Coordinated Financial Crisis Resolution*

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Abstract

When debtor countries are in financial distress, exposed creditors face a dilemma. Even though they want to lend more to the debtor to minimize losses on their existing claims, they fear that their efforts alone are insufficient to prevent default of the debtor country. Why then do creditors increase their exposure to distressed debtor countries if they lack the capacity to close the financing gap individually? Whereas previous work has analyzed creditors' lending decisions in isolation from each other, we argue that creditors' lending decisions are inherently interdependent. The potential for significant losses across creditor groups provides incentives for informal coordination to address these concerns. If other creditors are willing to coordinate, the perceived risks of lending decline. Creditors become less concerned that they will lose their existing claims. As a consequence, individual creditor's decisions to provide loans or debt relief are conditioned not only on their own exposure to the debtor, but also on the likelihood that the debtor receives support from other sources. We use a stochastic actor-oriented model to analyze how networks of financial rescue strategies of four central creditor groups to over 100 debtor countries co-evolve between 1990 and 2010. We find that creditors' decisions to offer financial support depend on the decisions of other creditors. They highlight that informal coordination across creditor groups plays a central role in international financial rescues.

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When the delegates of 44 nations met at Bretton Woods in July of 1944 to set up new rules for the global financial architecture post-World War II, the main goal was to help rebuild the shattered postwar economy and to promote international economic cooperation. Proponents of the new institutions felt that global economic and monetary cooperation was necessary to maintain international peace and security.[1] A key element of the system was the International Monetary Fund (IMF), which would have the responsibility and resources to restore balance to the borrowers' international payments. The prevailing vision was that IMF would lend resources to countries in crisis, enabling them to make payments on at least their short-term debt. The financial reprieve would allow the country in crisis to implement necessary macroeconomic reforms in order to restore the confidence of foreign investors.[2] The ability of the IMF to prevent financial crises from happening (or resolving them quickly) was considered perhaps the most important strategy to protect against the economic and political consequences of another Great Depression.

The surge in the volume of financial flows and the number and type of creditors during the 1970s made financial crisis resolution both more complex and too onerous for the IMF to handle alone. Debtors now have to negotiate with multiple creditors from the private sector (i.e., private financial institutions and individual bondholders) and the official sector (i.e., official bilateral lenders, multilateral institutions, and central banks).[3] For creditors, the explosion in financial lending presents a formidable challenge. For creditors that are already exposed to a debtor country, a failure to continue lending may provoke a default and the loss of existing claims. For this reason, exposed creditors should have strong incentives to offer crisis lending, even at an expected loss, if this lending averts an immediate default and if the expected loss does not exceed the gain of no default (Krugman, 1985, 88). The challenge is that no creditor is able to close the financing gap unilaterally. As a consequence, even if lending occurs the debtor might still default and the creditor would loose not only its existing claims but also the new claims it incurred in order to prevent the default. Since the expected gains from crisis lending are not likely to exceed the costs, creditors may shy away from crisis lending in the first place. Since the financing gap cannot be closed unilaterally, the effectiveness of individual bail-ins or bail-outs, and therefore the willingness of creditors to lend to distressed debtors, depends in large parts on whether other creditors decide to continue lending. Yet, analyses to understand why and how financial rescues occur, and whether they are effective, have focused almost exclusively on individual creditor decisions with-

[1] In his opening speech at the Bretton Woods conference, Henry Morganthau said the "bewilderment and bitterness" resulting from the Great Depression became "the breeders of fascism, and finally, of war."

[2] That is, the IMF assumed a number of lender of last resort functions (Bagehot, 1873). In addition, the IMF loan was supposed to act as an immediate catalyst for other investments by signalling that policy reform would be undertaken (Boughton, 2000, 274). Whether the catalytic approach is effective has been subject to intense academic debate (Bauer, Cruz and Graham, 2012).

[3] The IMF, World Bank, regional development banks, G-7, Group of Ten, and the group of bilateral creditors that meet in the Paris Club are collectively known as the official sector.

out taking into account the interaction between them. Despite the importance of effective coordination for international financial stability we know little about how the decisions of creditors affect each other in the resolutions of financial crises.[4]

This paper focuses on international coordination during financial crisis resolution. Even though creditors shy away from developing rigid rules about coordination to reduce expectations of large-scale bailouts for systemically important countries, their lending decisions are informally coordinated to protect against crisis contagion and to ensure international financial stability. We argue that decisions both within and across creditor groups are mutually reinforcing. In times of debtor distress, exposed creditors want to prevent a default of the debtor through additional lending, but also worry that the loans may not be sufficient to prevent the country's default, which would further increase their losses. Even if creditors have a strong preference for resolving the crisis, they may shy away from offering support if it would be insufficient to close the financing gap. Informal coordination with other creditors can minimize the risks of ineffective crisis resolution. If other creditors participate in the rescue effort, the creditors' perceived risks of lending decline and their expectations to recover not only new claims but also existing claims increases. It is therefore in the *collective* interests of exposed creditors to lend to a debtor to avert immediate default. When creditors coordinate, each one becomes more willing to provide additional loans or to restructure existing ones. The IMF plays a central role because its unique ability to impose and monitor policy conditionality provides important signals to other creditor groups. The more stringent the IMF conditionality, the more willing other creditors are to lend to the debtor state.

To test the empirical implications of our argument, we analyze the extent to which bail-ins and bail-outs of the IMF, bilateral official creditor governments, the Paris Club, and the London Club are coordinated and mutually reinforcing.[5] Drawing from recent empirical work on international trade, alliances and defense cooperation networks,[6] we use a stochastic actor-oriented model (SAOM) to model the co-evolution of the decisions of these four creditor groups to lend

[4]The literature on catalytic financing has discussed the ability of IMF loans to lead to more private financial flows usually through so-called voluntary bail-ins (Corsetti, Guimaraes and Roubini, 2003; Roubini and Setser, 2004; Cottarelli and Giannini, 2003; van der Veer and de Jong, 2008), but little work has tried to understand the explicitly negotiations and discussions that occur across creditor groups during times of financial need. The work on private creditors and the IMF by Gould (2003, 2006) is an important exception. See also Bunte (2019) and Arias, Mosley and Rosendorff (2020) who analyse the demand for different types of creditors and debt instruments by debtor countries. In addition, the choice of instruments has important implications for governments' policy-making autonomy and financial stability within debtor countries (Mosley, 2003; Stone, 2008; Ballard-Rosa, 2020).

[5]Historically, these four groups have arguably been the main actors during crisis solution. In this paper, we focus on those actors as there is a limitation to the number of networks we can analyze in the SAOM framework given the relative rarity of rescues across the network (1,291 instances out of 416,176 total possible dyads). We will discuss additional creditor groups in the empirical section.

[6]See, for example, Manger, Pickup and Snijders (2012); Warren (2010, 2016); Kinne (2013, 2016); Chyzh (2016); Kinne and Bunte (2018).

to over 100 debtor countries in the time period of 1990 to 2010. The network approach allows us to analyze whether the decisions of each creditor group are affected by the lending decisions of other creditor groups while controlling for within network effects that have been shown to matter in previous work on individual creditor groups. We find that the decisions of bilateral official creditors, the IMF, the London Club and the Paris Club members are mutually dependent, and reinforcing. Receiving a loan from one creditor group significantly increases the likelihood of receiving loans from other creditors as well. IMF conditionality also serves as important credibility mechanism to reduce the expected risks of financial rescues from other creditor groups.[7]

The findings shed light on the complex nature of international cooperation during financial crises. The resolution of financial crises involves decisions over a large number of financial instruments, including IMF and official bilateral lending, sovereign debt restructuring and rescheduling through the Paris Club and other informal channels, swap agreements, and private sector involvement. Much scholarship has analyzed the causes of IMF loans and its conditionality,[8] and there is an increasing academic interest in understanding the politics of sovereign debt restructuring, private sector involvement, and official bilateral loans.[9] Our paper builds on these insights but analyzes the coordination between different creditor groups and instruments during financial crisis resolution.[10] The strong findings that coordinated rescues are positively reinforcing are particularly interesting in light of the mixed and conditional evidence for catalytic lending.

The implications go beyond the study of coordinated financial rescues. Coordination to provide international public goods almost invariably involves numerous actors and strategies. For example, efforts to support sustainable economic development involves bilateral and multilateral official donors, non-governmental organizations and other private actors. Donors can also pursue various strategies ranging from the provision of foreign aid to technical assistance, to trade policies.[11] Attempts to address civil conflict could involve military interventions, economic or political sanctions, diplomacy, and other means, provided by both bilateral, regional, and multilateral entities. But even though cooperation

[7] In the appendix, we further discuss the prevalence of free-riding incentives across creditor groups and show that while incentives of free riding exist when it comes to sharing the burden of the rescue, they tend to not loom as large as one might expect in an environment where little formal enforcement mechanisms exist.

[8] For example, Thacker (1999); Vreeland (1999, 2007); Stone (2002, 2008, 2011); Dreher (2009); Dreher, Sturm and Vreeland (2009); Copelovitch (2010*a*,*b*); Caraway, Rickard and Anner (2012); Rickard and Caraway (2014).

[9] See, among others, Gould (2003, 2006); Depetris and Kraay (2007); Dobbie and Song (2015); Reinhart and Trebesch (2016); Cheng, Diaz-Cassou and Erce (2016); Schneider and Slantchev (2018); McDowell (2017); Schneider (2019); Schneider and Tobin (2020); Leblang, Schneider and Tobin (2019); Ferry (2019); Vaughn (2019); Bon and Cheng (2020).

[10] Gould (2003, 2006) studies how the increasing reliance of the IMF on private creditors has affected their influence on IMF conditionality. The study provides an very important starting point for our theoretical analysis of the mutual coordination of creditor types.

[11] Scholars who focus on official development aid have even started to analyze coordination efforts (Aldasoro, Nunnenkamp and Thiele, 2010; Knack and Rahman, 2007; Steinwand, 2015).

and coordination across actors and the use of different strategies appears essential in international cooperation, and strategies are often highly contingent on each other, we know very little about how actors and their decisions affect each other.

The Rationale for Coordination in Lending

The following discussion is primarily intended to provide basic definitions and motivate the main assumptions of our theory by substantiating three major claims. First, even though the IMF is a central actor in international financial crisis resolution its resources are not sufficient to resolve any given financial crisis unilaterally. Second, the surge in international financial flows and the proliferation of creditors has increased demands for coordinated financial rescues. Third, several attempts since the 1980s to develop more formal coordination mechanisms have largely failed both for ideological and practical reasons.

Many countries have experienced financial crises (Reinhart and Rogoff, 2009; Valencia and Laeven, 2012). These crises have one common feature: the demand for foreign currency surges while creditors' willingness to provide access to this foreign currency that the debtor country desperately needs plunges.[12] This parallel surge in demand and fall in supply typically leads to a gap between the foreign exchange a country has (or is expected to raise) and what it needs to raise from creditors in order to cover its current account deficit, pay its maturing debts, arrears, accumulation of net international reserves, and IMF loans (Roubini and Setser, 2004, 119). The economic effects are profound. Financial crises lead to a large drop in economic activity, to collapses in housing, asset, and equity prices, and explosions of unemployment and government debt (Reinhart and Rogoff, 2009, 224).[13] Beyond their effects on domestic markets, the integration of financial markets and economic interdependence fuels crisis contagion, and the effects of these crises on global economic activity have been "breathtaking" (Reinhart and Rogoff, 2009, 225).

Effective crisis resolution is key to avoiding potential financial calamities that would affect debtors and creditors alike. Measures to close the external financing gap include domestic policy adjustments, exceptional liquidity provision by external actors (so-called bailouts), or a restructuring of official and private debts (so-called bail-ins).[14] *Domestic policy adjustments* typically involve a change in the exchange rate regime or macroeconomic policy reforms to address the

[12] In fact, creditors usually try to minimize their future exposure by withdrawing their loans rather than lending more money. The reasons for the increase in the demand for foreign currency that marks a financial crisis vary across countries and affect the country's ability to emerge from it (Roubini and Setser, 2004, 17).

