De Facto Bank Bailouts

Internet Appendix

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This Internet Appendix presents the results of the supplementary analyses referred to in the main paper.

A. Robustness

Loan size. We investigate whether conditional on country i receiving a loan, the size of the IMF loan also increases with U.S. bank exposure. Using our sample of 269 IMF loans, we regress the natural logarithm of loan size on ln(US_BANK_EXPOSURE) plus the same vector of controls $\boldsymbol{X}$ and year fixed effects. The results are presented in Table 1 across four columns, with each column adding additional controls. In all cases, the coefficient estimate on ln(US_BANK_EXPOSURE) is positive and significant. The point estimate in column 4 is 0.33, which implies that (since both variables are in log form) a 1% increase in U.S. bank exposure leads to a 0.33% increase in loan size. Thus, the economic importance of this effect appears to operate mainly on the extensive margin.

[Insert Table 1 here]

FFIEC data. There is an alternative data source detailing U.S. bank foreign exposure available from the Federal Financial Institutions Examination Council (FFIEC). The FFIEC data come in disaggregated form, with total foreign exposure broken down into public exposure, bank exposure, and other sector exposure. Over our entire sample period, about 30% of U.S. bank foreign exposure is to the public sector. The remaining is to banks (30%) and to other sectors (40%). We reestimate **??** using these data and we present the results in Table 2. Columns 1 to 4 present the results for public, bank, other

sector, and total exposure, respectively.

[Insert Table 2 here]

Although we find that exposure to both the public and the private sector is significant in explaining the likelihood of receiving an IMF loan, notably, the effect is largest, both in magnitude and statistical significance, for public exposure. Since public sector exposure is more directly absorbed by IMF loans, these results suggest that U.S. banks can benefit directly via loan conditionality, which typically enforces the payment of debt in arrears.

Linear probability model. Since interaction terms can be problematic in non-linear models (see **?**), we replicate **??** using a linear probability model.[1] The results for this specification, presented in Table 3, are qualitatively the same as our main findings above.

[Insert Table 3 here]

B. Identification

A predictive model of IMF loan allocations. Since the concern is that U.S. banks can predict where IMF loans are going and increase their exposure, we build a predictive model using the observable information available to banks. Specifically, we estimate the following logit model:

[1] Here, the function $g(.)$ in **??** takes the form $g(x) = x$.

$$g(\text{IMF\_LOAN}_{i,t}) = \alpha_1 \text{SOVEREIGN\_DEFAULT}_{i,t} + \boldsymbol{\beta}' \boldsymbol{X}_{i,t-1} + I_i + T_t \quad (1)$$

where all the predictors are lagged versions of the variables described in the main text. We then take the predicted values from this regression, $\widehat{\text{IMF\_LOAN}}$, and relate them to ln(US_BANK_EXPOSURE) in the following linear regression:

$$\begin{aligned} (2) \qquad \ln(\text{US\_BANK\_EXPOSURE})_{i,t} &= \gamma_1 \text{SOVEREIGN\_DEFAULT}_{i,t} \\ &\quad + \gamma_2 \widehat{\text{IMF\_LOAN}}_{i,t} + \boldsymbol{\beta}' \boldsymbol{X}_{i,t} + I_i + T_t + \varepsilon_{i,t} \end{aligned}$$

If U.S. banks indeed increase their exposure to countries that they consider more likely to receive IMF loans, then we should find γ_2 in equation (2) to be positive and significant. We estimate Section .B and equation (2) and present the results in Table 4. We can see from column 2 that the coefficient on $\widehat{\text{IMF\_LOAN}}$ is actually negative and marginally significant, which is inconsistent with the notion that banks increase their exposure to countries that are more likely to receive IMF loans.

[Insert Table 4 here]

C. The Trade-off between De Facto and Direct Bailouts

Our main de facto bailout hypothesis argues that the U.S. (and other major IMF members) uses its political power to direct IMF loans to defaulting sovereigns to which

U.S. banks are exposed. This indirect bailout mechanism can reduce the losses to U.S. banks that stem from sovereign default which in turn reduces the need for direct bailouts in the form of guarantees (or recapitalizations). The corollary to this is that countries lacking the political clout to direct IMF loans to defaulting sovereigns to which their own banks are exposed have only the option of direct bailouts at their disposal to shore up their banking systems. While an extensive empirical investigation of this possibility is beyond the scope of this paper, we provide some suggestive evidence in Table 5 below.

