlated with projections but unbiased. Second, there is no comprehensive historical data on gross external financing needs or other measures of liquidity needs. While IMF financing is intended to fill a portion of those external financing needs, we do not have data on the total liquidity requirements, especially for countries without an IMF arrangement. Data on government surplus and the current account are our best measures available.

V.   Empirical methodology

With secondary market spreads as our primary measure of access to ICM, the first step in the empirical analysis is to investigate econometrically the determinants of those spreads. We regress quarterly average spreads on both domestic fundamentals and external financial conditions, as in Equation 1:

$$Spread_{i,t} = \alpha_i + \mu_t + \beta X_{i,t-1} + \varepsilon_{i,t} \qquad (1)$$

Spread is the log of ex-Quasi EMBIG sovereign spreads, α and μ are the vectors of country fixed effects and time fixed effects (with the latter replaced by US FCI or VIX in some specifications),[19] and *X* is a vector of the main determinants of sovereign spread including lagged values of: public debt (in percent of GDP), government overall fiscal balance (in percent of GDP), real GDP growth, foreign currency reserves (in percent of GDP),

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[18] "Selective default" refers to episodes where a debtor defaults on a specific issue or a class of obligations but continues to honor other payment obligations.

[19] The empirical work on determinants of spreads (Section VIa) uses FCI so that that the role of FCI can be easily compared with other variables; the robustness checks use VIX. The empirical work on IMF effects (Section VIb) uses time fixed effects, giving the model more degrees of freedom around changing financial conditions from quarter to quarter; results are similar either way.

current account balance (in percent of GDP), log of real GDP per capita, domestic CPI inflation, and institution quality, measured by the government effectiveness index.

We use one period lagged fundamentals as regressors, both to account for delays in data releases and to avoid potential reverse causality. Since our dependent variable is calculated as a quarterly average and data releases may occur a couple of months after the end of the data collection period, this lag replicates the process by which new information is incorporated into bond spreads by investors. In addition, while most macroeconomic fundamentals take time to respond to market developments, we could imagine spreads quickly affecting exchange rates and leading to changes in external variables; using lagged fundamental variables should alleviate this potential problem of reverse causality, as well as lessen problems from omitted variables. In contrast, because the financial conditions are real-time measures that are continuously updated and observed, we do not lag US FCI or VIX. Moreover, because our sample is composed of noninvestment-grade countries, reverse causation is unlikely—these mostly small economies should not significantly affect global financial conditions.

As an alternative specification for our robustness checks, we model the high persistence in sovereign spreads, because a few observers in the academic literature have found a persistence in the series that is not explained by fundamentals (Bobetko, Dumicic, and Funda 2013). Thus, we include lagged values of the dependent variable (sovereign spread) on the right-hand side of the equation, as in the linear dynamic panel model in Equation 2:

$$Spread_{i,t} = \alpha_i + \mu_t + \gamma Spread_{i,t-1} + \beta X_{i,t-1} + \varepsilon_{i,t} \qquad (2)$$

The presence of a lagged dependent variable in the right-hand side of the equation is a source of a potential endogeneity problem due to the correlation between this lagged term and the time invariant effect (α_i). To deal with this endogeneity issue, we apply the first difference to Equation 2 to eliminate the unobserved time invariant effects:

$$\Delta Spread_{i,t} = \mu_t + \gamma \Delta Spread_{i,t-1} + \beta \Delta X_{i,t-1} + \varepsilon_{i,t} - \varepsilon_{i,t-1} \qquad (3)$$

However, there is another endogeneity problem in Equation 3 due to the presence of two correlated terms in the equation, namely $\Delta Spread_{i,t-1}$ and $\varepsilon_{i,t-1}$[20]. To deal with the endogeneity problem due to the correlation of the lagged error term and the first difference of the dependent variable on the right-hand side of the equation, we follow the Anderson and Hsiao (1981) approach. We estimate the first difference model in Equation 3 with a panel instrumental variables technique that uses lagged levels of the endogenous variables as instruments ($\Delta Spread_{i,t-2}$ is used as an instrument for $\Delta Spread_{i,t-1}$).

Next, we explore the role of IMF arrangements more directly, using a simple econometric specification to map the impact of an IMF arrangements on spreads over time:

$$Spread_{i,t} = \alpha_i + \mu_t + \beta X_{i,t-1} + \Gamma D_{i,t} + \varepsilon_{i,t} \qquad (4)$$

---

[20] $\varepsilon_{i,t-1}$ is part of $Spread_{i,t-1}$ by construction.

We have added to our initial specification in Equation 1 a vector D of dummy variables representing the proximity to an IMF arrangement. This vector consists of 33 dummy variables covering periods from 16 quarters before Board approval of an IMF arrangement to 16 quarters after approval of an IMF arrangement. For example, the first dummy variable is 1 whenever the observation occurs 16 quarters prior to the approval of an IMF arrangement for that country and 0 otherwise. The second dummy variable is 1 whenever the observation is 15 periods before IMF arrangement approval, and so on. The estimated vector of coefficients Γ then represents the deviation from normal spreads for that country around the time of an IMF arrangement. The choice of 16 quarters as the horizon represents a balance of two objectives—it covers the longest IMF arrangements, which can initially be up to four years, while maintaining a narrow event window to decrease the impact of other factors in coefficient estimates.

To investigate why certain IMF arrangements affect spreads more than others, we divide our sample of IMF arrangements into two or more groups (e.g., large arrangements vs. small arrangements or successfully completed vs. incomplete arrangements). Each group gets its own set of dummy variables, which is equal to 1 only when the observation is a certain number of periods before or after an IMF arrangement within that group. We then estimate a different vector of coefficients Γ for each group in one equation:

$$Spread_{i,t} = \alpha_i + \mu_t + \beta X_{i,t-1} + \Gamma_1 D_{1,i,t} + \Gamma_2 D_{2,i,t} + \varepsilon_{i,t} \qquad (5)$$

VI. Empirical results

A. Determinants of spreads

The empirical analysis consists of two parts. First, the baseline regression allows a comparison of the role of various fundamental and global determinants of log spreads, where the coefficients are estimated based on Equation 1 and then normalized. Second, a dynamic IMF effect is added to the baseline regression, as specified in Equations 4 and 5. Though most of the results are presented graphically for ease of interpretation, Table 6.1 shows a sample of results from the two kinds of regressions.

Table 6.1. Regression results

Determinants of Log Spread

	Baseline (Equation 1)		With dynamic IMF effect (Equation 4)	
Lag Real GDP growth	-0.0194***	(-4.20)	-0.0171***	(-5.97)
Lag Public Debt/GDP	0.00948***	(5.07)	0.00448***	(3.83)
Lag Government Surplus/GDP	-0.0171	(-1.82)	0.000220	(0.06)
Lag CPI Inflation	0.000490	(0.66)	0.000331	(1.07)
Lag Foreign Currency Reserves	-0.00539	(-1.92)	-0.00979***	(-4.42)
Lag Current Account Balance	-0.0109*	(-2.44)	-0.00103	(-0.41)
Lag Log GDP per capita	-0.0000531	(-0.00)	-0.661***	(-10.99)
Lag Government Effectiveness Index	-0.789***	(-7.37)	-0.812***	(-12.62)
FCI Index (US)	0.163***	(5.85)	Quarterly fixed effects	
Dummy - 16 quarters before Board			0.0433	(0.36)
Dummy - 15 quarters before Board			0.0865	(0.99)
Dummy - 14 quarters before Board			0.0888	(1.07)
Dummy - 13 quarters before Board			0.134	(1.55)
Dummy - 12 quarters before Board			0.161	(1.77)
Dummy - 11 quarters before Board			0.235**	(2.92)
Dummy - 10 quarters before Board			0.257***	(3.41)
Dummy - 9 quarters before Board			0.301***	(3.62)
Dummy - 8 quarters before Board			0.326***	(4.85)
Dummy - 7 quarters before Board			0.307***	(5.60)
Dummy - 6 quarters before Board			0.384***	(7.21)
Dummy - 5 quarters before Board			0.367***	(6.64)
Dummy - 4 quarters before Board			0.392***	(6.75)
Dummy - 3 quarters before Board			0.362***	(7.40)
Dummy - 2 quarters before Board			0.393***	(8.11)
Dummy - 1 quarter before Board			0.394***	(8.00)
Dummy - 0 quarters before Board			0.393***	(6.99)
Dummy - 1 quarters after Board			0.397***	(6.32)
Dummy - 2 quarters after Board			0.349***	(6.17)
Dummy - 3 quarters after Board			0.329***	(5.86)
Dummy - 4 quarters after Board			0.309***	(5.26)
Dummy - 5 quarters after Board			0.337***	(5.88)
Dummy - 6 quarters after Board			0.282***	(4.74)
Dummy - 7 quarters after Board			0.307***	(4.67)
Dummy - 8 quarters after Board			0.243***	(4.26)
Dummy - 9 quarters after Board			0.211***	(3.49)
Dummy - 10 quarters after Board			0.218***	(3.88)
Dummy - 11 quarters after Board			0.206***	(3.45)
Dummy - 12 quarters after Board			0.174*	(2.38)
Dummy - 13 quarters after Board			0.133	(1.75)
Dummy - 14 quarters after Board			0.0683	(0.96)
Dummy - 15 quarters after Board			0.0597	(0.87)
Dummy - 16 quarters after Board			0.0639	(0.91)
_cons	5.238***	(5.86)	11.97***	(19.47)
R-squared	0.359			
Obs.	2513		2513	

t statistics in parentheses
Level of significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Country fixed effects were included in both regressions but omitted from this table.
Quarterly fixed effects in lieu of FCI were included in Equation 4.

To draw any inferences about how a country can restore access to ICM, we need to know not just the statistically significant determinants of spreads shown in Table 6.1 but also how much those determinants vary within a limited time horizon. A natural choice for normalizing coefficients would be the standard deviation of each variable, as shown in Table 6.2. If the goal were to understand how much of a difference in spreads each of these variables can explain across our dataset, we would take the standard deviation across the entire dataset, labeled "cross-country and cross-time variation" in the table. Yet, some of these variables are easier for a country to change than others, and our goal is to understand how much each of these variables can actually change for a given country within the three-year horizon of a typical IMF arrangement.[21] Thus, as a second methodology, we compute the within-country variation, defined as the standard deviation of the rolling 12-quarter difference of each determinant (i.e., $d(X_{i,t} - X_{i,t-12})$). As a third methodology, we consider only 12-quarter changes that happen within the context of an IMF arrangement; this measure is calculated as $d(X_{i,t+12} - X_{i,t})$ for only those observations t that represent Board approval of an IMF arrangement.