[13] These crises are also likely to affect sovereign debt markets (Brooks and Kurtz, 2012; Brooks, Cunha and Mosley, 2015).

[14] Closely related, and oftentimes a consequence of other crisis resolution elements, are attempts to attract new sources of private financing, such as foreign direct investment or the return of flight capital (Rieffel, 2003, 77-78).

major economic imbalances that gave rise to the crisis.[15] But even if governments in debtor countries are committed to reducing current account deficits by adjusting domestic policies and accepting painful (and politically costly) economic contractions, these measures are rarely sufficient to calm domestic and foreign investors who continue to withdraw their capital instead of rolling over their short-term claims on the country (Frankel and Roubini, 2001; Corsetti, Guimaraes and Roubini, 2003). A *bailout* is a strategy to provide enough liquidity to the debtor country to make payments on at least those loans that are maturing immediately. Exceptional financing usually comes in the form of loans or grants from multilateral and bilateral creditor agencies.[16] Bailouts can help stop liquidity runs by restoring the confidence of investors. Even if bailouts are not sufficient to close the financing gap, they give the debtor some financial reprieve, which allows it to implement macroeconomic policy adjustments to regain access to financial markets in the medium term. Debt-restructuring, or a *bail-in*, allows debtors to roll over or re-schedule maturing loans held by the government or domestic banks.

The global financial architecture that arose from the ashes of World War II incorporates all three core elements of crisis resolution as an effort to increase international financial stability. The International Monetary Fund (IMF) emerged as a a central actor and coordinator. It provides loans to its member countries to restore their balance of payments while at the same time minimizing the risk of moral hazard by limiting the size of the loans and requiring macroeconomic policy adjustments (Vreeland, 2007; Dreher, 2009; Dreher and Walter, 2010). The underlying idea is that an IMF program would restrain investors long enough for the debtor to make the necessary adjustments to restore its finances. In addition, participation in an IMF program would serve as a credible signal to private investors that a country has sound financial institutions and follows sensible policies, or at least that such policy adjustments are forthcoming. This "stamp of approval" (Rodrik, 1995) or "good housekeeping seal of approval" (Bordo, Mody and Oomes, 2004), and the expectation that the IMF will monitor and enforce a debtor country's policies (Tirole, 2002) should serve as a catalyst for further investment from other actors, including voluntary debt restructurings with private creditors or more foreign direct investment (Vreeland, 2003; Jensen, 2004; Bauer, Cruz and Graham, 2012).

Theoretically straightforward, the approach has one major caveat. The loan can only be effective in reassuring creditors if it is sufficiently large to cover all of the debtor's short-term liabilities.[17] This condition has been one major

[15] When global or regional financial liquidity is low, governments in crisis are much less capable of issuing debt in primary capital markets because investors pay more attention to political risk (Ballard-Rosa, Mosley and Wellhausen, 2019). This further deepens the influence of financial market considerations on governments' policy autonomy and makes already bad matters worse (Mosley, 2000).

[16] We use the terms "bailout" and "rescue loan" interchangeably even though they have had different connotations in the public use.

[17] This idea follows the well-known argument by Bagehot (1873) that emergency liquidity support, to be effective, must in principle be unlimited.

obstacle to the success of the catalytic lending approach.[18] As financial crises have become more common, and virulent, the IMF's resource constraints have limited its ability to resolve financial crises independently.[19] By design, the IMF is ill-equipped to fill the external financing gaps of crisis countries especially during liquidity crises; its financial resources in relation to cross border capital flows have even declined over the last two decades and its crisis response is slower than what is needed to protect countries against a sudden run and potential contagion to other countries (McDowell, 2017, 30f.).[20] When the IMF does step in, the size of the loans are typically just enough to cover "the most obvious sources of payment difficulties" (Roubini and Setser, 2004, 19). In 1995, the IMF approved a loan for Mexico of up to approximately $17.8 billion, which was the largest-ever loan approved by the IMF at the time, both in terms of amount and overall quota (about 688.4%) (IMF, 1995). Still, the amount was insufficient to address Mexico's financing gap adequately. Experts estimated that Mexico would have needed at least $50 billion in order to satisfy just the portion of debt that was maturing in the near term. This was more than double what the IMF *de facto* provided. Similarly, the IMF loan of $30 billion to the Greek government in 2010 was the largest loan in the IMF's history, but still not sufficient to address Greece's financing gap. In both cases, the IMF relied on support from other private and official creditors.

These challenges became apparent in the late 1970s. The poor economic performance of industrialized and industrializing countries in the 1970s combined with pressure to liberalize macroeconomic policies such as floating exchange rates as well as sharp increases in oil prices led to a significant expansion of international private credit markets, and a shift of creditors from the developed to the developing world (Lipson, 1981; Cohen, 1982). Many developing countries borrowed heavily from private creditors during this period, and commercial banks, faced with declining demands in developed markets, were more than willing to supply the loans. When these countries first began to exhibit financial distress in the late 1970s and early 1980s, they turned to the IMF for help, which was now confronted not only with much higher demands for liquidity for troubled economies but also with a greater number of more diverse types of creditors (some of them with little incentives to help the countries in need).

As the IMF's former historian, James Boughton, put it: the "singlest greatest problem faced by the Fund in the 1980s was to garner the financial resources

[18] The empirical evidence on a catalytic effect is weak (see 4). For this reason, many observers have called for more coercive forms of PSI.

[19] Under the Stand-By Arrangements—the IMF's workhorse lending instrument—a debtor country can request up to 145% of its quota annually and 435% cumulatively (access may be somewhat higher in exceptional circumstances). A country's IMF quota is a weighted average of GDP (50%), openness (30%), economic variability (15%), and international reserves (5%). For a recent discussion of these issues, see McDowell (2017, Chapter 2). The Meltzer Commission also discusses the limits of IMF financing as a central concern in their recommendations for IMF reform (International Financial Institution Advisory Commission, 2000).

[20] Problems mount when countries face solvency crises. Solvency crises do not require large amounts of liquidity to solve, but are problematic for the IMF because of the risk of default (on even IMF loans) and the low likelihood that the country will be able to make the necessary policy adjustments.

to meet the demand for its services" (Boughton, 2001, 44). Even though the member countries agreed to increase IMF quotas three times in the period that immediately followed (in 1980, 1983, and 1990), these reforms were not sufficient to equip the IMF with sufficient resources to address future crises. The IMF increasingly had to rely on supplementary financiers to help ensure the success of its loan programs (Gould, 2003, 555). Jacques Polak, former director of research and a former executive director of the IMF, noted early on:

> "Traditionally, a key component of any Fund arrangement was that the resources provided by the Fund together with those from the World Bank, aid donors, commercial banks, and other sources, would cover the country's projected balance-of-payments gap. In the absence of an integral financing package, the Fund could not be confident that the degree of adjustment negotiated with the country would be sufficient. To this end the Fund sought financial assurances from other suppliers of financial assistance."[21]

The actors that participate in these crisis resolution efforts are diverse, ranging from bilateral and multilateral official creditors to private creditors. The main creditor groups include official multilateral creditors (the IMF, the World Bank, or the Bank of International Settlements) who provide bailouts, official bilateral creditors who provide bailouts (usually but not exclusively the G-7 countries) and bail-ins (usually, but not exclusively through the Paris Club), and private creditors (including mainly commercial banks and bondholders) who negotiate private debt-restructuring of commercial or bond debt (often through Bank Advisory Committees, commonly known as the London Club).[22]

During a typical financial crisis, crisis resolution is coordinated by a combination of these creditor groups. The Brady Plan of the 1980s was an early attempt to coordinate across different groups. It called on the IMF, the World Bank, the United States and other official creditor countries to cooperate with commercial bank creditors to reduce the debt of crisis countries in the developing world. During the Mexican Peso crisis in 1994/95, international cooperation on a financial rescue package included the IMF (U.S.$ 18 billion), the U.S. government (U.S.$ 20 billion), a coalition of Latin American countries (U.S.$ 1 billion), Canada (U.S.$ 1 billion), and private commercial banks (U.S.$ 3 billion). Crisis resolution for Brazil in 1998 included support from the IMF (U.S. $18 billion), bilateral official creditors (especially from Japan), and multilateral development banks. The second financial rescue package for Greece in 2012 involved the IMF (€19.8 billion), European countries (€144.7 billion via the EFSF), as well as a large consortium of private commercial banks (which accepted a 50% write-off part of Greece's debt). And the financial package for Ireland in 2010 was

[21] Cited in Gould (2006, 6).

[22] The Paris Club members are the governments of the largest economies in the world, which come together on a case-by-case basis to discuss debt restructuring or debt relief of states in financial crisis. The London Club members are private commercial banks, which also come together on a case-by-case basis to discuss debt restructuring or debt relief.

cobbled together by the IMF (€23 billion), the European Financial Stability Facility (€23 billion), the National Pension Reserve Fund (€18 billion) and other bilateral creditors such as the United Kingdom, Denmark, and Sweden.[23]

Even though coordination appears essential for sustainable crisis resolution, creditors have developed remarkably few formal coordination mechanisms, norms, and enforcement capacities. This is not for the lack of trying. The main obstacles to a formalization of coordinated crisis resolution are ideological differences and moral hazard concerns. Most official creditors have shied away from a formalization of crisis resolution in fear of moral hazard. Clear expectations for bailouts and bail-ins could make debtors less likely to take their promises to repay seriously and creditors more willing to pursue risky lending and investment strategies, thereby increasing the likelihood of future financial instability. For example, the bailout to Mexico in 1995 was sharply criticized for "bailing out" private creditors and thereby creating an incentive for more imprudent lending in the future. At the same time, clear expectation of a no-bailout would obliterate any hope for debtors to stabilize. Many decision-makers have therefore strategically refrained from developing rigid rules around the participation and responsibilities of these various actors.[24]

Beyond moral hazard concerns, official creditors have ideological differences about the involvement of the private sector, and its formalization. Even though the Brady Plan called for collective action between official and private creditors early on, it was the large-scale IMF bailout to Mexico in 1995 that initiated a wave of discussions about the coordination across various creditor groups, and a more serious involvement of the private sector (PSI). It was also the Mexican bailout that showcased the ideological differences amongst official creditors (Roubini and Setser, 2004, 187). Whereas the U.S. supported large-scale financial support for illiquid (but not insolvent) countries, it did not support a more coercive approach to private sector involvement. European creditors, on the other hand, opposed massive unconditional liquidity provision. These ideological differences resulted in an ambivalent approach toward formalized coordination.[25]

Despite attempts and informal agreement on some issues, no clear policy was ever developed (Rieffel, 2003).[26] To this day few formalized mechanisms exist to ensure coordination across creditor groups. A notable exception is the Paris Club's requirement that the debtor country negotiates an IMF program before it restructures official debt.[27] Furthermore, one of its key principles is

[23] https://www.theguardian.com/business/ireland-business-blog-with-lisa-ocarroll/2010/nov/28/ireland-bailout-full-government-statement, last accessed: September 2019.

[24] We will discuss the exceptions below.

[25] For example the Cologne G-7 Communiqué from 1999 emphasized the importance to involve private creditors into crisis resolution efforts, but left open the possibility of large-scale IMF bailouts, especially if the country had not intervened too much to defend a fixed exchange rate.

[26] George W. Bush's action plan in 2002 (which emphasized the need for collective action clauses) or discussions within the IMF about the establishment of a formal Sovereign Debt Restructuring Mechanism are two examples of failed attempts to formalize clear policy.

[27] The Paris Club has concluded several agreements with countries that were not IMF mem-

the "Comparability of Treatment Clause", which calls for equal burden-sharing across all groups, including private creditors as well as official creditors who are not members of the Paris Club. But even those formalized attempts do not offer clear expectations, and are subject to much contention across creditor groups. Establishing comparability is extremely challenging, and in practice, the Paris Club often focuses on establishing that some progress in private negotiations has been made (Sturzenegger and Zettelmeyer, 2007, 141).[28] Most other attempts at enforcing collective action are *ad hoc*. For example, the IMF has repeatedly conditioned its support on the ability of crisis countries to seek private or official debt restructuring deals. In 1982, the IMF conditioned its support on the ability of private creditors to provide new loans for Mexico and get a "critical mass" of a minimum of 80% of the over 600 exposed banks to agree to participate (Rhodes, 2011, 212).

