Appendix
"Institutionalizing the Autocratic Penalty Away: Fiscal Rules, Autocracy and Sovereign Financial Market Access"

A List of autocracies in the analysis with fiscal rules

Table A.1: Autocracies with fiscal rules in place, 1990-2015

Country	Years with fiscal rules & autocratic status
Armenia	2008-2015
Ecuador	2003
Indonesia	1990-1999
Kenya	1997-2002
Sri Lanka	2011-2015
Malaysia	1990-2015
Namibia	2001-2015
Nigeria	2007-2015
Peru	2000-2001
Russia	2007-2008; 2013-2015
Singapore	1990-2015

B Tables

Table B.1: Descriptive statistics

Variable name	Mean	St. Dev.	Min	Max	N
Bond issuance	0.44	0.39	0	1	2345
Autocracy	0.31	0.46	0	1	2345
Polyarchy index	0.62	0.25	0.02	0.95	2306
Fiscal rule	0.31	0.46	0	1	2345
Government gross debt	50.84	33.08	0	260.96	2345
Current account balance	-1.68	8.98	-44.84	45.45	2345
Log of GDP per capita	8.83	1.34	5.64	11.63	2345
GDP growth rate	2.58	3.94	-14.56	36.98	2345
Oil rents	3.72	9.64	0	64.01	2345
Proportion issuance in region	0.61	0.23	0.01	1	2345
Current IMF program	0.30	0.46	0	1	2345
Exports to the US	928.71	2964.11	0	40265.72	2345
Default crisis	0.01	0.11	0	1	2345
Leader election	0.22	0.41	0	1	2345

C Analyzing amount issued

Table B.2: Table for Figure 2

	(1)
Autocracy	-0.19
	(0.07)**
Fiscal rule	-0.13
	(0.05)**
Autocracy X Fiscal rule	0.31
	(0.12)**
Government gross debt	-0.00
	(0.00)*
Current account balance	0.00
	(0.00)*
Log of GDP per capita	0.30
	(0.11)***
GDP growth rate	0.00
	(0.00)
Oil rents	-0.00
	(0.00)
Proportion issuance in region	0.55
	(0.16)***
Current IMF program	-0.06
	(0.03)*
Exports to the US	-0.00
	(0.00)
Default crisis	-0.24
	(0.07)***
Leader election	0.00
	(0.01)
Country-fixed effects	Yes
Year-fixed effects	Yes
N	2,345
$Within R^2$	0.16

Dependent variable is bond issuance.
Standard errors clustered by country in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.3: Table for Figure 3

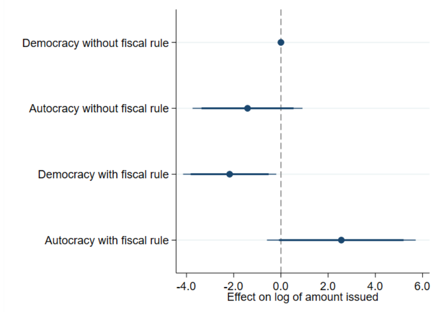
	(1)
Polyarchy index	0.49
	(0.18)***
Fiscal rule	0.32
	(0.20)
Polyarchy index X Fiscal rule	-0.53
	(0.25)**
Government gross debt	-.00
	(0.00)*
Current account balance	0.00
	(0.00)*
Log of GDP per capita	0.29
	(0.11)***
GDP growth rate	0.00
	(0.00)
Oil rents	-0.00
	(0.00)
Proportion issuance in region	0.54
	(0.16)***
Current IMF program	-0.07
	(0.03)**
Exports to the US	-0.00
	(0.00)
Default crisis	-0.22
	(0.07)***
Leader election	-0.00
	(0.01)
Country-fixed effects	Yes
Year-fixed effects	Yes
N	2,306
$Within R^2$	0.17

Dependent variable is bond issuance.

