Mixed Signals: IMF Lending and Capital Markets *

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Abstract

The effect of new IMF lending announcements on capital markets depends on the lender's political motivations. There are conditions under which lending reduces the risk of a deepening crisis and reduces the risk premium demanded by market actors. On the other hand, the political interests that make lenders willing to lend weaken the credibility of commitments to reform, and the act of accepting an agreement reveals unfavorable information about the state of the borrower's economy. The net "catalytic" effect on the price of private borrowing depends on whether these harmful effects dominate the beneficial effects of the liquidity the loan provides. Decomposing the contradictory effects of crisis lending provides an explanation for the discrepant empirical findings in the literature about market reactions. We test the implications of our theory by examining how sovereign bond yields are affected by IMF program announcements, loan size, the scope of conditions attached to loans, and measures of the geopolitical interests of the United States, a key IMF principal.

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1. Introduction

Crisis lending is intended to restore confidence in capital markets. For example, efforts to shore up the euro zone have focused on conditional lending to reassure investors in sovereign bonds. The International Monetary Fund has long claimed that its lending acts as a "seal of approval" on national economic policies, which catalyzes private capital flows.[1] The evidence about whether crisis lending succeeds in restoring market confidence, however, is mixed. A likely explanation for the mixed findings is that the political incentives to engage in crisis lending and borrowing lead to multiple countervailing effects, and quantitative studies of market reactions to crisis lending have not captured all of the mechanisms. International lending is a political decision, which results from bargaining between the borrower and the lender, and its terms depend on the parties' relative bargaining power and the quality of their relationship. Furthermore, the inferences that private investors draw from observing crisis lending depend on what new information it reveals, which in turn depends on this bargaining process.

The recent debt crisis in the euro zone illustrates the countervailing effects of four mechanisms by which crisis lending influences the calculations of private actors. When multilateral actors lend to Greece, for example, the infusion of liquidity reduces the short-term risk of involuntary default, which should reassure bond holders. This is a *liquidity* effect. In addition, any new commitments that Greece makes to undertake fiscal reforms as a condition for receiving the loan should improve its prospects for long-term solvency. This is a *conditionality* effect. On the other hand, the Greek decision to accept a bailout reveals information about the severity of the crisis. The fact that the government is willing to accept a particular deal reveals private information, because governments that were more confident about the future would hold out for more generous terms. As a result, there is *adverse selection* into the set of countries that participate in IMF programs, so investors update their expectations to reflect more risk when a new program is announced.[2] Finally, the capital market must make

[1] E.g. Rodrik (1995) and Fischer (1999) argue that multilateral lending can provide a seal of "good health" to markets.

[2] Bas and Stone 2014.

an assessment of how likely the promised reforms are to be implemented. Since powerful or well-connected countries are treated more leniently when they fail to comply with conditions (Stone 2002; 2004), investors expect them to be less likely to comply. This *moral hazard* effect undermines the benefits of policy commitments.

Lender motivations play an important role in these calculations. For example, bargaining between Greece and the "troika" of the European Commission, the IMF and the ECB reflects the priority of maintaining political and economic union in Europe. Greece is critical because the fiscal vulnerabilities in Spain, Italy and other countries raise the risk that a default in one euro country could lead to rapid contagion. Moreover, Greece is important because German and French banks are heavily exposed to Greek debt, so a Greek default might lead to a banking crisis in the core countries. Consequently, creditors are anxious to make a deal. These considerations should be reflected in the bargaining over loan terms: Greece should receive more generous loans than less pivotal countries facing similar circumstances, and the conditions attached to the loans should be less rigorous. For the same reasons, future enforcement of those conditions is expected to be lax, which undermines the reassurance that conditionality provides. Thus, strategic importance influences the terms of loan packages through several channels that can have countervailing effects on the reactions of capital market participants.

Since the effect of crisis lending on market expectations depends on bargaining, we do not expect to observe a straightforward "catalytic" effect. On the positive side, liquidity and conditionality should improve the investment climate and lower interest rates—and countries that are the favorites of lenders should receive more of the liquidity and less of the conditionality. On the negative side, because of adverse selection, we expect the effect of new lending announcements to be harmful to the investment climate, once we control for the salutary effects of liquidity and conditionality. Furthermore, we expect lending to have less beneficial effects in countries that are especially favored by the IMF's principals. The net effects of crisis lending should depend on the various elasticities involved, so we make no predictions about them; but the four mechanisms are straightforward and amenable to quantitative testing. We test these hypotheses using data from the IMF's Monitoring of

Agreements (MONA) database for the period 1992-2002, and we find evidence consistent with the operation of all four mechanisms.

Our central empirical finding concerns the distinctiveness of countries that are geopolitically or economically important to the United States. These countries are offered larger loans, on softer terms, and with less rigorous enforcement of conditionality, and the perverse effect is that crisis lending is least effective, in terms of lowering bond yields, in the countries of greatest importance. The net effect of lending can reduce or increase bond yields, depending on the relative weights of the countervailing influences of the liquidity, adverse selection, and moral hazard effects. However, the evidence clearly shows that IMF lending causes market confidence to deteriorate when the borrowing country is politically or economically important. This suggests that design features of IOs that may be necessary to secure the "buy in" of major powers, such as the IMF governance structure, which allows key shareholders to exert informal influence over lending decisions, can have unintended consequences that undermine their effectiveness (Stone 2011).

2. Market Reactions to IMF Lending

Restoring investor confidence is a key element of the IMF mission and a critical component in evaluating whether IMF programs are beneficial for participating countries. IMF loans are intended as bridge finance for countries that are going through a process of adjustment to overcome balance-of-payments disequilibria. Consequently, IMF financial programming estimates the size of the financing gap that has to be covered in the short term to prevent default or a collapse of central bank reserves, and allocates a portion of the gap to IMF resources, a portion to short-term policy adjustment measures, and a portion to private financing. Critical to this feasibility calculus is the assumption that government commitments to carry out reform, backed by the IMF, will reassure private creditors sufficiently that private capital flows will provide the necessary support for the adjustment effort. If market confidence does not materialize, the program will fail.

The effectiveness of IMF programs in catalyzing private capital flows has received consid-

erable attention in the economics literature, but the empirical findings are mixed (Bird and Rowlands 2002; Brune et al. 2004; Edwards 2005; Mody and Saravia 2003; Eichengreen et al. 2007; Gray 2009; Bauer, Cruz, and Graham 2012).[3] For instance, correcting for selection, Edwards (2006) finds that IMF programs generate net outflows of portfolio investment, and Jensen (2004) finds a similar effect for foreign direct investment. Mody and Saravia (2003) find a positive effect of IMF programs only in cases of intermediate financial risk, which the authors characterize as instances when IMF programs are viewed as joint commitments between a government and the IMF. Eichengreen and Mody (2000) find evidence that IMF lending decreases bond spreads, while Cottarelli and Giannini (2002) find little evidence that IMF interventions catalyze investment. It is clear that catalytic effects vary considerably across types of countries, but there is little consensus about the systematic sources of this variation.[4] To date, the question of how IMF programs influence international markets has not been studied with sensitivity to international bargaining or the political interests of the IMF's major shareholders.

