Internet Appendices

Appendix A. Monetary Policy Rates

This appendix defines the monetary policy rates that I use. My sample firms are based in 43 different countries and have foreign-currency debts in 45 currencies. In all, I use 48 separate interest rate series. About half of this data comes from the BIS and the IMF, but I have verified this data where possible by comparing it with statistical reports from the various central banks. The rest of the data comes from Bloomberg or from statistics published by the central banks. I have selected rates (a) for which historical values are available, (b) which respond sharply to actions taken by the monetary authority, and (c) which are comparable in maturity across countries (i.e., maturity less than two weeks, typically overnight). For countries that have no policy rate—Singapore, Croatia, and Sri Lanka—I drop the currency from my sample but keep firms located in the country that have debts in other currencies.

Argentina	Midpoint of the 7-day "active" repo (central bank lending rate, Bloomberg ticker "ARPPAC Index") and the 7-day "passive" repo (borrowing rate, Bloomberg ticker "ARPPPA Index"), starting 5/31/2004
Australia	cash rate target reported by the BIS
Bahrain	1-week deposit facility rate reported by the IMF
Brazil	SELIC rate reported by the BIS
Bulgaria	Base Interest Rate reported by the Bulgarian National Bank.
Canada	central bank target overnight rate reported by the BIS
Chile	official monetary policy rate reported by the BIS
China	1-day China interbank offer rate (Bloomberg ticker "IBO001 Index"
Colombia	1-day repo rate reported by the BIS
Croatia	The Croatian National Bank maintain's a constant exchange rate against the Euro, so I drop Croatian Kuna as a foreign currency. For Croatian firms, I use the rate reported by the BIS as the domestic rate.

Czech Republic	two-week repo rate reported by the BIS
Denmark	CD rate reported by the BIS
Egypt	midpoint of the overnight lending rate (Bloomberg ticker "EGBRLR Index") and the overnight deposit rate (Bloomberg ticker "EGBRDR Index")
Euro Area	rate on main refinancing operationg reported by the BIS
Hong Kong	base rate reported by the BIS
Hungary	key rate reported by the BIS
India	overnight repo rate reported by the BIS, starting 2001-Q2.
Indonesia	base rate (Bloomberg ticker "JIIN1W Index")
Israel	Bank of Israel rate reported by the BIS.
Jordan	midpoint of the overnight repo and overnight deposit rates reported by the Bank of Jordan
Japan	uncollateralized overnight call rate reported by the Bank of Japan
Kuwait	discount rate reported by the Central Bank of Kuwait
Malaysia	overnight money market rate (Bloomberg ticker "MAOPRATE Index") until 2004-Q1; overnight policy rate reported by the BIS starting 2004-Q2
Mauritius	rate reported by the IMF; I also fill in the value of 8.5% for the key repo rate in 2006-Q4, based on data from the Bank of Mauritius.
Mexico	bank funding rate reported by the BIS
New Zealand	official cash rate reported by the BIS
Nigeria	monetary policy rate reported by the IMF
Norway	sight deposit rate reported by the Norges Bank.
Pakistan	State Bank of Pakistan reverse repo rate (Bloomberg ticker "PAPRSBPD")
Peru	rate reported by the BIS when available; otherwise, official monetary policy rate (Bloomberg ticker "PRRRONUS Index")