Coordinated Financial Crisis Resolution

We build on historical evidence and existing theories of international lending to develop a theory about internationally coordinated financial crisis resolution. We argue that creditors' lending decisions are inherently interdependent. The potential for significant losses across creditor groups provides incentives for informal coordination to address these concerns. If other creditors are willing coordinate, the perceived risks of lending decline. Creditors become less concerned that they will lose their existing claims. As a consequence, individual creditor's decisions to provide loans or debt relief are conditioned not only on their own exposure to the debtor, but also on the likelihood that the debtor receives support from other sources.

When the IMF or a finance minister from one of the G-7 receives a phone call from a finance minister to let them know that the country is rapidly running out of foreign reserves, and that it cannot get additional loans from the international capital market to serve the maturing claims, this usually has serious financial and economic consequences for private and public creditors that are exposed to that country. In these situations, without a large influx of capital, the country is likely to default on its debt (Roubini and Setser, 2004, 1). In the case of default, creditors who hold maturing claims lose the principal and interest owed by the defaulting country; the potential losses are tremendous. While a few creditors get paid in full, and a few investors can sell their local currency for a foreign currency at a better price, the run on foreign reserves will likely require other creditors to take significant losses in the subsequent debt restructuring. For example, in 2001 Argentina defaulted on $132 billion in loans, resulting in serious financial losses for its creditors.

bers or did not satisfy the precondition of having an IMF loan. For example, Venezuela did not need IMF liquidity, but agreed on enhanced surveillance by the IMF. Other examples are deals with Colombia, Yugoslavia, and Cuba (Rieffel, 2003, 159).

[28]The clause has also led to significant debate about its positive (or negative) effects. For example, van der Veer and de Jong (2008) show that the clause can have both positive and negative effects on future capital flows.

When considering whether to offer new loans, negotiate haircuts or other measures to grant the debtor states financial reprieve, creditors face a dilemma. Exposed creditors have incentives to offer liquidity to help the debtor state serve its short-term debt because they worry about losing their existing claims in the case of default. However, if they expect that these new or renewed loans would not have a calming effect on financial markets and prevent default, they could face even larger financial losses. Unless massive liquidity is committed, there is a great deal of uncertainty around the effectiveness of crisis resolution. And at least since the 1980s, creditors have not been able to provide the necessary liquidity individually. Instead of providing new loans, creditors could try to protect their assets by withdrawing loans that mature (instead of rolling over the claims) and by increasing interest rates on new loans. While this option is more costly to those creditors who hold claims that do not mature immediately–and are very unlikely to be paid back if there is a run on the country's foreign reserves–creditors may choose this option if they believe that other creditors will do the same. To minimize their losses, each creditor has an incentive to exit while other creditors roll over their claims or provide additional liquidity. By calling maturing loans, creditors decrease their exposure and the potential effect a default would have on their losses.

Even though the incentives to exit are strong, creditors know that if all creditors were to exit, the results could be catastrophic, and therefore, have a collective interest in avoiding this outcome. Collective action can lead to support that is sufficient to avert a subsequent default. In a situation where lack of collective action leads to catastrophic outcomes for both debtor and creditors, creditors strongly prefer to coordinate and their individual decisions depend on the decisions of other exposed creditors.

Despite the lack of formal coordination and enforcement mechanisms, creditors can rely on informal coordination, which is facilitated because actors across creditor groups overlap. Within the official sector, the G-7 countries are the main players that tend to participate in Paris Club negotiations, have the most votes on the IMF Executive Board, and are also in a position to offer large-scale financial support. Being represented in virtually all official creditor groups allows official creditors to provide and receive more information about the intent of other creditors; and it generates opportunities for coordination. The G-7 finance ministers meet regularly, at least twice and up to four times a year in stand-alone meetings (plus informal meetings at the sidelines of other meetings). When countries experience financial crises, the finance ministers of the G-7 countries are in constant contact to discuss and coordinate their strategies. The G-7 are at the center of crisis resolution. They discuss the amounts and forms of official support as well as alternative strategies with other creditor groups to adopt and implement coordinated crisis resolution approaches. There is significant overlap at the administrative level as well. For example, the G-7 finance ministers have appointed deputies who meet in advance of the official meetings to discuss the most sensitive issues. These deputies are in contact with each other on an almost daily basis (Rieffel, 2003, 26). Many of them have experience across institutions. Two Paris Club chairmen, Jacques de Larosière

and Michel Camdessus, became managing directors of the IMF after their term at the Paris Club. Finally, when the Paris Club meets, it always invites the IMF as an observer.

For the private sector, coordination has been more challenging and highly conditional on individual creditors' ability to induce collective action. Whereas commercial banks have historically been open to debt restructuring deals, the number of banks who are exposed to a debtor country is often large–over 600 banks were exposed to Mexico in the early 1980s–and coordination more difficult. Yet, the same large banks tend to be involved in most restructuring negotiations, and there has been some consistency in the bankers who chaired or served on the Bank Advisory Committees.[29] Personality matters as well. Some bankers were central to improving coordination efforts within the group of private creditors. Bill Rhodes from Citibank, who wrote an entire book about his attempts to improve coordination, is a notable example. His (in)famous strategy was to keep everyone at the negotiation table day and night until agreement was reached. During the Argentina crisis in 1992, the IMF had asked private creditors to resolve commercial bank debts as a condition for reimbursing its $3.6 billion multi-year loan (Rhodes, 2011, 71f). During the annual meeting of the Inter-American Development Bank where all major parties (including the World Bank, the IMF, major banks and governments) participated, Rhodes collected and brought all bankers to a hotel and did not let them out of the room except to eat or to go to he bathroom. He would not even let them go back to their hotel to sleep. As he recalls:

> "By Sunday night, you got the feeling that the participants would have said yes to almost anything just to be able to go to bed (...) Everyone was so worn out that we were just running on adrenaline" (Rhodes, 2011, 72).

On a more formal level, the Institute of International Finance (IIF), which was founded in 1983, significantly improved coordination both within the group of private creditors, but also between the private and the public sector. The IIF started to collect data on bank exposures in the major borrowing countries and produce (Rieffel, 2003, 161). This information was vital for coordination efforts across exposed banks. It now has more than 450 members from over 70 countries and is a central mechanism for banks to coordinate their efforts and risk management.

There is also substantial informal coordination between the public and the private sector, especially the IMF and the major G-7 finance ministers on the official side, and the London Club members on the private side.[30] Coordination is highly informal and *ad hoc*, often occurring during phone calls and in meetings in hallways and corridors at the sidelines of official conferences. When Mexico

[29] Rieffel (2003, 118) provides a table with BAC Chairmen, which illustrates remarkable overlap across time.

[30] There is very little explicit coordination between the Paris Club and the London Club (Roubini and Setser, 2004, 260).

was running out of reserves, the Mexican president called the chairman of the Fed, U.S. Secretary of the Treasury, and the managing director of the IMF separately. The negotiations that started with bilateral meetings between top U.S. banks evolved rapidly:

> "We quickly developed an unusual international working arrangement among competing commercial banks, regulators, international financial institutions, creditor countries, and many of the borrowing countries. Rather than exclude the official sector from negotiations, I regularly kept in touch with officials at the International Monetary Fund, the World Bank, the U.S. Treasury, and central banks around the world, including the Federal Reserve, both in Washington and New York. I wanted to keep the creditor countries aware of our progress so that official-sector aid from the IMF and various governments could be coordinated with the private sector" (Rhodes, 2011, 209).

This network of central actors improves the information of each individual creditor group. Being able to observe other actors' decisions and actions affects the risk calculus of creditors who want to avoid the debtor's default by offering new loans but also worry about the risks associated with further increasing their exposure. If other creditors are willing to increase their exposure as well by offering new loans, the likelihood increases that immediate financing needs are met and a panic might be prevented. This lowers the perceived risks of lending for other actors. If creditors are more confident that funding from other sources is forthcoming, they should be more willing to commit to further loans as well. As a consequence, the strategies and decisions of exposed creditor groups should be mutually contingent on each other. This explains why the Paris Club conditions its support on the existence of an IMF program, and the London Club often refuses to even meet unless the crisis state has reached or made significant progress toward an agreement with the IMF. The approval of an IMF loan to Algeria in 1994 unlocked agreements about debt relief with both the Paris Club and the London Club (Boughton, 2012, 689). The IMF loan to Mozambique in 1990 was followed by the rescheduling of most of Mozambique's debt to official creditors through a Paris Club agreement as well as further financial commitments from bilateral creditors a few years later (Boughton, 2012, 731).

Private and official creditors often rely on IMF loans as an anchor, but the IMF also often conditions its support on the willingness (and ability) of debtor states to attract additional sources of funding to complete the IMF package. As early as 1958, the IMF required Argentina to request financial assistance from sources other than the IMF (Gould, 2003).[31] During the Mexico crisis in 1982, the IMF managing director indicated that without private sector involvement, he would not recommend to his Executive Board the amount of IMF financing that was negotiated under the program which Mexico would need to meet the

[31] In the 2000s, it even turned down Argentina's request for additional loans because the country did not want to pursue a restructuring of its loans (Rhodes, 2011).

interest payments on its bank debt. Given the extent of bank exposure (Mexico's outstanding debt accounted for 44% of the total capital of the nine largest U.S. banks), "it was clear that without coordinated action on the part of banks and the official sector, it was possible that a wave of defaults could destabilize the global banking system and throw the entire world into a depression" (Rhodes, 2011, 63). For Rhodes, the case was clear: "cooperation was in everyone's interest" (Rhodes, 2011, 67).[32] In the end, over 500 banks participated in the deal. One day after a critical mass of banks had agreed to a restructuring deal, the IMF board approved its loan program (Rieffel, 2003, 158).

In 1999, the IMF conditioned its support for Ecuador on the country's willingness to seek debt restructuring from private and official creditors through the London and Paris Clubs. Paris Club members themselves announced that their help would be contingent on London Club support. Boughton (2012, 613) summarizes the mutual contingencies during this episode succinctly:

> For each of these targeted agreements, creditors would normally expect the government to reach a prior agreement with the IMF on a stand-by arrangement. That agreement, in turn, would require the Fund to have a solid assurance that Ecuador could finance its external payments. This circle could be squared if all of the main parties could reach tentative agreements, conditional on the others, so that the IMF could coordinate the complex package and bring all the negotiations to a conclusions. Any slippage would be fatal."

The financial crisis resolution efforts in South Korea in 1997 further demonstrate the importance of getting everyone on board. The IMF and the U.S. Treasury had agreed on emergency financing, but wanted commercial banks to roll over short-term bank loans. The initial IMF loan was made contingent on private sector involvement. When a new president was elected in South Korea, the private sector itself insisted on the country committing to IMF austerity (Rhodes, 2011, 97). Resolution efforts often have to strike this very delicate balance.

Creditors rely on each other to minimize the risks of crisis lending. Since no actor is able to provide sufficient liquidity, the conditioning of support on the willingness of other creditors to spring into action is not uni-directional. Creditor coordination efforts during the Mexico crisis in the 1990s illustrate this very well. Mexican officials initially tried to avoid the IMF and approached potential bilateral creditors first. However, they were later pressed to accept the IMF and its conditionality because "no official creditor–including the United States–was willing to advance its own money bilaterally without the IMF's written assurance that Mexico was implementing a sound economic policy program" (Boughton, 2012, 469).[33] But at the same time, the IMF also relied on the U.S.

[32] This did not stop Rhodes and the IMF from going back and forth about approaches to help coordinate the involvement of the private sector. For example, the IMF wanted 90% of banks to participate, Rhodes argued for no more than 70% (they compromised on 80%.

[33] In fact, even U.S. officials initially thought a bilateral bailout without IMF participation would be sufficient (Boughton, 2012, 467).

to offer additional liquidity since its loan was too small to cover the external financing gap. James Boughton described the IMF contribution to the bailout as just the "seed money" to a larger package (Boughton, 2012, 470). More generally, the IMF's rules require it to ensure that each program is fully financed. If the U.S. had refused to dispense funds under its own agreement with Mexico, the program would have been under-financed, and the IMF would have likely had to suspend its own program as well. Cottarelli and Giannini (2003, 11) describe the dilemma elegantly: "More bluntly, under the new practice it was unclear who was being made hostage to whom."