Bargaining influences the effects of IMF lending in the first place by determining its terms. IMF programs are heterogeneous treatments: some loans are larger, others are smaller; some require extensive policy reforms, while others entail much more limited conditions. Thus, empirical studies that estimate a uniform effect of such diverse treatments will be misspecified—in principle, the effects of IMF programs should be conditional on their terms. Liquidity and conditionality, in turn, depend on bargaining, and in particular on the relationships that borrowing countries have with the major IMF principals. Cross-national empirical research confirms that international politics influences multilateral lending decisions. The interests of the United States have been shown to exert a broad influence over IMF lending, including the likelihood of receiving an IMF program (Thacker 1999) and loan size (Broz and Hawes 2006, Copelovitch 2010, Stone 2011, Chwieroth 2013). U.S. interests in borrowing countries are also associated with less extensive conditionality required by IMF programs (Stone 2008,

[3]See Steinwand and Stone 2008 for a review.

[4]Another possible reason for discrepant findings is that different studies have different types of catalysis in mind. Some focus on FDI while others focus on portfolio investment, and some focus on indicators of country risk, like bond yields, while others focus on investment flows.

2011, Copelovitch 2010).[5] While these relationships are widely understood, this is the first paper to investigate their impact on market reactions to IMF lending.

Bargaining has a second influence on the effects of IMF lending because it reveals information to market actors. Consider a simple bargaining model, in which the borrower has private information about some variable that affects the state of the economy, the IMF makes an ultimatum offer concerning the terms of a loan, which the borrower accepts or declines, and the investor observes and decides whether to invest. A sophisticated investor understands that governments become more eager to accept loans when their private information is unfavorable, so observing an agreement causes the investor to update beliefs about the state of the economy in an unfavorable direction. The investor understands that there is adverse selection into IMF programs—the worst candidates are the most likely to accept the IMF's terms—so observing an agreement with the IMF causes capital flight and higher loan yields.[6] Bas and Stone (2014) use a structural model to test for adverse selection into IMF programs, finding that it is indeed the countries with the poorest growth prospects that are most interested in participating. Correcting for adverse selection, they find that IMF programs are associated with increased short-term growth on average and in the majority of cases. Nevertheless, an outside observer would be correct to infer that output was likely to decline when an IMF program is announced, because the announcement reveals that the government's private information is unfavorable.

Bargaining has a third influence on the effect of IMF lending, through expectations about renegotiation. The only mechanism available to the IMF to enforce conditionality is to withhold tranches of funding at periodic program reviews if the associated conditions have not been fulfilled. The problem is that the IMF's commitment to enforce conditionality rigorously may not be fully credible, because these agreements are not binding and can be subject to renegotiation. At any point in time, the IMF is tempted to negotiate the best feasible package of policy concessions going forward in return for disbursing the current

[5] Copelovitch finds that exposure of banks from the five largest financial centers is associated with reduced conditionality. Stone 2008 and 2011 find such effects only for U.S. bank exposure, and find similar effects of U.S. foreign aid, exports, military alliances and UN voting similarity.

[6] The result is not limited to the ultimatum game. Similar results hold in any bargaining model with the same information structure, such as, for example, a Rubinstein alternating-offer game (Rubinstein 1982).

tranche, while treating any past misbehavior by the borrower as a sunk cost; however, behaving this way undermines the incentives for borrowers to comply in the future. The best credible enforcement strategy balances the future benefits of maintaining reputation for enforcement against the short-term benefits of getting a particular country back "on track." The short-term benefits depend on the importance of the borrower to the IMF's principals, so this trade-off varies systematically across borrowers. In a repeated-game model of the IMF, multiple borrowers and a representative investor, Stone (2002) demonstrates that the best reputational equilibrium the Fund can achieve under these circumstances treats the most important borrowers differently from the rest, playing a less rigorous "tit-for-tat" enforcement strategy with important borrowers and a rigorous "hold-the-line" strategy with less important ones. The result is a form of moral hazard: important countries are spared the consequences when they renege, so they renege more often, and investors charge them higher risk premiums.

One way to empirically capture the political importance of a borrower is to measure its relationship with the United States. Stone (2002) finds quantitative evidence that enforcement of conditionality in post-Communist countries was associated with U.S. foreign aid, and Stone (2004) finds that enforcement in African countries was associated with U.S. aid, UN voting similarity with the United States, and post-colonial ties to the UK and France. Global samples show associations with aid, UN voting, U.S. bank exposure, U.S. exports, and alliances (Dreher et al. 2009b, Stone 2011).[7] Extant work has not examined whether this influence affects the responses of private capital markets to lending, however.

We turn next to the current empirical analysis. The research is designed to decompose the countervailing effects of crisis lending that operate through the channels of liquidity, conditionality, adverse selection and enforcement, and to examine how these mechanisms are affected by the political relationship between the borrower and the lender.

[7]Similarly, temporary membership in the UN Security Council and similarity to U.S. voting patterns in the UN General Assembly can affect the disbursement of World Bank loans (Dreher et al. 2009a, Kilby 2009).

3. Hypotheses

Our first set of hypotheses concerns the effect of bargaining on loan terms. The interest of the leading IMF shareholders in supporting a particular borrower—their political bias in favor of the borrower—is hypothesized to increase loan size and to decrease conditionality. Following most of the literature, we focus on the interests of the United States, which are either considered to be decisive in IMF governance or broadly representative of the decisive coalition of leading states.

H1 (Bargaining and Loan Terms): Political biases (U.S. interests in the loan recipient) are associated with higher liquidity and lower conditionality.

Loan terms, in turn, influence the market interest rate, because they affect the probability of an involuntary default. Increased liquidity—an expanded crisis loan—decreases the probability that capital outflows exceed the available resources in the short term, which decreases the risk premium. Similarly, increased conditionality reduces the probability of a liquidity crisis, because implementing economic reforms reduces the size of the financing gap that must be filled by the private sector. Consequently, conditionality is expected to reduce the market interest rate. Our model predicts that more conditionality and larger loans will depress interest rates.

H2 (Loan size and interest rates): Larger crisis loans are associated with lower interest rates.

H3 (Conditionality and interest rates): Higher conditionality is associated with lower interest rates.

Note that our first three hypotheses lead to an indeterminate prediction about the effect of political bias on bond yields in studies that fail to control for loan size and conditionality. This is because bias leads to larger loans with less conditionality, and while larger loans decrease bond yields, lower conditionality has the opposite effect. Controlling for loan size and conditionality, however, will capture both of these effects, so any remaining effects of bias must be attributed to a different mechanism.

Our next hypothesis reflects adverse selection. Crisis lending is not randomly distributed, so the class of countries that negotiate crisis loans differs systematically from the population of non-participants (Vreeland 2003). We assume that governments have private information about factors related to the probability of default, which influences the return private market actors can expect. This could be because the government deliberately hides bad news, as was the case with Mexico in 1994-95, Korea in 1997 and Russia in 1998, each of which concealed the deterioration in its usable foreign reserves. Alternatively, it could be because the government has superior information about domestic political constraints that will skew economic policy and make a crisis more likely. For example, the Argentine government knew that it would not be able to meet its budget targets when it negotiated them in 2000. Governments that face weaker economic fundamentals have stronger incentives to accept a loan, so countries that accept lending packages reveal themselves to be in worse circumstances than the average country without a loan, and thus, on average, more prone to subsequent crisis. This is the adverse selection effect we have referred to above. Therefore, after controlling for the effects of loan size and conditionality—the two mechanisms by which IMF programs are supposed to exercise their beneficial effects—we expect the onset of a loan to generate increased bond yields.

