Influence by omission: The IMF's lending capacity and central bank design

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12 August 2025

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Abstract

A large literature explores how loan conditionalities and policy recommendations embedded in International Monetary Fund lending programs influence country behavior and policy choices. We argue that the IMF's influence extends beyond these intentional efforts. This paper shows that the growth in the IMF's lending capacity has failed to keep pace with financial globalization, and that this has incentivized emerging and developing economies to strengthen their domestic institutions for financial stability, particularly, their central bank's capabilities to act as a lender of last resort. We conceptualize this as *influence by omission*, whereby the IMF shapes behavior not through direct engagement but through its declining ability to serve as an effective financial backstop. Using original data coding central bank lender of last resort powers for 60 developing countries between 1994 and 2020, we find that countries with relatively limited access to IMF resources are significantly more likely to strengthen their central banks' lender of last resort authority. This finding is robust across a range of model specifications, instrumental variable analyses, and dynamic estimations. An event study of countries' response to the Covid shock reveals that countries with stronger lending of last resort capabilities were much more likely to manage the crisis without drawing on IMF resources. Importantly, this effect is specific to lender of last resort powers and does not extend to other aspects of central bank governance such as independence or transparency, suggesting that distinct international and domestic incentives shape different reform trajectories.

Keywords: Central Banks, Domestic Reforms, Financial Stability, International Monetary Fund, Lender of Last Resort

Acknowledgments: This paper was presented at the 2022 EPSA, 2022 APSA, 2023 ISA, and 2024 IPES annual conferences. It was also presented at research seminars at the University of Essex, University of Pennsylvania, University of Strathclyde, Leiden University, and London School of Economics and Political Science. We thank discussants and participants at these events, Michaël Aklin, Despina Alexiadou, Ben Cormier, Julia Gray and Beth Simmons for their comments and suggestions.

1. Introduction

The International Monetary Fund (IMF) was founded at Bretton Woods in 1944 to lend to countries facing balance of payments crises. Although the fixed exchange rate regime it was designed to defend is now a relic of history, the IMF still plays a critical role in assisting member states in crisis. The ability of the IMF to perform this role has always depended on the size of its resources. For most of its history, the IMF's funding has come from quota subscriptions paid by member states. Members quotas are reviewed at least every five years to ensure that the IMF's resources remain fit for purpose. However, many emerging and developing countries have long argued that the IMF's resources have been chronically inadequate. For example, at the 1974 IMF's Annual Meeting, Egypt lamented that "…*The Fund's Annual Report strikes an alarming tone when it states that official financing facilities and arrangements are clearly not adequate for the developing countries even with the new oil facility*" (International Monetary Fund 1974). In 1988, Thailand stated that "*A substantial increase in quotas would be of crucial importance in enabling the Fund to play an effective role in supporting members' adjustment efforts. I support at least a doubling of quotas*" (International Monetary Fund 1988). Similarly, South Africa in 1989 reiterated that "*South Africa strongly supports, as we have in the past, a substantial and appropriate increase in the Fund's resources*" (International Monetary Fund 1989).

These misgivings are supported by IMF staff members, who regularly recommend increases of resources commensurate with the growth of international trade and capital flows. Although they have advocated for increases between 75-100 percent, the increases approved by the Executive Board are nearly always far smaller, typically falling between 0-51 percent (U.S. General Accounting Office 1988). For example, during the Ninth Review in the late 1980s, IMF staff recommended a 100 percent increase of resources, in line with the calls from Thailand and others. The eventual increase was 50 percent. One consequence of this dynamic has been a steady decline in the IMF's lending capacity relative to standard benchmarks of financial globalization, including the stock of external liabilities in emerging and developing countries (Denbee, Jung, and Paternò 2016).

In parallel, over the past several decades, many emerging and developing economies have sought to bolster their domestic institutions for financial stability, especially their central banks and their capacity to act as a lender of last resort (LLR). For example, Egypt in 2003 granted its central

bank the power to take "*whatever measures it considers, comprising the extension of exceptional finance to bank*."[1] Thailand in 2008 added to its central bank charter "*in the case where any financial institution faces liquidity problem which may seriously endanger the stability of economic and monetary system as a whole…[the Bank]…may grant loan or give financial assistance by other means to the said financial institution*"[2] while in 2017 South Africa added that "*the Reserve Bank is responsible (a) for protecting and enhancing financial stability*."[3]

In this article, we show that declining prospects for international assistance in times of crisis and continued efforts to boost the capabilities of domestic central banks are subtly connected. Unlike existing research which shows how the IMF influences countries by commission, such as through its lending practices, recommendations, and especially loan conditionalities, we argue that the relative size of the IMF's lending capacity influences states by omission. Our argument in brief is that the inability of the IMF's lending capacity to match the growth of financial globalization is noticed by the IMF's potential borrowers and that states respond by strengthening the capabilities of their central banks to combat crises, especially to act as more capable lenders of last resort.

We test our theory using original data on central bank lender of last resort capabilities for 60 emerging and developing countries between 1994 and 2020.[4] We also develop a novel measure of countries' borrowing capacity from the IMF. A series of quantitative tests provide strong support for our argument. Our results hold across a range of estimation techniques, alternative measures of our dependent and independent variables, and additional controls. Placebo tests show that borrowing capacity from the IMF has no discernible effect on other aspects of central bank governance, such as central bank independence or transparency.

Our results suggest a novel explanation for the seemingly surprising manner in which many emerging and developing countries managed the Covid shock. Despite the IMF touting its US$1 trillion lending capacity to assist emerging and developing economies, between March 2020 and December 2021 emerging and developing countries collectively tapped just over 12% of the IMF's resources, a meagre sum relative to the scale of the crisis (Stubbs et al. 2021). Under-utilizing IMF resources seems puzzling given these countries' historical vulnerability to financial downturns. Instead,

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[1] Law No. 88 of 2003 Promulgating the Law of the Central Bank, the Banking Sector, and Money, enacted June 15, 2003.

[2] Bank of Thailand Act, B.E. 2485 (1942), as amended by the Bank of Thailand Act (No. 4), B.E. 2551 (2008).

[3] Financial Sector Regulation Act, No. 9 of 2017, enacted August 21, 2017.

[4] Our coding for lending of last resort powers stretches back to the 1920s in some cases. However, our empirical analyses are restricted by data availability for the main independent variable.

throughout the pandemic, emerging and developing countries leveraged their increasingly sophisticated and capable central banks (Cantú et al. 2021). To this we add an event study, which shows that following the March 2020 shutdown, emerging and developing country central banks had stronger and more active responses to the crisis if they possessed stronger LLR powers and drawings on the IMF were minimal. Therefore, while central bank interventions and borrowing from the IMF are not one-for-one substitutes in an economic sense, the countries that are increasingly leveraging their central bank appear to be "graduating" from the need to seek recourse to the IMF.