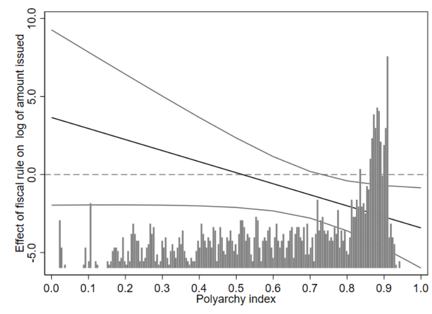
Standard errors clustered by country in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure C.1: Democracy, autocracy and fiscal rules: Amount issued



(a) Autocracy dummy: Coefficients



(b) Polyarchy index

Note: Dependent variable is the yearly mean of monthly log of debt issued in constant US dollars from Ballard-Rosa, Mosley and Wellhausen (2019). Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

D Use of fiscal rules strength index

This section tests the theoretical argument of the article using, instead of a national fiscal rule dummy, three different versions of a continuous fiscal rules strength index which also take both the number and qualitative aspects of the national fiscal rules into account. These indexes are partly inspired by similar indexes constructed in the Schaechter et al. (2012) paper and are constructed using data and variables from the IMF's Fiscal Rules Database.

The indexes are constructed by adding up subindexes for each of the four types of fiscal rules, revenue rules, expenditure rules, balanced budget rules and debt rules. The aggregate indexes are then standardized to run from 0 to 5 or 0 to 3 in the case of the index without auxiliary institutions.

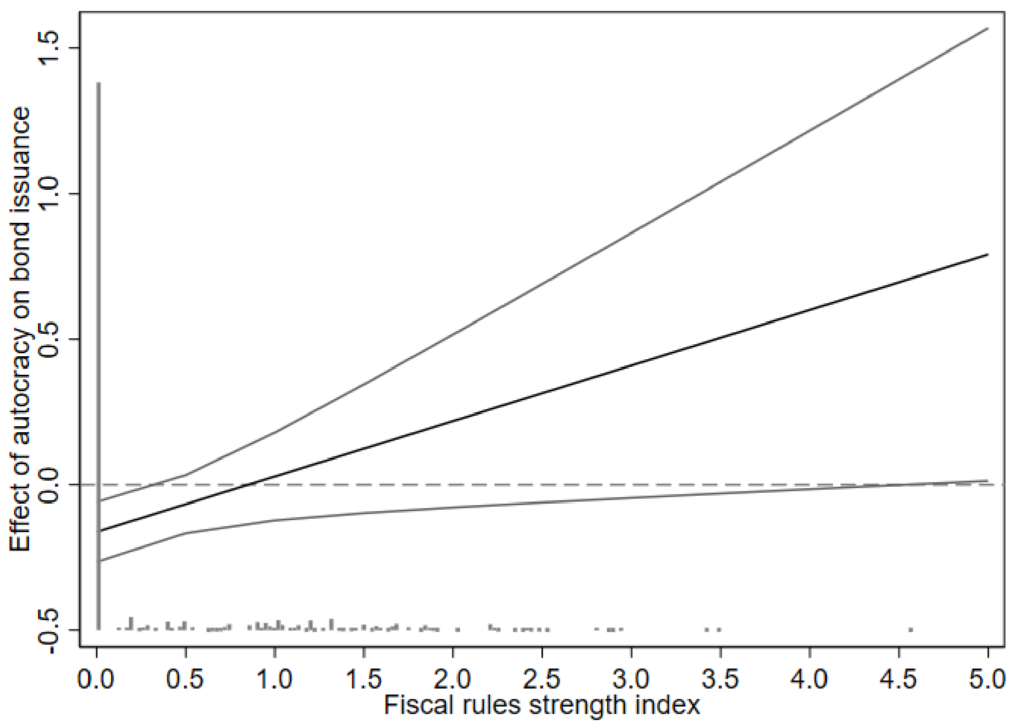
For all the subindexes, each fiscal rule is considered stronger, and thus receive a higher score on the subindex if the rule covers a larger share of the public sector (from central government to general government), if it has a stronger legal coverage (from political commitment over coalition agreement, statutory basis, international treaty and finally at the constitutionally level) and if it has formal enforcement procedures (stronger if it has).