H4 (Adverse selection): Controlling for amount of financing and conditionality, IMF lending announcements are associated with higher bond yields.

Our final hypothesis concerns moral hazard. Following Stone (2002), we assume that it is more costly for lenders to deny support to politically influential borrowers, which reduces the sanctions that influential borrowers face when they renege on their commitments to implement reforms. In that model, the IMF withholds financing from countries that renege in order to build a reputation for enforcing conditionality, but has lower standards for allowing important countries to return to good standing (the maximum level of punishment that is credible is a function of the importance of the borrower). Because they are offered less onerous terms for returning to good standing, influential countries face punishment intervals with a shorter expected duration, which are therefore less costly. As a result, their incentives to comply with conditionality are weaker. Influential countries implement a lower proportion

of their policy commitments, so they are more subject to financial crises, and consequently they pay higher risk premia. This effect should be present for influential countries regardless of whether they are currently participating in a conditional lending program, since participating in an IMF program in the future is always a possibility. That is, the fact that a country would not be subject to effective discipline if it turned to the IMF for a bail-out in the future has an impact on its credit rating, even if it is not currently participating in a program. However, the effect should be strongest for countries that are currently participating, because future participation is discounted and uncertain.

H5 (Moral hazard): Controlling for amount of financing and conditionality, political bias exerts an upward pressure on bond yields, and this effect is strongest for countries that are crisis borrowers.

4. Research Design

To capitalize on data availability and a comparable set of cases of lending, we focus on crisis lending by the International Monetary Fund, using data drawn from the IMF's Monitoring of Agreements Database (MONA). The data span the period from 1992 to 2002 and cover the 66 countries that were not members of the OECD and for which data on bond yields were available from IFS. Our dependent variable is the nominal yield of short-term sovereign bonds issued in home country currency and measured at the end of each month.[8] Our quantities of interest are the effect of new program announcements, conditional on measures of U.S. influence over the IMF, the effects of those measures of influence when a new program is announced, and the effects of conditionality and loan size. We treat conditionality and loan size as endogenous.[9] We use a dummy variable for a month in which a new program

[8]Our empirical analysis thus speaks to the short-term (within one month) reaction of financial market actors, as opposed to longer term flows like FDI, or lagged effects of lending on investment inflows. While we recognize that these are also important measures of market catalysis, we focus here on short term perceptions that might influence future crisis dynamics, as interest rates for sovereign debt can either substantially ease or exacerbate economic crises.

[9]To our knowledge, this is the first empirical analysis to control for both loan size and number of conditions and treat loan terms as endogenous in a study of the effects of loan programs on bond yields. Barro and Lee (2001) control for endogeneity and Dreher (2006) controls for both endogeneity and conditionality, but both study economic growth rather than bond yields.

is announced to capture the short-term effects of new program announcements. Any information contained in the lending decision should be reflected in this short-term effect. To capture conditional effects, we regress interest rates on the new program dummy, influence variables × new program, influence variables × no new program, conditionality and loan size, and controls.

Measures of U.S. Influence

Our theory does not provide guidance about which particular interests motivate the United States to interfere in IMF program design, so we take an eclectic approach and allow for a range of variables to exert effects that reflect alternative interests. Following extant studies, we operationalize U.S. interests in terms of similarity of the borrowing country with the United States in UN General Assembly voting patterns (e.g. Thacker 1999, Stone 2004, Oakley and Yackee 2006), similarity to the United States in alliance portfolios, and exposure of U.S. banks to loans to recipient countries (Copelovitch 2010, Stone 2008, 2011).[10]

Instrumental Variables

We have argued that IMF loan size and conditionality affect bond yields and depend on variations in U.S. interests in particular countries, but that U.S. interests also have direct effects on bond yields through the moral hazard mechanism, so we adopt an instrumental variables approach in order to identify the separate mechanisms by which U.S. interests exercise their hypothesized effects. The validity of instrumental-variables analysis depends on the strength and exogeneity of the instruments, which we explore further below. We use the following instrumental variables, which are correlated with loan size and conditionality, but are not strongly correlated with bond yields.[11]

[10] We also tested for effects of U.S. foreign aid and U.S. exports, but those variables did not yield significant results, so they are not included in the specifications that we report below.

[11] The instruments collectively pass the Sargan test of overidentifying restrictions. The highest correlation between our instrumental variables and treasury bill rates is $\rho = .17$ for the case of total outstanding commitments, followed by $\rho = .14$ for countries with extended IMF program commitments. These instruments are not highly correlated with our measures of U.S. influence, which theoretically drive loan size and conditionality. The highest correlation between affinity scores and any instrument is $\rho = .15$ for number of countries participating, which is perhaps the least likely of our instruments to have a causal association

Number of countries participating: Przeworski and Vreeland (2000, 2001) and Vreeland (2003) argue that the IMF becomes reluctant to lend when its resources are stretched thin because of the need to hold something in reserve for future crises. This might lead the Fund to make smaller loans or extract more extensive conditionality in return for scarce funds. Alternatively, the number of countries participating in IMF programs might be an index for systemic vulnerabilities that magnify the risks of contagion. This could lead the IMF to offer more generous lending terms, including larger loans and more limited conditionality.

Ratio of Prior commitments of IMF financing to IMF Quota: The IMF has formal rules about access to credit measured in terms of multiples of a country's contributed quota. These rules can be waived, but the Executive Board is reluctant to extend credit substantially beyond previous precedents. To the extent that quotas represent constraints on IMF lending, previous commitments reduce the amount of credit available, and should reduce the size of new lending arrangements. Alternatively, the defensive lending hypothesis holds that countries that owe substantial amounts to the IMF may more easily qualify for additional credits because the Fund seeks to prevent any of its debtors from going into default. We find support for the hypothesis that prior commitments constrain new credits, and not for defensive lending.

Extended program: This is a dummy variable that codes arrangements that are designed to be disbursed over more than one year, including the EFF, ESAF, and PRGF. Such programs are typically intended to follow successful Stand-By arrangements and deepen structural reforms, so they typically involve more extensive conditionality and larger commitments of financing.

These instruments consistently satisfy the benchmarks commonly recommended in the literature to identify strong instruments. Following our main empirical results we present

with a particular country's affinity score with the U.S. U.S. commercial bank exposure is also not strongly correlated with any of our instruments ($\rho < .02$), with the exception of its moderate correlation of $\rho = .15$ with the ratio of prior IMF commitments to IMF quota. Alliance similarity with the U.S. is not strongly correlated with any instrument.

robustness analyses that assess the stability of our results to alternative assumptions about these instrumental variables. [12]

Control Variables

We control for economic variables that are correlated with interest rates and the terms of crisis lending (foreign debt, GDP per capita, reserves as a share of GDP, population). In addition, we control for missing data, which is a measure derived from a principal components analysis of the missingness of 19 time series reported by member countries to the IMF. Countries that fail to report these data are likely to have low administrative capacity, and this is associated with higher conditionality and higher interest rates. IMF standing is a measure of past non-performance of conditionality, which is derived from a 12-month moving average of a dummy variable that measures whether a country has an IMF program that is suspended for non-performance. Past non-performance is associated with additional conditionality and higher interest rates.