Our paper speaks to two literatures. First, building on research showing how access to international institutions serves as signals for markets (Chapman et al. 2017; Gray 2013; Shim 2022), our paper expands on the IMF's influence on member states and markets beyond the Fund's explicit recommendations and conditions (Goes 2022; Reinsberg, Stubbs, and Kentikelenis 2022a). While existing research finds that the IMF adjusts its behavior when borrower countries have viable outside options (Clark 2022; Kaplan and Shim 2024), we show that the relative decline in the IMF's lending capacity has encouraged countries to create their own outside options at the domestic level. Therefore, our argument has implications beyond our immediate case as it predicts that states adjust their behavior according to the ascending or declining stature of a relevant international institution. This reasoning could inform the study of the effects of the oscillating stature of the United Nations, NATO, or international climate agreements.

Second, our findings contribute to the literature on monetary institutions in several ways. First, we add to the literature on the politics of financial stability, a goal that has gained preeminence in the past decades in central banks' mandates. Second, we show that central bank powers, of which lender of last resort capabilities are but one example, should be studied alongside traditional central bank governance metrics of independence and transparency. Central banks' freedom to act needs to be contextualized within the substantive domain in which they are empowered to act. Additionally, our results add further nuance to the new literature on the politics of sovereign finance (Ballard-Rosa, Mosley, and Wellhausen 2021; Bunte 2019; Kern, Reinsberg, and Shea 2024; Mosley and Rosendorff 2023), by showing other considerations that may affect countries' willingness to approach multilateral lenders. Finally, our original data on lender of last resort powers and a measure of countries' borrowing capacity from the IMF allow for further research on these matters.

2. Argument

2.1 Effects of the IMF by commission and omission

A large literature shows that the IMF's lending practices, recommendations, surveillance, and loan conditions affect member states' political and economic circumstances and policy choices (Mosley and Rosendorff 2023; Simmons 2000; Steinwand and Stone 2008). Irrespective of whether these changes originate in the power politics of the IMF's largest shareholders or in the technocratic ideas of its staff (Copelovitch 2010), most of the IMF's impact on member states are acts of *commission* because it comes directly through participation in IMF programs such as complying with loan conditionalities or following recommendations embedded in Article IV consultations.[5] Loan conditions target a range of domestic policies, including structural reforms, fiscal, and monetary policies. There is evidence of IMF effects on aspects of central bank governance, both through recommendations – the IMF was part of the consensus that deemed central bank independence a signal of good governance (Johnson and Kwak 2011; McNamara 1998) – and explicit conditions to introduce central bank reforms (International Monetary Fund 1999; Kern, Reinsberg, and Rau-Göhring 2019; Reinsberg, Kern, and Rau-Göhring 2021). Equally well-studied are political and economic knock-on effects due to a country's participation in IMF programs. Some studies find that IMF program participation modestly boosts democracy (Nelson and Wallace 2017), increases income inequality (Lang 2021), erodes women's economic and political rights (Detraz and Peksen 2016), and is associated with more repression in autocracies (Nelson and Dinkel 2024).

Other generally less studied ways in which the IMF affects country behavior are through indirect channels outside the context of IMF programs or recommendations. We label these effects *by omission*. For example, Lang (2021) argues that changes in the IMF's liquidity position alters the incentives of member states to enter into an IMF program in the first place. Similarly, Lipscy and Lee (2019) show that countries accumulate fewer foreign currency reserves when they have greater influence over the IMF, unintentionally increasing their own financial crisis risks. In these cases, the

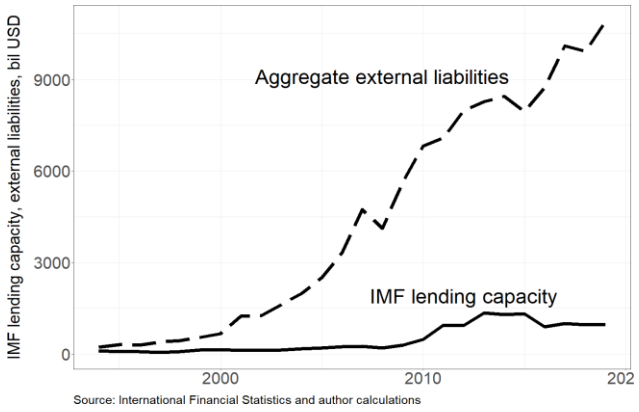
[5] While non-compliance is a critical issue, countries appear to abide by their loan conditions the majority of the time (Reinsberg, Stubbs, and Kentikelenis 2022b).

IMF alters country behavior not by mandating adherence to policy changes, but by how relative access to the IMF's resources forms part of the backdrop for domestic financial policy choices.

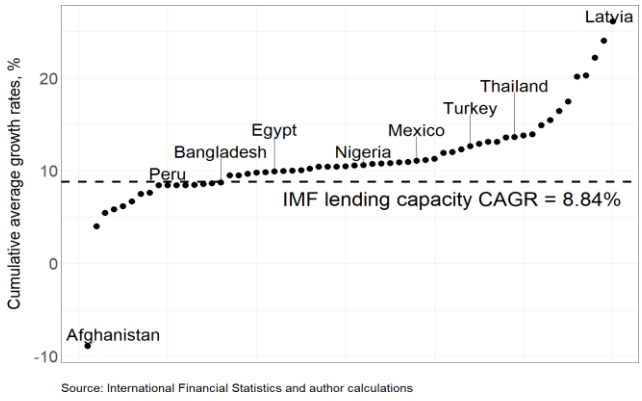
There are reasons to suspect that countries view the IMF as a less attractive option than in past decades. This change cannot be attributed to large scale reforms to the loan conditionalities that impose serious constraints on governments (Kentikelenis, Stubbs, & King, 2016). Rather, we argue, it is because over time, the amount of IMF funds available to borrow has slowly eroded when benchmarked against the size of the potential borrowers' economies and their exposure to financial risks. Figure 1a charts the evolution of the IMF's lending capacity and of aggregate external liabilities in emerging and developing countries – a standard barometer of financial globalization (P. R. Lane and Milesi-Ferretti 2007). Figure 1a shows that while the IMF's total lending capacity has grown over time, this growth has not kept pace with the expansion in financial globalization (Denbee, Jung, and Paternò 2016). While the IMF's lending capacity stood at 21% of these countries' external liabilities in 2000, this percentage fell to 9% by 2019 despite the large contributions to the IMF's lending capacity during and following the Global Financial Crisis of 2008.

Figure 1. IMF lending capacity vs. emerging and developing countries external liabilities.