Table 6.2. Three ways of calculating standard deviations of explanatory variables

	Cross-country and cross-time variation		3-year within-country variation		3-year within-country variation during IMF arrangements	
	std. deviation	mean	std. deviation	mean	std. deviation	mean
FCI_US	1.19	0.01	1.71	-0.14	1.93	-0.53
Public debt/GDP	26.11	52.16	17.55	3.31	16.19	-1.92
Government surplus/GDP	3.40	-1.56	3.70	-0.39	4.13	1.20
Real GDP growth	4.99	3.66	6.77	-1.02	6.17	0.93
Inflation	6.69	6.20	7.94	-0.81	6.36	-1.56
Foreign currency reserves	8.68	15.77	5.16	0.69	5.19	2.01
Current account balance	3.98	-0.96	3.56	0.10	3.37	0.87
Log GDP per capita	0.80	8.40	0.24	0.14	0.24	0.16
Gov't. effectiveness index	0.48	-0.21	0.18	0.03	0.17	0.04

The differences between the cross-country and within-country standard deviations are immediately apparent for some variables and illustrate the importance of choosing the right methodology for normalizing coefficients from the spread model. For example, the variations in log GDP per capita and government effectiveness are about three times larger in the cross-country variation than in the within-country variation. The interpretation here is that level of development and institutional quality are slow-moving variables, and even if differences in these variables explain differences in spreads, there is little that policymakers can do about it in the short run. In contrast, within-country variation is similar to the cross-country variation in other variables like government surplus, current account balance, and inflation.

The variation of fundamentals under an IMF arrangement, as measured by standard deviations, is not significantly different from the variation in the dataset overall. While the sign of the mean changes is in the direction expected for all the variables, the magnitude of the difference is small, notably smaller than the standard deviation. That result is surprising considering that arrangements are often accompanied by reforms.

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[21] EFF and ECF arrangements, which together are the most frequent in our dataset and meant to address protracted balance of payment needs, are on average 37 months long in our dataset. EFF arrangements can be up to 4 years long, while ECF arrangement are 3 to 4 years long, but extendable to 5 years. SBA arrangements, designed to address present, prospective or potential balance of payments needs, are the next most frequent in our dataset, with an average duration of 22 months and a maximum of three years.

Perhaps other factors are at play, and the arrangements are preventing these variables from deteriorating further.

To compare the effect of fundamentals on spreads, we multiply the within-country standard deviations by the estimated coefficients from Table 6.1 and summarize the results in Figure 6.1.

Figure 6.1. Regression coefficients normalized by three-year standard deviations
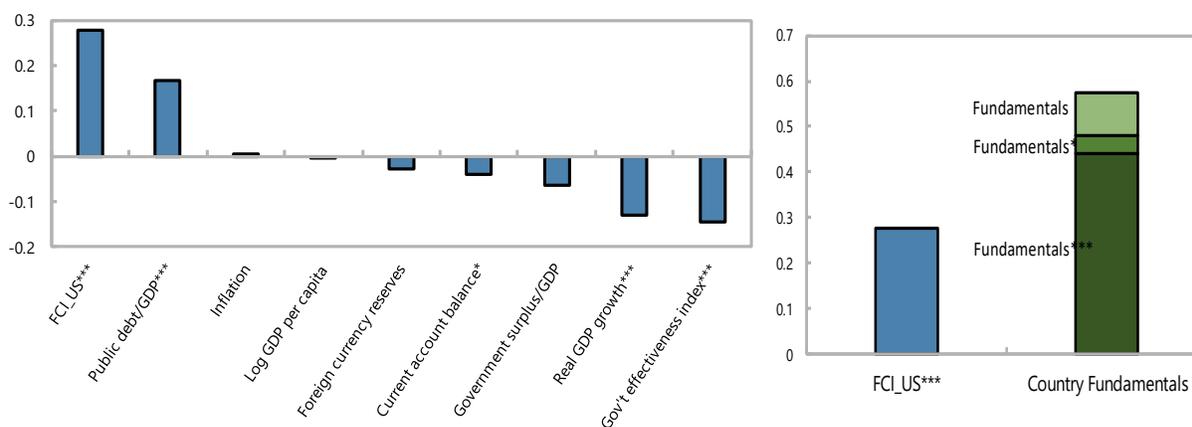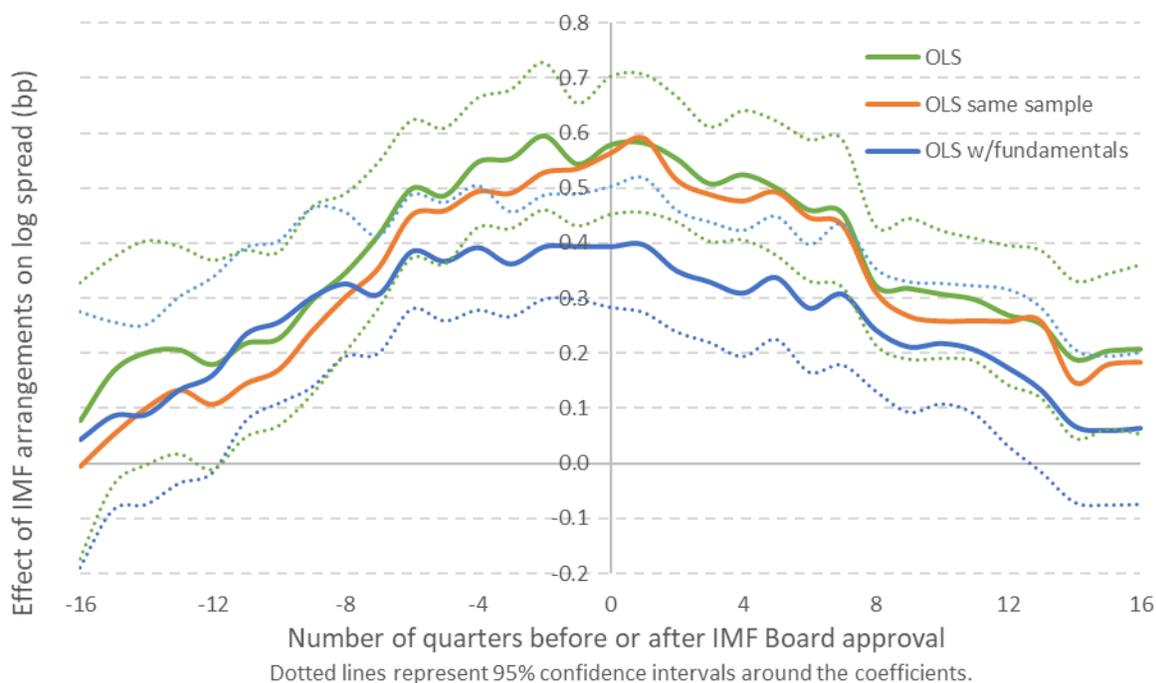

Note: Level of significance: $^{*} p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$ based on Driscoll-Kraay standard errors; Fundamentals*** include public debt/GDP, real GDP growth, and government effectiveness index; Fundamentals* include current account balance; and Fundamentals represent the remaining ones (government surplus/GDP, FX reserves, log of GDP per capita and inflation).

In the results above, global financial conditions, debt/GDP, real GDP growth, current account balance, and government effectiveness are statistically significant, with coefficients of the expected sign. Global financial conditions matter the most, with debt/GDP taking second place. Notably, while the coefficient on government surplus is negative, as expected, the coefficient is not statistically significant, and the normalized coefficient is relatively small—the normalized coefficient on the public debt ratio is two-and-a-half times larger. Thus, regarding fiscal variables, it is the stock rather than the flow that has the potential to make the largest difference to creditworthiness. The coefficient on foreign currency reserves has the expected sign but is not statistically significant, while the coefficients on inflation and log GDP per capita are not statistically significant. The side graph in Figure 6.1 illustrates that while financial conditions are the most important determinant of access to ICM, all of the country fundamentals combined matter twice as much. A caveat to our results is that role of debt/GDP in shaping access to ICM may not be stable over time, as discussed in Section VII.

B. Role of the IMF

The previous analysis considered the role of macroeconomic and institutional variables in explaining spreads, taking into account the potential for reform in the context of an arrangement. Next, we consider more explicitly the role of the IMF in helping restore access to ICM. Using the event study framework described earlier in Equation 4, we estimate the dynamic effect of IMF Board approval of an IMF arrangement on spreads. Figure 6.2 graphs the typical path of log spreads around the time of Board approval.

Figure 6.2. Effect of IMF arrangements on log spreads over time

Number of quarters before or after IMF Board approval

Dotted lines represent 95% confidence intervals around the coefficients.

Each of the lines in the graph represents a different specification or sample and thereby a different vector of estimated coefficients. In all cases, a country's bond spreads tend to increase during the four-year window prior to the approval of an IMF arrangement and to decrease following the approval, with spreads reversing most of the previous increases. The green line does not include the macroeconomic fundamentals as explanatory variables in the regressions and shows a large effect, with log spreads increasing by 0.58 at the time of Board approval of the arrangement and decreasing by 0.37 in the following 16 quarters. These log changes correspond to a 78% increase in spreads, followed by a 45% recovery.[22] Once fundamentals are included in the regression, as in the blue line, the magnitude of the estimated effect diminishes; spreads increase 48% and then decrease 39%. Including fundamentals in the regression decreases the sample size, however, and the diminished effect may result from a change in sample rather than the inclusion of fundamentals. To check this alternative explanation, the orange line is estimated using only those observations for which macroeconomic data were available but does not include those macroeconomic fundamentals as regressors, allowing a more direct comparison with the blue line.[23] Here spreads increase 76% and decrease 46%. The dotted lines represent 95% confidence intervals around the coefficients for the blue and green lines and demonstrate that the effects of IMF arrangements are statistically significant.[24]

Our interpretation of these results is as follows. A deterioration in economic fundamentals causes spreads to rise. Several years may go by before this deterioration is severe enough to lead to an IMF arrangement. The market learns that an IMF-supported arrangement is in the works, and sometimes receives informal updates on

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[22] Percentage change is calculated as the exponential of the absolute value of the change in log spreads so that percentage increases and percentage decreases are comparable.

