Online Appendix

for the article

Global Diffusion, Policy Flexibility, and Inflation Targeting

International Interactions

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Contents

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A1 Summary Statistics and Coding

Variables	Source	Min.	Max.	Mean	S.D.
IT ADOPTION	Own coding	0	1	0.02	0.14
IT FLEXIBILITY (INDEX)	Own coding	2	16.5	5.15	2.31
IT FLEXIBILITY SL (INDEX)	Own coding	0	3.23	0.73	0.71
IT FLEXIBILITY SL (RANGE)	Own coding	0	1.23	0.25	0.26
POLITY	Polity IV Project	-9	10	7.06	3.94
POLITICAL SYSTEM	DPI 2012 Database	0	2	0.95	0.97
GOVERNMENT PARTY	World Bank	1	3	1.94	0.94
LEGAL CBI	Bodea and Hicks (2015)	0	0.93	0.43	0.20
EXCHANGE RATE CLASSIFICATION	Ilzetzki et al. (2010)	1	15	8.18	3.77
FDI (% OF GDP)	World Bank	-6.90	31.80	2.61	2.97
EXPORTS (% OF GDP)	World Bank	5.51	126.00	33.79	18.60
GDP PER CAPITA	World Bank	153	87998	8907	12603
INFLATION (5-YEAR AVERAGE)	World Bank	-0.59	2408	44.90	213
IMF CONDITIONALITY	Dreher (2006)	0	2	0.16	0.38
CAPITAL CONTROLS	Chinn and Ito (2006)	0	1	0.55	0.35

Table A1: *Descriptive statistics and data sources.*

Three major variables have been coded for the empirical analyses of this article: IT ADOPTION, IT FLEXIBILITY, and IT FLEXIBILITY IN NEARBY COUNTRIES (the spatial lags abbreviated in Table A1 as SL). The dependent variable of the main models presented in the article, IT ADOPTION, is the coding of the year when a country adopted IT as official monetary policy framework. The adoption is only coded when countries explicitly introduced IT as monetary policy framework (not when they just added a reference to inflation control to their operational goals). This is consistent with the IMF literature on IT targeting. Of the 76 countries in the sample, 30 adopted IT. The coding of IT ADOPTION is based on monetary policy and inflation reports of central banks, which usually list the year of IT introduction in the discussion of their monetary policy. The information from these primary sources were double-checked with IMF working papers and additional secondary literature.[1]

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[1]All primary and secondary sources are available upon request.

Note that IT ADOPTION codes the year of introduction as a binary variable (not the conduct and design of the policy). The information on the design of the IT framework is coded with the IT FLEXIBILITY (INDEX), which is defined as the sum of the point target and range. The IT FLEXIBILITY (INDEX) is coded on a yearly basis for each year after the adoption of the framework. All of the information on the targets and ranges also come from central banks' monetary policy and inflation reports. The minimum value of this variable is 2 (that is, a 2 percent target with no range). The central banks of Finland, Sweden, and the United Kingdom operated under this rigid version of IT. The most flexible IT framework, with a value of 16.5, is coded for Ghana in 2010. The IT FLEXIBILITY (INDEX) varies strongly across countries and also within countries over time. Appendix A2 shows some further descriptive analyses of this variable.

To measure the flexibility of IT in nearby countries (i.e., the spatial lags), I used data on the inverse of the distance between capital cities in 2012 from the R package cshapes by Nils B. Weidmann and Kristian Skrede Gleditsch. I multiplied this spatial connectivity matrix with the vector coding the IT FLEXIBILITY (INDEX) discussed above. This variable codes, for each year, the weighted average of the IT flexibility of all countries operating under the IT framework by assigning higher weights to nearby countries. Appendix A5 reports the findings using the alternative IT flexibility measure that relies only on the range, that is, the IT FLEXIBILITY SL (RANGE).