Philippines	liquidity providing official market intervention representative rate reported by the BIS
Poland	yield on 7-day bank bill reported by the BIS
Romania	key rate (Bloomberg ticker "ROKEPOL Index") until 2002-Q4; rate reported by the BIS starting 2003-Q1
Russia	1-week Moscow interbank bid rate (Bloomberg ticker "MIBID1W Index") until 2013-Q2; key rate reported by the Central Bank of the Russian Federation starting 2013-Q3
Saudi Arabia	official market repo rate reported by the BIS
Singapore	The Monetary Authority of Singapore targets an exchange rate instead of an interest rate, so I drop Singapore dollars as a foreign currency. For the firms located in Singapore, I use the Singapore overnight deposit rate (Bloomberg series "SDDR1T Curncy") as the domestic rate.
South Africa	7-day repo rate reported by the IMF
South Korea	base rate reported by the BIS
Sri Lanka	I was unable to find official policy rates for Sri Lanka, so I drop Sri Lankan Rupees as a foreign currency. For Sri Lankan firms, I use the central bank overnight offer rate (Bloomberg series "SLBR1DAY Index" as the domestic rate
Sweden	7-day repo rate reported by the BIS
Switzerland	1-week Swiss franc LIBOR (Bloomberg ticker "SF0001W Index")
Taiwan	discount rate reported by the Taiwan's central bank
Thailand	1-day bilateral repo rate reported by the Bank of Thailand
Turkey	overnight borrowing costs reported by the Central Bank of The Republic of Turkey
Ukraine	key rate reported by the National Bank of Ukraine
United Kingdom	policy rates reported by the BIS

United States	federal funds target reported by the BIS data (target until 2008-Q4; midpoint of target range starting 2009-Q1)
Venezuela	repo rate reported by the Bank of Venezuela
Vietnam	refinancing rate reported by the IMF

Appendix B. Cluster-Robust Standard Errors

Least-squares regression relies on the assumption that regression errors are uncorrelated. When this is not the case, as when errors are correlated within clusters of observations along some dimension, the standard errors must be adjusted. My results are sensitive to the choice of clustering specification. Here, I explain my choice of cluster variables, and show that the inferences in the body of the paper are robust to the wild bootstrap method of Cameron, Gelbach, and Miller (2008).

Abadie, Athey, Imbens, and Wooldridge (2017) discuss two reasons for clustering: one relating to sample design, and the other related to economics. In my sampling design, I only select firms for which data are available, for currencies that the firm has used in the past, and currencies for which a policy rate is available. The sample selection thus favors some firms and some currencies over others, suggesting these two as natural clustering variables. Economic reasons for correlated errors within firm and within currency clusters are more obvious. In most of this paper's regression specifications, I cluster standard errors by firm and by foreign currency. Nevertheless, this choice leads to a conflict: in estimations where the precise nature of the clustering is not modeled (as in this paper), a required assumption is that the number of clusters goes to infinity. In practice, Cameron and Miller (2015) suggest avoiding tests with fewer than 50 clusters. The number of firms in my sample is large, but the number of foreign currencies is only 47. This is potentially worrisome because a small number of clusters can result in over-rejection of the null hypothesis by biasing the standard errors downward.

Cameron et al. (2008) recommend bootstrapping procedures to improve statistical inference in sample like mine that have few clusters. In simulations, they find that inference from these bootstraps is more accurate than least-squares regression with cluster-corrected standard errors, even with as few as five clusters (Cameron et al. (2008), Table 3). I bootstrap the t-statistics for all of my tests that cluster by currency using the Wild Bootstrap of Cameron et al. (2008) (see their Appendix B).

The intuition of bootstrapping t-statistics is as follows. The ideal inference would rely on a very large number of repeated samples. Where repeated samples are impossible, the econometrician may assume that the relationship of the unobserved population to her sample is the same as the relationship of her sample to a subsample of itself. Thus, instead of estimating a model on repeated samples of the population and comparing each $\hat{\beta}_i^{sample}$ to zero, she estimates her model on repeated subsamples of her main sample and compares each $\hat{\beta}_i^{subsample}$ to the $\hat{\beta}^{sample}$ from the main sample. In each iteration of the bootstrap, she calculates a Wald statistic $t_i^{subsample}$ based on the null hypothesis $H_0 : \hat{\beta}_i^{subsample} = \hat{\beta}^{sample}$. If the resulting distribution of $t_i^{subsample}$ is wide, it means that $\hat{\beta}_i^{subsample}$ is frequently different from $\hat{\beta}^{sample}$. The inference is that, if it were possible to take repeated samples from the population, $\hat{\beta}_i^{sample}$ would frequently be different from 0; hence, the distribution of t_i^{sample} based on $H_0^* : \beta = 0$ is also wide. In this case, some skepticism is due a high t-statistic from the estimation on the main sample. The econometrician only considers values of t^{sample} that are in the tails of the distribution of $t_i^{subsample}$ as grounds for rejecting the null hypothesis $H_0^* : \beta = 0$.