[23] There were 87 IMF arrangements in total for which we had spread data. We only had complete macroeconomic data for 74 of those arrangements.

[24] The coefficients for the orange line were similarly statistically significant but the dotted lines were omitted for readability.

the progress of the ongoing negotiations. Thus, spreads may stabilize in anticipation of an arrangement, with Board approval of the arrangement allowing spreads to start recovering toward previously lower levels. Including developments in macroeconomic fundamentals in the regression decreases the magnitude of estimated spread movements attributable to the arrangement itself. Nevertheless, a strong "IMF effect" remains. An alternative interpretation of these results—that IMF arrangements are merely correlated with a decline in spreads—is addressed in more detail in Section VII.

Next, we consider whether the type of IMF arrangement plays a role in the timing of regaining access to ICM. We classified the arrangements into three groups: (1) EFF and ECF, (2) SBA and SCF, and (3) precautionary arrangements.[25] The categorization is based on the depth of the balance of payments need, with ECF and EFF targeting protracted balance of payments needs and SBA and SCF designed to meet present, prospective, or potential balance of payments needs. Precautionary arrangements are often not drawn at all and are therefore considered as a third group,[26] with the results shown in Figure 6.3.

Figure 6.3. Comparison of different types of IMF arrangements
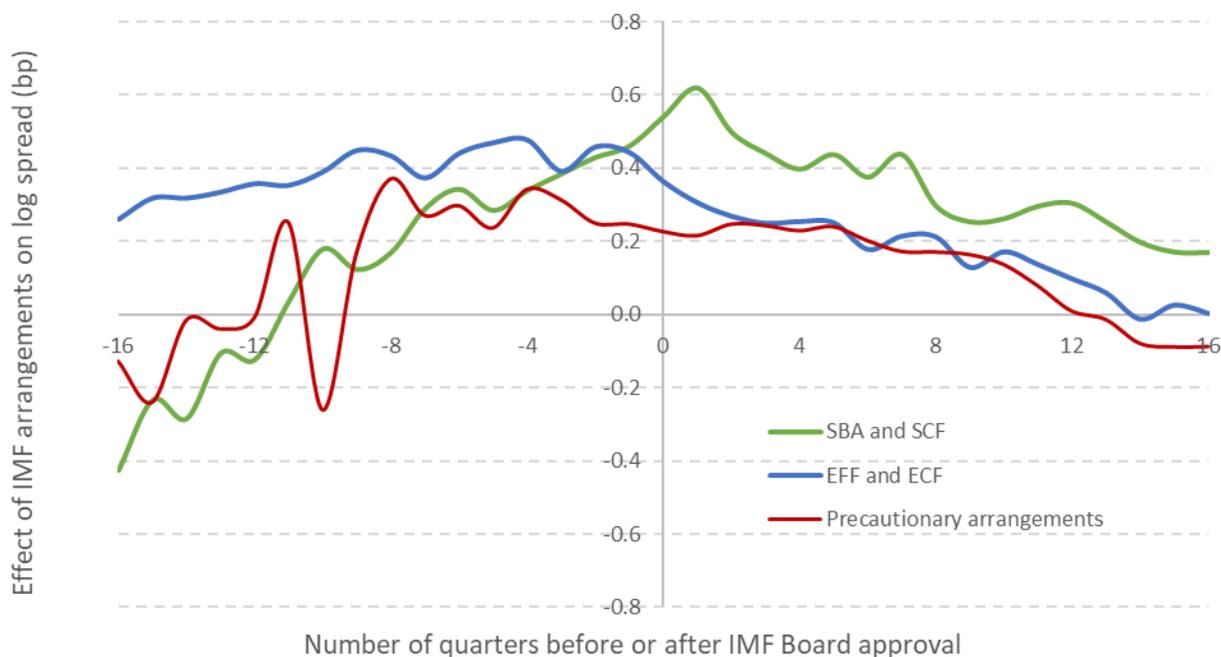
All three types of arrangements are associated with a reduction in log spreads. The reduction in spreads from peak to trough is largest for the ECF and EFF and smallest for the precautionary arrangement, consistent with the depth of the balance of payments needs these arrangements are designed to alleviate, but the differences are small. ECF and EFF arrangements show an elevated spread throughout the 16 quarters prior to the IMF arrangement, whereas spreads for the other arrangements become elevated only about 9 quarters prior to the

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[25] Our dataset includes 21 EFF and ECF, 30 SBA and SCF and 23 precautionary arrangements for which we have spread data. The first category encompasses Extended Fund Facility (EFF) arrangements, Extended Credit Facility (ECF) arrangements, Enhanced Structural Adjustment Facilities (ESAF), as well as the blend of these arrangements. The second category consists of Stand-by Arrangements (SBA), Stand-by Credit Facility (SCF), and the blend of SBA and SCF.

[26] It is possible that other groupings of arrangements would produce more significant differences in access to ICM effects, but data limitations prevented testing with alternate categorizations.

arrangement. Perhaps countries opting for ECF and EFF arrangements have delayed correcting imbalances, resulting in an extended period of high spreads. The below-normal spreads for the SBA and SCF and precautionary arrangements 4 years prior to the arrangement suggest that crises are often preceded by unfounded exuberance, or they may just result from small sample size and wider confidence intervals of event studies far from time zero. The coefficients for all three lines are statistically significant during periods approximately two years before Board approval until two years afterwards, but the confidence intervals are wide and volatile for periods beyond two years and are omitted from the graph for clarity. The coefficients for the blue line (EFF and ECF) and green line (SBA and SCF) show statistically significant differences at 1 and 2 quarters after Board approval.
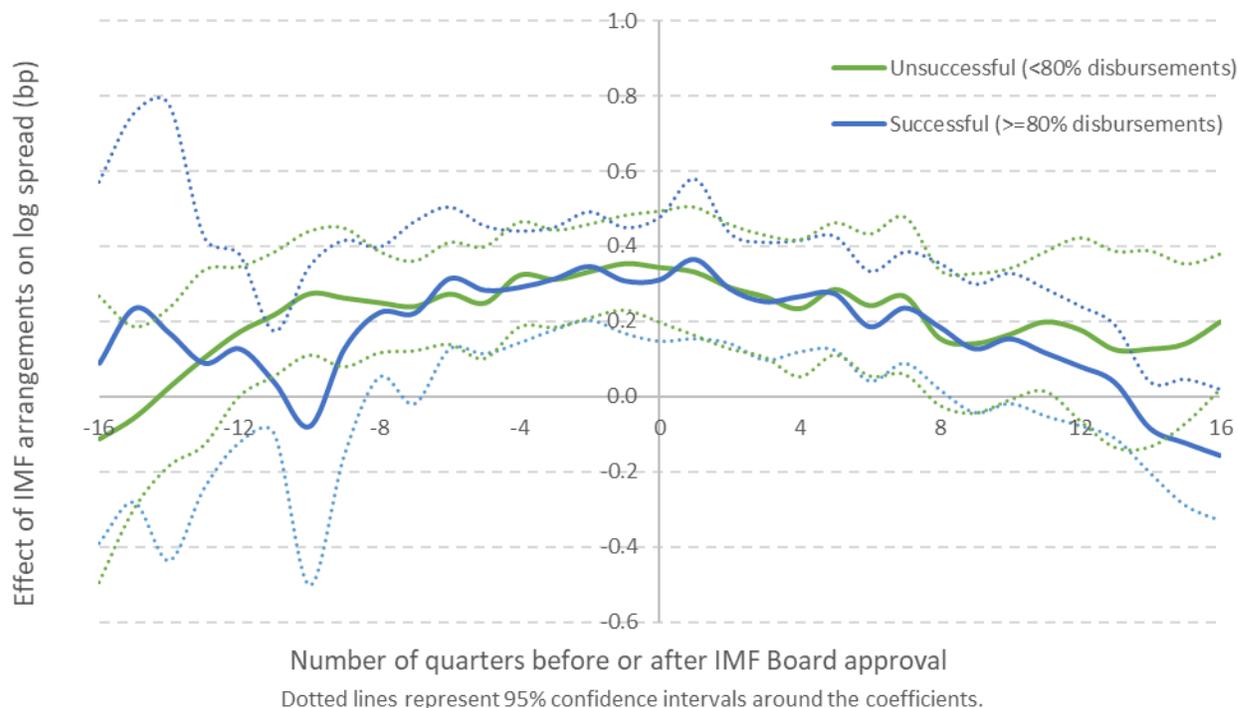
Why should an IMF arrangement influence spreads on sovereign bonds? Is it because of liquidity—that the IMF provides external financing when no other creditor is willing to do so—or is it because of conditionality—that the IMF arrangement involves a credible commitment to a variety of policy and structural reforms to improve the same macroeconomic fundamentals that led to a loss of access to ICM? A third, more pessimistic interpretation, perhaps in line with Presbitero et al. (2015), is that IMF arrangements signal the existence of extremely large macroeconomic imbalances such that a debt treatment would be required for debt to return to a sustainable path. Distinguishing between these potential explanations could have important implications. The drop in spreads associated with an IMF arrangement represents an average across all arrangements, whereas in fact, some arrangements have larger effects and other arrangements have no effect at all. In which cases are arrangements most likely to restore access to ICM?

We determine why there is an IMF effect by comparing arrangements across different characteristics. Specifically, we divide IMF arrangements into different groups and estimate the IMF effect for each group, as described previously in Equation 5. Relevant characteristics we examine, based on their values at the start of the arrangement, include fiscal balance, debt-to-GDP ratio, GDP growth, and output gap.[27] But there are only two arrangement characteristics where we find meaningful differences in the effects on spreads: the success of the arrangement as measured by disbursements or reviews completed and the initial size of the arrangement relative to GDP.