5. Results

The results of three models are presented in Table 1 below. The first model uses OLS to provide a baseline for comparison, and the second and third use instrumental variables (2SLS) to model the endogeneity of conditionality and the size of IMF lending facilities predicted by our model. The second model allows for cross-sectional and time series variation, and the third uses country fixed effects to focus on over-time variation within countries.[13] It is important to control for fixed effects for several reasons in this particular analysis; for example, this prevents country heterogeneity in the size of bond markets across countries

[12] The inclusion of these instruments in our instrumental variables regressions below consistently yields first-stage F statistics of over 119 and 611 for our equations predicting loan size and conditionality, respectively, which is well over the threshold of 10 suggested by Staiger and Stock (1997). The ratio of prior IMF commitments to IMF quota is a statistically significant predictor of loan size and number of conditions; number of countries currently under IMF programs and extended commitments are strong predictors of number of conditions, but not of loan size.

[13] We also estimated models including year fixed effects, which are included in the online appendix, as well as more restricted models with dummy variables for years in which a notable financial crisis occurred, and our substantive results remained unchanged. Details are available from the authors.

from biasing the results.[14] The results are broadly consistent across the three models, but there are important differences that we highlight below. The coefficient of IMF program initiation is statistically insignificant in the first model when the three U.S. influence variables take a value of zero, but is significantly associated with higher interest rates in the two-stage and fixed-effects specifications, just as the adverse selection hypothesis suggests. As we will see below when we interpret the conditional effects, however, IMF program initiation is statistically significant in all three models across most of the range of the U.S. influence variables. Note that this variable measures the short-term effect of initiating a new IMF program, which is our theoretical quantity of interest, not the steady-state effect of having an IMF program.

In the 2SLS estimates we focus on the second-stage estimates that predict interest rates; the first-stage estimates (presented in Table 3) confirm our theoretical expectation that political importance increases loan size but depresses the number of conditions attached to a loan, as H1 predicts. IMF credit is measured as the monthly change in aggregate IMF commitments in the month in which a new program is introduced, so it represents a short-term effect. The effect is substantively and statistically insignificant in the baseline OLS model. In the second model, which treats the loan amount as endogenous, however, IMF credit is highly significant, and is estimated to reduce interest rates, as H2 anticipates. This variable is measured in millions of SDRs, so a coefficient of -0.03 means that a one standard deviation increase in IMF credit for countries receiving IMF loans (equivalent to roughly 1.4 billion SDRs) generates a decrease of 44 percentage points. The coefficient remains highly significant with a nearly identical substantive effect in the fixed-effects specification. Countries experience greater gains in investor confidence, all else equal, when they receive larger infusions of IMF credit, and the effects can be substantial.

[14] A related argument is that perhaps bond supply rationing drives bond yields (e.g. Stiglitz and Blinder 1983). We are confident that our results are not driven by supply rationing for several reasons. First, cross-national heterogeneity in supply strategies will largely be controlled for by country fixed effects. Second, within-country bond rationing is unlikely to occur during economic crises, when governments want to prevent skyrocketing interest rates. Third, there is not a compelling reason to think that supply rationing would be systematically linked to our right hand side variables, and as such the omission of a bond supply control is unlikely to generate bias in coefficient estimates (although it may reduce the model's overall explanatory power).

Table 1: Effect of IMF Program Initiation and U.S. Influence on Bond Yields

	OLS		2SLS		2SLS (Fixed Effects)	
	Coefficient (std. error)	p-value	Coefficient (std. error)	p-value	Coefficient (std. error)	p-value
IMF Program Initiation	0.94 (5.80)	0.87	15.82 (6.10)	0.00	14.97 (6.06)	0.00
IMF Credit	1.06 (0.72)	0.14	-0.03 (0.01)	0.00	-0.03 (0.01)	0.00
Number of Conditions	0.68 (0.07)	0.00	-1.02 (0.13)	0.01	-1.20 (0.13)	0.00
New IMF Program						
Alliance portfolio	5.17 (12.73)	0.69	9.25 (13.48)	0.493	43.88 (14.11)	0.00
UN Voting	35.22 (6.01)	0.00	16.85 (6.16)	0.01	15.40 (6.14)	0.01
U.S. Bank Exposure	-97.51 (104.86)	0.35	1907.328 (473.32)	0.00	1931.70 (471.28)	0.00
No New Program						
Alliance portfolio	-15.86 (1.15)	0.00	9.73 (4.16)	0.02	42.65 (5.90)	0.00
UN Voting	5.27 (0.67)	0.00	6.30 (0.96)	0.00	5.25 (0.98)	0.00
U.S. Bank Exposure	7.71 (14.09)	0.59	38.94 (24.43)	0.11	85.47 (28.34)	0.00
Control Variables						
Population	-0.13 (0.01)	0.00	-0.004 (0.04)	0.918	0.36 (0.10)	0.00
Foreign Debt	.33 (0.02)	0.00	0.179 (0.065))	0.01	0.36 (0.09)	0.00
GDP per capita	-0.61 (0.06)	0.00	-0.10 (0.02)	0.00	-.113 (0.03)	0.00
Reserves/GDP	-24.32 (1.89)	0.00	-40.0 (3.70)	0.00	-47.39 (3.92)	0.00
Missing Data	8.27 (1.57)	0.00	9.07 (1.84)	0.00	8.43 (1.86)	0.00
IMF Standing	2.63 (0.90)	0.00	-2.92 (1.24)	0.02	-3.39 (1.24)	0.01
Constant	26.93 (0.74)	0.00	22.10 (2.41)	0.00	-1.64 (3.50)	0.638
Fixed Effects					Countries	
F test of fixed effects					42.53	0.00
number of obs	8,373		8,373		8,373	
rho (variance due to fixed effects)					0.66	

The estimated effect of conditionality on bond yields differs across the three models, but does so in a way that makes us confident in our interpretation of the results. The OLS estimate indicates that conditionality, contrary to theory, increases bond yields. However, when we model the endogeneity of conditionality, as well as when we control for fixed effects that capture a wide range of country-level variables that affect both conditionality and creditworthiness, the result is reversed. Focusing on the 2SLS results with fixed effects, it is clear that when a particular country is subject to more conditionality, its interest rates are lower, as predicted by H3. The results indicate that conditionality has a substantial depressing effect on bond yields. Conditionality is measured as a count of types of conditions contained in a particular program review, ranging from 0 to 19 and averaging almost 6, so conditionality is estimated to depress bond yields under IMF programs by just over 7.2 percentage points on average. A one standard-deviation increase in conditionality, or 3.6 more conditions, is sufficient to depress interest rates by another 4.32 percentage points.