Two of the indexes also takes into account various auxiliary rules and institutions of each fiscal rule. One index takes into account, and thus adds to each subindex, whether there are multiannual expenditure ceilings in the country (not added for the revenue rule subindex), whether there is a "fiscal responsibility law", whether an independent body (such as a fiscal council) sets official budgetary assumptions and whether an independent body monitors implementation of the public budget. These auxiliary institutions are part of all the subindexes, and the final index thus gives relatively high weight to these auxiliary rules and institutions.

As mentioned, one of the fiscal rules strength indexes takes into account all of these institutions when calculating the subindexes, whereas another more only takes into account whether an independent body sets budgetary assumptions and whether an independent body monitors budget implementation. The third index does not take any of these auxiliary institutions into account.

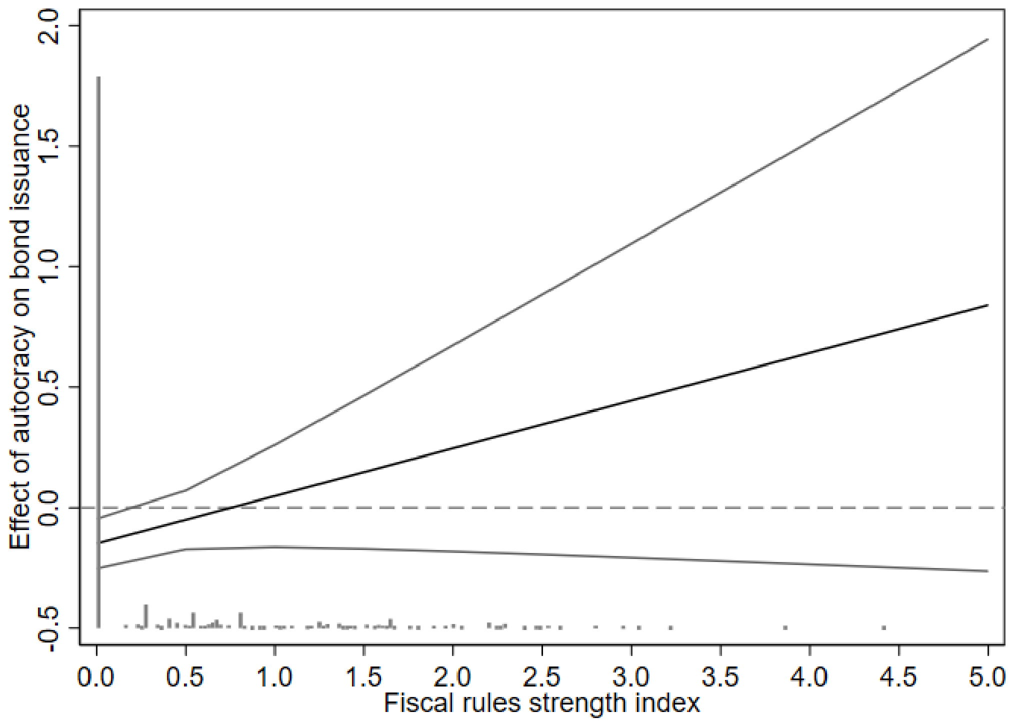
The results using these three indexes as the measure of fiscal rules can be seen in figures D.1-D.3. Here, the results and interpretation are similar as when the fiscal rule dummy was used as the measure of national fiscal rules. The autocratic disadvantage in sovereign bond market access decreases as the strength of the country's fiscal framework increases.