(a) Aggregates



(b) Compound annual growth rates (CAGR)



Notes: The formula for compound annual growth rates is $\left(\frac{V_{initial}}{V_{final}}\right)^{\frac{1}{t}} - 1$, where V_{final} is the value in the final period, $V_{initial}$ is the initial value, and t is the number of years. Figure 1b is derived using $V_{initial}$ in 1994 (or earliest year thereafter), V_{final} in 2020, and t is years between V_{final} and $V_{initial}$. Data on IMF's Forward Commitment Capacity, key component in the Fund's lending capacity, is available since 1994. Figure 1b depicts the 60 countries included in our sample. For the 109 emerging and developing economies, 74 have a CAGR in their external liabilities greater than 8.84%.

This divergence is not driven by a disproportionate increase in liabilities in a few large emerging economies, such as China or India. Figure 1b plots the average compound annual growth rate (CAGR) of the IMF's lending capacity, and of 60 emerging and developing countries' external liabilities. Since 1994, the IMF's lending capacity has grown at a compound annual rate of 8.84%, which is below the CARG of the external liabilities of 44 of the 60 countries.

2.2 Variance in lender of last resort powers

The lender of last resort is a critical instrument for financial stability. When otherwise solvent banks face sudden liquidity problems, they may resort to fire sales during periods of financial turmoil. These sales reduce credit supply, further deepening the liquidity crisis. Bagehot (1873) articulated the lender of last resort function, advocating for central banks to lend generously during crises as long as commercial banks offer good collateral and pay a penalty interest rate. By providing temporary liquidity, the lender of last resort prevents insolvency and safeguards the broader financial system and the money stock, significantly influencing the severity and cost of financial downturns.

Although lender of last resort capabilities are often depicted as a natural consequence of central bank money (Goodhart 1988), the desirability of these powers and their extent is controversial (Alves, Bonfim, and Soares 2021). By reducing banks' costs of risk taking, lender of last resort powers create moral hazard problems (Solow 1982). Drechsler et al. (2016) show that weakly capitalized banks are more likely to access the lender of last resort and use these loans to purchase risky assets. Others suggest that last resort lending might not be the only or best response to banking crises (Jordana and Rosas 2019; Rosas 2006). Additionally, in a context of increasingly autonomous central banks (Garriga 2025), strong lender of last resort powers leverage the judgement of independent central bankers. However, when this removes the decision from the government's discretion it places additional demands on central bankers that may conflict with their price stability mandate.[6] This makes the existence and extent of lender of last resort powers a politically contested matter.

[6] The Richmond Federal Reserve head, Jeffrey Lacker, advocated for "credible limits to central bank intervention in credit markets [as] critical to central banks' core monetary policy mission." https://www.nasdaq.com/articles/us-economics-richmond-feds-lacker-worries-policy-can-induce-financial-instability-limits

Out dataset introduced below shows considerable variation in the strength of central banks' lender of last resort powers. For example, countries may grant their central bank the ability to determine the opportunity of banking rescues, the amount or kind of collateral requested, the interest rate and the maturity periods, or other characteristics of the loan. Additionally, these choices may be constrained by the participation of third parties in the decision-making process, such as the officials from the Finance Ministry. In the case of central banks, lender of last resort decisions can be made by a more or less independent central bank's board or relying on a stand-alone financial stability committee. Furthermore, conditions may vary for times of crises, and it may be the central bank who defines when this happens.

Interestingly, variation in lender of last resort powers does not seem correlated with central bank independence: some highly independent central banks lack strong lender of last resort powers, while some less autonomous central banks may possess such authority.[7] Furthermore, some countries dramatically increased central bank independence without entrusting significant lender of last resort powers to their central bank, while others altered their central bank's lender of last resort powers without changing their formal independence.[8] This suggests that the logic driving both kinds of central bank governance reforms may be different.

As already alluded to, we argue that for emerging and developing economies the IMF and an effective central bank are both options on a menu for states seeking domestic financial stability. However, this was not always the case. In the first few decades of the post-war era, the main recourse for countries in crisis was an IMF stand-by arrangement, whereby governments would borrow from the IMF in exchange for implementing reforms. However, as financial globalization deepened and grew faster than the IMF's lending capacity, the Fund's resources began to cover a smaller share of

[7] According to our data on lender of last resort powers and Garriga (2025)'s CBI data, examples of countries with highly independent central banks but limited lender of last resort capabilities are Argentina under the convertibility law, Colombia in 1992, Guatemala since 2002, Indonesia since 1999, Kazakhstan since 2003, Nicaragua since 1999, Peru since 1992, Russia since 2002, Tunisia since 2006, Turkey since 2001, and Ukraine 1999-2009. Countries with important lender of last resort powers and low formal central bank independence are Botswana 1975-1995, Korea 1970-1996, and Thailand 1998-2012.

[8] There are many examples of countries that did not reform the autonomy of the central bank but reduced their lender of last resort powers (Albania in 1992, Honduras in 2004, Mongolia in 2002, or Russia in 1994), or increased these powers without altering their independence (Argentina 2002, Colombia 1993, Indonesia 2009, Morocco 2005, Malaysia 2003, Russia 2013, Thailand 1985 and 1998, Trinidad and Tobago 1986, and Zimbabwe 2010).

the liquidity a modern crisis could demand. Under plausible scenarios, the IMF's resources have been judged to be merely adequate, following a moderate economic shock provided that countries first ran down their foreign exchange reserves and accessed any regional financing arrangements they were parties to first (Broos et al. 2018). Sensing this, it is not surprising that policymakers have sought alternatives to the IMF.

Importantly, and as mentioned above, strengthening lender of last resort powers is also costly both because it generates moral hazard problems, and because it implies a loss political control over the opportunity and extent of the use of these powers. This may partially explain why, for decades, emerging and developing economies found in the IMF's lending capabilities a viable financial safety net to manage financial crises. Their ability or expectation to rely on this international financial safety net made the need for costly domestic reforms less pressing. However, financial globalization of emerging and developing economies may have grown to such an extent that relying primarily on IMF resources to meet a crisis may no longer adequate. Even if a country was willing to accept the conditionalities of an IMF rescue package, if the IMF is unable to provide sufficient assistance, the attractiveness of the IMF as financial safety net wanes and countries become more vulnerable to unmanageable financial shocks.

Thailand's response to the 1997-98 Asian crisis illustrates our argument. In August 1997, exchange rate pressures convinced Thai policymakers to float the bhat, a decision which soon sparked a sharp devaluation. As the crisis deepened and spread to other Asian economies, the Thai government reached out to the IMF and secured a US $17 billion package (Walter 2013). Although the bailout package seemed adequate, as Lane (1999) notes, it was modest and dwarfed by the waves of private capital fleeing the country. Moreover, the IMF assistance arrived slowly as each tranche was released only after the country met specific milestones. Markets judged this arrangement inadequate and the run on banks and finance companies accelerated. In the end, the government increasingly leaned on its own resources including guarantees and emergency lending facilities.