The results for our three measures of U.S. influence generally support the model's prediction that bias increases bond yields, as H5 predicts. The results strengthen when we control for endogeneity and become uniformly significant across measures of influence when we also control for country fixed effects. The similarity in alliance portfolios has a consistently positive coefficient, but is only significant when we control for fixed effects. This suggests that the variation in alliance commitments that is important is taking place within countries over time, for example, as East European countries dropped out of the Warsaw Pact and joined NATO. In the fixed-effects specification, increasing alliance similarity with the United States by one standard deviation is estimated to increase interest rates by 2.3 percent in the month of a new IMF program announcement. To put this result in context, the alliance similarity between the United States and Poland increased by 65 percent of one standard deviation in this sample between 1990 and 2000. UN voting similarity also has consistently positive coefficients, which are significant in the OLS, 2SLS, and 2SLS with fixed effects specifications. The estimated marginal effect of increasing voting similarity with the United States by one standard deviation is to increase interest rates by just under 5 percent in the month of a program announcement. These increases represent direct effects, estimated after controlling

for the indirect effects of political influence through liquidity and conditionality.

The exposure of U.S. banks to particular countries tells a similar story. The OLS coefficient is negative. However, modeling the endogeneity of conditionality and IMF credit reverses the effect, and shows that countries that are important to U.S. banks pay much higher interest rates when they receive new IMF programs. Examining the results of the reduced-form equations makes clear why endogeneity plays an important role in the interpretation of these effects (See Table 3.) The exposure of U.S. banks plays a major role in explaining the size of IMF loans to particular countries, and IMF credit in turn reduces interest rates. When we control for the indirect effect of bank exposure that operates through IMF credit, we find that the direct effect of U.S. bank exposure (which our model attributes to the moral hazard effect) is to substantially increase interest rates. On average, this effect increases interest rates by 7.7 percent. Increasing the exposure of U.S. banks by one standard deviation increases interest rates by an estimated 29 percent. One standard deviation is a bit under 2 percent of total U.S. foreign bank assets, so it is not near the high water mark set by Mexico in 1995 of 18 percent. This is approximately the level reached by Colombia in the early 1990s, and Greece, the Philippines, South Korea, South Africa and Venezuela in the late 1990s. This effect is stronger in the model with fixed effects, indicating that cross-country variation masked some of the effects due to over-time variation within particular countries.

We argued above that variations in IMF credibility should affect bond yields regardless of whether a country is currently participating in a program, because resorting to IMF financing is always an available strategy. In other words, the existence of the IMF creates moral hazard for influential potential borrowers that are not IMF program participants. The effects should be smaller for non-participants, however, because the possibility of future program participation would be uncertain and discounted. Four of the six hypothesis tests that we perform with models that account for endogeneity support this hypothesis. Similarity of alliance portfolios with the United States has essentially the same effect when there is no new program as when there is a new program announcement in the two-stage least squares specification with fixed effects. Similarity of UN voting records has significant effects

that raise bond yields, although the effects when a country does not have a new program announcement are only 34 percent as large as when a new program is announced.[15] Bank exposure has statistically significant effects that are 4.4 percent as large when there is no new program as when there is a program announcement. These results broadly support our conjecture. Our control variables have the expected effects. Foreign debt increases bond yields, richer countries pay lower interest rates, central bank reserves lower interest rates, and missing data increases interest rates.

Because the interpretation of interaction effects is not straightforward, Table 2 presents the conditional effects of announcing a new IMF program with U.S. influence measures fixed at their means and at one standard deviation above their means. The effect of initiating a new IMF program is highly significant in the 2SLS equations when all three U.S. influence measures are fixed at their mean, and extracts a risk premium of 25.65 percentage points (the 95% confidence interval of the effect runs from 17.23 to 34.08 percentage points). The effects are stronger in the fixed effects specification, and the effects become stronger still when the U.S. influence measures are increased. Increasing alliance similarity with the United States by one standard deviation increases the estimated coefficient by 20 percent, and the estimated effect of a new program is approximately 14 percent greater in countries that vote in alignment with the United States in the UN to a degree that puts them one standard deviation above the mean.

What is the total effect of political influence on bond yields for IMF program participants? In other words, what is the cumulative effect of our measures of U.S. influence on bond yields, both operating directly and indirectly through IMF credit and conditionality? Table 3 displays the results of model 3, but now with first stage estimates reported. By adding the coefficients of U.S. influence across the stages, we can estimate the aggregate, or net effect as it operates through increasing loan size, decreasing conditionality, and the direct moral hazard and adverse selection effects. Consider the loan that the IMF extended to Russia to counter a crisis of confidence in the sovereign bond market in July 1998. At the time, Russia's alliance profile and UN voting profiles vis-a-vis the United States were

[15] The difference in coefficients is not statistically significant.

Table 2: Conditional Effects of New IMF Program Announcements

	OLS		2SLS		2SLS (Fixed Effects)	
	Coefficient (std. error)	p-value	Coefficient (std. error)	p-value	Coefficient (std. error)	p-value
All variables at their means	-0.02 (1.87)	0.99	25.65 (4.30)	0.00	41.05 (4.72)	0.00
Alliance S-score 1 std. dev. above mean	0.96 (3.25)	0.77	27.41 (5.37)	0.00	49.39 (6.05)	0.00
UN Voting S-score 1 std. dev. above mean	12.98 (2.94)	0.00	31.88 (4.62)	0.00	46.73 (5.00)	0.00
US Bank exposure 1 std. dev. above mean	-1.41 (2.37)	0.55	52.83 (10.40)	0.00	68.57 (10.54)	0.00

close to their average levels, so they are estimated to have had no substantial effects on the terms of the loan, but Russia's share of U.S. bank lending had risen over the previous two years to almost five percent of total foreign assets (approximately 3% above the mean for Russia in this sample). Under U.S. pressure, the IMF scrambled to assemble its largest loan to Russia, activating its General Arrangements to Borrow in order to secure the necessary resources. This in turn required U.S. Congressional action, prompting Treasury Secretary Robert Rubin to write to House Speaker Newt Gingrich, '"Our interest in successful political and economic reform in Russia is compelling. A collapse of the ruble would undoubtedly strengthen Russian opponents of reform, who include ultra-nationalists and Communists."[16] According to model 3, the scale of U.S. bank exposure is estimated to have boosted the size of the IMF loan to Russia by 1.65 billion SDRs, or approximately 26 percent of the 6.3 billion SDRs that the IMF committed.[17] The portion of the size of the loan attributed to U.S. bank exposure, in turn, is estimated to have depressed bond yields by 54 points. On the other hand, the large scale of U.S. bank exposure is estimated to have had a *direct* effect of

[16]Cited in Stone (2002), 155.

[17]The 17.1 billion dollar headline figure announced at the time included loans from the World Bank and Japan.

raising Russian bond yields by 58 percentage points, which is attributable to moral hazard. In addition, program initiation is estimated to have raised the premium on Russian bonds by another 15 percentage points, which is attributable to adverse selection. The net effect of political influence, as measured through U.S. bank exposure, is thus estimated to be 19 percentage points.