[Insert Table 5 here]

Data on bank bailouts, especially guarantees, is not readily available. Thus, to proxy for the extent of direct government intervention into the banking sector we use changes in deposit insurance coverage during the Global Financial Crisis. During this tumultuous period, governments all around the world introduced or expanded their deposit insurance or guarantee schemes in an effort to stabilize their local banking systems. For example, in 2008, the Australian banking system went from having no deposit insurance scheme to complete coverage of all deposits (without limit) and with no need to pay an insurance premium; thus, this was a deposit guarantee offered by the Australian government. Using data from the World Bank Deposit Insurance Database[2], we construct a dependent variable equal to the change in deposit insurance coverage (DI_COVERAGE_CHANGE) from before 2008 to after (as a percentage of GDP)[3] for 106 countries and run cross-sectional regressions relating this variable to various proxies for political influence.

[2]See https://datacatalog.worldbank.org/dataset/deposit-insurance-dataset.
[3]For countries introducing limitless insurance or guarantee schemes, we assign a value of 100.

In column 1, our measure of political influence in the IMF is that country's IMF vote share (IMF_VOTING_SHARE). We see a significant negative correlation, implying that countries with more political influence in the IMF tended to introduce smaller increases in deposit insurance/guarantees during the Global Financial Crisis. It may be possible that a country does not need direct influence over IMF decisions to have influence over the allocation of IMF loans. For example, being "friends" with the most powerful IMF member, the U.S., may be sufficient to see de facto bailouts allocated in such a way as to benefit that country. Thus, in column 2 we use each country's historical voting similarity with the U.S. in the United Nations General Assembly (i.e., the percentage of its votes in line with those of the U.S.) as our main independent variable (UN_VOTING_SIMILARITY). We find a negative and significant correlation, implying that being politically aligned with the U.S. also appears to have reduced the magnitude of the governmental response to the financial crisis. Finally, in column 3 we examine the correlation between ln(US_BANK_EXPOSURE) and deposit insurance coverage changes post-crisis and find a negative and significant relation. One interpretation of this result is that because countries to which U.S. banks are highly exposed are more likely to receive de facto bank bailouts, these country's governments felt less need to intervene directly in their own banking sectors given an external shock that could have led to problems in the domestic economy. An alternative interpretation is that these governments wanted to minimize their exposure to the banking sector to reduce their own chances of default and to avoid a de facto bailout that would likely come with politically costly conditions attached, such as austerity measures. We repeat the analysis above, adding country level controls in columns 4 to 6, and find that only ln(US_BANK_EXPOSURE) is robust to the

addition of controls.

D. De Facto Bailouts and Government Incentives to Default

In Table 6 we investigate whether the exposure of banks from other major non-U.S. members alters default incentives in a similar fashion to that shown in **??**. We do not find any evidence that other countries' exposure significantly alters government default incentives.

[Insert Table 6 here]

TABLE 1

IMF Loan Size

This table presents coefficient estimates for an OLS regression where the dependent variable is the natural logarithm of the loan amount a country receives from the IMF. The sample consists of 269 loans to 47 countries between 1983 and 2016. The variable ln(US_BANK_EXPOSURE) is the natural logarithm of the exposure U.S. banks have to a given country, as a percentage of their total exposure worldwide. SOVEREIGN_DEFAULT is a dummy variable which takes 1 if a country's external debt is in default in year t, and 0 otherwise. Column 2 includes country-specific macroeconomic characteristics as controls: GDP, GDP_GROWTH, INFLATION, POPULATION, and EXCHANGE_RATE. Column 3 controls for each country's degree of ECONOMIC_OPENNESS, as well as its level of trade relationship with the U.S. (TRADE_WITH_US); and column 4 accounts for whether a country is a temporary member of the United Nations (UN) Security Council (TEMPORARY), the country's voting similarity with the U.S. voting history at the UN (UN_VOTING_SIMILARITY), and for the country's level of democracy (POLITY). To aid comparison of economic magnitudes, the elasticity associated with our main variable of interest, ln(US_BANK_EXPOSURE), for each model is presented in a separate row below the regression estimates. Regressions include year fixed effects to account for aggregate time trends that are common to all countries in the sample. Standard errors are clustered at the country level to allow for error correlation within each panel.

