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How does democracy affect public debt? Evidence from the Arab world

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Abstract
This paper investigates the impact of democracy on public debt in the Arab world over the period 2002–2013. The results confirm the existence of an inverted-U relationship between democracy and public debt. This supports the hypothesis that some level of democracy is required to control public debt.

JEL H60 D72
Keywords Democracy; public debt; non-linear dynamic panel; Arab world

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1. Introduction

The wave of democratization that has recently swept the Arab world has led to macroeconomic instability especially in countries that have experienced democratic changes. This might be because these new regimes face many challenges related to the rise of redistribution demands and the expansion of public-sector wage bill. These facts suggest that the democratization of the Arab regimes may lead to higher debt levels since the excessive government spending would have to be financed by public borrowing. Thus, studying the relationship between democracy and public debt in the Arab Spring context is of key importance.

Interestingly, a large body of evidence suggests that democratic transitions are costly as it is often associated with excessive debt accumulation. In this regard, political economy literature emphasizes that higher debt levels are mainly due to the electoral process, and more specifically, to politicians' behavior during the election period (Nordhaus, 1975). Motivated by the desire to win elections and maintain power, opportunist politicians increase public spending and run deficits before elections to stimulate growth and reduce unemployment in order to gain voters' support. The partisan preferences of the ruling political party may, as well, influence debt levels. Generally, left-wing governments give strong interest to employment and produce larger debt than right-wing ones (Hibbs, 1977). In addition, the conflicts of interests between political parties may in turn lead to larger deficits and debt levels. This may arise from the common pool problem according to which each political party tends to orient public spending in favor of its constituency as these expenditures are financed from the general fund (von Hagen and Harden, 1995; Roubini and Sachs, 1989).

Nevertheless, some would argue that democracy enhances public debt only in its infancy. However, when democracy reaches higher levels, an adverse effect would be expected. This is mainly due to the fact that the holding of regular, free and fair elections may lead to a better fiscal transparency (Wehner and de Renzio, 2013). In fact, in democracies, the survival of the government depends on citizens' trust that the ruling elite are implementing policies that respect the will of the people. For this reason, politicians prefer to disclose information about their policy choices and take actions that please voters in order to ensure their stay in office (Hollyer et al. 2011). In other words, fiscal transparency may curb rent seeking behavior by holding decision-makers personally accountable for their actions, thus ensuring a better fiscal performance (Alt and Lassen, 2006).

The current study makes the following contribution to the literature. First, most of prior empirical studies that have examined the political determinants of public debt make use of a range of political factors such as government fragmentation (Roubini and Sachs, 1989), government ideology (Neck and Getzner, 2001), constraints on the executive (Bittencourt, 2015), political instability (Edwards and Tabellini, 1991), election years (Chaudhuri and Dasgupta, 2005). Nevertheless, to the best of our knowledge, none of these studies take into account the potential effect of the level of democracy on public debt. Second, we suppose that higher debt levels are reached only at the initial stages of democratic transitions. For this reason, we attempt to provide an explanation to the possible non-linearity in the democracy-debt relationship, suggesting that up to a certain level of democracy, democracy is associated with lower public debt levels.

To this end, we estimate a dynamic panel model for a sample of 16 Arab countries over the period 2002-2013 using the system-GMM estimator of Blundell and Bond (1998). Our results provide strong evidence of an inverted–U shape relationship between democracy and public debt. These findings are robust to an alternative measure of democracy.

The remainder of this paper is organized as follows. Section 2 introduces the data and the empirical methodology. Section 3 discusses the regression results, while section 4 concludes.

2. Data and methodology

In this study, we employ a panel of 16 Arab countries covering the period 2002-2013 (See Appendix for the country list). To investigate the linear effect of democracy on public debt, we estimate the following dynamic model:

$$DEBT_{it} = \alpha\, DEBT_{it-1} + \beta\, DEM_{it} + \gamma\, X_{it} + \eta_i + \varepsilon_{it} \quad (1)$$

Where $DEBT_{it}$ is the ratio of total public debt stocks to GDP, $DEBT_{it-1}$ is the lagged public debt variable, DEM_{it} is the democracy level of country i in period t, X_{it} is a set of economic explanatory variables, η_i denotes country-specific fixed effects and ε_{it} is the error term.