A2 Variation of the IT Flexibility Variable

The analysis of the IT FLEXIBILITY (INDEX) variable is interesting for evaluating the argument that less-democratic countries adopt more flexible versions of IT and that the average flexibility of all adopted IT frameworks increases as more countries introduce IT throughout the process of global diffusion. The left box plots of Figure 1 show that fully institutionalized democracies with a polity score of 10 operate with more rigid versions of IT, while inflation-targeting countries with a polity score below 6 use more flexible versions. The right box plot of Figure 1 reports the distribution of IT frameworks in two temporal periods of diffusion. The findings show that the flexibility of the frameworks increases as the diffusion of IT reaches global coverage in the second stage of diffusion.
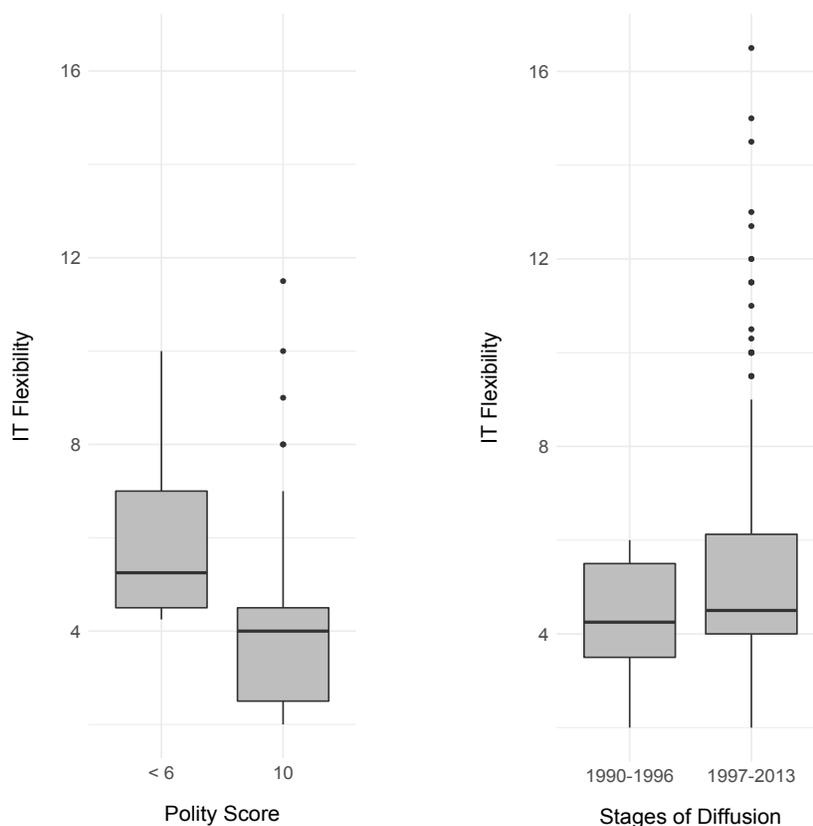

Figure 1: *Box plots of the IT flexibility variable for less-democratic countries with polity scores below 6 and fully institutionalized democracies with polity scores of 10 and for two temporal stages of diffusion: early adoptions (1990–1996) and global spread (1997–2013).*

A3 Central Bank Independence and IT

Several parts of the article have indicated that IT and central bank independence share important similarities, but they are also distinct. The conventional view of monetary economists, emerging in the late 1980s, advocates monetary policy making that is independent from political pressure, with a focus on low and stable inflation. Thus, one might expect that IT adoption is more likely, the more a country grants independence to its central bank. However, the institutional independence of a central bank may also substitute for IT because institutional independence already addresses the time inconsistency problem by shielding central banks from political influence. To prevent that monetary policy decisions are adjusted to the election cycle, there is no need to constrain the mandate of a central bank with an IT framework in case a central bank is already institutionally independent from political influence.

Some independent central banks, like the FED, have some discretion in the conduct of monetary policy, and they explicitly seek to influence other economic indicators besides inflation, such as unemployment. Aside from that, the IT framework includes important elements that are not part of the broader argumentation for central bank independence, particularly the accountability of the central bank to the government and the public. In the abundant literature on rules, discretion, and independence, some economists argue explicitly for a distinct IT framework as an "optimal central bank contract" (Kydland and Prescott, 1977; Walsh, 1995; Svensson, 1997). For the purpose of the article's analysis, it is important to note that central bank independence and the introduction of IT are related but also distinct, and they are not, per se, complementary.