In unbalanced panels, where the clusters of observations are not equally sized, clusters will not have the same representation in random subsamples as they do in the main sample, and some clusters may be entirely omitted from some subsamples. A wild boostrap is particularly well-suited for this problem, since it relies on pseudo-subamples that have the same number of observations in each cluster as the full sample. The wild bootstrap begins by estimating the econometric model on the full sample and saving the residuals. In each iteration of the bootstrap, each cluster's residual vector $\hat{u}$ is replaced with $\hat{u}^*$ that equals $\hat{u}$ with probability 0.5 or $-\hat{u}$ with probability 0.5. Next, the pseudo-sample is given by $(\hat{y}_1^*, X_1), ..., (\hat{y}_G^*, X_G)$ where $\hat{y}_g^* = X_g'\hat{\beta} + \hat{u}_g^*$. The econometric test using the pseudo-subsample results in a $\hat{\beta}^*$ and a Wald statistic $w^* = (\hat{\beta}_1^* - \hat{\beta}_1)/s_{\hat{\beta}_1^*}$ for each subsample.

Bootstrap results appear in the tables that follow. The first five columns describe the regressions from the main body of the paper—dependent variables, independent variables, controls, fixed effects, etc.) Columns 6-7 show the regression coefficients and the t-statistics from the regressions in the main body of the paper. The final column shows the p-values from the bootstrap exercise just described. A p-value less than α justifies rejecting the null hypothesis that $\beta = 0$ at level α. In practically all cases, the p-values support the statistical inferences in the paper.

P-Values from Wild Bootstraps

Dep. Variable	Ind. Variable	Controls	Fixed Effects	Note/Add'l Controls	Bootstrap Results		
			h=home, f=foreign	h=home, f=foreign	β	t	p
			Panel A: Benchmark Results				
Δshare	$\Delta r = \Delta(r^f - f^h)$	GDP^f, Bank ROA^f	h*yr		-0.277***	(-2.958)	[0.016]
"	"	GDP^h, Bank ROA^h	f*yr		-0.062***	(-4.733)	[0.000]
"	"	"	h*yr, f*yr		-0.263***	(-2.848)	[0.000]
"	"	FX, GDP^f, Bank ROA^f	h*ind*yr, f*ind*yr		-0.276***	(-2.853)	[0.020]
"	"	FX, GDP^h, Bank ROA^h	h*ind*yr, f*ind*yr		-0.112***	(-5.383)	[0.000]
"	"	"	h*yr, f*yr		-0.263***	(-2.848)	[0.000]
"	"	FX, firm chars, GDP^f, Bank ROA^f	h*yr, f*yr		-0.264***	(-2.607)	[0.032]
"	"	FX, firm chars, GDP^h, Bank ROA^h	h*ind*yr, f*ind*yr		-0.116***	(-4.725)	[0.000]
"	"	"	h, f, yr		-0.263***	(-2.848)	[0.000]
			Panel B: Numerator & Denominator				
$\left(\frac{D}{A}\right)_t - \left(\frac{D}{A}\right)_{t-1}$	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr	Δleverage and Δr	-0.045	(-0.631)	[0.518]
$\left(\frac{D_t - D_{t-1}}{A_{t-1}}\right)$	"	"	"	alternate leverage	0.108	(1.118)	[0.524]
ln(share)	$r^f - r^h$	"	h*yr, f*yr, firm	decomposition	-0.083***	(-2.951)	[0.002]
ln(numerator)	"	"	"	decomposition	-0.086**	(-2.525)	[0.026]
ln(denominator)	"	"	"	decomposition	-0.004	(-0.318)	[0.762]
			Panel C: Results by Firm Size				
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr	assets $\geq$ median	-0.544*	(-1.692)	[0.222]
"	"	"	"	assets $<$ median	-0.004	(-0.018)	[0.946]