The IMF can only provide partial liquidity insurance and depends on supplementary financing from other creditors to help ensure the success of its programs, and in turn, other creditors depend on each other for additional liquidity and the IMF to help facilitate their financing transactions and make borrowers' commitments more credible. During the Peso crisis, officials knew that the liquidity needed to prevent the crisis from worsening "likely exceeded the means of bilateral creditors, or of the IMF and other multilateral agencies acting as a group" (Boughton, 2012, 469). Concerted multilateral action under the lead of the IMF appeared the only viable course for many. Similarly, no one believed that the proposed IMF loan to Thailand during the Asian Financial Crisis in 1997 would be sufficient to stem the crisis (Boughton, 2012, 508). During a meeting of the "Friends of Thailand" in Tokyo, a package of about $16 billion ($4 billion from the IMF) was assembled that included contributions from the IMF, Japan, China, the World Bank, the Asian Development Bank, and six central banks (Reserve Bank of Australia, the Hong Kong Monetary Authority, Bank Indonesia, the Bank of Korea, Bank Negara Malaysia, the Monetary Authority of Singapore). In addition, the Thai government secured the promises of its largest private creditors (mainly banks from Japan) that they would maintain their credit lines (Boughton, 2012, 509).[34] For Indonesia, the "first line of defense" included commitments from the IMF, the World Bank and the Asian Development Bank.[35]

What the IMF lacks in liquidity it makes up in its ability to foster credibility in the international financial markets. The importance of the IMF in these coordinated rescues depends less on its financial resources (which usually fall short of what is deemed necessary), and more on its information advantage and credibility in imposing, monitoring, and enforcing austerity and other policy reforms. Neither bail-ins nor bail-outs will fail if the debtor country takes advantage of the financial breathing space to make the policy adjustments needed to address the major economic imbalances that gave rise to the crisis. In signing an IMF agreement, the IMF signals that the debtor country has sound fiscal institutions and follows sensible policies. In addition, the IMF agreements ensure that if necessary, the country's receipt of loans are conditioned on the imple-

[34]The U.S. government was unable to help in this case because U.S. Congress had imposed restrictions on the use of the Treasury's own funds after the Mexico episode.

[35]Several countries (including Australia, China, Hongkon, Japan, Malaysia, Singapore, and the United States) agreed to serve as potential "second line of defense." (Boughton, 2012, 525).

mentation of further policy reforms to address the underlying macroeconomic problems. As a consequence, while the IMF requires debtor states to attract other means of financing (or some restructuring deal) through official or private creditors, these actors informally or formally require debtor states to engage in an IMF program. For example, London Club packages often include "comfort letters" from the IMF to reassure that the IMF program has a viable chance and that the IMF would monitor and enforce the progress made under the program (Rieffel, 2003, 125).

More generally, official and private lenders accept the IMF agreement as a signal that the debtor intends to crack down on its deficit. Lenders typically renegotiate their own claims on that condition. When the Fund reaches an agreement with a country, other creditors (instead of rushing to ask for their own money) are willing to increase their lending because it has entered a period of stabilization under the tight controls of an IMF standby agreement (Lipson, 1981). IMF involvement in Brazil in the 1980s was seen as critical for commercial banks to be able to find a restructuring deal with the government. In 1983, Bill Rhodes even flew to Brazil to convince the government to implement the IMF conditions it had failed to implement, which caused the IMF to stop payment. Participating banks became worried that they would lose their investments without policy reform, and they had relied on the IMF program to ensure its delivery (Rhodes, 2011, 80).

The importance of IMF conditionality is perhaps best demonstrated in cases where the IMF was not involved. During the Peruvian financial crisis in 1976, U.S. banks agreed on a loan without IMF support (Lipson, 1981, 623). Peru's creditors thought that they could ensure adherence to an effective stabilization program by establishing a system for continuous monitoring of the Peruvian economy and by making the second installment of their loan formally contingent upon satisfactory performance. Yet, when the loan's second installment came due and Peru was unable to meet its obligations, no delay was ever seriously considered despite Peru's evident failure to meet its policy commitments. The banks, as private institutions, simply did not have the legal or political leverage to dictate policy directly to a sovereign government. Instead, the banks found themselves drawn deeply and visibly into Peruvian politics. For the private sector, there was only one lesson to be drawn from this disastrous episode: commercial banks could not impose conditions, only the IMF could. Since then, private lenders have refused to depart from that practice. The Peruvian case has remained the only one where private creditors attempted to extract fiscal policy reforms from a debtor country in crisis without the involvement of the IMF (Cohen, 1982).

To summarize, exposed creditors have a strong collective incentive to act, and their lending strategies depend upon each other. If creditors observe that other creditors are willing to lend, their perceived risk of increasing their own exposure declines, which increases their own willingness to lend to avert default of the debtor country. Observing agreements with other creditor groups can serve as a catalyst for additional funding from other actors as well. The IMF plays a pivotal role in the success of this informal risk reduction process because

of its ablity to impose and monitor policy conditionality. The IMF depends on other creditors to help ensure the success of its loan programs and its future bargaining leverage with debtors. In turn, other creditors depend on the IMF to help facilitate their financing transactions and make debtors' commitments more credible.

Research Design

To test our theoretical argument, we analyze the four most prominent official creditor groups and their lending strategies to over 100 debtor countries over the post-Cold-War period 1991–2010: IMF loans and conditionality, official bilateral loans, and sovereign debt restructuring from the Paris Club and the London Club. Lending decisions depend on a set of specific considerations within this group of creditors as well as across the creditor groups. In the case of official bilateral lending, for example, a creditor country's decision whether or not to offer new loans to a debtor depends on features such as the creditor's exposure to the debtor country and economic factors in the debtor country. Our argument suggests that this decision also depends on decisions made by other creditor groups, notably whether the IMF offers a loan to this debtor or whether the Paris Club or the London Club reschedule or restructure maturing claims. We can therefore consider each creditor group as one network in the larger network of financial crisis resolution.

Capturing these intricate interdependencies necessitates a research design that explicitly assesses all of these possible across- and within-network determinants. The within-network dependencies suggest that we cannot simply model each network using conventional regression approaches without violating core assumptions of strict exogeneity and residual independence. While standard network models can address these issues, the across-network dependencies suggest that we also cannot treat each network as exogenous and model each financial support network separately. To solve these issues, we adopt a framework of co-evolving network dynamics and employ a stochastic actor-oriented model (SAOM) developed by Van De Bunt, Van Duijn and Snijders (1999), and later refined by Snijders (2001, 2005) and Snijders, Lomi and Torló (2013).[36]

Following Kinne and Bunte (2018), we interpret this framework as a longitudinal multiplex network that is composed of multiple "layers." Each layer is a network that consists of ties between actors that change over time, where the outcome variable of interest is the existence of a tie between actors. In our case, these layers correspond to the bilateral loan network, the IMF loan network, and the network of sovereign debt rescheduling through the Paris Club and the London Club. The actors are either creditors—such as a bilateral official creditor, the IMF, sovereign debt holders represented by the Paris Club and the London Club—or debtors. A tie exists if financial support is extended between

[36]The SAOM has been applied in several international relations studies to model systems with multiple networks (Manger, Pickup and Snijders, 2012; Kinne and Bunte, 2018; Warren, 2010, 2016; Kinne, 2013, 2016; Chyzh, 2016).

two actors. We are using binary ties to signify whether or not financial support exists, that is, whether or not the IMF provided a loan to a debtor country in a given year, whether or not a creditor country offered a loan in a given year, and whether or not the London Club or the Paris Club offered debt restructuring in any given year.[37] Because the IMF's ability to impose conditions is central, we also estimate regressions that focus on whether or not the IMF imposed conditionality. Each dependent variable is coded as 1 if a loan/debt restructuring took place, and 0 if not.

To test our two hypotheses, we assess two sets of four-network systems: one with *IMF loans* as an outcome for the IMF network, and one with *IMF conditional loans* as an outcome for the IMF network. For each system, the SAOM for the multiplex of financial support is given by

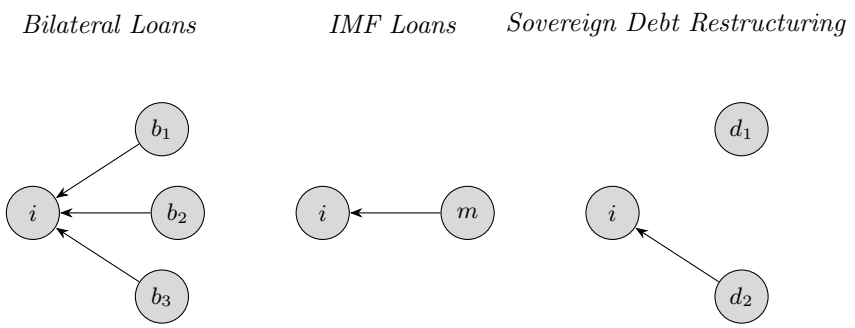
$$
\begin{aligned}
f_i^Y(w,x,y,z) &= \sum_k \beta_k^Y s_{ki}^Y(w,x,y,z) \\
f_i^X(w,x,y,z) &= \sum_k \beta_k^X s_{ki}^X(w,x,y,z) \\
f_i^W(w,x,y,z) &= \sum_k \beta_k^W s_{ki}^W(w,x,y,z) \\
f_i^Z(w,x,y,z) &= \sum_k \beta_k^Z s_{ki}^Z(w,x,y,z)
\end{aligned}
$$

where each utility function corresponds to one of the three layers in the network: $f_i^Y(w,x,y,z)$ is a utility function for actors i in the bilateral loan (Y) network, $f_i^X(w,x,y,z)$ is the utility function for actors i in the IMF loans or conditional loans (X) network, and $f_i^W(w,x,y,z)$ and $f_i^Z(w,x,y,z)$ are the utility functions for actors i in the sovereign debt relief (W) network. The right-hand side variables are captured by $s_{ki}^Y(w,x,y,z)$, $s_{ki}^X(w,x,y,z)$, $s_{ki}^W(w,x,y,z)$ and $s_{ki}^Z(w,x,y,z)$, which describe the personal network of each actor i for each layer of the network Y, X, W, and Z, respectively. These variables are one of three types: (1) node-level or dyad-level covariates, such as debtor financial crisis, creditor economic development, or economic exposure between actors; (2) endogenous network effects, such as "activity," which captures the cumulative extent to which a debtor/creditor is receiving/offering financial support; or (3) cross-network effects, such as the extent to which receiving/offering financial support in one network leads to receiving/offering support in another network. The β vectors are the parameters that indicate how strongly each component affects the evolution of each layer in the multiplex network.

Our network structure differs from prior uses of the SAOM framework in international relations in one noticeably aspect. Creditors can only form ties with debtors in one of the four networks: for example, the IMF can only form a tie in the IMF loan network, since it cannot extend a bilateral official loan

[37] Data from Das, Papaioannou and Trebesch (2012); Bon and Cheng (2020); Schneider and Tobin (2020); and the IMF.

Figure 1



nor can it offer restructuring of sovereign debt through the London or Paris Club deliberations. Likewise, a creditor country offering a bilateral loan cannot extend an IMF loan or individually offer to restructure London Club debt. As such, we are modeling what is referred to as a "disjoint" network, whereby it is impossible that a tie exists for any given pair of actors (i, j) across all three networks (Ripley et al., 2019). Figure 1 provides an illustration of this structure for a hypothetical debtor country across all three networks. In the left panel, country i is the recipient of bilateral loans from three creditor countries (b_1, b_2 and b_3); in the center panel, i is receiving a loan from the IMF (m); and in the right panel, i is receiving sovereign debt restructuring from the Paris Club (d_2) but not the London Club (d_1). Of note is that the IMF (m) cannot extend a loan in the bilateral loan network, nor can a single creditor country offer a loan in the IMF loans network. Likewise, neither actor can offer to restructure debt in the debt restructuring network, nor can the London and Paris Clubs offer official bilateral or IMF loans.