Some arrangements, where reforms are successfully implemented by the authorities, are fully disbursed, while other arrangements are suspended because needed policies are not implemented. Thus, we divide IMF arrangements into two groups. We define successful arrangements as those where 80% or more of the approved amounts are disbursed by the end of the arrangement, and for precautionary arrangements, those where 80% or more of weighted reviews are completed. In contrast, unsuccessful arrangements are those that disburse less than 80% or have completed less than 80% of weighted reviews.[28] Figure 6.4 compares the behavior of spreads for these two types of arrangements.

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[27] These characteristics are in addition to the time-varying macroeconomic fundamentals included in the regression.
[28] Our dataset includes 25 successful arrangements by this definition and 39 unsuccessful arrangements. We were missing disbursement data for some arrangements.

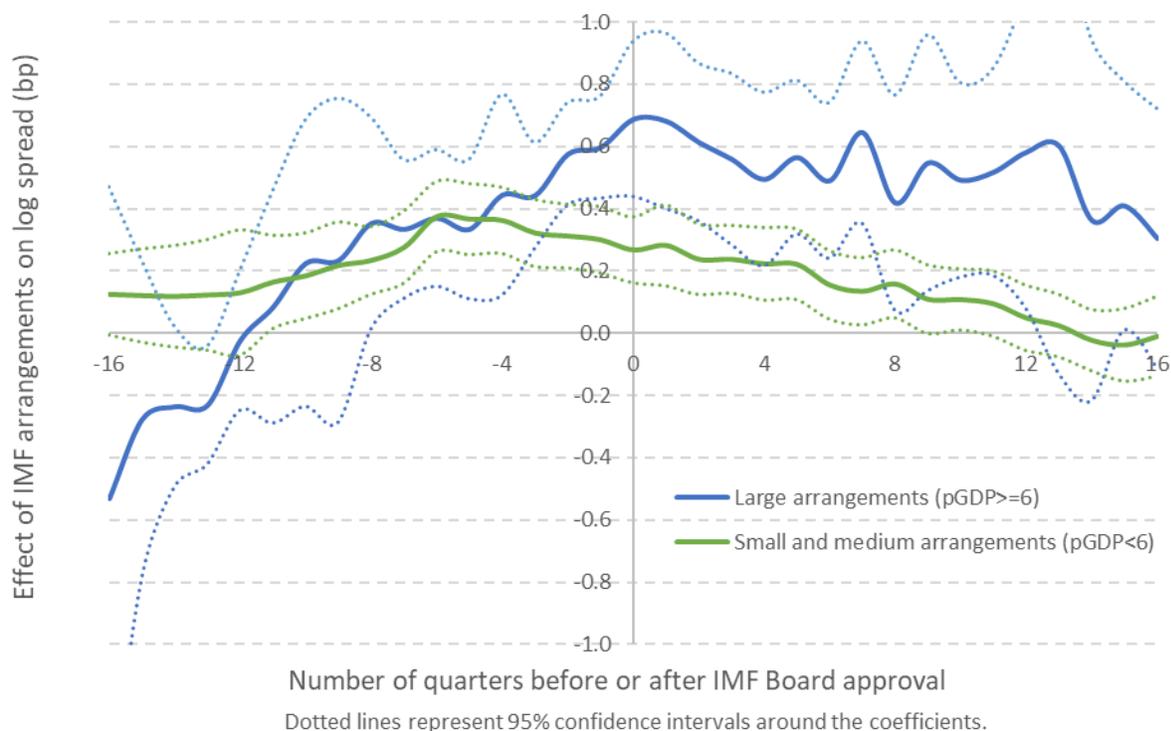## Figure 6.4. Successful vs. unsuccessful arrangements

Number of quarters before or after IMF Board approval

Dotted lines represent 95% confidence intervals around the coefficients.

Both successful and unsuccessful arrangements see a ramp up in spreads as Board approval approaches.[29] Nevertheless, it is only successful arrangements that show a pronounced fall in spreads by the end of the 4-year horizon, whereas spreads of unsuccessful arrangements remain elevated. Specifically, the fall in log spreads for successful arrangements from the peak is 0.52, over three times larger than the fall in spreads for unsuccessful arrangements; the difference between the two lines at the end of the horizon is statistically significant at the 99% level. The lines start to diverge at the 11th quarter with the amount of divergence increasing over time, consistent with our choice of proxy and threshold for success.[30] That relationship implies that ICM value the reforms that IMF arrangements encourage.

Next, we examine the role that the size of the IMF arrangement might play, considering that the liquidity effect might be important in boosting market confidence and reducing spreads. We measure size as the amount of financing initially approved as a percent of GDP, and we choose a threshold at 6% of GDP[31] to create two groups in which to classify the arrangements. We define large arrangements as those whose size exceeds this threshold, and Figure 6.5 contrasts spread movements for large arrangements and other arrangements.

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[29] The increase in spreads among successful arrangements is volatile early on, from quarters -16 to -10, and is accompanied by wide confidence intervals.

[30] We have tried many variants of this regression to confirm the robustness of our results, including (1) different thresholds, (2) separating out precautionary arrangements, and (3) controlling for financial conditions rather than using fixed time effects. In all regressions, successful arrangements do better, though the amount of statistical significance and the periods in which we find statistical significance vary somewhat.

[31] Based on this threshold, our dataset includes 20 large arrangements and 54 other arrangements. If we instead split the arrangements into two equal-size groups, the lines representing the estimated effects would be closer together but the blue line in the graph would still be above the green line.

Figure 6.5. Large arrangements vs. other arrangements

Number of quarters before or after IMF Board approval

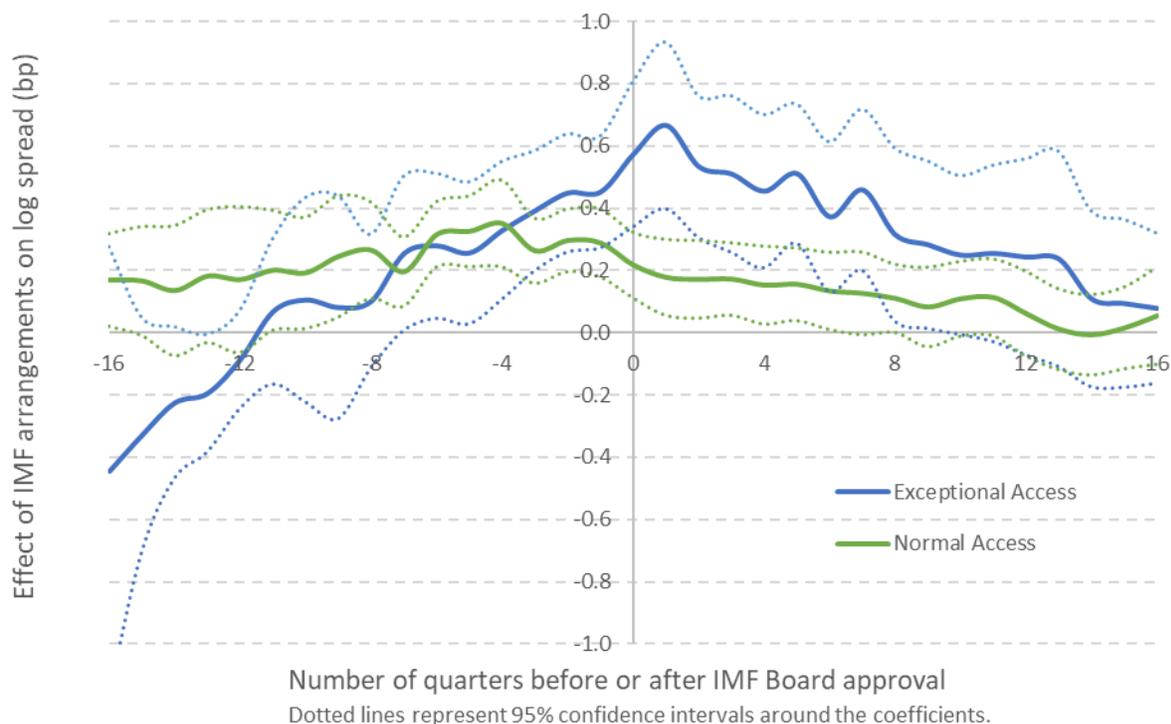Dotted lines represent 95% confidence intervals around the coefficients.

Surprisingly, small and medium IMF arrangements appear more effective than large arrangements at restoring access to ICM, and the differences between the blue line and green line are statistically significant at the 95% or 99% levels for most of the time periods. That difference is the opposite of what might be expected. Yet, arrangement size is endogenous and depends largely on the estimated size of the country's external financing gap, as well as the availability of sources of finance other than the IMF. The fact that, prior to arrangement approval, spreads increase by a larger amount for the larger arrangements is likely a reflection of this endogeneity as well. Perhaps, the uncertainty surrounding arrangements with high access makes the restoration of access to ICM more difficult. Another potential explanation is that the larger the arrangement, the larger will be the share of multilateral debt in the sovereign's overall debt in the medium-term. Since multilateral debt is generally not restructured, bondholders may be pricing their expectation that they would bear the burden of any future restructurings.

We find a broadly similar result when the size of the arrangement is instead measured by whether the arrangement provided exceptional access, that is, funding in excess of preestablished quota limits. Quotas are not solely based on GDP. Access limits, expressed in annual and cumulative terms as a percentage of quota, as well as the quotas themselves, adjust over time,[32] and as such this proxy is different from arrangement size in GDP terms. As shown in Figure 6.6, exceptional access arrangements have larger spread increases and delayed recoveries. Spreads remain higher for exceptional access arrangements than normal access arrangements for the entire 4-year period after Board approval, and the differences are statistically significant

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[32] Limits were last reviewed in 2016 and will be reviewed again in 2024. In March 2023, a temporary increase of annual and cumulative limits was approved from 145/435 to 200/600 to help emerging markets and developing economies deal with a challenging economic environment.

for the first 2 years. The lines do converge more by the end of year 4 than the large and small arrangements lines did in the previous graph.

Figure 6.6. Exceptional access vs. normal access

Number of quarters before or after IMF Board approval
Dotted lines represent 95% confidence intervals around the coefficients.