In this linear specification, the effect of democracy on debt is supposed to be the same for all countries regardless of their level of democracy. As discussed above, we acknowledge that the effect of democracy on debt depends on the democracy level. Thus, to capture this non-linearity, we include a squared term of democracy in Eq. (1):

$$DEBT_{it} = \alpha\, DEBT_{it-1} + \beta_1\, DEM_{it} + \beta_2\, DEM^2_{it} + \gamma\, X_{it} + \eta_i + \varepsilon_{it} \quad (2)$$

The Eq. (2) represents a quadratic function with a maximum at DEM* = - β_1 / 2 β_2, where the expected sign for β_1 is positive and β_2 is negative, suggesting a U-shape relationship between democracy and public debt. This reflects that public debt levels in countries with democracy scores below DEM* positively responds to changes in democracy. However, once the democracy threshold DEM* is reached, this positive turns out to be negative. As depicted in Fig 1, the Freedom House measure of democracy[1] appears to have a nonlinear effect on public debt.

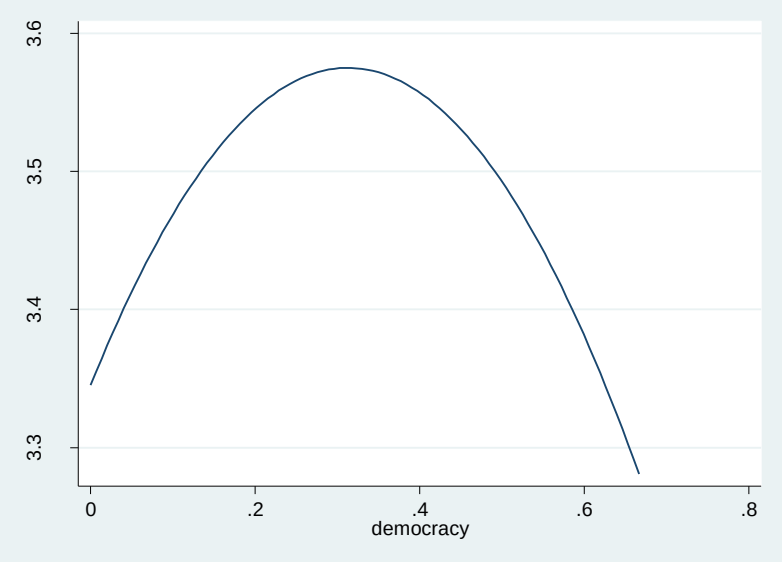

Fig 1. Non-linear effect of democracy on public debt

When examining the effect of democracy on public debt, we must address the endogeneity problem related to reverse causality running from public debt to democracy. Interestingly, in indebted countries, external debt constraints the promotion of democracy due to the high costs associated with organizing elections, implementing human rights reforms and ensuring fair justice (Combes and Ouedraogo, 2014). The endogeneity problem can also arise as a result of measurement errors, omitted variable bias and the presence of lagged dependent variable among the explanatory variables. To address such simultaneity bias, we estimate our specifications using the system-GMM estimator of Blundell and Bond (1998). This estimator allows

[1] The Freedom House index is constructed by averaging the sum of political rights and civil liberties sub-indices. The political rights index refers to how fair and free elections are held, while the civil liberties index involves a set of fundamental rights and freedoms mainly freedom of expression and belief, associational and organizational rights, rule of law and individual rights. The index is measured on a 1–7 scale, with 1 representing the most free and 7 representing the least free. The scale has been inverted and normalized between zero and one, so that higher values indicate higher level of democracy.

controlling for the endogeneity of explanatory variables through the use of lagged levels of these variables as instruments.

As a preliminary analysis to the non-linear relationship between democracy and public debt, we have split our sample into two main groups. The first group includes countries with democracy below the mean of the sample and the second group covers countries with democracy beyond the mean of the sample.

The results from the system-GMM estimator shown in table 1 indicate that democracy reduces public debt for countries whose level of democracy is higher than 0.19. However, this effect becomes positive for less democratic countries.