The empirical results reported in the article do not corroborate the hypothesis that the introduction of IT is a direct consequence of increased central bank independence. Rather, this non-finding supports the argument that the operational activity of a highly independent central bank does not need to be regulated by an IT framework to shield monetary policy making from political influence.

A4 Adding Government Orientation and Inflation as Controls

Besides the control variables used in the main models of the article, I also added government orientation (categorized as right, center, and left) and the rolling average of inflation over the last five years. The conventional expectations are that governments on the right are more likely to introduce IT and that a period of high inflation may increase the probability of IT adoption. Both variables come from the World Bank and are not added to the main models of the articles because the data coverage is low. The sample size of the analysis shrinks by one third because of missing values if we introduce these variables to the model (the N drops from 1211 to 639). The estimates reported in Table A4 show that all of the discussed main findings of the article are robust to this model specification and that neither government orientation nor inflation are systematically correlated with the adoption of IT. The non-finding of the government orientation variable is in line with a recent study by Giesenow and de Haan (2019), who also do not find any partisan effects. As compared to the main models of the article, only the effects of the FDI and capital control variables are different. Again, however, the sample size of this robustness check shrinks significantly due to missing data of the government orientation and inflation variables.

	Model 4	Model 5	Model 6
INTERCEPT	−14.343**	−28.173***	−21.255***
	(6.885)	(10.399)	(7.940)
POLITY	0.421*	1.880**	1.168***
	(0.223)	(0.858)	(0.451)
EXCHANGE RATE CLASSIFICATION	0.234**	0.251***	0.254***
	(0.091)	(0.093)	(0.092)
CENTRAL BANK INDEPENDENCE	−0.418	−0.518	−0.417
	(1.322)	(1.346)	(1.358)
POLITICAL SYSTEM	−0.182	−0.231	−0.220
	(0.277)	(0.286)	(0.289)
FDI (% OF GDP)	0.104	0.127	0.127
	(0.089)	(0.090)	(0.089)
EXPORTS (% OF GDP)	0.009	0.007	0.006
	(0.019)	(0.020)	(0.020)
GDP PER CAPITA	2.523	2.607	3.410
	(2.980)	(3.099)	(3.070)
IMF CONDITIONALITY	−0.269	−0.221	−0.210
	(0.762)	(0.784)	(0.787)
CAPITAL CONTROLS	−2.521**	−2.865**	−2.878***
	(1.065)	(1.112)	(1.094)
INFLATION (5-YEAR AVERAGE)	−0.001	−0.000	−0.001
	(0.002)	(0.002)	(0.002)
GOVERNMENT PARTY	0.012	−0.030	−0.049
	(0.269)	(0.270)	(0.270)
IT FLEXIBILITY IN NEARBY COUNTRIES (SPATIAL LAG)	−0.333	−0.479	5.229**
	(0.904)	(0.903)	(2.471)
POLITY $\times t$		−0.092*	
		(0.048)	
IT FLEXIBILITY (SPATIAL LAG) $\times$ POLITY			−0.677**
			(0.291)
t	0.954	1.851	0.894
	(1.439)	(1.458)	(1.466)
t^2	−0.351	−0.327	−0.204
	(1.032)	(1.008)	(1.056)
t^3	0.018	0.001	−0.027
	(0.233)	(0.228)	(0.240)
AIC	181.998	179.975	179.154
BIC	253.357	255.793	254.973
N	639	639	639

$^{***}p < 0.01,\ ^{**}p < 0.05,\ ^{*}p < 0.1$

Table A4: Main models of the article (see Table **??**) including inflation averages of the past 5 years and government orientation as additional controls.