Dep. Variable	Ind. Variable	Controls	Fixed Effects h=home, f=foreign	Note/Add'l Controls h=home, f=foreign	Bootstrap Results β	t	p
Panel D: Results By Time Period							
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr	2002-2008	-1.191**	(-2.310)	[0.032]
"	"	"	"	2009-2017	-0.118	(-0.869)	[0.396]
"	"	"	"	omit 2008-2009	-0.226*	(-1.764)	[0.036]
"	"	"	"	omit 2003-2004	-0.136	(-1.394)	[0.300]
"	"	"	"	omit 2002	-0.299***	(-2.885)	[0.000]
"	"	"	"	omit 2003	-0.218**	(-2.260)	[0.024]
"	"	"	"	omit 2004	-0.222**	(-2.155)	[0.120]
"	"	"	"	omit 2005	-0.298***	(-2.915)	[0.000]
"	"	"	"	omit 2006	-0.306**	(-2.263)	[0.088]
"	"	"	"	omit 2007	-0.412***	(-3.200)	[0.000]
"	"	"	"	omit 2008	-0.154*	(-1.814)	[0.024]
"	"	"	"	omit 2009	-0.408***	(-2.824)	[0.000]
"	"	"	"	omit 2010	-0.312***	(-3.314)	[0.000]
"	"	"	"	omit 2011	-0.269*	(-1.902)	[0.196]
"	"	"	"	omit 2012	-0.275***	(-2.626)	[0.000]
"	"	"	"	omit 2013	-0.265**	(-2.457)	[0.000]
"	"	"	"	omit 2014	-0.236**	(-2.533)	[0.000]
"	"	"	"	omit 2015	-0.302***	(-2.701)	[0.002]
"	"	"	"	omit 2016	-0.378***	(-4.049)	[0.000]
"	"	"	"	omit 2017	-0.435***	(-3.337)	[0.000]

Dep. Variable	Ind. Variable	Controls	Fixed Effects h=home, f=foreign	Note/Add'l Controls h=home, f=foreign	Bootstrap Results β	 t	 p
			Panel E: Results by Debt Type				
Δshare (all)	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr	full sample	-0.298***	(-2.829)	[0.000]
" (comm. paper)	"	"	"	"	-0.003	(-0.437)	[0.708]
" (rev. credit)	"	"	"	"	-0.065	(-0.492)	[0.658]
" (term loans)	"	"	"	"	0.031	(0.396)	[0.694]
" (bonds/notes)	"	"	"	"	-0.262	(-1.577)	[0.344]
Δshare (all)	"	"	"	2002-2008	-1.191**	(-2.310)	[0.032]
" (comm. paper)	"	"	"	"	-0.019	(-0.933)	[0.336]
" (rev. credit)	"	"	"	"	0.112	(0.508)	[0.684]
" (term loans)	"	"	"	"	-0.356	(-0.711)	[0.496]
" (bonds/notes)	"	"	"	"	-0.928***	(-3.908)	[0.000]
			Panel F: Δ Cash and Δr				
$\Delta\text{cash} = \Delta_t\left(\frac{C}{A}\right)$	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr		0.031	(0.499)	[0.680]
$\Delta\text{cash} = \frac{\Delta_t C}{A_{t-1}}$	"	"	"	alternate cash	-0.008	(-0.100)	[0.914]
			Panel G: Results by Debt Cost				
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr	debt cost *geq* median	-0.418*	(-1.892)	[0.164]
"	"	"	"	debt cost < median	-0.131	(-0.341)	[0.748]
			Panel H: Results by Hedging Motive				
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr	% Debt < % Subs	-0.910*	(-1.917)	[0.164]
"	"	"	"	% Debt $\geq$ % Subs	-0.135	(-0.615)	[0.644]