Capital markets initially reacted to the loan announcement with some optimism, and Russian bond yields declined in anticipation of the loan package announcement. Yet shortly after the announcement, bond yields began to rise to crisis levels, reaching 75 percent by early August—25 points above the Russian average treasury bill rate for the sample—and soared to 150 percent by the middle of August as it became clear that the Russian government was considering default (Sturzenegger and Zettelmeyer 2006, 98). Amid increasing market panic, Russia defaulted on some obligations, suspended inter-bank payments and devalued the ruble in late August. The dynamics driving investor expectations during the crisis were complex, but our theoretical model suggests that the terms of the bailout may have signaled that first, the extent of the Russian crisis was larger than anticipated, and second, the importance of the Russian economy to IMF principals was such that it could acquire bailout funding without implementing the longer-term structural reforms necessary to return to fiscal solvency. Indeed, although the July program included a far-reaching set of reforms intended to restore fiscal solvency, signals began to leak out within days of signing the accord that the Russian government did not seriously intend to implement them. As Blustein puts it, "during the 1990s, the Russians had usually heard 'yes' when it came to seeking aid from the IMF, to the point that the mantra 'too big and too nuclear to fail' pervaded attitudes of many market participants about the country" (2001, 238). Russia's geopolitical and economic importance created a perception that it would continue to receive IMF funding, making the ultimate decision of the IMF to allow default a surprise for many. At the same time, however, perceptions of geopolitical importance created concerns about the underlying state of the Russian economy and fears about future crises. These concerns created a self-fulfilling prophecy as the combination of rising bond yields, capital flight, and bank runs drove the economy into collapse. Blustein concludes that "it is reasonable to wonder whether Russia

Table 3: Fixed Effects IV Regression

Variable	IMF Credit	Conditions	Bond Yields
IMF Program Initiation	154.65 (89.10)	2.30** (0.65)	14.97* (6.06)
IMF Credit	–	–	-0.03** (0.01)
Number of Conditions	–	–	-1.20** (.13)
New IMF Program			
Alliance Portfolio	-6.27 (219.40)	0.47 (1.61)	43.87** (14.11)
UN Voting Affinity	-102.16 (92.8)	-2.44** (0.68)	15.40* (6.14)
US Bank Exposure	54892.73** (1514.65)	13.75 (11.13)	1931.70** (471.28)
No New IMF Program			
Alliance Portfolio	-44.45 (98.38)	0.55 (0.72)	42.65** (5.9)
UN Voting Affinity	0.36 (15.15)	0.05 (0.11)	5.38** (0.98)
US Bank Exposure	1221.252** (401.61)	-13.25** (2.94)	85.47** (26.34)
Control Variables			
Population	1.50 (1.60)	0.13** (0.01)	0.36** (0.10)
Foreign Debt	1.10 (1.37)	0.09** (0.01)	0.347** (.09)
GDP per Capita	2.74 (5.33)	-0.11** (0.04)	-1.14** (0.31)
Reserves/GDP	-37.01 (62.75)	-1.13* (0.45)	-47.39** (3.92)
Missing Data	23.54 (28.40)	.164 (0.21)	8.43** (1.86)
IMF Standing	-61.88** (15.85)	1.63** (0.12)	-3.39** (1.24)
Instruments			
Number of countries	-0.17 (0.31)	0.01** (0.002)	–
Extended Program	44.83** (11.61)	4.57** (0.09)	–
Commitments/ Quota	-44.09** (6.29)	0.61** (0.05)	–
Constant	-8.44 (56.96)	-2.89** (0.42)	-1.64 (3.49)
n = 8337			
F	127.47**	447.32**	–
χ^2			810.60**

**Signficant at the .01 level. *Significant at the .05 level. Standard errors in parentheses.

was set up for the colossal letdown of 1998 because it had been told 'yes' too many times in the past" (2001, 239).

In summary, we find several pieces of evidence that support our model. We find that conditionality decreases and the scale of financing increases with some of our measures of IMF bias, as hypothesized. We also find that conditionality and liquidity exert strong depressing effects on bond yields. We find robust direct effects of measures of U.S. influence—alliances, UN voting patterns, and U.S. bank exposure—on the yields of sovereign bonds, which are consistent with the moral hazard hypothesis that countries that enjoy privileged access to U.S. decision makers pay additional risk premia. We find that the initiation of new IMF programs is associated with an increase in the risk premium, controlling for conditionality and loan size, and that the risk premium increases more sharply in the presence of U.S.

influence. These results hold in models that treat conditionality and loan size as endogenous variables, as the theory specifies is appropriate, and in a model with country fixed effects.

6. Robustness

This section presents a number of additional analyses that probe the robustness of the results to alternative specifications and assumptions. We start with our preferred model, Model 3 in Table 1, which includes instrumental variables for IMF credit and conditionality and country fixed effects. First we eliminate control variables and add additional control variables. Next we add year fixed effects. Next we drop the identification restrictions used to estimate the instrumental variables one by one. Finally we replicate the results using bond spreads over U.S. Treasury bills rather than nominal yields as the dependent variable. The results demonstrate a high degree of resilience to these alternative procedures.

The first three models illustrate the effects of excluding or adding groups of variables to our preferred model. The first model excludes all of the country-level variables, the second excludes only descriptive country-level variables but includes economic-policy variables, and the third includes all of the variables in the main model in addition to the number of unmet conditions from the previous program (if any), democracy (polity2, which ranges from -10 to 10), and trade openness (exports plus imports divided by GDP).

Table 4: Robustness to Control Variables

	Model 1	Model 2	Model 3
New Program	24.80 (7.93)	16.45 (6.36)	16.38(6.44)
IMF Credit	-.06 (.01)	-.04 (.01)	-.04 (.01)
Conditions	-1.39 (.14)	-1.17 (.14)	-1.44 (.18)
New IMF Program			
Alliance portfolio	24.78 (17.25)	39.81 (14.73)	38.58 (15.02)
UN Voting	10.45 (7.78)	14.52 (6.44)	15.19 (6.52)
U.S. Bank Exposure	3192 (760)	2249 (494)	2330 (499)
No New IMF Program			
Alliance portfolio	32.08 (7.15)	39.14 (6.01)	36.94 (6.34)
UN Voting	5.01 (1.18)	5.07 (1.03)	4.99 (1.04)
U.S. Bank Exposure	75.76 (28.97)	68.29 (26.78)	109.87 (30.39)
Control Variables			
Population			0.29 (0.11))
Debt			2.87 (0.94)
GDP per capita			-0.77 (0.36)
Reserves		-47.61 (4.02)	-49.40 (4.24)
Missing Data		8.73 (1.93)	11.57 (2.18)
IMF Standing		-2.80 (1.30)	–4.91 (1.30)
Unmet_{t-1}			0.88 (0.21)
Democracy			0.45 (0.11)
Trade Openness			0.04 (0.01)
Constant	3.76 (3.50)	6.10 (2.94)	-2.59 (3.79)
Country FE	Yes	Yes	Yes
n	8703	8373	8373

The results are broadly consistent across the models, and neither excluding nor adding control variables changes the signs of any of the quantities of interest. Two U.S. influence variables have only marginally significant effects in the model that drops all country covariates, but their substantive effects remain significant. All of the relationships are robust to including additional covariates.

The next set of models controls for year as well as country fixed effects, in order to address the possibilities that macroeconomic events at the international level could have confounding effects across a number of countries in our sample, that there could be trends in the data over time, or that contagion (for example, of financial crises, such as the Asian Crisis and the Mexican Peso Crisis) could undermine the inferences that we draw from the data.