There is little support for the third hypothesis, that investors' expectation of a debt restructuring is responsible for the rise in spreads. Most arrangements do not involve a restructuring of external debt with private creditors, and our sample contained only 19 selective defaults across 12 countries. Still, as one test of this hypothesis, we exclude arrangements during which a default occurred, which is a proxy for restructuring. Excluding such cases does not change the result—the hump shape around the time of the IMF arrangement remains. From a theoretical perspective, expectations of debt restructuring would not lead to the hump-shaped evolution of spreads, unless investors repeatedly overestimated the expected losses from a debt restructuring before arrangement approval. Moreover, the fact that successful arrangements see a larger compression in spreads suggests that reforms, conditionality, and commitment, rather than just relief regarding potential debt restructuring, help to compress spreads.

VII. Robustness checks

A. Outliers and defaulted bonds

An important recurring question in our econometric analysis is how to deal with outliers. Even though 90% of the spreads in our dataset are below 1,000 bp, there are observations with spreads up to 45,000 bp.[33] Outliers are sometimes excluded from econometric analysis because they are not representative and because a typical least-squared regression may put too much weight on such nonrepresentative datapoints. Correcting the misspecification is typically preferable to just dropping the data, and that is especially the case here because we are most interested in the right-hand side of the distribution. That is, we want to know how spreads behave not in normal times, but rather in times of sovereign debt distress, right at the margin of where access to ICM is gained or lost. A related question is what to do when countries have bonds in default, which are often but not always also the bonds with high spreads. Such bonds seem different, and one could argue that they are not comparable with performing bonds. Conversely, they are still priced based on expected cash flows, like performing bonds, even if those cash flows are not the same ones as originally contracted. These defaulted bonds are quite relevant to our analysis, because our objective is to trace the path of the resumption of access to ICM around the time of an IMF arrangement.

In analysis not reported in this paper, we used several methodologies to address this problem, such as excluding observations with spreads below a threshold (1,000 bp or 2,000 bp) and running quantile regressions, which are less sensitive to outliers at the median quantile. The results reported in this paper are based on using the log of spreads as the dependent variable, a simple, standard approach that allows us to consider the entire distribution. That is, a one-unit change in a fundamental variable should have a larger effect on spreads when that spread is already high. All these methodologies yield similar results.

Just as we excluded observations with high spreads, one could also argue in favor of excluding observations with low spreads. While we tried to choose just the higher-risk countries based on noninvestment-grade credit ratings during periods of issuance, we still have spreads as low as 20 bp in our sample. Presumably, countries with spreads this low are not in danger of losing access to ICM. If there are nonlinearities between log spreads and fundamentals, then the coefficients estimated using such spreads would not be relevant for countries at the margin of access to ICM, which are the countries of most interest to us. We repeat our analysis using only observations with spreads in the range of 500 bp to 1,500 bp, finding similar results on the rank ordering of the importance of fundamentals.

We run our regressions including and excluding periods of selective default from our sample, but as shown in Table 7.1, changes in the sample do not significantly affect our results on the relative importance of fundamental variables. Similarly, excluding selective default did not affect our key results, including the hump-shaped spread pattern around IMF arrangements, the outperformance of successful arrangements and the underperformance of large arrangements.

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[33] When countries are in distress, all bonds tend to trade at similar, distressed prices. That happens because markets are expecting a default, and the recovery as a percentage of the bond's face value following a restructuring is the same for all bonds on the curve. If some bonds on the curve have short maturities, then spreads can be extremely large.

We also test for the effect of recent defaults on spreads, that is, default in the three-year period prior to the current observation. We find no statistically significant effect of a previous default once we control for whether the bond is currently in default.[34] The lack of an effect of previous defaults could result from a variety of factors—perhaps the reputational damage from a default is offset by the improvement in debt sustainability. A comprehensive discussion and analysis of the cost and benefits of default is beyond this paper's scope.

B. Persistence and local projection models

A minority of researchers have included past values of spreads as explanatory variables in spread regressions, as shown in Equation 2. This equation implicitly assumes that spreads are path dependent rather than forward-looking. That view is not one we agree with for high-yield sovereign bond markets—it would lead to obvious arbitrage opportunities, such as buying securities with previously high spreads and recovering fundamentals. It would also pose a significant impediment to the resumption of access to ICM for countries that had lost it. Nevertheless, if spreads indeed evolved in this way, failure to account for the persistence could put a significant estimation bias in our coefficients. We thus consider this possibility as a robustness check in Table 7.2.

We also incorporate time-series modeling into our event studies by using the local projection approach developed by Jorda (2005). This methodology has the advantage of being robust to misspecification, because impulse responses can be defined without knowledge of the data generating process. The local projection technique also provides flexibility, as it can easily accommodate potentially nonlinear or state-dependent impacts. Our local projection modeling (Annex IV) confirms that IMF arrangements are associated with a statistically significant reduction in bond spreads within the 12-quarter horizon of a typical IMF arrangement.

C. Robustness of ranked fundamentals to different specifications and periods

Considering the large number of regressions and specifications, we present some of our robustness check results in a condensed format. For each regression, we rank the normalized coefficients—normalized by three-year within-country standard deviations—according to their absolute values, with the rank of 1 assigned to the largest and the rank of 9 assigned to the smallest. Each column in Table 7.1 represents a separate regression and shows the rankings of the normalized coefficients. To make it easier to draw conclusions across all the regressions, we calculate the average ranking in the last column.

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[34] Current default does have a statistically significant, positive effect on spreads. Our result that past default does not have a statistically significant effect on spreads is in line with the findings of Gelos, Sahay, and Sandleris (2011).

Table 7.1. Ranking of explanatory variables under alternative specifications

	Baseline	Pre-GFC (2003-07)	GFC (2008-10)	Post-GFC (2011-19)	COVID (2020-22)	VIX instead of US FCI	Excluding selective defaults	Average ranking
Financial conditions	1	2	1	1	1	1	1	1.1
Public debt/GDP	2	1	2	9	6	3	2	3.6
Gov't. surplus/GDP	5	6	5	5	7	7	5	5.7
Real GDP growth	4	5	4	2	9	4	4	4.6
Inflation	8	7	9	8	5	8	9	7.7
FX reserves	7	8	7	7	2	6	6	6.1
Current account	6	3	6	6	8	5	7	5.9
Log GDP per capita	9	4	3	4	4	9	8	5.9
Gov't. effectiveness	3	9	8	3	3	2	3	4.4

As noted in Section VI, our baseline regression finds financial conditions to be the most important determinant of spreads and debt/GDP to be the second most important determinant. Debt/GDP is the most important determinant in the pre-Global Financial Crisis (GFC) period, with a ranking of 1, but seems to lose importance after the GFC, with a ranking of 9 in the period after the GFC but before the COVID pandemic. In turn, government surplus becomes more important, with a ranking of 5 post-GFC. This large shift in relative importance for debt/GDP may signal a change in investor sentiment towards indebted countries. Perhaps, when global interest rates are low, the cost of servicing a large debt burden is also low, and investors focus on other variables in assessing riskiness and conferring access to ICM. Combining the post-GFC and COVID period improves the ranking of debt/GDP to 4 (not shown in the table).

If we run our regression across the whole sample using VIX instead of US FCI as the measure for global financial conditions, financial conditions are still the most important variable, but debt/GDP falls to third place from second place. Excluding observations where the country is rated "selective default" makes little difference in the ranking of normalized coefficients. On average across all the specifications, financial conditions are ranked first, while debt/GDP is ranked second. Nevertheless, the potential instability of coefficients over time may warrant further investigation.

We repeat the same analysis with a persistence term in the regression as in Equation 2, using the Anderson and Hsiao bias correction, with the results shown in Table 7.2.

Table 7.2. Ranking of explanatory variables with persistence term

	Baseline	Pre-GFC (2003-07)	GFC (2008-10)	Post-GFC (2010-19)	COVID-19 (2020-22)	VIX instead of US FCI	Excluding selective defaults	Average ranking
Financial conditions	1	1	1	1	1	1	2	1.1
Public debt/GDP	2	5	9	3	8	2	3	4.6
Gov't. surplus/GDP	5	6	5	7	7	5	5	5.7
Real GDP growth	7	8	7	4	9	7	6	6.9
Inflation	8	9	3	8	3	8	8	6.7
FX reserves	3	4	6	2	6	3	1	3.6
Current account	9	3	8	6	5	9	9	7.0
Log GDP per capita	4	2	2	5	2	4	4	3.3
Gov't. effectiveness	6	7	4	9	4	6	7	6.1

Financial conditions still ranks first and debt/GDP ranks second in the baseline, with both coefficients of the expected sign, similar to the results in the previous analysis. This time, debt/GDP plays a larger role in the post-GFC period than in the pre-GFC period, the opposite result to the one in the previous set of regressions. Variations that use VIX instead of US FCI and those that exclude selective defaults still find debt/GDP to be one of the most important variables.

D. IMF arrangement endogeneity

A country's request for an IMF arrangement and the Board's subsequent approval of that arrangement are not random or exogenous decisions but rather choices affected by a variety of economic developments and political factors. Thus, our finding that the approval of an IMF arrangement reduces bond spreads may result from other factors that we have not separately controlled for and that are correlated with the adoption of an IMF arrangement. For example, the spread reduction may come from a new political commitment to economic reform, whereas a similar commitment to the implementation of an IMF arrangement would be required to gain Board approval. Or, the selection bias may go in the other direction—perhaps, countries only go the IMF if they are unable to accomplish needed reforms on their own. The former example would lead to an overestimation of the effect of IMF arrangements while the latter example would lead to an underestimation.