Figure D.1: Fiscal rules strength index with full auxiliary institutions



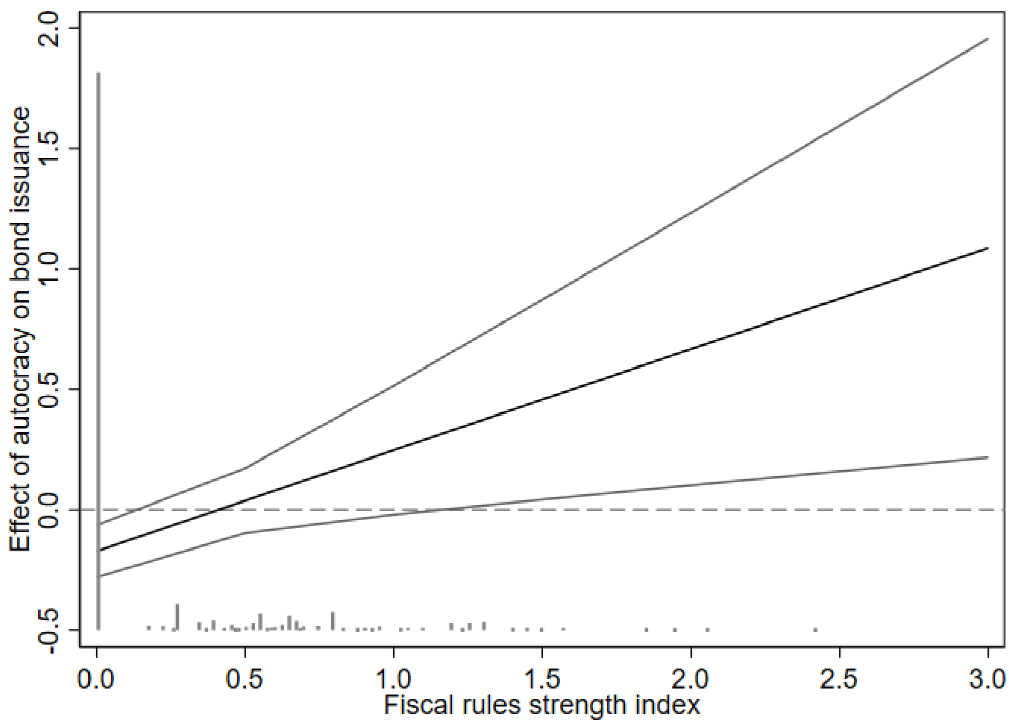
Note: Outer lines represent 90 percent confidence intervals.

Figure D.2: Fiscal rules strength index with limited number of auxiliary institutions



Note: Outer lines represent 90 percent confidence intervals.

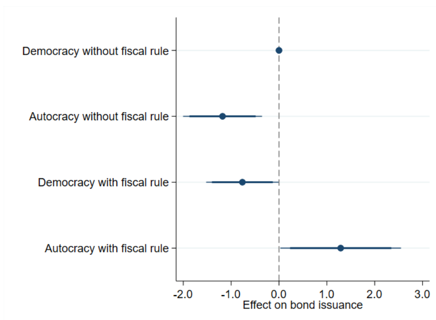
Figure D.3: Fiscal rules strength index with no auxiliary institutions



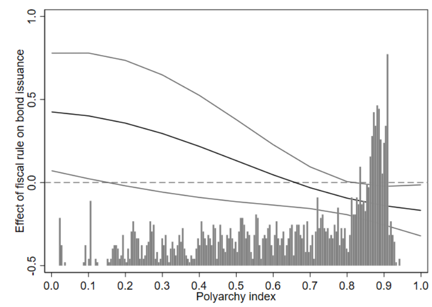
Note: Outer lines represent 90 percent confidence intervals.