Table 5: Year Fixed Effects

	Model 1	Model 2
New Program	14.82 (5.49)	12.40 (5.40)
IMF Credit	-.02 (0.01)	-0.02 (0.01)
Conditions	-1.54(0.15)	-1.22 (0.12)
New IMF Program		
Alliance portfolio	33.00 (13.93)	35.31 (13.70)
UN Voting	11.42 (5.56)	12.05 (5.49)
U.S. Bank Exposure	1307 (414)	1242 (409)
No New IMF Program		
Alliance portfolio	34.52 (7.90)	35.33 (7.69)
UN Voting	1.84 (0.93)	1.88 (0.92)
U.S. Bank Exposure	26.79 (25.39)	29.70 (25.15)
Control Variables		
Population	0.84 (0.10)	0.85 (0.10)
Foreign Debt	1.75 (0.83)	2.18 (0.82)
GDP per capita	0.67 (0.32)	0.61 (0.32)
Reserves	-16.84 (3.85)	-17.70 (3.79)
Missing Data	30.50 (2.19)	30.87 (2.16)
IMF Standing	-2.68 (1.11)	-1.64 (1.11)
Unmet_{t-1}	1.18 (0.17)	
Country FE	Yes	Yes
n	8337	8373

The results are impressively robust to the inclusion of year as well as country fixed effects. None of the estimated coefficients of interest changes signs, and the substantive effects remain significant, with no dramatic changes in the sizes of the estimated effects. We conclude that none of the above criticisms undermines our main results. However, the inclusion of year fixed effects does reduce the magnitude of the effects of all three measures of U.S. influence when there is a program initiation, which suggests that a portion of the substantive effect estimated in the paper may be due to contemporaneous shocks or contagion effects. An alternative interpretation, however, is that over-time variation in some of our measures of U.S. influence, including particularly U.S. bank exposure, is correlated with financial crises in a number of countries, and controlling for time fixed effects attributes this effect to exogenous shocks. In other words, part of the apparent effect of contagion likely operates through our quantities of interest, so the conservative strategy of controlling for time effects may bias our estimated effects downwards.

The next three models, whose results are presented in Table 6, drop the exclusion restrictions on our instruments one at a time. (A minimum of two instruments is required to identify the model, since there are two endogenous variables.) The first model drops the restriction on *Number under*. The second drops the restriction on the lagged level of *Prior IMF commitments*. The third drops the restriction on *Extended program*. The results are robust to dropping the exclusion restriction on *number under*. This is the instrument that appears to be most likely to violate exclusion restrictions from a theoretical standpoint: the number of countries under existing IMF programs is not only a good indicator of how thinly spread IMF resources are, but may also be an indicator of global economic recession. As such, it might be a proxy for exogenous shocks that would affect interest rates across emerging markets. However, none of the coefficients of interest changes appreciably when we drop the restriction that the number of countries participating only affects interest rates through its effects on IMF credit and conditionality. This is consistent with the result reported above that our findings are robust to including year fixed effects in the specification. *Number under* is a statistically significant predictor of number of conditions (coefficient of .984, standard error of .028 in an auxilliary regression) but not a statistically significant predictor of IMF credit.

When we drop the restriction that prior IMF commitments only affect the interest rate through their effects on IMF credit and conditionality, three of our six coefficients of interest retain the expected signs and are significant at p=.02 or lower. Two measures of U.S. influence continue to have strong positive effects on interest rates when new programs are announced, conditionality continues to depress interest rates, and the effect of a new program announcement is to increase interest rates for U.S. allies and countries that vote like the United States in the UNGA. (New program announcements have an insignificant negative coefficient, but the interaction effects make the coefficient positive and significant for most of the range of the data.) Two of our results do not hold in this specification: IMF credit increases interest rates, rather than decreasing them; and U.S. bank exposure decreases interest rates, rather than increasing them. These results are parallel to the effects that we found in the baseline OLS specification in Model 1, which does not control for the

endogeneity of IMF credit. As prior work has shown (Copelovitch 2010, Stone 2011), IMF credit is closely related to U.S. bank exposure, so failing to treat IMF credit as endogenous attributes a portion of the positive effect of bank exposure on bond yields to IMF credit. Prior IMF commitments play an important role in identifying the effect of bank exposure on IMF credit, so the results look a lot like the OLS estimates when that restriction is removed.

Table 6: Dropping Identification Restrictions

	Number	*Commitments*	*Extended*
New Program	14.67 (5.97)	-3.96 (9.35)	62.76 (40.21)
IMF Credit	-0.03 (0.01)	0.08 (0.03)	-0.17 (0.11)
Conditions	-1.14 (0.14)	-1.71 (0.26)	-12.55 (8.39)
New IMF Program			
Alliance Portfolio	54.34 (14.09)	46.91 (20.23)	58.84 (46.24)
UN Voting	16.48 (6.05)	25.25 (8.96)	-25.87 (36.20)
U.S. Bank Exposure	1844 (464)	-4003 (1391)	9758 (5970)
No New IMF Program			
Alliance Portfolio S	53.52 (6.32)	46.73 (8.54)	53.54 (20.44)
UN Voting	5.77 (0.97)	5.01 (1.41)	6.42 (3.24)
U.S. Bank Exposure	85.77 (27.91)	-32.09 (45.26)	107.15 (91.64)
Control Variables			
Population	0.47 (0.11)	0.08 (0.16)	2.14 (1.36)
Foreign Debt	0.04 (0.01)	0.02 (0.01)	0.17 (0.10)
GDP per capita	-0.70 (0.34)	-1.21 (0.48)	-1.66 (1.13)
Reserves/GDP	-43.71 (3.95)	-46.64 (5.63)	-61.82 (16.40)
Missing Data	8.14 (1.83)	6.40 (2.70)	13.34 (6.93)
IMF Standing	-2.86 (1.23)	4.22 (2.46)	6.97 (8.61)
Number under	-0.09 (0.02)		
Commitments/Quota		0.004 (0.001)	
Extended			58.49 (43.19)
Constant	-7.56 (3.69)	3.34 (5.13)	-41.72 (31.61)
Country FE	Yes	Yes	Yes
n	8373	8373	8373

We believe that the argument for using the ratio of prior IMF commitments to IMF quotas as an instrument is well grounded. The logic relies directly on the IMF's internal technical rules for approving loans, which sets credit limits explicitly in terms of the ratios of prior IMF lending to IMF quotas. The numerator, prior commitments, is accumulated before a new program is announced and is publicly available information, so it should not be responsible for one-month bond price movements. In addition, the denominator, IMF quota,

is remarkably arbitrary. Although quotas are officially based on formulas that incorporate macroeconomic variables, multiple alternative formulas have been introduced for parallel use over the years, and none of the formulas closely tracks actual quotas. Quotas are exogenous to short-term movements of capital flows because they are adjusted at irregular intervals as part of multilateral agreements to expand the capital base of the IMF, and only one quota expansion occurred during the period we study. Furthermore, the ratio is a strong instrument, because it is a good predictor of IMF credits and conditions. An auxilliary regression of the ratio of prior commitments to quota on the amount of IMF financing yields a coefficient of -12.24 (1.62), meaning a one unit change (just over one standard deviation) in this ratio translates into a reduction in new credit by just over 12 million Special Drawing Rights (SDRs). A similar regression of the ratio on the number of conditions applied to a given country yields a coefficient of 0.9 (0.02), meaning that a one-unit change in the ratio adds one additional condition to a program. The mean number of conditions for a country receiving a new IMF program in a given period is just over 6, so an additional condition increases conditionality by about 17% for the average new borrower.