DEPENDENT VARIABLE: ln(IMF_LOAN_AMOUNT)	1	2	3	4
ln(US_BANK_EXPOSURE)	0.46***	0.25***	0.32***	0.33***
	(8.08)	(4.62)	(5.85)	(6.44)
GDP		4.05***	3.47***	3.25***
		(3.57)	(5.07)	(5.64)
GDP_GROWTH		-0.06***	-0.06***	-0.05***
		(-3.29)	(-3.52)	(-3.11)
INFLATION		-0.00**	-0.00	-0.00
		(-2.42)	(-1.31)	(-0.93)
POPULATION		0.00*	0.00	0.00
		(1.86)	(1.37)	(1.60)
EXCHANGE_RATE		-0.05**	-0.04	-0.05*
		(-2.26)	(-1.59)	(-1.91)
ECONOMIC_OPENNESS			-0.73***	-0.57**
			(-3.28)	(-2.43)
TRADE_WITH_US			-2.74***	-2.33***
			(-4.66)	(-4.33)
TEMPORARY				-0.17
				(-1.17)
UN_VOTING_SIMILARITY				1.40***
				(2.76)
POLITY				-0.04***
				(-2.82)
Constant	9.07***	7.38***	8.61***	8.30***
	(22.09)	(16.59)	(20.31)	(19.03)
Elasticities				
ln(US_BANK_EXPOSURE)	0.46	0.25	0.32	0.33
Observations	269	256	237	222
R-squared	0.610	0.749	0.815	0.817
Year Fixed Effects	Yes	Yes	Yes	Yes

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 2
FFIEC Data
This table presents coefficient estimates for the logistic model in **??** using data from the Federal Financial Institutions Examination Council (FFIEC). The sample consists of an unbalanced panel of 47 countries between 1983 and 2016. Column 1 considers banks exposure to the Public Sector, column 2 exposures to the Banking Sector, column 3 exposures to Other Sectors, and column 4 considers the total (FFIEC) exposure. For each type, exposures are measured as the natural logarithm of the exposure U.S. banks have to a given country's sector as a percentage of their total exposure worldwide. The dependent variable is a dummy which takes 1 for countries that received an IMF loan, and 0 otherwise. SOVEREIGN_DEFAULT is a dummy which takes 1 when a country's external debt is in default, and 0 otherwise. To aid comparison of economic magnitudes, the elasticity associated with our main variable of interest, SOVEREIGN_DEFAULT × SECTOR_EXPOSURE, for each model is presented in a separate row below the regression estimates. Regressions include all controls used in **??** column 4, country fixed effects, and year fixed effects. Standard errors are clustered at the country level.

	1	2	3	4
DEPENDENT VARIABLE: IMF_LOAN	Public	Private	Banks	Total FFIEC
SOVEREIGN_DEFAULT	10.07***	6.92***	8.17***	6.96***
	(4.02)	(3.35)	(3.98)	(3.40)
PUBLIC_SECTOR	-0.10			
	(-0.86)			
SOVEREIGN_DEFAULT × PUBLIC_SECTOR	0.49**			
	(2.37)			
PRIVATE_SECTOR		0.04		
		(0.30)		
SOVEREIGN_DEFAULT × PRIVATE_SECTOR		0.35*		
		(1.70)		
BANKING_SECTOR			-0.04	
			(-0.26)	
SOVEREIGN_DEFAULT × BANKING_SECTOR			0.33*	
			(1.88)	
FFIEC_BANK_EXPOSURE				0.07
				(0.41)
SOVEREIGN_DEFAULT × FFIEC_BANK_EXPOSURE				0.47**
				(2.23)
Elasticities				
SOVEREIGN_DEFAULT × SECTOR_EXPOSURE	2.74	1.97	1.91	2.22
Observations	1,018	1,085	1,089	1,114
Pseudo R-squared	0.443	0.415	0.431	0.420
Controls	Yes	Yes	Yes	Yes
Controls × SOVEREIGN_DEFAULT	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 3

Linear Model

This table presents coefficient estimates for an OLS regression of the model in **??**. The dependent variable is a dummy which takes 1 for countries that received an IMF loan, and 0 otherwise. The sample consists of an unbalanced panel of 47 countries between 1983 and 2016. The variable ln(US_BANK_EXPOSURE) is the natural logarithm of the exposure U.S. banks have to a given country, as a percentage of their total exposure worldwide. SOVEREIGN_DEFAULT is a dummy variable which takes 1 if a country's external debt is in default in a given year, and 0 otherwise. Column 2 includes country-specific macroeconomic characteristics as controls: GDP, GDP_GROWTH, INFLATION, POPULATION, and EXCHANGE_RATE. Column 3 controls for each country's degree of ECONOMIC_OPENNESS, as well as its level of trade relationship with the U.S. (TRADE_WITH_US); and column 4 accounts for whether a country is a temporary member of the United Nations (UN) Security Council (TEMPORARY), the country's voting similarity with the U.S. voting history at the UN (UN_VOTING_SIMILARITY), and for the country's level of democracy (POLITY). To aid comparison of economic magnitudes, the elasticity associated with our main variable of interest, SOVEREIGN_DEFAULT $\times$ ln(US_BANK_EXPOSURE), for each model is presented in a separate row below the regression estimates. Regressions include country fixed effects to control for unobserved time-invariant characteristics, and year fixed effects to account for aggregate time trends that are common to all countries in the sample. Standard errors are clustered at the country level to allow for error correlation within each panel.