Dep. Variable	Ind. Variable	Controls	Fixed Effects h=home, f=foreign	Note/Add'l Controls h=home, f=foreign	Bootstrap Results β	t	p
			Panel I: Market Access				
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr	Table 11, Panel A, Column 1	-0.475***	(-2.778)	[0.024]
"	Δr X Bank ROA (home)	"	"	"	0.319**	(2.430)	[0.000]
"	$\Delta r = \Delta(r^f - f^h)$	"	"	Table 11, Panel A, Column 2	-0.320***	(-3.630)	[0.000]
"	Δr X Bank ROA (foreign)	"	"	"	0.087	(0.721)	[0.454]
"	$\Delta r = \Delta(r^f - f^h)$	"	"	Table 11, Panel A, Column 3	-0.246**	(-2.409)	[0.028]
"	Δr X ln(1+%subs)	"	"	"	-0.012	(-0.435)	[0.688]
"	$\Delta r = \Delta(r^f - f^h)$	"	"	Table 11, Panel A, Column 4	-0.309***	(-2.960)	[0.000]
"	Δr X Size-Age Index	"	"	"	0.095*	(1.808)	[0.006]
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm char, GDP (h & f)	firm*currency, yr	Table 11, Panel B, Column 1	-0.170***	(-5.131)	[0.000]
"	Δr X Bank ROA (home)	"	"	"	0.118**	(2.400)	[0.000]
"	$\Delta r = \Delta(r^f - f^h)$	"	"	Table 11, Panel B, Column 2	-0.115***	(-3.602)	[0.000]
"	Δr X Bank ROA (foreign)	"	"	"	0.095	(0.533)	[0.794]
"	$\Delta r = \Delta(r^f - f^h)$	"	"	Table 11, Panel B, Column 3	-0.134***	(-5.211)	[0.000]
"	Δr X ln(1+pct. subs)	"	"	"	-0.065***	(-3.645)	[0.000]
"	$\Delta r = \Delta(r^f - f^h)$	"	"	Table 11, Panel B, Column 4	-0.111***	(-4.414)	[0.000]
"	Δr X Size-Age Index	"	"	"	0.081**	(2.322)	[0.000]

Dep. Variable	Ind. Variable	Controls	Fixed Effects h=home, f=foreign	Note/Add'l Controls h=home, f=foreign	Bootstrap Results $\boldsymbol{\beta}$	$\boldsymbol{t}$	$\boldsymbol{p}$
			Panel J: Financial Flexibility				
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr	Table 12, Panel A, Column 1	-0.263***	(-2.846)	[0.000]
”	Δr X Cash	”	”	”	-1.138***	(-3.378)	[0.000]
”	$\Delta r = \Delta(r^f - f^h)$	”	”	Table 12, Panel A, Column 2	-0.290***	(-2.754)	[0.000]
”	Δr X Leverage	”	”	”	0.757***	(2.917)	[0.000]
”	$\Delta r = \Delta(r^f - f^h)$	”	”	Table 12, Panel A, Column 3	-0.308***	(-3.037)	[0.000]
”	Δr X Interest Coverage	”	”	”	-0.002**	(-2.617)	[0.000]
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm char, GDP (h & f)	firm*currency, yr	Table 12, Panel B, Column 1	-0.123***	(-5.412)	[0.000]
”	Δr X Cash	”	”	”	-1.159***	(-2.607)	[0.000]
”	$\Delta r = \Delta(r^f - f^h)$	”	”	Table 12, Panel B, Column 2	-0.125***	(-4.371)	[0.000]
”	Δr X Leverage	”	”	”	0.952***	(3.188)	[0.000]
”	$\Delta r = \Delta(r^f - f^h)$	”	”	Table 12, Panel B, Column 3	-0.123***	(-4.852)	[0.000]
”	Δr X Interest Coverage	”	”	”	-0.002**	(-2.163)	[0.000]