A5 Alternative Measure of IT Flexibility

As discussed in the article, the economics literature identifies inflation targets of 2 percent and ranges of 1–3 percent as optimal (Bernanke et al., 1999).[2] The main analysis of the article uses the sum of both dimensions to construct the IT flexibility index (see also Appendix A1). The model reported in Table A6 checks whether the main finding of the article—that the diffusion effect of the IT flexibility spatial lag is conditional on the polity score—also holds if we only the consider the range as measure of flexibility. To that end, I construct a variable following the estimation procedure discussed in the article and in Appendix A1 by multiplying the range with the row-standardized spatial distance connectivity matrix. Model 7 in Table A6 shows the results for the IT flexibility variable as alternative measure. The main findings are robust: the coefficient of the IT flexibility variable is positive and significant and the coefficient of the interaction term negative and significant.

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[2]Bernanke, Ben S., Thomas Laubach, Frederic S. Mishkin and Adam S. Posen. 1999. Inflation Targeting: Lessons from the International Experience. Princeton, N.J.: Princeton University Press.

	Model 7
Intercept	-17.594^{***}
	(3.780)
Polity	1.111^{***}
	(0.345)
Exchange Rate Classification	0.224^{***}
	(0.071)
Legal CBI	0.221
	(1.111)
Political System	-0.002
	(0.241)
FDI (% of GDP)	0.124^{**}
	(0.060)
Exports (% of GDP)	-0.017
	(0.016)
GDP per capita	-0.870
	(2.125)
IMF Conditionality	-0.828
	(0.751)
Capital Controls	-0.892
	(0.729)
IT Flexibility in Nearby Countries (Range)	13.447^{**}
	(5.251)
IT Flexibility (Range) × Polity	-1.858^{***}
	(0.623)
t	0.210
	(0.481)
t^2	0.237
	(0.421)
t^3	-0.112
	(0.108)
AIC	255.352
BIC	331.840
N	1211

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

Table A5: Estimates of the main IT adoption logit model with an alternative measure of IT flexibility using only the IT range (standard errors in parentheses).

A6   Exchange Rate Regimes as Dummy Variables

The main models of the article use the 15-points scale exchange rate classification index by Ilzetzki et al. (2010) for measuring the effect of the exchange rate regime on the likelihood of IT adoption. This fine-grained index is a significant predictor of IT adoption (see Model 1 to 7). To further investigate how fixed exchange rate regimes differ from intermediary and freely floating systems, I recode the variable into three categories (fixed exchange rate systems are coded as 1 to 5, intermediary as 6 to 10, freely floating as 11 to 15). Model 8 includes the intermediary and freely floating exchange rate regime dummy variables, while the fixed exchange rate regime serves as reference category. The findings show that countries with more freely floating exchange rate regimes (intermediary or freely floating) are more likely to introduce IT than countries with a fixed exchange rate regime. However, the effects are not significant, suggesting that there is not a systematic difference between the regime types.

	Model 8
INTERCEPT	−16.239***
	(3.767)
POLITY	1.146***
	(0.347)
EXCHANGE RATE REGIMES (INTERMEDIARY)	0.573
	(0.522)
EXCHANGE RATE REGIMES (FLOATING)	0.406
	(0.584)
LEGAL CBI	0.790
	(1.118)
POLITICAL SYSTEM	−0.050
	(0.237)
FDI (% OF GDP)	0.081
	(0.055)
EXPORTS (% OF GDP)	−0.023
	(0.015)
GDP PER CAPITA	0.534
	(2.119)
IMF CONDITIONALITY	−0.839
	(0.755)
CAPITAL CONTROLS	−1.237*
	(0.719)
IT FLEXIBILITY IN NEARBY COUNTRIES (SPATIAL LAG)	5.120***
	(1.751)
IT FLEXIBILITY (SPATIAL LAG) × POLITY	−0.633***
	(0.211)
t	0.262
	(0.502)
t^2	0.193
	(0.436)
t^3	−0.113
	(0.113)
AIC	264.733
BIC	346.241
N	1205

$^{***}p < 0.01,\ ^{**}p < 0.05,\ ^{*}p < 0.1$

Table A6: Estimates of the main IT adoption logit model with intermediary and freely floating exchange rate regime dummy variables and fixed exchange rate regime as reference category, instead of the full 15-points scale index (standard errors in parentheses).