DEPENDENT VARIABLE: IMF_LOAN	1	2	3	4
SOVEREIGN_DEFAULT	0.96***	0.92***	0.91***	0.87***
	(6.50)	(4.47)	(3.49)	(3.22)
ln(US_BANK_EXPOSURE)	0.00	-0.02	-0.01	-0.01
	(0.03)	(-0.91)	(-0.60)	(-0.49)
SOVEREIGN_DEFAULT $\times$ ln(US_BANK_EXPOSURE)	0.07***	0.07**	0.08***	0.09***
	(2.94)	(2.48)	(2.75)	(2.99)
Elasticities				
SOVEREIGN_DEFAULT $\times$ ln(US_BANK_EXPOSURE)	1.70	1.70	1.94	2.18
Observations	1,529	1,436	1,359	1,246
R-squared	0.446	0.498	0.493	0.512
Controls	Yes	Yes	Yes	Yes
Controls $\times$ SOVEREIGN_DEFAULT	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 4

Predictive Model

This table presents coefficient estimates for the endogeneity test described in **??** using an unbalanced panel of 47 countries between 1983 and 2016. Column 1 shows estimates for a logistic regression in which the dependent variable is a dummy which takes 1 for countries that received an IMF loan, and 0 otherwise. Covariates in this model include SOVEREIGN_DEFAULT which is a dummy variable that takes 1 if a country's external debt is in default, and 0 otherwise, and lagged versions of the controls used in **??** column 4. Column 2 presents estimates from an OLS regression in which the dependent variable is ln(US_BANK_EXPOSURE). This variable is estimated as the natural logarithm of the exposure U.S. banks have to a given country, as a percentage of their total exposure worldwide. The independent variable of interest is $\widehat{\text{IMF\_LOAN}}$, which is the predicted probability of receiving an IMF loan estimated from column 1. Regressions include controls used in **??** column 4, country fixed effects, and year fixed effects. Standard errors are clustered at the country level.

	1	2
DEPENDENT VARIABLE:	IMF_LOAN	ln(US_BANK_EXPOSURE)
SOVEREIGN_DEFAULT	2.20***	
	(8.46)	
$\widehat{\text{IMF\_LOAN}}$		-2.35*
		(-1.79)
GDP	-0.23	0.28***
	(-0.35)	(6.29)
GDP_GROWTH	-0.05**	0.00
	(-2.07)	(0.00)
INFLATION	0.00	-0.00
	(0.50)	(-0.81)
POPULATION	-0.01	0.00***
	(-1.12)	(3.62)
EXCHANGE_RATE	-0.00	-0.10**
	(-0.02)	(-2.32)
ECONOMIC_OPENNESS	0.60	1.11*
	(0.82)	(1.79)
TRADE_WITH_US	5.48***	1.02
	(3.33)	(1.14)
TEMPORARY	-0.16	0.17*
	(-0.50)	(1.75)
UN_VOTING_SIMILARITY	3.94*	0.06
	(1.67)	(0.06)
POLITY	-0.00	0.02
	(-0.16)	(1.08)
Observations	1,189	1,159
Pseudo R-squared / R-squared	0.298	0.898
Country Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes

Robust z-statistics (Column 1) and t-statistics (Column 2) in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 5

Government Guarantees

This table presents coefficient estimates for an OLS regression where the dependent variable is the change in the deposit insurance coverage limit of 108 developed and developing countries before and after the 2008 Global Financial Crisis. In Columns (1) and (4), the main explanatory variable is each country's voting share at the IMF (IMF_VOTING_SHARE). In Columns (2) and (5), the explanatory variable of interest is the country's voting similarity with the U.S. voting history at the UN (UN_VOTING_SIMILARITY), and in Columns (3) and (6) the main explanatory variable is the natural logarithm of the exposure U.S. banks have to a given country, as a percentage of their total exposure worldwide (ln(US_BANK_EXPOSURE)). In addition, Columns (4) to (6) include country-specific macroeconomic characteristics as controls: GDP, GDP_GROWTH, INFLATION, POPULATION, and EXCHANGE_RATE. To aid comparison of economic magnitudes, the elasticity associated with our main variable of interest for each model is presented in a separate row below the regression estimates.