Figure 2 shows the actual multiplex financial rescues network with the three disjoint layers of bilateral loans, IMF loans, and sovereign debt restructuring from the Paris Club and London Club combined. Each layer is a cumulative network of all ties over the entire time period, from 1991 to 2010, simply for illustrative purposes. In the models below, we separate the data to analyze it as a longitudinal multiplex of 20 annual financial rescue networks. Rather than considering these as separate networks, this characterization allows for direct estimation of the correspondence between receiving loans in one network to receiving loans in any other networks.

With this in mind, we test the empirical implications of our argument with the cross-network effect *in-degree popularity*$_i$, which captures states' overall financial support activity in another network.[38] With three layers in our multi-

[38]This is technically captured by the `outPopIntn` term in `RSiena`, which is defined by the out-degrees of i in one network times the out-degrees of i in another network. We focus only on debtor country popularity, however, since creditors are disjoint across networks. Therefore the "out-degree" here refers somewhat confusingly to a debtor country receiving financial support from another node in the network.

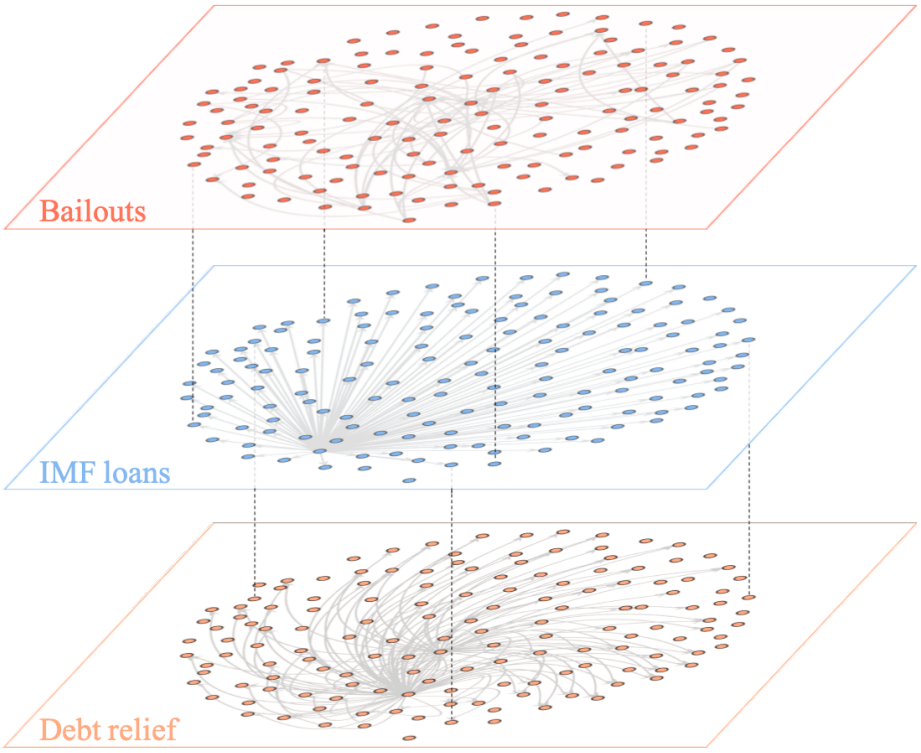


Figure 2: Multiplex network of financial rescues, cumulative across 1991–2010. The presence of a tie within each network represents a loan between two actors: a bilateral loan between creditor and debtor countries (top network); a loan between the IMF and a debtor country (middle network); or debt restructuring between either the Paris or London Club and a debtor country (bottom network). The positioning of nodes is fixed across networks, and is only illustrative; the location of a node does not signal relative importance or centrality of an actor.

plex network, we have six different *in-degree popularity*$_i$ cross-network effects:

- *Bilateral Loan: IMF in-degree popularity*$_i$. Tendency for countries receiving an IMF loan to receive a bilateral loan.
- *Bilateral Loan: debt-restructuring in-degree popularity*$_i$. Tendency for countries receiving debt restructuring to receive a bilateral loan.
- *IMF: bilateral loan in-degree popularity*$_i$. Tendency for countries receiving a bilateral loan to receive an IMF loan.
- *IMF: debt-restructuring in-degree popularity*$_i$. Tendency for countries receiving debt restructuring to receive an IMF loan.
- *Debt-restructuring: bilateral loan in-degree popularity*$_i$. Tendency for countries receiving a bilateral loan to receive debt restructuring.
- *Debt-restructuring: IMF in-degree popularity*$_i$. Tendency for countries receiving an IMF loan to receive debt restructuring.

As ties cannot exist within debtor countries or within creditor countries—there are no bilateral loans between crisis countries, nor are there instances of debt relief or IMF loans between countries—thus, we do not include any typical endogenous network terms such as transitivity or similar cross-network terms such as tie closure that are common in other multiplex network studies.

To account for non-network influences on receiving financial support, we rely on the literature for the determinants of rescues from each of our networks. We describe the determinants and differences across networks below and include variable definitions and sources in the appendix. For each network, we categorize each of our covariates into five categories: liquidity versus solvency, economic exposure, political factors, geography, and additional controls. The components of each category naturally differ by network, with bilateral loans focused on the creditor country, the IMF and the Paris club focused on the G-5, and the London Club focused on commercial banks.

Liquidity versus Solvency. When creditors decide whether or not to extend a loan or to restructure debt, one important factor is whether the debtor is insolvent, a perceived inability to meet the requirements of their overall external debt obligations, or illiquid, an inability to service its foreign debt. Solvency and liquidity problems have distinct solutions. If a country is insolvent, debt reduction would be considered more appropriate ease the crisis. If it is illiquid, an increase in short term debt would be necessary. It is not clear that these two conditions are entirely separable. If crisis countries were simply illiquid, they should be able to borrow freely from the international capital market. Yet an inability to borrow freely does not imply insolvency or no creditor would be willing to even discuss additional borrowing, let alone increasing their exposure in the short term as is often the case (Krugman, 1985). Further, solutions meant to ease short-term liquidity constraints could lead to long-term issues of solvency. Thus, while we need to control for liquidity and solvency in our networks, these

factors are not likely pure determinants of a creditor's decision, but rather, measures of creditor uncertainty.[39] We rely on the macroeconomic literature on sovereign debt crises which commonly uses short term debt to foreign exchange reserves as the main measure of liquidity and external debt to GDP to measure solvency (Feder, Just and Ross, 1981; Detragiache and Spilimbergo, 2001; Horn, Reinhart and Trebesch, 2020).

Economic Exposure. Members of the individual networks are most often involved in the discussions over additional credit or debt restructuring because they are exposed to the debtor countries in the first place. The hope is that by increasing credit in the short run, debtor countries are more likely to recover and payoff all of their outstanding debt. Exposure varies by network. For the London Club, we measure exposure of commercial banks as the outstanding commercial bank debt owed by the debtor country. To proxy for Paris Club risk, we focus on total sovereign government debt owed by the debtor country as a proxy for the risk of any given sovereign participating in the Paris Club negotiations.[40] For the bilateral loan network we have data only on bilateral outgoing loans (not repayments), so we are not able to account for the sovereign's direct exposure to the debtor country. However, bilateral creditors have exposure concerns beyond their own outstanding debt. Commercial banks that operate in or hold the debt of the country in crisis can fail or face great losses in the case of a default. The economic difficulties of commercial banks could then spillover into the creditor country. The BIS provides the logged amount of debtor country debt held by creditor country banks in millions of constant US dollars. For the IMF, the literature points to the importance of the major donors in decision making over IMF programs (Copelovitch, 2010*a*,*b*). Following this literature, we use financial exposure of the commercial banking sector to the debtor country, averaged over the G5, the IMF's largest shareholders.

Political Factors. Debtor countries may be systematically important to creditor governments. We rely on a measure from the foreign aid literature on the strategic decisions of foreign aid donors and measure the difference in foreign policy preferences between two states by using the difference in UN General Assembly ideal points that reflects the positions of the creditor and debtor countries toward the U.S.-led liberal order.[41] We use the negative absolute difference in the ideal points of both sides of each dyad, where lower values indicate greater preference similarity. For the bilateral network, we measure the difference in ideal points between the debtor country and the potential creditor. For the IMF and the Paris Club we follow Copelovitch (2010*a*,*b*) and measure the average difference in ideal points between the debtor country and each of the G-5 countries. We do not include political factors for the London Club since commercial banks are not driven by geopolitical concerns, but focus on commercial profits. For the bilateral loan network we further include an indicator

[39] Our goal is not to determine whether it is a problem of liquidity or solvency, but merely to control for the effect of either on the likelihood of a network rescue.

[40] The sovereign and commercial debt data come from the World Bank's International Debt Statistics Database.

[41] Data from Strezhnev and Voeten (2012).

of whether the creditor and debtor countries are in a joint alliance. *Alliance* is a dummy variable equal to one in any year that a dyad is involved in a defense pact.[42]

Geography. Countries in closer geographic proximity are more likely to offer financial assistance and are more likely to be exposed to economic spillovers (Tirole, 2015; Horn, Reinhart and Trebesch, 2020). The bilateral loan network includes the logged distance (in miles) between the creditor and debtor country (Distance). For the IMF and Paris Club, we include the minimum distance between the debtor country and the members of the G-5. We exclude distance for the London Club.[43]

Controls: The remaining control variables are standard in the literature on IMF loans, bilateral loans, and sovereign and commercial debt. All four networks include a series of variables to control for the macroeconomic policies, economic stability, and additional economic risk factors of the debtor country. These variables include: the debtor's GDP, GDP per capita, GDP growth, and the current account as a percentage of GDP.[44] The bilateral loan network includes an additional variable to deal with the potential for domestic public constraints on the government providing a loan. Here we use *Election Timing*, a dummy variable equal to one if a legislative election was held in the creditor country in the same year as the financial crisis.[45] The idea is that providing loans to foreign countries is often unpopular and therefore less likely to occur in years that elections are being held. The London Club networks includes a dummy that controls for whether the restructuring negotiations were part of a Brady Deal. The IMF network model includes three additional determinants of the likelihood of a new IMF loan: the log of the IMF's liquidity ratio, as an indicator of the ability of the IMF to lend and past IMF loan, a dummy variable equal to one if the debtor country has ever received a past IMF loan.[46] Finally, we include a dummy variable equal to one if a country is experiencing a currency crisis, balance-of-payments crisis, sovereign-debt crisis, or a banking crisis.[47]

Results

Across all three networks and both model specifications, we find positive and significant estimates for cross-network effects: financial crisis lending decisions are highly contingent on each other. We begin by describing the results for cross-network effects across two sets of networks corresponding to our arguments regarding IMF loans and conditionality, respectively. We then discuss the coefficient estimates for the control variables in each set of models, which differ noticeably from estimates in prior studies of financial rescues.

[42] Data are from the Correlates of War Alliances data set.
[43] Data are from Gleditsch and Ward (2001).
[44] Data from the World Bank.
[45] Data from Beck, Keefer and Clarke (2010).
[46] Data from the IMF.
[47] Data from Valencia and Laeven (2012); Reinhart and Rogoff (2009).

Figure 3 presents our estimates for network influence effects for the four networks in the model in which IMF loans are measured broadly as any loan received from the IMF, with or without conditions.[48] These estimates are best interpreted using the log-odds framework. Beginning with the bilateral loan network, we find that receiving an IMF loan increases the probability of receiving a bilateral loan by 49 per cent ($\exp 0.400 = 1.492$). A creditor country would be 49 per cent more likely to extend a bilateral loan to a debtor country that has received an IMF loan when compared to a debtor that has not received a loan from the IMF. This effect is roughly half the size of the sovereign debt restructuring cross-network effect, where we find that receiving sovereign debt restructuring increases the probability of receiving a bilateral loan by 118 per cent, a roughly two-fold increase. Overall, these findings strongly suggest that bilateral loan decisions are highly contingent on the lending decisions of other creditor groups.