E Fixed-effects probit regression

Figure E.1: Democracies, autocracies and fiscal rules: Probit regression



(a) Autocracy dummy: Coefficients

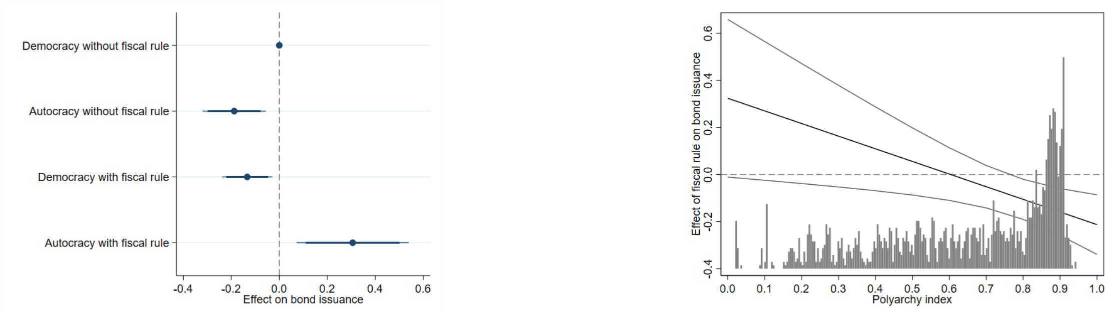


(b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

F Robustness tests

Figure F.1: Controlling for current US Treasury rate

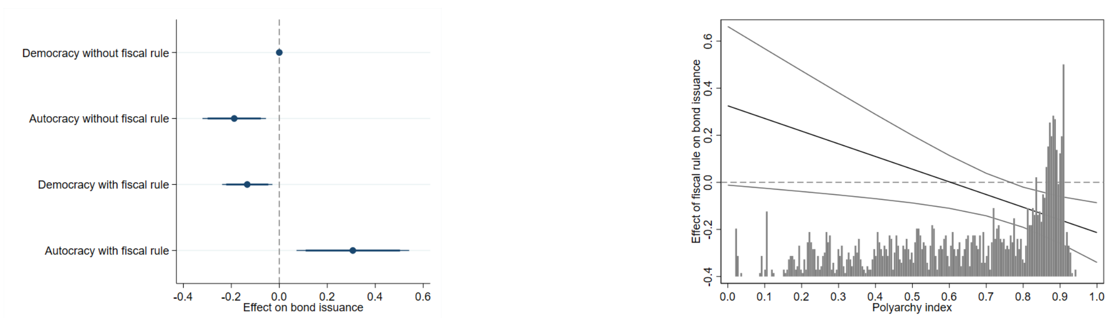


(a) Autocracy dummy: Coefficients

(b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

Figure F.2: Controlling for annual inflation

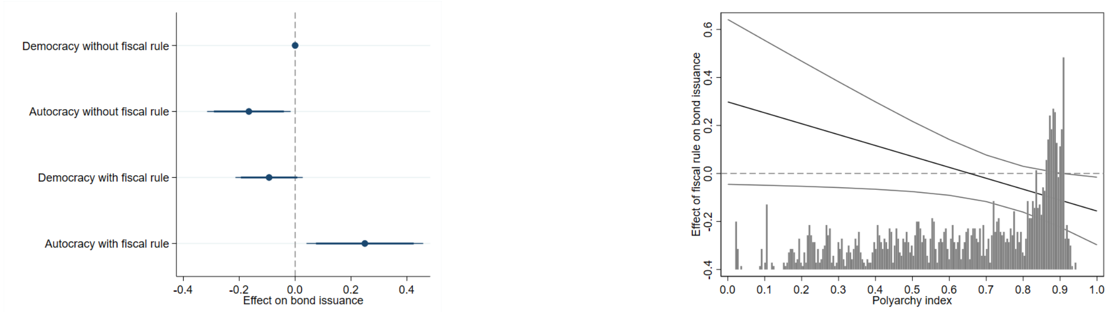


(a) Autocracy dummy: Coefficients

(b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

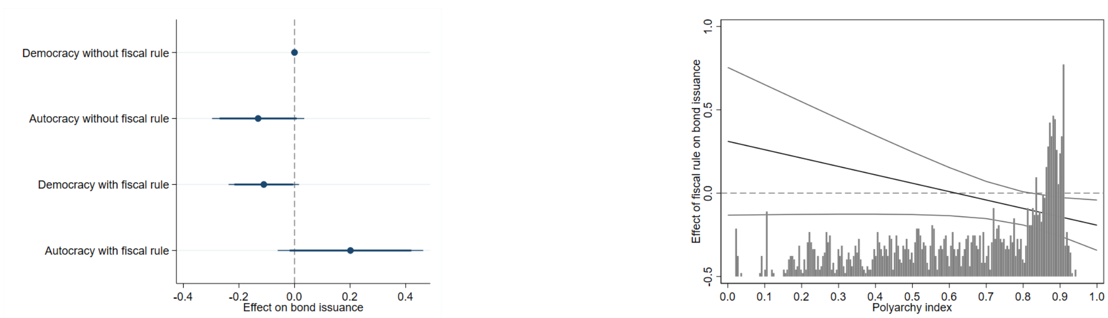
Figure F.3: Controlling for central bank independence