When the restriction that extended programs only affect interest rates through their effects on conditionality and IMF credit is dropped, the estimates' standard errors increase substantially. Five of the coefficients of interest retain the expected signs in this specification, but their significance drops to the 0.1 level. In an alternative specification that controls for unmet conditionality, the significance of the coefficients is somewhat greater, ranging from .06-.09. The substantive magnitude of the estimated effects is considerably increased when we drop this restriction, however. This indicates that the restriction was not biasing our results against the null hypothesis, but rather the opposite. At the same time, it apparently increased the precision of our estimates.

Extended, as noted above, is a dummy variable indicating whether IMF loans are designed to be disbursed over multiple years. This can be done for a variety of reasons. Sometimes a multi-year program is designed to achieve deep structural reforms, which may be difficult to implement within a single year. This would suggest a correlation with unfavorable economic conditions. Alternatively, an extended program is sometimes used as a capstone

after successful stabilization has been achieved, which suggests a correlation with favorable conditions. Extended programs are available to borrowers at every income level. The decision to design a multi-year program appears to lie primarily with the IMF staff, which uses its own technical criteria to decide when it is appropriate, and an element of exogeneity is introduced by the fact that IMF standard procedures do not allow a country to participate in an extended program until after completion of a one-year Stand-by arrangment. *Extended* is a good predictor of the number of conditions, with a coefficient of 5.48 (.036) in an auxilliary regression. Recall the mean number of conditions for a new borrower is about 6 with a standard deviation of about 3.5, so extended programs tend to entail more than a standard deviation of additional conditions, and almost double the level required in the average program. *Extended* does not predict IMF financing, with a coefficient statistically indistiguishable from 0 in auxilliary regressions.

Finally, in response to comments by anonymous reviewers, we checked the robustness of our results to including a control for the nominal exchange rate and to using the spread between the nominal yield and the interest rate on U.S. Treasury bonds as the dependent variable ("spreads") instead of the nominal yield.

Table 7: Spreads and Exchange Rates

	Baseline	Spread	Exch Rate
New Program	17.44 (6.20)	17.28 (6.15)	17.19 (6.14)
IMF Credit	-.03 (0.01)	-0.03 (0.01)	-0.03 (0.01)
Conditions	-1.51(0.17)	-1.49 (0.17)	-1.49 (0.17)
New IMF Program			
Alliance Portfolio	42.27 (14.38)	54.97 (15.26)	42.49 (14.24)
UN Voting	14.80 (6.24)	14.92 (6.19)	14.57 (6.18)
U.S. Bank Exposure	2022 (481)	1979 (476)	1962 (475)
No New IMF Program			
Alliance Portfolio	42.53 (6.11)	55.26 (6.06)	42.90 (6.05)
UN Voting	5.28 (1.00)	5.05 (0.99)	5.12 (0.99)
U.S. Bank Exposure	84.77 (28.77)	78.22 (28.53)	84.60 (28.49)
Control Variables			
Population	0.33 (0.11)	0.32 (0.11)	0.33 (0.10)
Foreign Debt	3.03 (0.90)	2.95 (0.89)	3.13 (0.89)
GDP per capita	-1.15 (0.34)	-1.20 (0.34)	-1.17 (0.34)
Reserves	-47.34 (4.00)	-44.63 (3.96)	-46.01 (3.97)
Missing	7.90 (1.89)	11.87 (1.87)	8.46 (1.88)
IMF Standing	-4.40 (1.24)	-4.42 (1.23)	-4.35 (1.22)
Unmet_{t-1}	1.18 (0.19)	1.13 (0.18)	1.16 (0.18)
Exch Rate			-0.44 (0.12)
Constant	-0.65 (3.59)	-11.64 (3.56)	-0.67 (3.55)
Country FE	Yes	Yes	Yes
n	8337	8337	8337

As expected, neither of these changes in our specification affected our results in any substantial way. The coefficients and standard errors are essentially unchanged. Using the spread rather than the yield as the dependent variable substantially changed only the constant. The nominal exchange rate, surprisingly, is significantly correlated with the bond yield in spite of the fact that this is calculated as a percentage, but including it in the specification does not affect any of the other estimates.

7. Conclusion

Here we return to our original motivation: how does multilateral lending affect financial market conditions? As we noted at the outset, existing findings are quite mixed, and our analysis provides a compelling reason for inconsistencies across different research designs. Namely,

multilateral crisis lending affects markets not in one, simple way, but through multiple and often countervailing mechanisms. Providing liquidity and conditionality presumably reassures bond markets, although demonstrating even this much has proved illusive until now. On the other hand, announcing a new program reveals private information, and if IMF programs are subject to adverse selection, this can result in negative market responses. Finally, the effect of a new program depends on expectations about compliance with conditionality and enforcement if the program goes off track. If enforcement systematically depends on the interests of major IMF shareholders, this should influence market expectations. Which of these effects dominates in a particular case depends on bargaining between the lender and the borrower, and the inferences that market observers draw from what they observe.

Our empirical results can be read as qualified support for the practice of conditional lending, since we find that increasing the scope of conditionality reduces the yield on government bonds. This indicates that market actors believe that the reforms promoted by the IMF improve the probability that they will be repaid. Since the success of the Fund at managing financial crises and limiting international contagion depends upon the perception that its programs are successful, this suggests that rather than implementing plans to streamline conditionality, it might better serve its purposes by expanding it. In addition, we find that larger IMF loans are more effective at stemming capital flight than smaller ones, all else equal.

On the other hand, we find evidence that the net effect of announcing a new program, controlling for the effects of liquidity and conditionality, is to raise the cost of borrowing. This indicates that on average, program announcements do not serve as seals of approval, but rather reveal that the government's financial situation is insecure. Furthermore, we find that the negative effect of announcing a program on market confidence increases when the borrowing country is important to U.S. foreign policy. This is consistent with the finding of our model that enforcement of conditionality is less rigorous for influential borrowers, which consequently are less likely to implement conditionality, and more likely to suffer financial crises. In addition, this interpretation is consistent with the finding that measures of U.S. interest in potential borrowing countries are directly associated with higher bond yields, and

that these effects are greatest when a new program is announced.

Although the mechanisms are complex, the results provide a clear picture of the effects of informal influence on capital markets. When borrowing countries are able to draw on U.S. influence, conditionality is reduced but liquidity is increased. These effects can work at cross-purposes: markets tend to respond positively to increased liquidity but negatively to reduced conditionality. When informal influence is at its peak, however, our analysis indicates that the announcement of a new IMF program leads to capital flight. That is, in the time period that we study, the effect of moral hazard was sufficiently intense that bondholders were more discouraged than encouraged, on balance, by the observation that a borrower had close ties to the United States. Weakened credibility of reform commitments outweighed the benefits of the super-sized loans that cozy relationships could provide. As a result, the net effect of borrowing from the IMF was to raise bond yields for the most prominent borrowers. This study therefore provides an example of the broader trade-off involved in governance arrangements that allow powerful countries to exert informal influence in exchange for "buy-in" to multilateral institutions. Such arrangements exacerbate the time consistency problems that powerful states face, frequently leading to unintended policy outcomes. In this case, it can be precisely the countries that the United States most wants to help to avoid financial crises that are able to derive the least benefit from IMF involvement.

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