Turning to the IMF loans network, we find that receiving a bilateral loan increases the probability of receiving an IMF loan 21-fold. The extremely large magnitude of this cross-network effect is likely due to the high overlap in the two networks: of the 69 bilateral loans in our sample, 35 (or, 51 per cent) of the debtor countries were also recipients of an IMF loan in that same year.[49] The cross-network effects for IMF loans of sovereign debt restructuring are similar to the bilateral loan network: recipients of debt restructuring correspond to a 149 per cent increase in the probability of getting an IMF loan. That is, the likelihood that the IMF is willing to lend to crisis countries significantly depends on the willingness of other creditor groups to contribute to the financial rescue package. To understand the magnitude of these results, consider the hypothetical example in our illustration in Figure 1, where country i receives debt relief from the Paris Club. Compare this to a hypothetical country j that receives no such debt relief. Holding other country and system characteristics fixed, our results indicate that country i is 1.5 times more likely to receive an IMF loan than country j. With a baseline of 940 loans out of 2,774 IMF–crisis-country dyads in our data, this is quite a large effect—enough to shift the average country from not likely ($\approx 34\%$) to receive a loan to being more likely than not ($\approx 51\%$) to receive an IMF loan.

The cross-network effects in the sovereign debt relief network largely track those of the bilateral loan and IMF loans networks. The more bilateral loans a debtor country receives, the greater its probability of also receiving debt restructuring through the Paris Club: debtors receiving bilateral loans are 21 times more likely to receive debt restructuring when compared to debtors not bailed out by bilateral creditors. At the same time, recipients of IMF loans are 55 per cent more likely to see their debt restructured compared to non-IMF-loan

[48] Note, we are currently running estimations with the new control variables as discussed in the research design section. They are not included in the current results graphs yet.

[49] The number increases to 64 per cent if we include countries who received an IMF loan in the year prior to a loan. Note that the large coefficient magnitude is not symmetric for the loan network, given the high number of countries receiving IMF loans (96 per cent, $n = 905$) that did not receive loans.

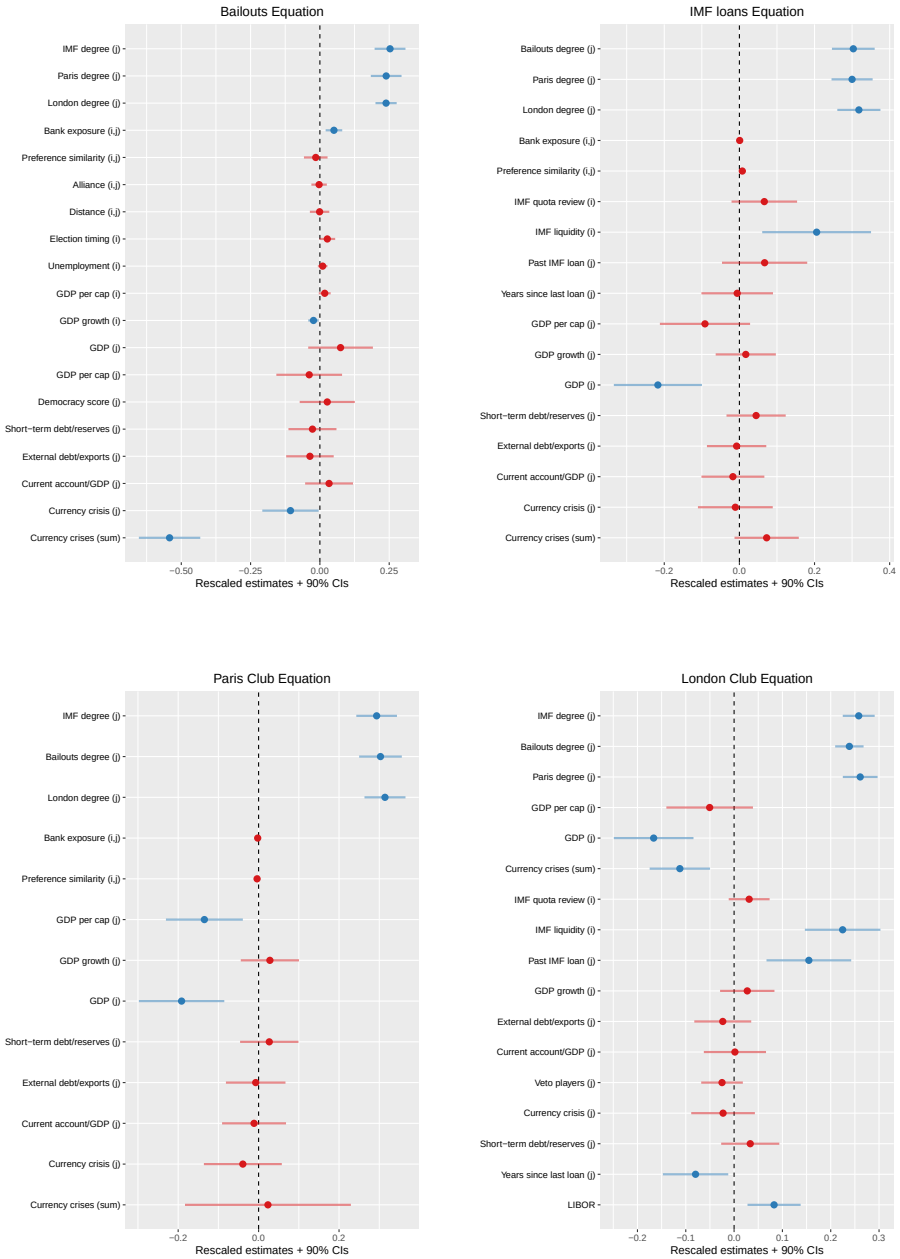


Figure 3: Coefficient plot for stochastic actor-oriented model for multiplex network of bilateral loans, IMF loans (*under IMF program = 1, 0 otherwise*), Paris Club and London Club restructurings.

recipients.

In sum, the results in Figure 3 are highly suggestive of the coordination between creditor groups, with mutually reinforcing lending strategies that suggest that creditors want to offer liquidity but aim to minimize risk, rather than free-riding incentives.

Figure 4 presents our estimates for a model specification in which IMF loans are measured as any loan received from the IMF with conditions;[50] a zero tie value in this case indicates either not receiving an IMF loan, or receiving a loan without conditions.[51]

[50] Note, we are currently running these estimations including the London Club and the control variables as listed in the research design.

[51] We also analyzed the influence of hard versus soft conditions, but found no substantial difference in results.

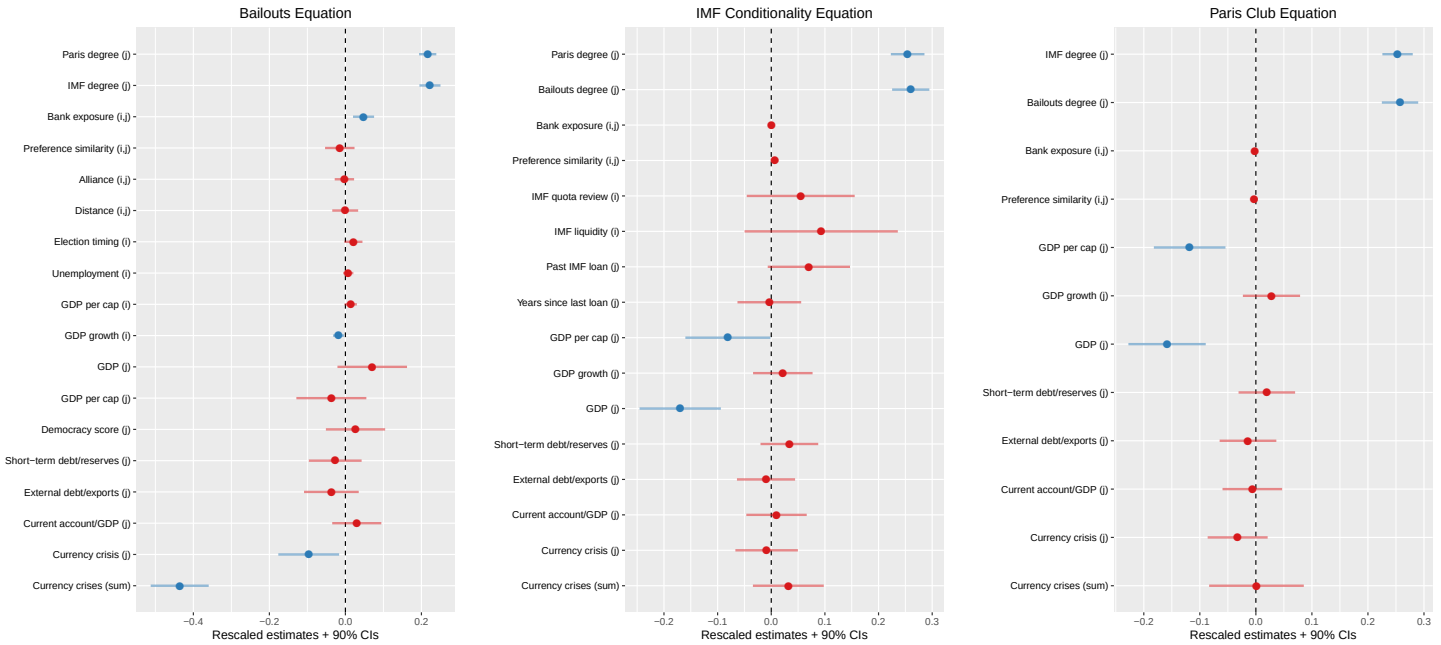


Figure 4: Coefficient plot for stochastic actor-oriented model for multiplex network of bilateral loans, IMF conditionality (*under IMF program with conditions = 1, 0 otherwise*), and Paris Club deals.

The results for the cross-network effects are similar in magnitude and direction. Most importantly, we find that IMF conditionality has a positive and significant impact of lending decisions in other networks. We find that receiving IMF conditionality or debt relief increases the probability of receiving a bilateral loan by 43 per cent and 118 per cent, respectively. For the debt restructuring network, we find that receiving a bilateral loan or IMF conditionality increases the probability of sovereign debt relief by 20-fold and 50 percent, respectively. At the same time, IMF conditionality is influenced by the other creditors' decisions. For the IMF conditionality network, we find that receiving a bilateral loan or debt restructuring increases the probability of an IMF loan with conditions by 21-fold and 149 percent, respectively.

While still preliminary, these results support our expectations that creditor decisions display strong interdependencies. The provision of financial support in one creditor network unlocks greater support from both other creditor networks. Specifically, debtors receiving loans in any given network have a significantly increased probability of receiving loans from other creditor groups.[52]

To scholars of financial rescues, the paucity of statistically significant estimates for the control variables in each model may at first seem alarming. On the one hand, it could indicate that knowledge that a country has received a loan, conditional on the known factors that determine loan receipt (e.g., all of our non-network covariates), is a much more powerful predictor of receiving a loan, conditional on similar non-network factors. On the other hand, because our models are focused on estimating endogenous and cross-network effects, estimates for non-network variables could be attenuated. This is partly because these covariates are themselves highly correlated with the outcomes in other networks within the multiplex. For example, higher levels of debt within the debtor country is almost certainly a determinant of whether or not the country receives any type of support. But when including IMF loans alongside Paris Club deals in the bilateral loans model, for instance, there is little remaining covariation between debt and the probability of a bilateral loan.

With this in mind, it is important to state that our findings do *not* suggest that such non-network factors are irrelevant for understanding crisis lending. Using the Indlekofer and Brandes (2013) diagnostic of the predictive relative importance (RI) of the variables for each year of financial rescues, we find that these covariates still account for much of the expected variation in loans and debt restructuring. Looking at the middle panel of Figure 5, for instance, we see that bilateral loans and Paris Club deals together account for 50% RI for most years in the sample; this can be interpreted as a roughly 50% expected impact on predicted loans, with the remaining 50% coming from non-network

[52] Our analysis focuses on decisions to lend during times of financial distress, and we find little evidence of free riding. However, creditors may still have incentives to free ride on the efforts of others by minimizing the size of the loans or debt restructuring. Our network models cannot capture this. In the appendix, we discuss the potential for free riding and use descriptive data on debt restructuring deals to show that private creditors, which have greatest incentives and opportunities to free ride, have not done so to the extent that one might expect.