(a) Autocracy dummy: Coefficients (b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

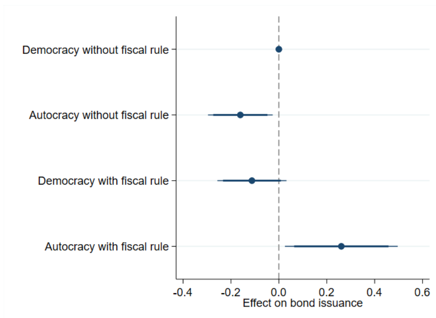
Figure F.4: Controlling for government transparency



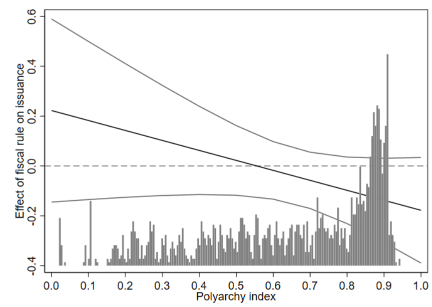
(a) Autocracy dummy: Coefficients (b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

Figure F.5: Excluding OECD countries



(a) Autocracy dummy: Coefficients



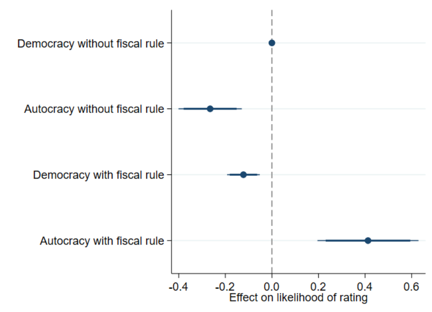
(b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

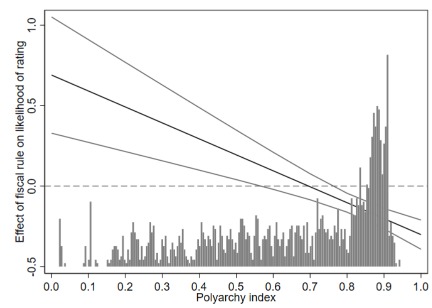
G Fiscal rules, autocracies and credit ratings

In this appendix, I supplement the main analysis by looking at whether fiscal rules have an impact on the role of regime type on credit rating dynamics, using credit rating data from the dataset of Ballard-Rosa et al. (2019). All analyses are done using OLS with country- and year-fixed effects and the same control variables as in the main analysis. Standard errors are also clustered at the country level. I first look at whether fiscal rules mitigate the effect of autocratic regime type on the likelihood of receiving a credit rating from a credit rating agency in the first place (the estimation is thus a linear probability model). As evident from Figure G.1, having a fiscal rule strongly mitigates the negative effect of being an autocracy on the likelihood of having received a sovereign credit rating in a given year.

Figure G.1: Democracies, autocracies and fiscal rules' effect on receiving a credit rating