Dep. Variable	Ind. Variable	Controls	Fixed Effects	Note/Add'l Controls	Bootstrap Results		
			h=home, f=foreign	h=home, f=foreign	β	t	p
Panel K: Marginal Contribution of Countries, Currencies, Pairs							
Δshare	Δr X country dummy	FX, firm chars	h*yr, f*yr	COUNTRY: Korea	0.447	(1.241)	[0.410]
"	"	"	"	China	0.054	(0.085)	[0.952]
"	"	"	"	U.K.	-0.596	(-0.979)	[0.464]
"	"	"	"	U.S.	0.467	(1.109)	[0.164]
"	"	"	"	Euro Area	-0.680	(-1.381)	[0.154]
"	"	"	"	Taiwan	0.469	(1.223)	[0.360]
"	"	"	"	Canada	0.273	(1.489)	[0.220]
"	"	"	"	Singapore	-0.590	(-1.172)	[0.406]
"	"	"	"	India	1.171***	(3.667)	[0.002]
"	"	"	"	Malaysia	-0.805*	(-1.717)	[0.254]
Δshare	Δr X currency dummy	FX, firm chars	h*yr, f*yr	CURRENCY: Dollar	0.014	(0.110)	[0.868]
"	"	"	"	Euro	-0.041	(-0.450)	[0.716]
"	"	"	"	Yuan	0.533**	(1.992)	[0.214]
"	"	"	"	Yen	-0.015	(-0.202)	[0.788]
"	"	"	"	Pound	-0.091	(-0.586)	[0.576]
"	"	"	"	HK Dollar	-1.330***	(-6.807)	[0.020]
"	"	"	"	CA Dollar	-0.220	(-0.983)	[0.444]
"	"	"	"	AU Dollar	-0.614***	(-3.489)	[0.000]
"	"	"	"	CH Franc	-0.989***	(-5.929)	[0.010]
"	"	"	"	Ringgit	0.120	(0.697)	[0.260]
Δshare	Δr X pair dummy	FX, firm chars	h*yr, f*yr	PAIR: Korea - Dollar	0.809*	(1.762)	[0.268]
"	"	"	"	China - Dollar	0.483	(1.202)	[0.292]
"	"	"	"	Taiwan - Dollar	0.363*	(1.715)	[0.196]
"	"	"	"	Canada - Dollar	-0.339	(-0.612)	[0.504]
"	"	"	"	Euro Area - Dollar	0.547	(0.690)	[0.538]
"	"	"	"	U.K. - Dollar	0.878	(1.539)	[0.152]
"	"	"	"	India - Dollar	-0.616*	(-1.900)	[0.182]
"	"	"	"	Hong Kong - Yuan	0.320	(1.108)	[0.258]
"	"	"	"	U.S. - Euro	0.051	(0.094)	[0.968]
"	"	"	"	Hong Kong - Dollar	-8.617***	(-5.110)	[0.230]

Dep. Variable	Ind. Variable	Controls	Fixed Effects h=home, f=foreign	Note/Add'l Controls h=home, f=foreign	Bootstrap Results β	t	p
Panel L: Currency & Country Characteristics							
Δshare	$\Delta r = \Delta(r^f - f^h)$	FX, firm chars	h*yr, f*yr		-0.215	(-1.117)	[0.372]
”	Δr X emerging (h)	”	”		-0.142	(-0.452)	[0.702]
”	$\Delta r = \Delta(r^f - f^h)$	”	”		-0.408***	(-3.925)	[0.000]
”	Δr X emerging (f)	”	”		0.473**	(2.369)	[0.028]
”	$\Delta r = \Delta(r^f - f^h)$	”	”		-0.271**	(-2.275)	[0.014]
”	Δr X cap. controls (h)	”	”		-0.071	(-0.389)	[0.722]
”	$\Delta r = \Delta(r^f - f^h)$	”	”		-0.368***	(-3.719)	[0.000]
”	Δr X cap. controls (f)	”	”		0.281***	(2.616)	[0.068]
”	$\Delta r = \Delta(r^f - f^h)$	”	”		-0.531***	(-2.779)	[0.000]
”	Δr X pegged (h)	”	”		0.471**	(2.334)	[0.032]
”	$\Delta r = \Delta(r^f - f^h)$	”	”		-0.332***	(-2.646)	[0.000]
”	Δr X pegged (f)	”	”		0.167	(0.467)	[0.724]

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