In the years after the crisis subsided, Thai policymakers implemented a series of reforms designed to strengthen the Thai banking system. Among these efforts was an overhaul of the central bank through the Bank of Thailand Act (B.E. 2551). The revision made preservation of financial stability an explicit objective of the Bank of Thailand (BOT). To ensure the BOT would be able to fulfil this objective, the Act broadened the BOT's lender of last resort toolkit by allowing it to extend emergency liquidity to any solvent institution whose distress threatens systemic stability, accept a wider

range of collateral, and fund interventions through its own bond issuance or the Financial Institutions Development Fund. Together, these provisions give the BOT significant balance sheet flexibility to act decisively in a crisis.

A few caveats are important. First, our argument does not imply that the IMF was *designed* as a safety net for domestic financial stability. Indeed, the IMF was created to provide support when countries experienced balance-of-payments crises. Yet, for two decades, and especially since the Global Financial Crisis, the IMF has been extending its interventions to crisis prevention and banking crisis management (Moretti, Dobler, and Chavarri 2020; Presbitero and Zazzaro 2012; Quintyn and Hoelscher 2003). This does not imply that the IMF has consistently operated as the international lender of last resort (Fernández-Arias and Levy-Yeyati 2012; Fischer 1999; Sau 2004) or that IMF and lender of last resort capabilities are perfect substitutes in stabilization functions. Our argument only requires acknowledging that, in some instances, the IMF has (had) *some* capacity to provide liquidity in the event of a banking crisis to avoid capital flight and deeper crises, but that for some countries that capacity may become insufficient given the scale of their liabilities.[9]

Second, our argument does not imply that the IMF is the *only* component of the global financial safety net (Scheubel and Stracca 2019). However, the IMF has been the most visible and straightforward source for developing countries facing liquidity issues that could translate into capital flight and currency crises.[10] Our argument does not imply that developing countries cannot or do not rely on other components of the global financial safety net. If available, these alternatives might make reliance on lender of last resort powers less necessary, which should weaken our empirical results. This potential effect on empirical results should not affect the logic of our argument.

Third, our argument does not imply that other domestic politics do not matter. As mentioned above, extending central banks powers is a politically contested issue. However, our focus is on international incentives: we argue that, independently from domestic dynamics, relative decreases in access to IMF lending increases the incentives to strengthen the central bank's lender of last resort

[9] Although IMF's liquidity interventions are in the form of foreign currency – and central banks act as lenders of last resort generally lending domestic currency to troubled banks, for emerging countries this does not imply a disconnection. Emerging economies cannot *just* print currency for bank rescues: foreign currency can back rescues to avoid an inflationary spiral that may further strengthen the instability effects of banking crises.

[10] Access to other sources of liquidity depend on a series of additional factors, such as interpersonal connections between central bankers (Sahasrabuddhe 2024).

powers. Furthermore, greater lender of last resort capabilities do not close the prospect of borrowing from the IMF. Nevertheless, we argue that the IMF's lagging lending capacity gives countries greater incentives to strengthen their domestic lender of last resort.

3. Empirical analysis

3.1 Dependent variable

To test our hypothesis, we introduce an original database cataloguing the extent of *de jure* lender of last resort powers in 60 emerging and developing countries.[11] We coded 161 unique pieces of legislation – central bank laws, statutes, decrees, and amendments from central bank websites, national official gazettes, and other online sources.[12]

Our coding focuses on the existence of specific lender of last resort powers during crises, building upon Calomiris, Flandreau, and Laeven (2016)'s measure of lending powers in crises.[13] We code six indicators covering the characteristics of central bank loans, who decides what institutions

[11] We exclude small island states and countries with a common currency as the CFA Franc Zone, but the geographic coverage of our database is wide. The countries included in our sample are: Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Bangladesh, Botswana, Brazil, Bulgaria, Cambodia, Chile, Colombia, Costa Rica, Egypt, El Salvador, Estonia, Ethiopia, Ghana, Guatemala, Honduras, Hungary, India, Indonesia, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Latvia, Lebanon, Lithuania, Malaysia, Mexico, Mongolia, Morocco, Nicaragua, Nigeria, Oman, Pakistan, Peru, Philippines, Poland, Russia, Rwanda, South Africa, South Korea, Sri Lanka, Tanzania, Thailand, Trinidad & Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, Uruguay, Venezuela, Zambia, and Zimbabwe. When a country accedes to the OECD – i.e., Poland after 1996 – it is dropped from our sample.

[12] In the documentation, we list each piece of legislation, its language, and original source. We also include the full codebook with examples for each coding decision.

[13] Calomiris, Flandreau, and Laeven (2016)'s lender of last resort index aggregates scores from four categories: the existence of a crisis mandate, the power to issue guarantees, lending powers during non-crisis times, and lending powers during times of crisis. Their index does not map onto our argument's expectations, which focus tightly on last resort lending capabilities. Therefore, we exclude the power to issue guarantees because it is not directly related to crisis lending, and powers to lend during non-crisis times.

can obtain funding and on what terms. Each indicator is binary, with 1 indicating greater lending powers (the supplementary materials include the codebook and examples). The six components are:

1. Collateral requirements: Collateral are assets pledged as security for a loan. This indicator equals 0 if there are explicit collateral requirements from borrowing financial institutions, and 1 if no requirement is listed or if the collateral decision is left to the central bank's discretion.

2. Maturity restrictions: The legislation may stipulate the maximum maturity for central bank loans. This indicator equals 0 if there is an explicit maturity restriction, and 1 if no restriction is listed or if the maturity decision is left to the central bank's discretion.

3. Interest rate restrictions: Interest refers to the cost of borrowing. This indicator equals 0 when there is an explicit interest rate restriction, and 1 if no restriction is listed or if the decision is left to the central bank's discretion.[14]

4. Extraordinary circumstances: Central bank legislation can constrain lender of last resort powers to periods of extraordinary circumstances or crises. This indicator equals 1 if extraordinary circumstances can be declared, and 0 otherwise.[15]

5. Financial stability committee: This component identifies whether a standalone financial stability committee makes last resort lending decisions. This indicator equals 1 if it exists, and 0 otherwise.

6. Government approval requirement: If the government (or the executive) can veto the central bank's last resort lending decisions, this component is coded 0, and 1 otherwise.