Addressing this endogeneity is not easy, because there is no possibility of a random trial here, but we try to do so using treatment effect techniques, which allow for doubly robust matching estimates (Imbens 2004; Lunceford and Davidian 2004; Kreif et al. 2011; Jorda and Taylor 2016), comparing the treatment group (countries under an IMF arrangement) to the counterfactual group (countries not under an IMF arrangement). We follow a two-step approach. First, we estimate the probability of requesting an IMF arrangement using a probit regression, based on macroeconomic variables, elections, and the country's past experiences with an IMF arrangement. Lagged macroeconomic variables, whether there is a legislative or presidential election during the year, and whether the country has had an IMF arrangement in the recent past are variables that have all been found in previous literature to predict the likelihood of an IMF arrangement (see Bal-Gunduz et al. 2013 for a review). We then use the propensity scores obtained to correct for selection bias in the next step and achieve a quasi-random distribution of the treatment and control observations. The second step involves regressing the log difference of spreads at each projection horizon in the treatment and control groups on various spread determinants to obtain conditional means. The average treatment effect is computed at each horizon as the difference in the estimated weighted mean change in log difference of spreads between the treatment and control groups. We find that IMF arrangements reduce spreads and that the effect is statistically significant, confirming the results in our event study. Nevertheless, we cannot control for all the potential confounding variables related to both the adoption of an IMF arrangement and the subsequent decline in spreads, such that some biases from endogeneity may remain.

The thrust of our argument, however, is in the mix of econometric and qualitative evidence all pointing in the same direction. First, it is not just the fall in spreads after Board approval that leads us to infer the existence of an IMF effect, but rather that the entire hump shaped evolution of spreads is centered around the date of Board approval—a rather unlikely coincidence. Second, what we have learned about the determinants of access to ICM provides a straightforward explanation for this coincidence. The achievement of debt sustainability is a major pillar of IMF arrangements, and our regressions showed that Debt/GDP was the second most important determinant of access to ICM. Similarly, our analysis of rating upgrades suggested that IMF arrangements are associated with country reforms which together boost perceptions of creditworthiness. Third, the result that

successful arrangements outperform unsuccessful arrangements in restoring access to ICM confirm that the IMF arrangements are focusing on reforms that the market cares about.

VIII.Concluding Remarks

Loss and resumption of access to ICM can occur due to external and domestic factors. When the loss of access to ICM is caused by external factors, there may be little a country can do. For example, our analysis of country credit ratings finds that commodity price swings played a role in 25% of cases where access to ICM was lost and regained. More importantly, global financial conditions play a large role. Our econometric analysis finds that the normalized coefficients on financial conditions are large relative to the coefficients on country fundamentals, suggesting that the size of changes in policies and reforms required to offset a sharp tightening in global financial conditions may be too large. Anecdotally, tight financial conditions imply higher borrowing costs for an investment-grade country but may mean a complete loss of access to ICM for an emerging or frontier market. In the case of a complete loss of access to ICM, the IMF can provide temporary financing. Fortunately, global financial conditions are cyclical and normally revert. Accommodative financial conditions, however, are a necessary but not a sufficient condition.

When the problem stems from domestic factors, access to ICM is restored by addressing fiscal imbalances. Fifty-one percent of access to ICM resumptions occur through a debt reduction according to our analysis of ratings upgrades. A smaller but still large share, 29%, occurs through fiscal consolidation. Similarly, our econometric analysis suggests that a debt stock reduction approach can have a larger effect than a flow adjustment through revenue or expenditure reforms, although not in every subperiod tested. Obviously, the two are related, as debt stock reduction could be achieved through either debt restructuring or through sustained fiscal consolidation. While financial conditions and debt reduction are important, our econometric analysis also shows that some variables, including variables that are targeted in IMF arrangements, are not important. Surprisingly, inflation plays a small role in determining spreads in almost all specifications, whereas FX reserves only play a significant role in our alternative specification that includes a persistence term. Anecdotally, domestic and external factors may even work together with unintended consequences. For example, loose global financial conditions may allow a country to accumulate a debt overhang that it cannot rollover when financial conditions tighten.

While these findings imply that the focus on debt sustainability in an IMF arrangement should help those countries regain access to ICM, we also find empirical evidence for that relationship. An IMF arrangement is cited as a driver of a credit rating upgrade to ICM access levels in 20% of the cases we analyzed. Those IMF arrangements rarely restore access to ICM on their own. Instead, credit rating agencies judge IMF arrangements to work together with additional reforms, usually fiscal reforms.

A main contribution of this paper is to find econometric evidence on the role of IMF arrangements in restoring access to ICM, as proxied by bond index spreads. We find that an IMF arrangement is associated with a 46% reduction in spreads on average four years after the approval of the arrangement. That effect is not just the result of an improvement in macrofundamentals during an arrangement. Larger amounts of IMF financing, measured in relation to GDP, are unexpectedly associated with worse outcomes, perhaps due to endogeneity issues, but nevertheless suggesting that the IMF's role is more than just a liquidity provider of last resort. Our analysis suggests that successful implementation of the policies and reforms covered by an IMF arrangement

(as measured by arrangement disbursements or weighted reviews completed) is an important contributor to the recovery of access to ICM.

This paper also provides preliminary guidance on how to assess the possible restoration of access to ICM, while also illustrating the difficulty in generating robust models. If the coefficients in the spread model can be estimated robustly, the macroeconomic predictions embedded in an arrangement could potentially be used to project the fall in spreads and potential resumption of access to ICM.

An avenue of future research is to examine other dimensions of access to ICM. While this paper uses secondary spreads on sovereign bonds as a proxy for access to ICM, it is unclear whether this variable contains all relevant information. Could two countries with the same secondary spread have access to different amounts of financing or access to different tenors? Considering the volume of issuance would also allow the study of syndicated loans, for which pricing information is often not public. Related to these dimensions, one may also check whether access to ICM is a continuous variable, as we have assumed. Is it possible to have partial access to ICM, and what combination of spreads, amounts, and tenors would partial-access to ICM countries be able to tap? This paper posits the existence of a spread threshold for access to ICM, a threshold beyond which investors would find sovereign credit too risky and issuers would find sovereign bonds too costly. Distinguishing between these two drivers—supply and demand, essentially—could help estimate the threshold at any point in time, for any country. By addressing such questions carefully, one might formulate a more standardized approach to determinations of access to ICM, an important component to the design of robust IMF arrangements.

Another stream of research could focus on the relationship between access to ICM and debt sustainability. Presumably, a country whose debt is deemed unsustainable would not have access to ICM. Nevertheless, sometimes debt is deemed sustainable even after the country has lost access to ICM, and the IMF is still able to lend. When a country loses access to ICM, does debt become less sustainable as a direct result or is the loss of access to ICM an early warning of the loss of sustainability? In answering such questions, we should recognize that both access to ICM and debt sustainability are functions of similar macroeconomic and financial variables. Debt sustainability assessments include thresholds or targets around key variables such as debt/GDP and gross financing needs, with different targets for different types of countries. Does the market also implicitly use such targets for allocating access to ICM? While our work has used spreads as a proxy for access to ICM, we have also shown how those spreads are determined, at least in part, by the underlying fundamental variables. Would it be possible to convert these estimated relationships into targets in order to clarify the link between fundamentals and access to ICM?

Annex I. Access to ICM in IMF policies

The concept of access to ICM plays a large risk-mitigation and signaling role in IMF lending, including in establishing whether it can lend at all, in determining the amount it can lend, and in setting the financial terms of that lending. This concept was introduced to IMF policies in 2002 to formalize the criteria for exceptional access to IMF financing and has been refined since then, with the last update in 2016. Because the IMF is tasked by its charter with providing temporary balance of payments support to its members to correct maladjustments,[35] a loss of access to ICM is one reason that IMF support may be appropriate. The amount and the terms of support the IMF can provide depends in part on the country's history of access to ICM and the likelihood of a resumption of access to ICM in the medium term, as access to ICM reduces risk to the Fund around repayment.

Regarding the amount, the IMF may only provide access to General Resources Account (GRA) Fund resources to its members in excess of preestablished quota limits, i.e., exceptional access to GRA resources, when that member is deemed able to access private capital markets to repay the IMF in the future.[36] If an assessment of loss of access to ICM is accompanied by a determination that debt is unsustainable, such exceptional access would be conditional on a debt restructuring operation that is sufficiently deep to restore debt sustainability with high probability. A restructuring may not be required when a country retains access to ICM through a crisis, even if the assessment on the sustainability of debt is uncertain. In contrast, members are precluded from exceptional access to solely IMF concessional lending through the Poverty Reduction and Growth Trust (PRGT) resources if they have had sustained past access to international markets. Finally, "presumed blender" countries can access PRGT resources only in conjunction with GRA resources, with the financing combined in a mix of 1:2 (PRGT: GRA), subject to a cap on the level of access to PRGT resources, according to the Policy Safeguards for High Combined Credit Exposure (PS-HCC) policy.

The financing terms of IMF loans to member countries depend on the source of the funds lent, and access to ICM determinations play a role here as well. IMF policy sets an income criterion and an access to ICM criterion to determine low-income country eligibility for IMF concessional lending through the PRGT, as well as for PRGT blending with general IMF resources, GRA, and for PRGT exceptional access. The access to ICM criterion for entry into PRGT requires that the member has no capacity to access international financial markets on a durable and substantial basis,[37] while gaining access to ICM (or fulfilling the income criterion) is required to graduate from PRGT eligibility. Blending of PRGT and GRA resources requires sustained past access to ICM only for countries at high risk of debt distress (and fulfilling the income criterion). Two alternative tests are

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[35] Article I. Purpose (v) To give confidence to members by making the general resources of the Fund temporarily available to them under adequate safeguards, thus providing them with opportunity to correct maladjustments in their balance of payments without resorting to measures destructive of national or international prosperity. Purpose (vi) In accordance with the above, to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members. https://www.imf.org/external/pubs/ft/aa/index.htm.

[36] Criterion(3) for exceptional access: The member has prospects of gaining or regaining access to private capital markets within a timeframe and on a scale that would enable the member to meet its obligations falling due to the IMF. Decision No. 14064-(08/18) for Article V, Section 3. https://www.imf.org/external/SelectedDecisions/Description.aspx?decision=14064-(08/18). This criterion is applied to General Resources Account (GRA) lending. A related but distinct framework for exceptional access through the Poverty Reduction and Growth Trust (PRGT) was introduced in 2009, and a policy covering combined PRGT-GRA was introduced in 2020. Exceptional access to PRGT lending has been rare: Somalia and Chad are some recent examples.