DEPENDENT VARIABLE: DI_COVERAGE_CHANGE	1	2	3	4	5	6
IMF_VOTING_SHARE	-8.90***			-14.23		
	(-4.10)			(-0.34)		
UN_VOTING_SIMILARITY		-69.49***			-23.61	
		(-2.82)			(-0.53)	
ln(US_BANK_EXPOSURE)			-4.77***			-5.37***
			(-4.18)			(-3.11)
GDP				9.87	-5.70*	3.12
				(0.19)	(-1.71)	(0.71)
GDP_GROWTH				0.88	0.99	0.11
				(0.78)	(0.84)	(0.11)
INFLATION				0.72	0.60	0.39
				(1.00)	(0.76)	(0.58)
POPULATION				-0.01	-0.03**	-0.00
				(-0.36)	(-2.12)	(-0.13)
EXCHANGE_RATE				0.34	0.29	-0.73
				(0.25)	(0.19)	(-0.52)
Constant	34.60***	42.99***	58.76***	26.40**	28.18	62.64***
	(7.01)	(5.32)	(6.59)	(2.03)	(1.38)	(3.73)
Elasticities						
	-0.01	-0.03	-0.05	-0.02	-0.01	-0.05
Observations	104	103	106	87	85	88
R-squared	0.051	0.067	0.165	0.074	0.075	0.179

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 6

Sovereign Default (Other Country Exposures)

This table presents coefficient estimates for a logistic model in which the dependent variable is a dummy variable which takes 1 if a country's external debt is in default in a given year, and 0 otherwise. For each country, the variable ln(LAGGED_LOCAL_BANK_EXPOSURE) correspond to the natural logarithm of the lagged local banking sector exposure to the local private sector (scaled by GDP). column 1 shows coefficient estimates for the variable ln(LAGGED_JAPAN_BANK_EXPOSURE) which is measured as the natural logarithm of the lagged exposure Japanese banks have to a given country, as a percentage of their total exposure worldwide. Similarly, columns 2 to 5 show coefficients estimates for the lagged exposures of Germany, France, the UK, and Italy, respectively. Column 6 presents estimates for the foreign exposures of these five IMF members as a whole. Finally, in column 7 we present coefficient estimates for the foreign exposures of all European banks in our sample. To aid comparison of economic magnitudes, the elasticity associated with our main variable of interest, ln(LAGGED_LOCAL_BANK_EXPOSURE), for each model is presented in a separate row below the regression estimates. Regressions include lagged values for all controls used in Table 1 column 4, country fixed effects, and year fixed effects. Standard errors are clustered at the country level.

	1	2	3	4	5	6	7
DEPENDENT VARIABLE: SOVEREIGN_DEFAULT	Japan	Germany	France	UK	Italy	Major non-US	Europe
ln(LAGGED_LOCAL_BANK_EXPOSURE)	-1.34**	-0.77*	-0.88**	-0.98*	-0.89**	-0.85*	-0.83*
	(-2.53)	(-1.78)	(-2.00)	(-1.81)	(-2.14)	(-1.67)	(-1.71)
ln(LAGGED_JAPAN_BANK_EXPOSURE)	0.51						
	(1.58)						
ln(LAGGED_GERMAN_BANK_EXPOSURE)		-0.68					
		(-1.20)					
ln(LAGGED_FRANCE_BANK_EXPOSURE)			-0.12				
			(-0.36)				
ln(LAGGED_UK_BANK_EXPOSURE)				0.15			
				(0.76)			
ln(LAGGED_ITALY_BANK_EXPOSURE)					-0.11		
					(-0.54)		
ln(LAGGED_MAJOR_NON_US_MEMBERS_BANK_EXPOSURE)						-0.14	
						(-0.34)	
ln(LAGGED_EUROPE_BANK_EXPOSURE)							-0.29
							(-0.67)
Elasticities							
ln(LAGGED_LOCAL_BANK_EXPOSURE)	-1.22	-0.70	-0.81	-0.90	-0.81	-0.78	-0.76
Observations	654	855	855	855	855	855	855
Pseudo R-squared	0.586	0.534	0.529	0.530	0.530	0.529	0.530
Lagged Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1