Our dependent variable is *LLR powers,* a single dimension index constructed from the first principal component of these six indicators – the linear combination of the six lender of last resort powers that explains the most variance in the index itself.[16] As a robustness check, we replace our index with an unweighted, additive index of lender of last resort powers, ranging between 0 and 6,

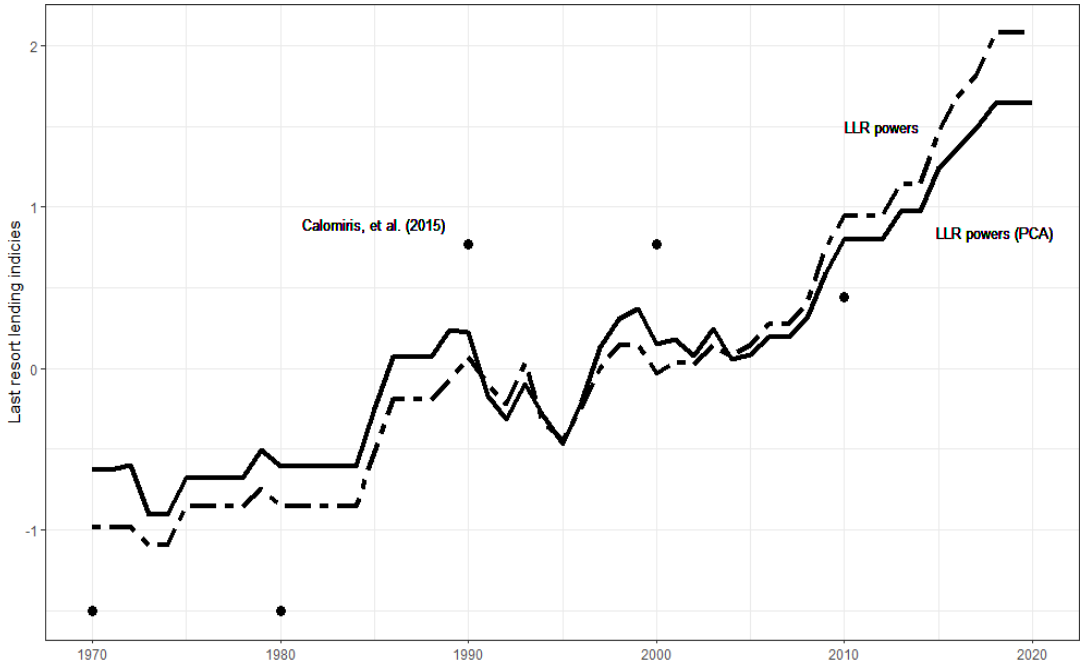
[14] Bagehot (1873) advised that last resort lending carry a penalty interest rate to deter opportunistic financial institutions' behavior. Interestingly, we find very few examples of penalty rates mandated in central bank legislation.

[15] This coding is akin to the crisis mandate indicator in Calomiris, Flandreau, and Laeven (2016).

[16] All six components contribute meaningfully to variation in *LLR powers*.

with higher numbers indicating greater lender of last resort powers. Figure 2 shows the yearly average of our principal component and additive index measures for *LLR Powers* and Calomiris, Flandreau, and Laeven (2016)'s decade-country measure. Although the average *LLR Powers* have generally expanded since the mid-1980s, there have been reversals in several countries.

Figure 2. Yearly sample mean lender of last resort powers. Different measures



Note. Scores in this are standardized to have a mean of 0 and standard deviation of 1, as used in the regression analysis. *LLR Powers (PCA)* is the principal component measure, *LLR Powers* is the additive index, and Calomiris et at (2015) is their decade measure average.

3.2 Operationalizing access to IMF resources

Our main independent variable is a country's *Borrowing capacity* from the IMF, the amount of financing a member could receive from the IMF. A member's borrowing capacity is determined both by the IMF's funds availability (lending capacity) and the countries' quotas. Under normal circumstances a member can borrow up to 200 percent of its quota annually and up to 600 percent of its quota

cumulatively.[17] Although the IMF does not have the financial capacity to lend up to every member's normal access limits simultaneously, there have been several instances where normal access limits have been exceeded – for example, Argentina and Uruguay in the early 2000s and Greece following the 2008 global financial crisis.

Our borrowing capacity measure starts with the IMF's definition of its aggregate lending capacity – the sum of its Forward Commitment Capacity (FCC) and supplementary borrowing.[18] The FCC is the IMF's official measure of resources available for new financial commitments over the next 12 months. It includes quota resources from members with robust external and reserve positions, undrawn amounts from activated supplementary borrowing arrangements like the New Arrangement to Borrow and Bilateral Borrowing Agreements, and expected member repurchases in the following year, subtracting IMF's one-year repayment obligations, and a prudential balance. To this figure, we add IMF borrowing, the undrawn amounts from inactivated supplementary borrowing arrangements (Broos et al. 2018; Scheubel and Stracca 2016, 2019). Next, we apportion the IMF's aggregate lending capacity to each member state according to the member's quota share. This produces our estimate of a state's total expected borrowing capacity from the IMF each year.

States with similar quota shares (and therefore similar levels of access to the IMF's lending resources) may nevertheless be differently exposed to global financial risks. Therefore, we scale our measure by a state's degree of global financial interconnectedness. This is important for our analysis because differential exposure to global financial risks implies different incentives to reform one's central bank's lender of last resort powers. Our measure *Borrowing capacity from IMF* is therefore derived using the following formula:

$$\textit{Borrowing capacity from IMF}_{i,t} = \frac{(\text{IMF FCC} + \text{IMF borrowing}) \times \text{IMF quota share}_{i,t}}{\text{Stock external liabilities}_{i,t}}$$

[17] These limits were set on March 2023 and are periodically updated.

[18] https://www.imf.org/en/About/Factsheets/Where-the-IMF-Gets-Its-Money. Data on the IMF's FCC and supplementary borrowing come from IMF's annual reports and quarterly financial statements. Accessed July 2022.

For example, in 2019, Indonesia's quota was 0.98% of all quotas ($6.43 billion USD). Indonesia's expected borrowing capacity for 2019 was $9.42 billion (0.98% of the IMF's 2019 total lending capacity of $958.96 billion). This represented 0.8% of Indonesia's aggregate external liabilities in that year. Higher values of our measure indicate a greater ability to utilize IMF resources to meet bouts of financial instability.

3.3 Control variables

Following the literature, we include several control variables. The count of *Past IMF programs* (Boockmann and Dreher 2003) accounts for the demand for crisis financing and comes data. Research has shown that the demand for IMF loans is influenced by the economic and political closeness of a borrower country to the IMF's major shareholders (Dreher et al. 2022; Dreher and Jensen 2007; Dreher, Sturm, and Vreeland 2009). *Trade with West (% GDP)* is the total value of country's bilateral trade with the United States, the United Kingdom, Germany, and France relative to the country's GDP, using data from United Nations (2021). *Distance from West at UN*, the ideal-point distance indicator of Bailey, Strezhnev, and Voeten (2017) between each borrower and the aforementioned four countries.

Reserves (% GDP) measures a country's stock of foreign currency reserves. Data come from the World Development Indicators. *Banking crisis* records the occurrence of a recent banking crisis with data from Laeven and Valencia (2018). We capture the strength of a country's *Electoral democracy* using VDem's *v2x polyarchy* variable (Coppedge et al. 2021), the average of indices measuring freedom of association, clean elections, freedom of expression, elected officials, and suffrage. *Veto players* proxies the feasibility of domestic policy change using the *polcoviii* variable from Henisz (2002). We control for *Central bank independence* from Garriga and Rodriguez (2023). Finally, we include the yearly sample average of *LLR powers* as a proxy for policy diffusion. Unless specified otherwise, all control variables are lagged one period. Our results do not hinge on this choice. Not lagging the independent and control variables, or lagging them two periods, produces similar results.