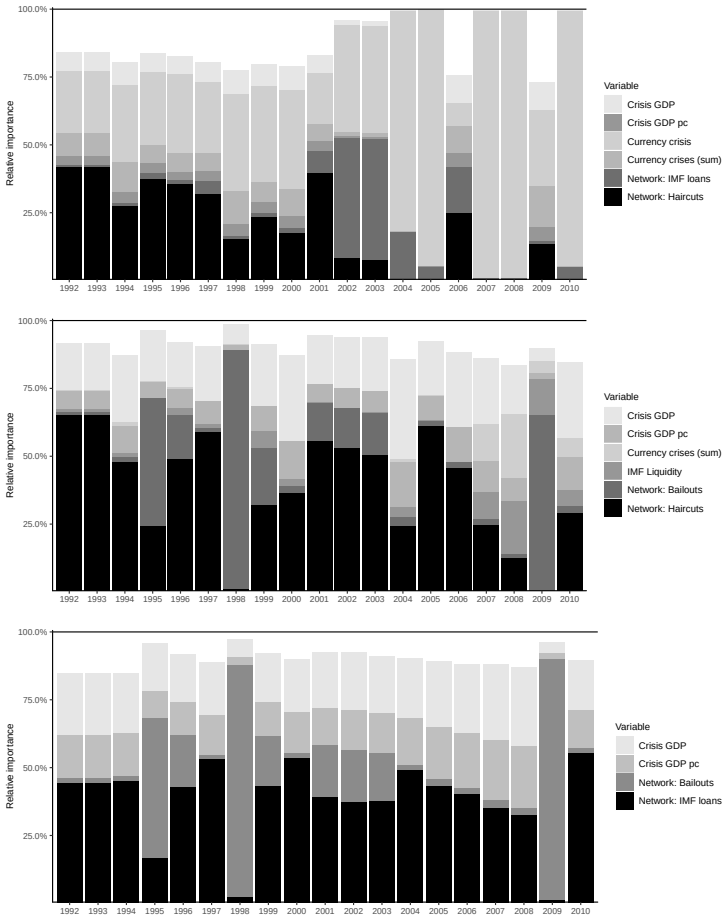


Figure 5: Relative importance of network and non-network variables in predicting financial rescues: bilateral loans (*top panel*), IMF loans (*middle panel*), and Paris Club debt restructuring (*bottom panel*). The expected relative importance is rescaled such that the total explained variation in each outcome sums to 100%. Any remaining relative importance within each year—denoted by the white space between the top of the graph and the top of the stacked bar—corresponds to all other non-labeled covariates in the model.

covariates. Debtor country conditions such as total GDP and GDP per capita levels still play an important role in predicting loans: in 2000, for example, these two covariates account have a 45% RI. Creditor conditions such as IMF liquidity similarly plays a non-trivial role in predicting loans, especially during the global financial crisis years of 2008 and 2009.

We see the same pattern if we run conventional models that include pseudo-network covariates. Table 1 in the Appendix shows the results from a logit model with all of our non-network covariates plus the count of the number of loans in each year.[53] While the network effects in these models cannot be credibly estimated—this is the very essence of the problem we aim to solve using the SAOM framework—we find results for the non-network covariates that conform with prior work. In the bilateral loan network, for example, we estimate that the likelihood of loans increases with increased economic exposure and decreases with creditor unemployment. Similarly, in the IMF loan model, the loan likelihood increases with preference similarity, crisis-country external debt, years since last IMF loan, and years in which an IMF quota review took place.

Conclusion

The IMF, originally conceived of as a lender of last resort to countries experiencing severe balance of payments crises has never quite been able to take on this role. Instead, the IMF serves as an anchor to all major international creditors, restoring confidence in an otherwise risky process. Creditors, including multinational, sovereign and private groups informally coordinate their lending decisions to ensure international financial stability and that the decisions made across and within creditor groups are mutually reinforcing. Given the risks involved in increasing exposure during times of debtor distress, individual creditor groups pay very close attention to what other creditors decide. The willingness of other creditors to provide new loans to a debtor decreases the risk of default, which increases the willingness of other actors to offer new loans or restructure existing loans. In a world where coordination over global public goods often fails without formal enforcement mechanisms, the informal coordination evident in financial crisis resolution may be able to serve as a model of success. Mutual dependencies and informal access to information about actor decisions appear central in explaining informal coordination.

Our findings shed light on the complex nature of international cooperation during financial crises. The resolution of financial crises involves decisions over a large number of financial instruments, including IMF and official bilateral lending, sovereign debt restructuring and rescheduling through the Paris Club and other informal channels, swap agreements, and private sector involvement. The strong findings that coordinated rescues are positively reinforcing are particularly interesting in light of the mixed and conditional evidence for catalytic lending. Beyond financial crisis resolution, coordination to provide international public goods almost invariably involves numerous actors and strategies. For example, efforts to support sustainable economic development involves bilateral

[53] Table 2 shows the results of these models without network covariates; note that here we also present a model with a continuous dependent variable for IMF loans, which we cannot yet include in our SAOMs specifications given its limitations for non-discrete outcomes (Ripley et al., 2019).

and multilateral official donors, non-governmental organizations and other private actors. Donors can also pursue various strategies ranging from the provision of foreign aid to technical assistance, to trade policies. Attempts to address civil conflict could involve military interventions, economic or political sanctions, diplomacy, and other means, provided by both bilateral, regional, and multilateral entities. But even though cooperation and coordination across actors and the use of different strategies appears essential in international cooperation, and strategies are often highly contingent on each other, we know very little about how actors and their decisions affect each other.

Our work is just a first step into explaining informal coordination in crisis resolution. It was beyond the scope of this paper to provide a more in-depth treatment of lingering free-riding incentives especially of the private sector. Although we provided some evidence that these are smaller than expected, future research could analyze the timing of decisions and pay closer attention to the relative size of the burden these creditor groups take on to address the free-rider issue more directly. In addition, networks exist beyond the bilateral, multilateral, sovereign and private creditors that we include here. One might ask how these additional creditors and rescue efforts further interact to determine the fate of countries facing financial crises.

Finally, our findings show that the informal coordination amongst creditors leads to a greater willingness to lend and forgive. We do not yet understand the implications of this coordination. That is, do they lead countries to recover faster? Do they have any effect on government survival? And perhaps most important, are there moral hazard implications for this coordinated lending? Such research, in conjunction with existing research on debtor strategies, could provide important insights into our understanding of international financial crisis resolution.

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Appendix

Creditor Coordination and Free Riding

The empirical results support our argument that creditors pay close attention to the strategies of other creditors when deciding to increase their exposure to a debtor country. Their strategies are highly contingent on each other. The potential for a catastrophic outcome allows creditors to overcome collective action problems by coordinating informally, especially if they are exposed to the debtor country. But even though creditors may agree to participate in the rescue efforts, they do not necessarily agree on how the burden should be distributed. It is impossible to derive measures of "fair" burden-sharing especially across different creditor groups.[54] As a first attempt at understanding burden sharing, we use a comparison that is more feasible: debt-restructuring by the Paris Club and the London Club, which is also particularly interesting given that the private sector should have stronger incentives to free ride.

Although the concept of fair burden-sharing is illusive, it generally implies that creditors carry a share of the costs of crisis resolution that is equivalent to their exposure to the debtor country. Yet, variations in incentives and cost expectations across creditor groups may affect a differential willingness to take on a larger burden. Most important, while the official sector is concerned about financial insecurity for a number of reasons, private creditors' only objective is to maximize their private returns. Because their main goal is profit, they have fewer incentives to write off their claims than official creditors. In the past, the London Club has largely resisted political pressure and focused on financial fundamentals (Rieffel, 2003, 112). In addition to having fewer benefits from coordination, they also tend to be more likely to get paid back than members of the Paris Club and official bilateral creditors. Official bilateral creditors tend to be junior to private creditors (Schlegl, Trebesch and Wright, 2019), which increases private creditors' incentives to hold out in the hope that official creditors engage more exhaustively. Indeed, in about 25% of cases, the total amount provided by official creditors exceeded the countries' financing needs and thus facilitated the private sector's withdrawal from the country instead of generating an incentive for additional capital inflows (van der Veer and de Jong, 2008).

As a consequence, the private sector has a greater incentive to minimize its burden in financial crisis resolution. This could occur either by holding out until other creditors have implemented support mechanisms, or by providing a smaller share of the overall burden. At the same time, private creditors face much higher obstacles to coordination. Restructuring negotiations for private creditors typically imply finding and dealing with hundreds of syndicated loans worth billions of dollars packaged and distributed to hundreds of banks in various corners of the globe (Rhodes, 2011, 212). Everyone has to be brought

[54] One possible strategy would be to use the timing of loans to assess free-riding. Unfortunately, this is not feasible due to data constraints. We plan to assess those incentives in greater detail through a representative case study, to be added to this paper.

on board to minimize holdout problems. Most countries have enormous and widespread global investor bases, and some countries don't even maintain a full or accurate list of their private creditors. It is estimated that between 500 and 1000 banks were exposed to Mexico in 1982. 800 banks were invited to the restructuring meeting; only 115 initially sent representatives (Rhodes, 2011, 84). The difficulties of coordination makes the response of private creditors much slower than the response of official creditors. Challenges mounted with the increasing importance of bond debt. Whereas commercial banks have organized in the London Club, bondholders are even more diverse and unorganized, and therefore difficult to coordinate. The mechanisms of a bond restructuring also differ from those of a bank restructuring. Bond exchanges typically re-profile either the country's entire stock of bonded debt or a significant chunk of it, while it is often possible to reschedule bank claims as they come due.[55]

As a consequence, one might expect that while private creditors participate in the international coordination they largely free ride on the efforts of official creditors who take the largest burden of crisis resolution. The IMF's approach to this has focused on obtaining voluntary private sector involvement through the so-called catalytic approach. The hope is that official intervention will trigger voluntary participation by private creditors. For example, Brazil was able to involve the private sector voluntarily as part of its modified IMF program. When bank exposure is high, the private sector has a greater incentive to coordinate in order to avoid catastrophic outcomes for the banking sector. When voluntary coordination fails, official creditors have pursued more compulsory measures, which involve debt standstills. If creditors indicate that their participation is conditional on private sector involvement, this decision to withhold support can trigger a debtor country to threaten private creditors with debt standstills in order to get them on board (Roubini and Setser, 2004, p165). Over time, the IMF has become more willing to use coercive approaches to private sector involvement, both for commercial banks and bondholders. In 1999, Ukraine was forced by the IMF to involve the private sector to cover its outstanding bond payments in order to avoid having to use IMF resources to reduce the claims of private lenders (Rieffel, 2003, 212). In Ecuador, the IMF even signaled its intend by lending into arrears after Ecuador had missed a payment on its discount Brady bonds (Rieffel, 2003, 213).[56]

The Paris Club has been particularly concerned about distributional con-

[55]Other differences are overstated: bond exchanges can be used to push out maturities, just as bank loans coming due can be rescheduled to provide a country with breathing space. Indeed, depending on the maturity profile of its bonded debt, the debtor even may have more time to take preemptive action with bonds, typically long-term instruments, than with bank loans (Roubini and Setser, 2004, 162). Many countries have been able to restructure bonds, and the Paris Club has included bondholders in its requests for burden sharing. The Cologne Communique clearly indicated that claims of bondholders should not be viewed as senior to to claims of banks, which made the official sector much more willing to force Ecuador to seek a restructuring of its bonded debt. Overall, international sovereign bonds have been restructured in a number of cases.

[56]Since 1996, the increasing willingness of the IMF to lend into arrears was seen as a hardening of the G-7 position on burden sharing with private creditors, including banks and bondholders.