[37] This criterion does not apply to countries that are eligible for PRGT resources but are considered "presumed blenders."

used to assess the access to ICM criterion:[38] (1) an issuance test; and (2) a "could have tapped" test. The issuance test determines whether the member has had public sector issuance, has guaranteed external bonds, or has received disbursements under public and publicly guaranteed external commercial loans in international markets during at least two or three of the past five years for which data are available, in a cumulative amount over that period equivalent to at least 25 or 50 percent of quota at the IMF at the time of the assessment.[39] The "could have tapped" test allows for a member to also be deemed to meet the access to ICM criterion if there is convincing evidence that the sovereign could have tapped international markets on a durable and substantial basis, even though the scale or duration of actual public sector borrowing may have fallen short of the specified thresholds.

The access to ICM assessment is also important for qualification criteria for the IMF's precautionary arrangements, available to members with strong fundamentals and policies. One of the nine core indicators for the Flexible Credit Lines/Precautionary and Liquidity Lines (FCL/PLL) is a track record of steady sovereign access to capital markets at favorable terms, assessed with the issuance and "could have tapped" tests, as well as an additional requirement that the member did not lose access to ICM at any point in the past 12 months.

These IMF policies demonstrate the case-by-case nature of the required assessment of access to ICM, particularly the "could have tapped" test, informed by staff judgment and several indicators that have been found to be significant drivers or correlates of access to ICM. The list of indicators includes but is not limited to volume, frequency, maturity, and terms of issuance, sovereign credit ratings, spreads, gross financing needs, and debt vulnerabilities. Since access to ICM also includes a forward-looking aspect, other suggested market indicators that could also be considered in real time include CDS spreads, country risk premia, market positioning, option-implied volatility and skewness, and the shape of the yield curve.

Even the way debt sustainability is analyzed depends in part on access to ICM. Determination on whether the low-income country debt sustainability framework (LIC DSF) or the market-access country sovereign risk and debt sustainability framework (SR DSF) is applied is based primarily on PRGT eligibility. However, PRGT-eligible countries are eligible to use the SR DSF if they fulfill the income and access to ICM criteria. The selection of frameworks has large implications, as the two frameworks produce substantially different 'landing zones' when the DSFs are used in debt restructuring cases.

Annex Table 1 on the next page enumerates the various policies that employ the access to ICM concept by the IMF and includes references to the official policy documents.

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[38] As explained in the table below, the access to ICM criterion is slightly different across the different IMF lending facilities (exceptional access, PRGT entry, exit, and blending).

[39] Borrowing of less than 2 percent of quota in a given year is excluded (de minimis borrowing). The most recent five-year period for which WB IDS data are available should be used. External bonds and commercial loans issued or contracted in markets that are not integrated with broader international markets do not qualify. Externally guaranteed or subsidized borrowing, and borrowing from state-owned banks and, generally, by state-owned enterprises are not considered commercial borrowing.

Annex Table 1: Access to ICM in IMF policies

IMF Policy	Access to ICM Relevance	Application	Access to ICM Assessment
GRA Exceptional Access (EA) /1	**Criterion 3**: The member has prospects of access to ICM within a timeframe and on a scale that would enable it to meet its obligations falling due to the Fund.	Access to ICM needs to be regained when arrangement repayments are due, e.g., for a 3-year EFF, the country would have to (re)gain access to ICM by the 5th year from the start of the arrangement.	Case-by-case judgement, informed by indicators: *spreads, credit ratings, nonresident holdings of debt, changes in maturity and currency composition and interest rate structure of sovereign debt, CDS spreads, country risk premia, market positioning, option-implied volatility and skewness, and the shape of the yield curve.*
PRGT Eligibility Criteria: Entry /2	Income Criterion **AND** Access to ICM Criterion	i. Issuance test (2/5 years, 25 percent of quota)	See PRGT Eligibility Criteria: Graduation.
PRGT Eligibility Criteria: Graduation /2	Income Criterion **OR** Access to ICM Criterion **AND** absence of serious short-term vulnerabilities including risk of *loss of access to ICM*	i. Issuance test (3/5 years, 50 percent of quota) ii."Could have tapped" test	"Could have tapped" test: case-specific assessment, considering relevant factors: *volume and terms of recent actual borrowing, sovereign credit rating, evolution of sovereign credit spreads (benchmark EMBI spreads of 570 bps), GFN (benchmark 14 percent of GDP), debt vulnerabilities under LIC DSF.*
PRGT Exceptional Access (EA) Criteria /2	Income Criterion **AND** Access to ICM Criterion	Issuance test (2/5 years, 25 percent of quota)	See PRGT Eligibility Criteria: Graduation.
PRGT and GRA Blending /3	Income Criterion **AND** Access to ICM Criterion, depending on debt vulnerabilities	For a member at **low/moderate risk of debt distress**: assumed access to ICM; For a member at **high risk of debt distress**: Issuance test (3/5 years, 50 percent of quota) (or a small/micro-state); For a member **in debt distress**: assumed no access to ICM.	A staff assessment on past "durable and substantial" access to ICM for countries **at high risk of debt distress** requires validation of the debt data (from the WB's International Debt Statistics) with country authorities.

FCL/PLL Qualification Criteria /4	One of the nine core indicators is a track record of steady sovereign access to capital markets at favorable terms.	i. Issuance test (3/5 years, 50 percent of quota). ii."Could have tapped" test iii. Requirement that the member **did not lose access to ICM at any point in the last 12 months**.	Loss of access to ICM includes: deteriorating funding conditions and adverse changes in issuance patterns (*volume, maturity, and frequency of issuance*) that cannot be explained by funding needs; comparison of spreads with comparator countries and relative performance of *spreads* during periods of global shocks: *EMBI spread; spread between country EMBI and EMBI overall index* (using latest observation and averages over previous five years); *current yield on benchmark bonds; credit ratings; and last external issuance* (details on amount issued/ original yield/maturity).
SRDSF (MAC DSA) vs. LIC DSF /5	PRGT-eligible countries are eligible to use the MAC DSA if they fulfill the Income Criterion **AND** Access to ICM Criterion.	See PRGT Eligibility Criteria.	See PRGT Eligibility Criteria.
/1 The Fund's Lending Framework and Sovereign Debt — Further Considerations (2015)			
/2 Eligibility to Use the Fund's Facilities for Concessional Financing (2020)			
/3 Fund Concessional Financial Support For Low-Income Countries—Responding To The Pandemic (2021)			
/4 PLL Staff Guidance Note (2018); FCL Staff Guidance Note (2018)			
/5 Staff Guidance Note on the Sovereign Risk and Debt Sustainability Framework for Market Access Countries (2022)			

# Annex II. Relationship between primary and secondary spreads

The graphs below plot primary sovereign issuance spreads from the Bond Radar emerging market database against secondary interpolated spreads for the same country, currency, and time period. Linearly interpolated spreads are calculated from Bloomberg historical data by finding two bonds closest in maturity to the tenor being issued; one bond must be longer and the other shorter than the primary issuance. The date chosen for the interpolated spread is the nearest available date at least one day before issuance, with coverage for 2012-21. We plot separately EUR-denominated and USD-denominated issuances.

Graphs by currency
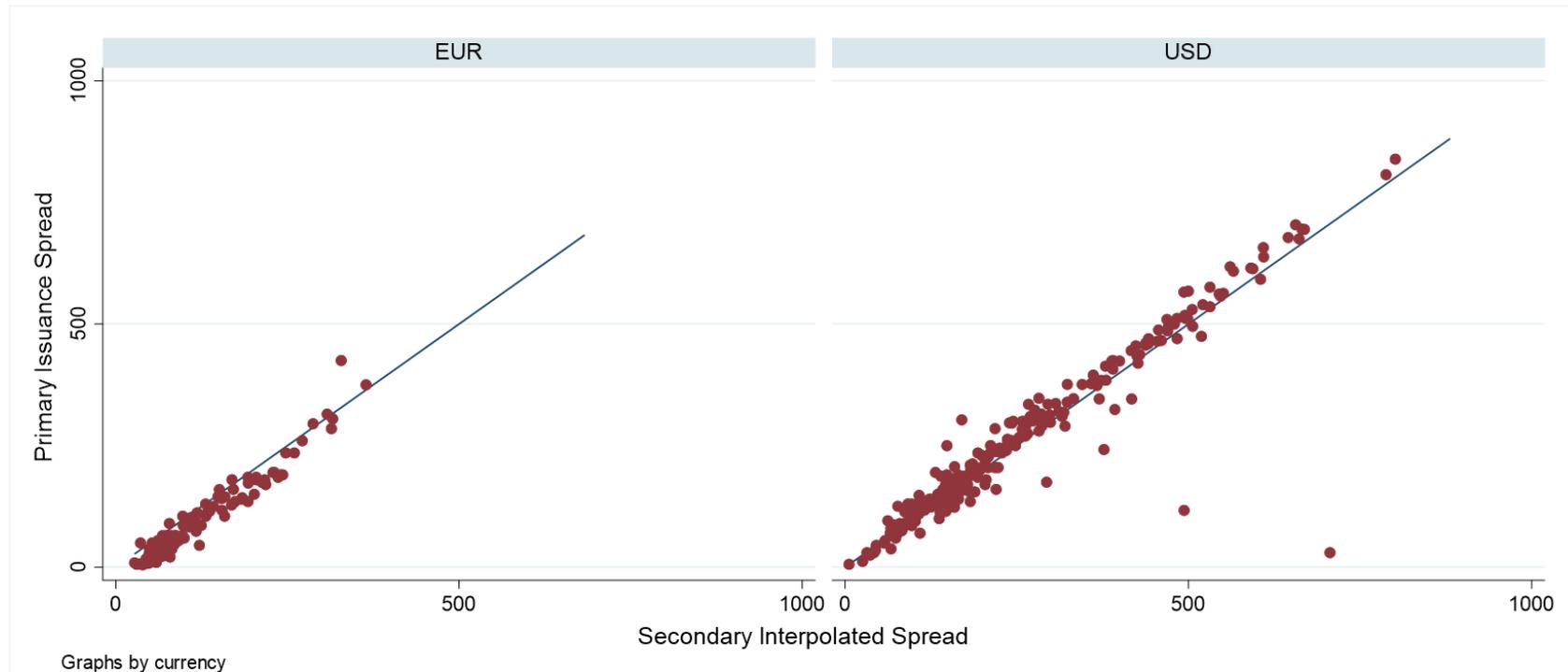
The datapoints all cluster close to the 45-degree line, supporting our claim that primary issuance usually happens at secondary spread levels. Market participants typically refer to the difference between primary and secondary spreads as the concession. For example, in USD-denominated emerging market sovereign issuance, concessions are usually small but positive. The decision to issue bonds is endogenous, and it is possible that some countries choose not to issue on a particular day because such issuance would have been at a large concession.