For interpretation purposes, all variables, except the banking crisis dummy, reserves and *LLR* have been standardized to a mean of 0 and standard deviation of 1. Table 1 presents summary statistics.

Table 1. Summary statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
LLR powers (PCA)	1,450	0.17	1.20	-4.03	2.33
LLR powers (additive index)	1,450	3.38	1.16	0	6
Borrowing capacity from IMF	1,390	0.02	0.03	0.001	0.38
Reserves (% GDP)	1,192	0.23	0.30	0.0003	3.04
GDP growth (per capita)	1,445	0.03	0.04	-0.18	0.19
Banking crisis	1,450	0.02	0.13	0	1
Trade with West (% GDP)	1,105	0.22	0.39	0.001	3.91
Past IMF programs	1,450	5.66	4.18	0	18
Distance from West at UN	1,448	2.02	0.73	0.48	3.85
Veto players	1,243	0.34	0.19	0	0.73
Electoral democracy	1,450	0.54	0.23	0.02	0.91
Central bank independence	1,450	0.59	0.19	0.13	0.91

3.4 Findings

Table 2 shows our results. Models (1) to (7) are OLS estimations with country- and year-fixed effects and standard errors clustered by country. Model (1) only includes *Borrowing capacity from IMF*, showing that our results are not driven by any particular choice of control variables (Lenz and Sahn 2021), and hold using the full sample. Models (2) to (5) sequentially include economic controls, political controls, and the yearly sample average of LLR powers as a proxy for diffusion. Models (6) and (7) reproduce models (3) and (5) replacing the dependent variable with the additive LLR powers index.

Table 2: IMF borrowing capacity and lender of last resort capabilities

Dependent variable	*LLR powers (Principal component)*					*LLR powers (Unweighted index)*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Borrowing capacity from IMF$_{t-1}$	-0.349***	-0.464**	-0.456**	-0.440**	-0.456**	-0.565**	-0.565**
	(0.127)	(0.182)	(0.175)	(0.187)	(0.175)	(0.231)	(0.231)
Past IMF programs$_{t-1}$		-0.072	-0.072	-0.098	-0.072	-0.069	-0.069
		(0.157)	(0.168)	(0.152)	(0.168)	(0.196)	(0.196)
Trade with West (% GDP)$_{t-1}$		-0.150	-0.148	-0.152	-0.148	-0.150	-0.150
		(0.117)	(0.115)	(0.117)	(0.115)	(0.152)	(0.152)
Reserves (% GDP)$_{t-1}$		0.480*	0.403	0.474	0.403	0.375	0.375
		(0.267)	(0.257)	(0.295)	(0.257)	(0.331)	(0.331)
Banking crisis$_{t-1}$		-0.031	-0.003	0.016	-0.003	0.016	0.016
		(0.071)	(0.074)	(0.067)	(0.074)	(0.090)	(0.090)
GDP growth (per capita)$_{t-1}$		-0.012	-0.009	-0.020	-0.009	0.001	0.001
		(0.028)	(0.029)	(0.028)	(0.029)	(0.035)	(0.035)
Distance from West at UN $_{t-1}$			-0.043	-0.049	-0.043	-0.056	-0.056
			(0.063)	(0.064)	(0.063)	(0.068)	(0.068)
Electoral democracy$_{t-1}$			-0.034	-0.022	-0.034	0.087	0.087
			(0.081)	(0.097)	(0.081)	(0.117)	(0.117)
Central bank independence$_{t-1}$			0.119**	0.118**	0.119**	0.195***	0.195***
			(0.052)	(0.048)	(0.052)	(0.066)	(0.066)
Veto players$_{t-1}$				-0.029			
				(0.035)			
LLR (sample average)$_{t-1}$					0.906*		1.253**
					(0.488)		(0.597)
Constant	-0.071	-0.193	-0.172	-0.159	-0.155	-0.214	-0.192
	(0.097)	(0.154)	(0.134)	(0.122)	(0.130)	(0.163)	(0.158)
R^2	0.081	0.163	0.180	0.173	0.180	0.226	0.226
Observations	1,450	1,081	1,081	946	1,081	1,081	1,081
Countries	60	58	58	57	58	58	58

Notes: Dependent variable: *LLR powers*. In models (1) through (5) *LLR powers* is measured using principal components analysis. In models (6) and (7) *LLR powers* is measured as unweighted additive index. All models include year and country dummies not reported for clarity. All variables, except the banking crisis dummy, reserves and *LLR (sample average),* have been standardized to a mean of 0 and standard deviation of 1. Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Across all models, we find support for our hypothesis: as a state's prospect of borrowing from the IMF declines, their central bank's capabilities to act as a lender of last resort are strengthened. Across our fixed effects specifications, coefficients associated with *Borrowing capacity from IMF* are negative and statistically significant. Substantively, we find that a one standard deviation reduction in our measure of a state's borrowing capacity from the IMF is associated with between one-third and one-half of a standard deviation reduction in its lender of last resort capabilities.

Regarding the control variables, *Central bank independence* is the only variable to achieve a statistically significant effect across all models, suggesting more independent central banks have stronger lender of last resort capabilities. While positive, its coefficients are generally small. *LLR (sample average)* is also significant when included but it does not always achieve the 95% threshold. Other control variables are statistically significant in at most one model. The coefficient associated with a country's stock of foreign currency reserves is positive and marginally statistically significant in model (2). This is consistent with the self-insurance motivation for enhancing lender of last resort capabilities. However, this coefficient size is modest.[19]

3.5 The IMF and central banks during the Covid crisis

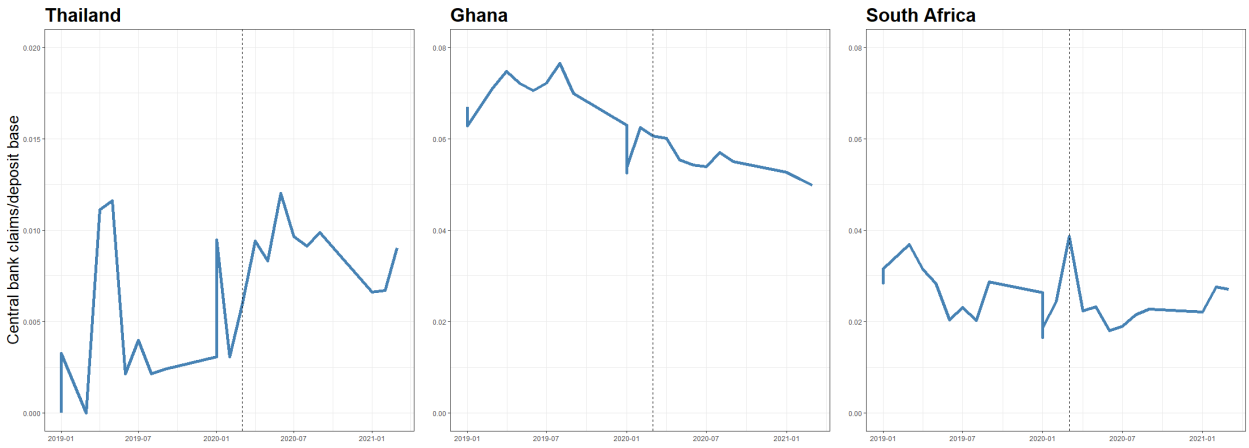
One implication from the above findings is that as a country's borrowing prospects from the IMF appear less attractive, central banks will also assume a more active role in managing and counterbalancing bouts of financial instability. To examine this possibility, we conduct an event study on the liquidity response to the Covid-19 shutdown.