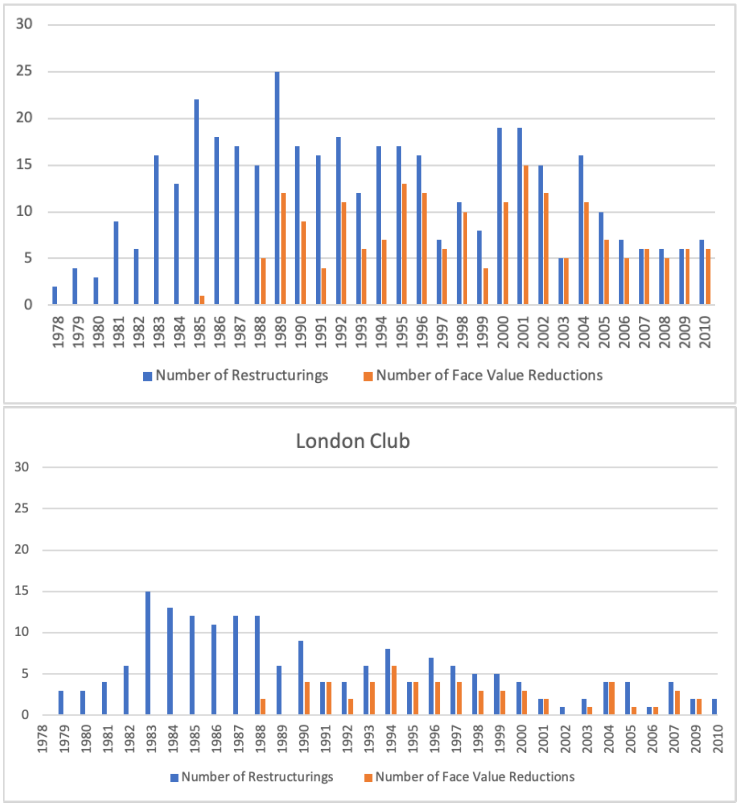

Figure 6: Number of Restructurings and Face Value Reductions in the Paris Club and London Club.

flict since it is junior for repayments compared to private creditors and official multilateral creditors. The Paris Club's "comparability of treatment" clause has aimed at addressing distributional concerns. For example, Paris Club support for Ecuador in the 1990s was contingent on London Club support. As another example, the Paris and London Clubs coordinated closely during the financial crisis of Zaire. The Paris Club granted a three-year debt moratorium and rescheduled U.S.$ 1 billion in loans. The one hundred private creditors demanded tougher conditions, including continuing service on outstanding loans. The Paris Club accepted this even though its members did not agree with this approach (Lipson, 1981, 621). The agreement with Pakistan in 1999 even included a new provision that extended the comparability of treatment to three Eurobond issues (Rieffel, 2003, 211). Another strategy of the Paris Club members–who incidentally also have the most votes on the IMF Executive Board–has been to insist that any IMF lending take place only in the context of a general restructuring of all the country's external debt (Roubini and Setser, 2004, 257).

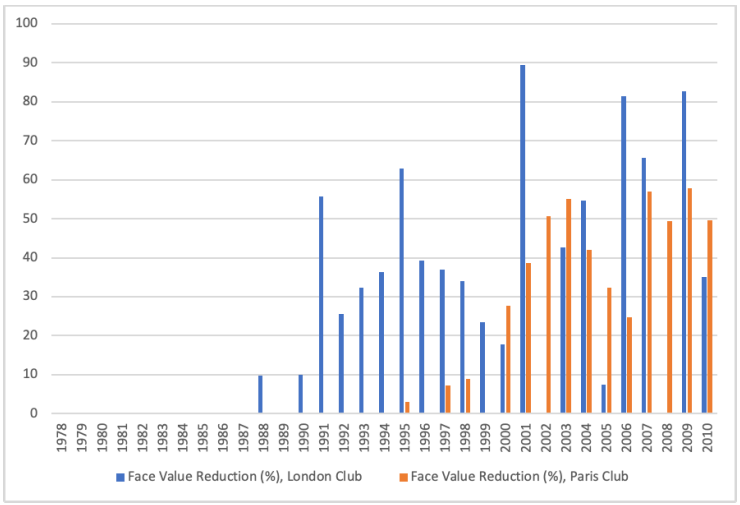

Figure 7: Face Value Reduction (%)

Figure 6 provides illustrative information on the number of restructurings and the number of nominal face value reductions from the 1970s to 2010.[57] Overall, there are more than 600 restructurings in 95 countries. Most are official restructurings through the Paris Club. Compared to its 447 restructurings, the London Club restructured debt in 186 cases (of those, 18 are sovereign bond restructurings). The first view indicates that official creditors have taken on the greatest share of the burden. But one has to be careful when interpreting these numbers. Not only was there little private lending until the 1980s, but the Paris Club was also reluctant to grant any debt relief in the initial years. This led to deals that did not address deeper solvency problems, which increased the likelihood of serial rescheduling.

Another way to assess burden sharing could be by focusing in on the share of deals in which debt relief was granted. Figure 6 illustrates that of the restructurings that happen, both the London Club and the Paris Club agreed to face value reductions at about the same rate, especially in more recent years. Figure 7 further indicates that the nominal reduction in debt has been relatively comparable over time. Although the annual aggregate numbers hide some of the existing variation, the Paris Club and the London Club have at times both taken on the leadership role with respect to the amount of debt they reduced as a percentage of their overall exposure.

The descriptive evidence indicates that private creditors have not completely passed the buck onto official creditors, even though distributional concerns remain. Future research could shed more light on how internal dynamics and exposure can affect the extent of free-riding in these crisis-resolution efforts by

[57] The face value reduction shows the nominal debt reduction only and does not take into account creditor losses due to maturity extensions or changes in interest rates.

focusing on a comparison across all creditor groups as well as the timing of the decisions.

Variables

Bilateral Loan Equation:

- Liquidity: short term debt/foreign exchange reserves
- Solvency: External debt/GDP
- Exposure: Financial exposure (BIS commercial bank debt)
- Political: Preference similarity–bilateral
- Geography: Distance–bilateral
- Debtor GDP
- Debtor GDP per capita
- Debtor GDP growth
- Debtor current account as a percentage of GDP
- Election Timing
- Creditor GDP per capita
- Creditor GDP growth
- Dummy for crisis (if any): currency crisis, sovereign-debt crisis, or a banking crisis.

IMF Loan Equation:

- Liquidity: short term debt/foreign exchange reserves
- Solvency: External debt/GDP
- Exposure: Financial exposure—G5 (BIS commercial bank debt)
- Political: Preference similarity—G5 average
- Geography: Distance—minimum to G5
- Debtor GDP
- Debtor GDP per capita
- Debtor GDP growth
- Debtor current account as a percentage of GDP
- IMF Liquidity ratio
- Past IMF loan
- Type of crisis (if any): currency crisis, sovereign-debt crisis, or a banking crisis.

Paris Club Equation:

- Liquidity: short term debt/foreign exchange reserves
- Solvency: External debt/GDP
- Exposure: G5–Log of sovereign government debt (WB)

- Political: Preference similarity—G5 average
- Geography: Distance–minimum
- Debtor GDP
- Debtor GDP per capita
- Debtor GDP growth
- Debtor current account as a percentage of GDP
- Type of crisis (if any): currency crisis, sovereign-debt crisis, or a banking crisis.

London Club Equation:

- Liquidity: short term debt/foreign exchange reserves
- Solvency: External debt/GDP
- Exposure: Log of outstanding commercial bank debt (WB)
- Political: –
- Distance: –
- Debtor GDP
- Debtor GDP per capita
- Debtor GDP growth
- Debtor current account as a percentage of GDP
- Brady Deal
- Type of crisis (if any): currency crisis, sovereign-debt crisis, or a banking crisis.

Logit Models

Table 1: Logit models with network covariates.

	Dependent variable:		
	Bilateral Loan	IMF Loan	Paris Club
	(1)	(2)	(3)
Constant	17.11	-2.19^{*}	-3.46^{***}
	(20.92)	(0.87)	(0.95)
Bank exposure (i,j)	0.73^{**}	0.00	-0.00
	(0.28)	(0.00)	(0.00)
Preference similarity (i,j)	0.37	-0.32^{***}	0.13
	(0.48)	(0.09)	(0.18)
Alliance (i,j)	1.00		
	(1.08)		
Distance (i,j)	-0.45		
	(0.61)		
Election timing (i)	-0.79		
	(0.77)		
Unemployment (i)	-0.48^{**}		
	(0.16)		
GDP per cap (i)	-2.87		
	(1.90)		
GDP growth (i)	-0.00		
	(0.20)		
GDP (j)	1.10^{*}	-0.08^{*}	-0.09
	(0.56)	(0.04)	(0.07)
GDP per cap (j)	-0.65	-0.11	-0.33^{**}
	(0.56)	(0.06)	(0.10)
Democracy score (j)	0.22		
	(0.96)		
Short-term debt/reserves (j)	1.79^{***}	-0.02	0.17^{**}
	(0.50)	(0.03)	(0.06)
External debt/exports (j)	-1.47^{*}	0.29^{***}	0.29^{*}
	(0.62)	(0.08)	(0.13)
Current account/GDP (j)	-0.08	0.00	-0.00
	(0.12)	(0.01)	(0.01)
Currency crisis (j)	2.73^{**}	-0.05	0.47
	(0.95)	(0.19)	(0.32)
Currency crises (sum)	0.02	-0.00	0.00
	(0.07)	(0.01)	(0.01)
IMF quota review (i)		0.23^{*}	
		(0.11)	
IMF liquidity (i)		-0.03	
		(0.08)	
Years since last loan (j)		2.71^{***}	
		(0.40)	
Past IMF loan (j)		-0.18^{***}	
		(0.02)	
GDP growth (j)		-0.01	0.00
		(0.01)	(0.02)
IMF degree (j)	1.11		2.03^{***}
	(0.72)		(0.24)
Paris degree (j)	-16.45	0.84^{***}	
	(1648.69)	(0.14)	
Bilateral loan degree (j)		0.78^{**}	-13.34
		(0.29)	(512.99)
Num. obs.	11741	2970	2970

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 2: Convention models without network covariates. AR(1) standard errors clustered by dyad.

	Dependent variable:			
	Bilateral Loan *Logit*	IMF Loan *Logit*	IMF Loans (logged) *OLS*	Paris Club *Logit*
Constant	18.91	−1.34	1.54**	−1.06
	(11.45)	(2.20)	(0.57)	(1.39)
Bank exposure (i,j)	0.79**	−0.00	0.00	−0.00
	(0.26)	(0.00)	(0.00)	(0.00)
Preference similarity (i,j)	0.38	−0.31	−0.35***	−0.19
	(0.41)	(0.23)	(0.07)	(0.27)
Alliance (i,j)	1.02			
	(1.16)			
Distance (i,j)	−0.50			
	(0.70)			
Election timing (i)	−1.02			
	(0.74)			
Unemployment (i)	−0.47***			
	(0.14)			
GDP per cap (i)	−2.95**			
	(1.09)			
GDP growth (i)	0.08			
	(0.20)			
GDP (j)	0.94*	−0.14	0.10***	−0.09
	(0.44)	(0.07)	(0.03)	(0.07)
GDP per cap (j)	−0.69	−0.01	−0.08	−0.44**
	(0.44)	(0.15)	(0.04)	(0.15)
Democracy score (j)	0.30			
	(0.99)			
Short-term debt/reserves (j)	1.75***	−0.12**	0.02	0.13
	(0.39)	(0.05)	(0.02)	(0.08)
External debt/exports (j)	−1.38**	0.22*	0.23***	0.48***
	(0.50)	(0.09)	(0.05)	(0.12)
Current account/GDP (j)	−0.12	0.00	0.00	−0.00
	(0.11)	(0.01)	(0.01)	(0.02)
Currency crisis (j)	2.93**	−0.17	0.10	0.26
	(1.01)	(0.16)	(0.13)	(0.38)
Currency crises (sum)	0.02	−0.00	0.00	0.01
	(0.06)	(0.01)	(0.01)	(0.01)
IMF quota review (i)		0.05	0.11	
		(0.07)	(0.08)	
IMF liquidity (i)		−0.23*	−0.14*	
		(0.10)	(0.06)	
Years since last loan (j)		2.46	0.99***	
		(1.44)	(0.15)	
Past IMF loan (j)		0.00	−0.08***	
		(0.01)	(0.01)	
GDP growth (j)		−0.00	−0.03***	0.01
		(0.01)	(0.01)	(0.02)
Num. obs.	11741	2970	2970	2970
Num. clust.	1085	186		186

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$