Annex III. Distribution of primary spreads

The histogram below shows the number of primary sovereign bond issuances from EM economies at different spread levels between 2003 and 2021. Only countries that were rated single-B by S&P at the time of issuance are shown—there were 276 such issuances.
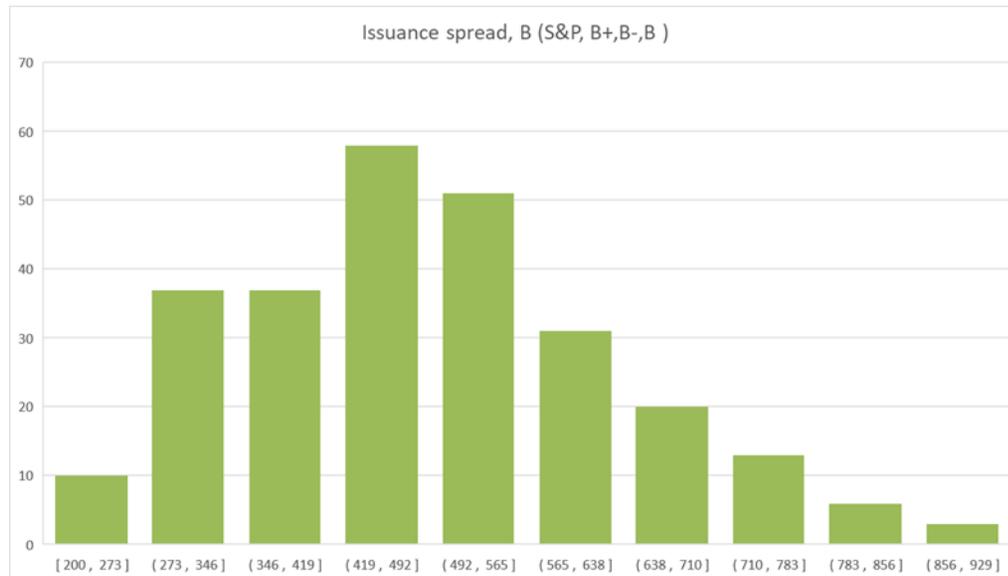
The histogram implies a spread cutoff for issuance. The number of issuances in the last spread category (range 856 bp to 929 bp) is small, suggesting that issuances at spreads over 1,000 bp are highly unlikely.

Annex IV. Results from a local projection model

The local projection method offers a useful analytical tool to assess the dynamic impact of an IMF arrangement on sovereign spreads while controlling for other determinants of spreads. The baseline estimations aim at measuring the time-varying impact of IMF arrangements on sovereign spreads while controlling for basic determinants of spreads, cyclical conditions, and time-invariant factors. We estimate the cumulative response of sovereign spreads during h horizons following the Board approval of an IMF arrangement using the following specification:

$$Spread_{i,t+h} - Spread_{i,t-1} = \mu_i^h + \sum_{j=1}^{l} \gamma_j^h \, \Delta Spread_{i,t-1} + \beta^h \, IMFprog_{i,t} + \theta^h \, X_{i,t} + \varepsilon_{i,t}^h,$$

where the dependent variable ($Spread_{i,t+h} - Spread_{i,t-1}$) is the cumulative change in the natural log of the ex-Quasi EMBIG spread in country i at different time horizons denoted by h, and t denotes quarters. The horizons cover from the first quarter of the approval of an IMF arrangement, h=0, up to three years, h=12. β^h and θ^h are the vectors of coefficients of interest for each horizon h=0,1,2,……..,12. ($X_{i,t}$) is the vector of control variables including the traditional determinants of sovereign spread (*global financial conditions, real GDP growth, inflation, fiscal deficit, public debt to GDP, external reserve, current account balance, GDP per capita*). Driscoll and Kraay (1998) standard errors are computed to account for correlations in the error terms.

The local projection technique also provides flexibility, as it can easily accommodate potentially nonlinear or state-dependent impacts. This allows us to investigate how the effects of IMF arrangement on spreads vary depending on the size of the arrangement (liquidity effect), and the strength of the implementation of the reform measures embedded in the arrangement (successful vs. unsuccessful arrangements), using the following state-dependent specification:

$$Spread_{i,t+h} - Spread_{i,t-1}$$
$$= \mu_i^h + \sum_{j=1}^{l} \gamma_j^h \, \Delta Spread_{i,t-1} + \beta^h \, IMFprog_{i,t} \times dummy_{i,t} + \varphi_h dummy_{i,t} + \theta^h \, X_{i,t} + \varepsilon_{i,t}^h,$$

where $dummy_{i,t}$ is an indicator of IMF arrangement size or of successful arrangement implementation.

The figure below shows the baseline and state-dependent results of the local projection estimates. Consistent with our findings from the event study analysis, our baseline results from the local projection model show that the announcement of the approval of an IMF arrangement by the Board has a negative and significant impact on sovereign spread. On average, spread decreases by almost 20% over three years, the average duration of an IMF arrangement. The impact of the IMF arrangement seems to be more visible after the first six quarters following the Board approval of the arrangement.

The results from the state-dependent estimates show that, although the arrangement's size (liquidity effect) may have an impact in the short term, it is the effectiveness of the arrangement's implementation (conditionality effect) that can significantly bring spreads down in the medium term. In distinguishing between characteristics, our results differ somewhat here from the event study because of not just a different methodology and specification, but also because the event study separates out precautionary arrangements for a different computation of arrangement success. Depending on the initial level of the country's sovereign spread, an IMF

arrangement can play an important role in helping the country regain access to ICM. This is achieved through a combination of its liquidity and conditionality effects, operating in the short and medium terms, respectively.

Annex IV Figure. Cumulative impact of IMF arrangement on sovereign spreads: Local projection method
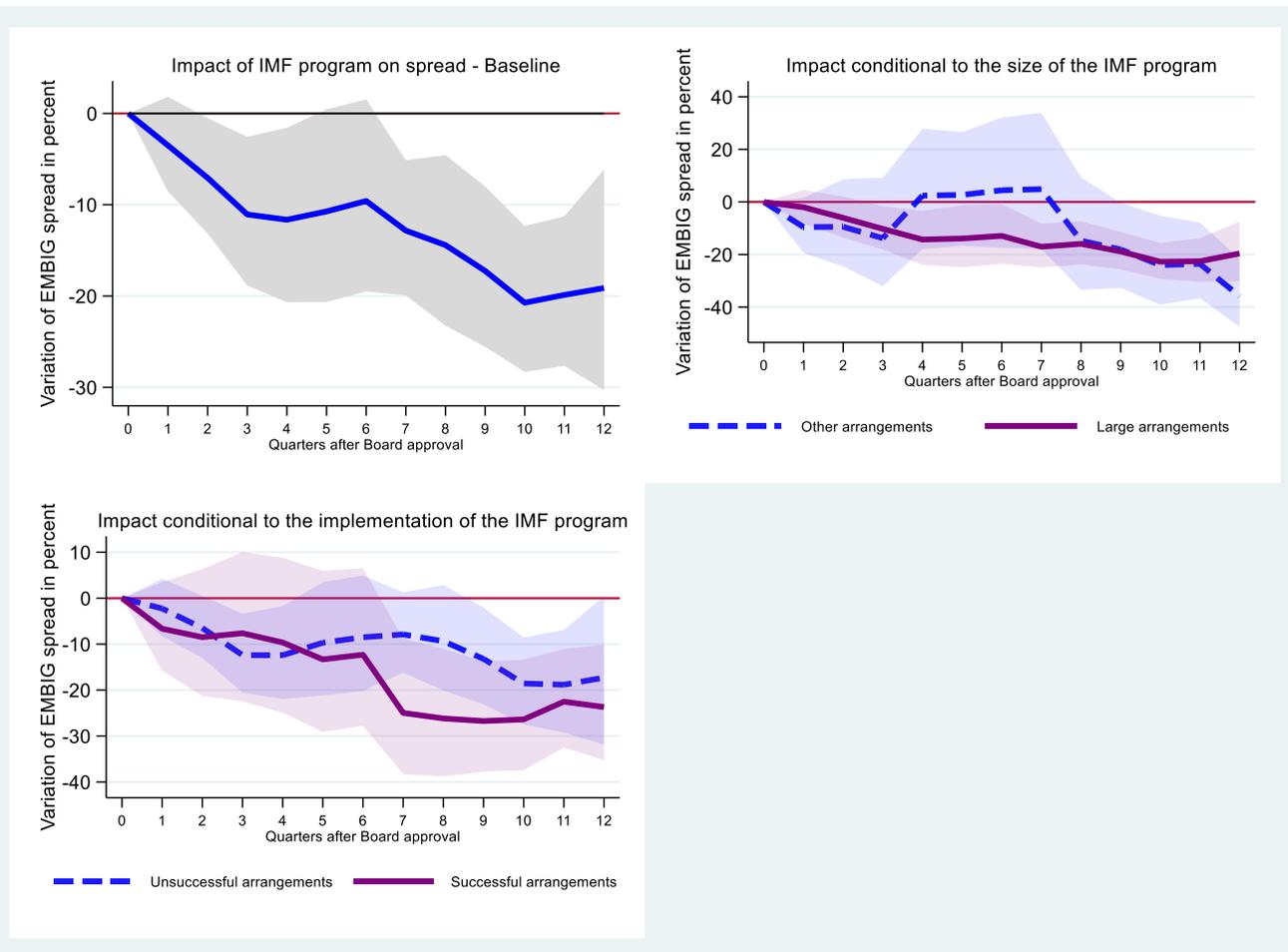
Source: Authors' calculations.
Note: The shaded areas (gray, blue, and purple) represent the 95% confidence interval of estimates.

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