In late March 2020, pandemic-induced lockdowns triggered a worldwide financial panic on a very short notice. There was significant variation in the way emerging and developing countries managed this panic, with some drawing on the IMF, others leveraging the liquidity operations and policy flexibility of their central bank, and others adopting a combination of these two approaches. These divergent strategies reflect differences in both central bank capacity and the political or practical constraints on accessing IMF resources.

[19] *Reserves (% GDP)* is not standardized and has a standard deviation of 0.16. Thus, a one standard deviation-increase in *Reserves (% GDP)* corresponds to an increase in LLR powers of approximately 0.11 unit in model (2).

Consider the examples of Thailand, Ghana, and South Africa. Figure 3 shows that, following the Covid-19 shutdown (marked by the vertical dashed line in each panel), the Bank of Thailand intervened heavily to support the liquidity needs of commercial banks. At the opposite end of the spectrum is Ghana, shown in the middle panel of Figure 3, where central bank liquidity actually *fell* during the first year of the pandemic. Lastly, South Africa is a middle case, where central bank liquidity remained steady.

Figure 3: Central bank liquidity before and after Covid shock in three emerging markets



The actions of these countries' central banks also are in sharp contrast regarding their interactions with the IMF. According to the IMF's Covid lending tracker, Thailand did not borrow any funds from the IMF, Ghana borrowed quickly and heavily, accessing a USD 1 bn Rapid Credit Facility on April 13, 2020, while South Africa negotiated a USD 4.3 bn Rapid Financing Instrument on July 20, 2020.[20] In the case of Ghana, this amount totaled 200 percent of its quota while for South Africa borrowing amounted to a more modest 100 percent of its quota. These diverging cases motivate our event study, which hypothesizes that following the March 2020 shutdown, countries that decided to forego IMF assistance had a stronger LLR response.

The event study follows the design of Gavin (2020). Central bank liquidity is measured as the level of central bank claims on the state's banking sector relative to the deposit base of the banking

[20] Information on country borrowings during the pandemic are available at https://www.imf.org/en/Topics/imf-and-covid19/COVID-Lending-Tracker.

sector. Data comes from the International Financial Statistics. Our dependent variable is a measure of "abnormal" central bank liquidity and is constructed in three steps. First, for each country *i*, we calculate the average level of central bank liquidity in the twelve month period prior to the shutdown of March 2020. Second, we project these country-specific averages into the event window, which is the twelve-month period between April 2020 and March 2021. As is common in event studies of this type, these projections are a counterfactual estimate what central bank liquidity would have been were it not for the March 2020 shutdown. Third, we subtract actual central bank liquidity from projected central bank liquidity for each month in the event window to derive our estimate of abnormal central bank liquidity. Using this design, our measure of abnormal liquidity is therefore an estimate of the liquidity assistance provided by central banks that can be attributed to the Covid shutdown. Our main independent variables are the variables *LLR powers* and *Borrowing capacity from IMF* and our observations are country-month.

Table 3: Abnormal liquidity during the Covid crisis by LLR powers and IMF purchases

	LLR powers (quartiles)				
IMF purchases	1	2	3	4	Mean
No	1.37	3.79	-0.37	2.97	1.68
	(106)	(53)	(57)	(30)	(246)
Yes	-0.68	0.75	0.76	-0.80	0.26
	(65)	(84)	(51)	(6)	(206)

Notes: The top number in each cell is the mean level of abnormal liquidity across all months in the event window, for each combination of IMF purchases and LLR powers. The lower number, in parentheses, is the number of observations.

Descriptive data in Table 3 show that countries that did not draw on IMF facilities provided far larger abnormal liquidity injections than those which did. On average, central banks in non-borrowers increased their claims on the banking sector by 1.68 percent of the total deposit base. This compares to just 0.26 percent for IMF borrowers. This pattern holds across almost every quartile of LLR powers: in the lowest quartile, non-borrowers delivered 1.37 percent versus –0.68 percent; in the second quartile, 3.79 percent versus 0.75 percent; and in the highest quartile, the relatively small number of observations notwithstanding, 2.97 percent versus –0.80 percent. While the middle quartile shows a slight reversal (–0.37 percent for non-borrowers against 0.76 percent for borrowers), it represents a minor deviation in an otherwise consistent trend. Overall, to address the Covid shock,

countries that shunned IMF purchases expanded central-bank liquidity substantially more relative to their peers that did borrow from the IMF, reinforcing the idea that robust domestic LLR responses can substitute for IMF support.

The regression analysis in Table 4 confirms the cross-tabulation insights from Table 3, where we see across the first row that stronger LLR powers resulted in higher levels of abnormal liquidity during the early days of the Covid crisis. Importantly, these results hold with and without controls. Also as expected, in models (2), (3), and (4) countries that drew on the IMF saw lower levels of abnormal liquidity.

Table 4: LLR, IMF purchases, and abnormal liquidity during the Covid crisis

	(1)	(2)	(3)	(4)
LLR powers	0.076**		0.072**	0.401***
	(0.031)		(0.030)	(0.051)
IMF purchases (dummy)		-0.108**	-0.328***	-1.104***
		(0.054)	(0.088)	(0.164)
Reserves (months imports)				-0.813***
				(0.074)
Domestic credit to private sector (% GDP)				0.994***
				(0.165)
GDP per capita				-1.900***
				(0.315)
Democracy				0.387***
				(0.093)
Inflation (log)				2.410***
				(0.556)
Central bank independence				0.722***
				(0.167)
Constant	-0.090**	0.058	0.061	0.648***
	(0.045)	(0.037)	(0.064)	(0.110)
R^2	0.01	0.00	0.04	0.71
Observations	452	1321	452	189
Countries	51	112	51	21

Notes: Dependent variable: *Abnormal liquidity*. In models (1) through (4) *LLR powers* is measured using principal components analysis. All variables, except the IMF purchases dummy have been standardized to a mean of 0 and standard deviation of 1. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Our empirical results explain why emerging and developing economies made surprisingly limited use of the IMF's crisis facility despite immense liquidity needs. The patterns in Table 3 and the regression estimates in Table 4 show that countries with stronger LLR powers had greater capabilities to stabilize their markets via abnormal liquidity injections, which, in the end, effectively pre-empted many from needing recourse to high levels of IMF financing. This suggests that, all else equal, governments will avoid IMF programs when their domestic monetary frameworks are sufficiently robust. In this way, the choice to tap Fund resources during a crisis reflects decades of political decisions over institutional design and preparedness, rather than being driven solely by particular economic contexts.