(a) Autocracy dummy: Coefficients

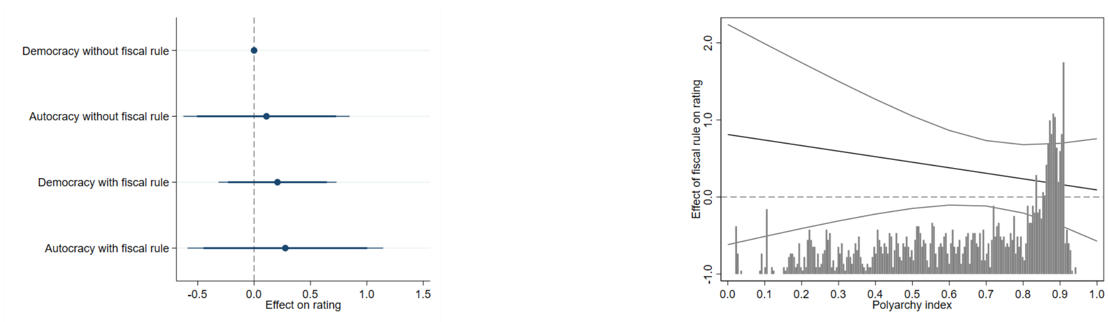


(b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

Then in figures G.2-G.4, I turn to the potential mitigating effects of fiscal rules on autocracies' credit ratings by the three main credit rating agencies: S&P, Moody's and Fitch. While the direction of the theoretical relationship seems to hold up, autocracies with fiscal rules receive on average better credit ratings than their non-fiscal-rules counterpart, there is a substantial amount of uncertainty associated with this pattern. It should also be noted that the number of observations are substantially lower for the rating data than the "has rating" variable. On average, the article's theoretical argument that fiscal rules help autocracies gain better access to international credit seem to hold for sovereign credit ratings as well but there is a great deal of uncertainty associated with these findings.

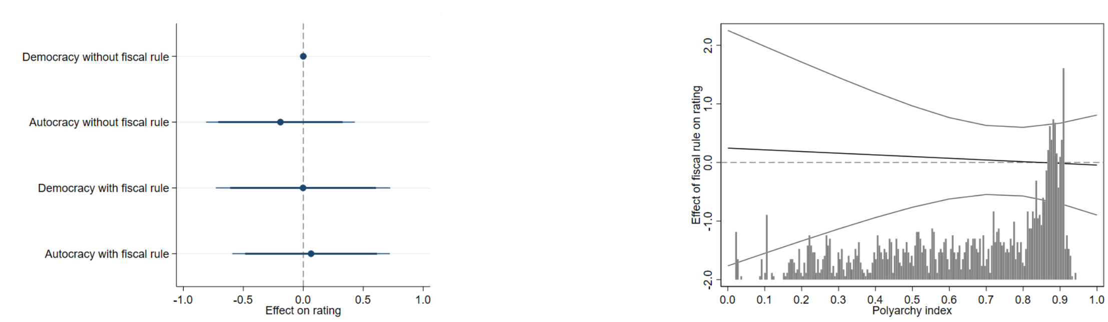
Figure G.2: Democracies, autocracies and fiscal rules' effect on credit rating (S&P)



(a) Autocracy dummy: Coefficients (b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

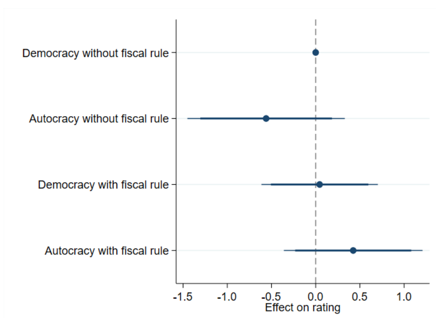
Figure G.3: Democracies, autocracies and fiscal rules' effect on credit rating (Moody's)



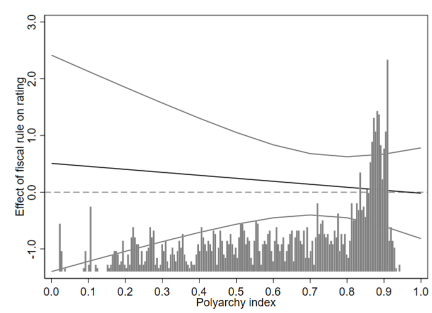
(a) Autocracy dummy: Coefficients (b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.

Figure G.4: Democracies, autocracies and fiscal rules' effect on credit rating (Fitch)



(a) Autocracy dummy: Coefficients



(b) Polyarchy index

Note: Thin lines represent 95 percent confidence intervals. Thick lines represent 90 percent confidence intervals. Outer lines represent 90 percent confidence intervals.