3.6 Robustness checks

In the Online Appendix, we show that our findings hold across a range of robustness checks, including a shift-share IV strategy addressing potential endogeneity, dynamic specifications, and both more and less restrictive definitions of IMF resources (Table A1).

To addresses the concern that a country's borrowing capacity from the IMF may be simultaneously determined with LLR capabilities, measured with error, or correlated with other characteristics of a country that also affect the institutional properties of its central bank, we adopt a shift-share instrumental variables strategy (Bartik 1991). We instrument for external liabilities in emerging and developing economies by interacting the share of each countries' external liabilities to total world external liabilities with the monetary policy rate in the United States. Model A1 confirms that endogeneity is not driving our results.

Regarding dynamic specifications,[21] our results also hold when we include a lagged dependent variable Model (A2), and when use panel-corrected standard errors that assumes standard errors are heteroskedastic, contemporaneously correlated across panels, and follow a panel-specific AR(1)

[21] Stata's *xtistest* command (Wursten 2018), with a null hypothesis of "no autocorrelation" to test Model 1 has a p-value of 0.014, indicating that we can reject the null hypothesis at the 5% level. The corresponding p-values for models (2), (3) and (5) are 0.069, 0.060 and 0.060. For Model (4), the N is too small to conduct a reliable test. While the evidence is mixed on the presence of surplus autocorrelation, out of an abundance of caution, we model dynamics more directly as robustness check.

process, following Beck and Katz (1995) (Model A3). Our results are also robust to defining the IMF's lending capacity in more restrictive (only accounting for the Forward Commitment Capacity, Model (A4)) and expansive ways (including all IMF Usable Resources, Model (A5)). Finally, we test whether the effect we attribute to our main independent variable, the ratio between potential available lending from the IMF over the stock of external liabilities, is driven by either of its components.[22] We re-estimate the models replacing *Borrowing capacity from IMF* with its components and find that neither *Quota share*, nor *Total external liabilities* is significantly associated with lender of last resort powers. This provides additional support to our claim that it is the size of IMF lending given potential crises costs that incentivizes countries to strengthen their lender of last resort powers, and not merely financial globalization. See Tables A2 and A3 in the Online Appendix.[23]

Our theory suggests that enhancing lender of last resort powers originates, in part, from declining prospects of financial support from the IMF. This is in contrast with the logic generally used to explain reforms to other aspects of central bank governance, such as central bank independence and transparency (Bodea and Hicks 2015; Cukierman 1992; Maxfield 1997). However, given that worldwide, central bank reforms have addressed all three dimensions,[24] it is important to show the plausibility of a differing logic informing these reforms. According to our argument, a state's borrowing capacity from the IMF should have no discernible effect on its level of central bank independence or transparency. Consequently, we also conduct several placebo tests (Eggers, Tuñón, and Dafoe 2024) by replacing *LLR powers* with measures of central bank independence (Garriga 2025) and transparency (Dincer and Eichengreen 2014). These models (Table A4) and panel local projections (Jordà 2005) (Figure A1) show that only *LLR powers* and not independence or transparency are increased following negative shocks to IMF borrowing access.

[22] We thank XXXX for this suggestion.

[23] We obtain the same results including if we include both variables *Quota share* and *Total external liabilities* together in the same models.

[24] Notice however that the levels of *LLR powers* are far from perfectly correlated with *Central bank independence* or *Central bank transparency* at the individual level.

4. Conclusions

The politics governing the powers and functions of central banks involves a complex amalgam of international and domestic forces. Important research shows how international markets and institutions have influenced central bank governance, especially in emerging and developing countries. In this paper, we focus on how the IMF may unintentionally influence an important aspect of central bank governance: the extent of lending of last resort powers granted to central banks in emerging and developing economies.

Our analysis shows that the relatively slow growth in the IMF's lending capacity relative to the pace of financial globalization has a subtle, but nevertheless significant, effect on how emerging and developing economies shape their domestic safety nets. When the IMF's resources grow slowly relative to countries' external liabilities, governments respond by expanding their central banks' powers to act as a lender of last resort. In this respect, we argue that the IMF is exercising influence by omission. This pattern holds across a variety of model specifications, alternative variable definitions and instrumental-variable and dynamic estimations, confirming that access to IMF resources and the design of LLR capabilities are linked. Additionally, we do not find the same linkage with other aspects of central bank governance, such as central bank independence and transparency. The event study of the Covid shutdowns makes clear that many emerging and developing country central banks are increasingly able to manage financial shocks without recourse to a large IMF package. Specifically, we find that countries with stronger LLR powers were able to inject larger amounts of emergency liquidity without drawing heavily on the IMF, while those with weaker LLR powers turned to the IMF more readily. Patterns of crisis management therefore are not merely a matter of economic criteria, but of long-standing political and institutional choices.

By highlighting the IMF's influence by omission, our findings extend the literature on international institutions beyond the familiar role of conditionality and policy advice. Given that the relative stature of the IMF itself shapes domestic reform incentives, this effect holds even in countries that never enter an IMF program. Finally, our study underscores the importance of looking beyond standard central-bank governance indicators, such as independence and transparency. The ability of central banks to act, and not merely their autonomy to do so, is enshrined in legislation and these powers play a crucial role in states manage exposure to economic shocks.

Our findings open new avenues for research. Our research can be extended to other components of the global financial safety net and integrate domestic reforms with the choice in foreign exchange reserves composition, central banks swap lines or regional financial agreements. More broadly, further research can explore whether our expectations extend to other international institutions that are experiencing changes in their stature or resources. In particular, whether we observe similar dynamics in international organizations such as the North Atlantic Treaty Organization, or the World Trade Organization, and self-insurance reforms in member and non-member states. Furthermore, this paper's original data, a codification of central banks' lender of last resort powers and a time-variant country-specific measure of country borrowing capacity from the IMF, highlight that central bank lending capabilities vary significantly over time and space. This variation may also respond to additional factors that exceed our analysis, such as domestic political dynamics or different forms of international diffusion (Elkins and Simmons 2005; Solingen 2012). Our data on lender of last resort powers will also facilitate further study of the domestic determinants of lender of last resort powers, and of the consequences of variance of these powers on financial stability, borrowing behavior, and market reactions to different configurations of central bank governance.

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