Table 1: The non-linear effect of democracy on debt: preliminary results

VARIABLES	Demf< 0.19 (1)	Demf> 0.19 (2)
$Debt_{(-1)}$	1.053***	1.050***
	(0.116)	(0.0446)
demf	2.994*	-1.107**
	(1.436)	(0.463)
Constant	-0.602*	0.154
	(0.325)	(0.107)
Observations	102	49
F-stat (p-value)	0	0
AR(2) (test p-value)	0.6	0.690
Hansen J test (p-value)	0.456	0.152

Notes: GMM regressions use robust standard errors clustered by country. We employ the two-step GMM estimator with the Windmeijer (2005) finite sample correction for standard errors. To avoid overfitting endogenous variables, we collapse the instrument set as suggested by Roodman (2009). The Hansen and AR(2) tests indicate that we cannot reject the validity of our instruments. *, ** and *** denote significance at the 10, 5 and 1% level, respectively

To check the robustness of our results, we use the Polity2 index[2] from the Polity IV database as an alternative measure of democracy. Other potential determinants of public debt, commonly used in the literature, are eventually added to the regression. Variables description and data sources as well as summary statistics of our main variables are provided in the Appendix.

[2] The Composite Polity Index ranges from -10 to 10, with higher values reflecting more democratic countries. The index has been normalized between zero and one. The Polity IV index provides a minimalist definition of democracy which is mainly based on elections and political competition and participation, in contrast to Freedom house index which provides a maximalist definition of democracy, in that it defines democracy by the set of freedoms it is supposed to assure (Munck and Verkuilen, 2002).

3. Results and discussion

Table 2 displays the panel regression results for the effect of democracy on public debt using system-GMM estimations. Columns (1) -(2) present the linear regression results, whereas the results from the quadratic models are captured in columns (3) -(4). In columns (1) and (3), we use Freedom House index as a measure of democracy. However, in columns (2) and (4), we test the robustness of our estimations using Polity IV index as an alternative measure of democracy.

Results derived from the linear model (Columns (1)-(2)) indicate a positive and statically significant effect of democracy on public debt, which suggests that the democratization of Arab political regimes leads to increased public debt. Accordingly, under democratic regimes, voters usually use their electoral power to ensure greater income redistribution in their favor, which stimulates public spending (Aidt et al., 2006). In addition, democracies are associated with higher wages (Rodrik, 1999). Obviously, under democracy, interest groups play an important role in exerting pressure on government for wage increases. The recent political changes occurred in the Arab world illustrate these findings. In fact, public debt has risen sharply in the early years of the Arab spring revolution, especially in countries that have succeeded in removing dictators from power. In Tunisia, for example, the post-revolution governments have been forced to borrow heavily to cover social transfers and to satisfy workers' demands for wage increases.

In columns (3) and (4), we include a quadratic term of democracy to account for nonlinearities. The results shown in column (3) reveal positive and statistically significant estimates for DEMF and negative and significant estimates for $DEMF^2$. These estimates suggest that there is an inverted-U shape relationship between democracy and public debt. More specifically, below the 0.36 democracy threshold, democracy is positively associated with public debt. However, beyond this threshold, the relationship between democracy and public debt becomes negative. These results remain the same even after using the Polity IV index. The findings confirm a non-linear relationship between democracy and debt with threshold level of 0.46 of democracy. These findings could be explained by the fact that in countries where no free and fair elections are held, especially resource-abundant ones, governments are not committed to allowing open access to information on its activities and providing a transparent budget to enhance rent-extraction opportunities (Wehner and de Renzio, 2013). Thus, the lack of fiscal transparency may lead to an increase in public debt (Alt and Lassen, 2006; Benito and Bastida, 2009). However, in countries where democratic institutions are well established, a better fiscal

transparency is often achieved as governments choose to disclose credible information to the public to minimize the risk of getting kicked out of office for poor fiscal performance and inadequate public finance management (Harrison and Sayogo, 2014). Hence, this may induce lower public debt levels.

Table 2: Linear Vs quadratic specification

	Linear specification		Quadratic specification	
	Freedom House	Polity IV	Freedom House	Polity IV
VARIABLES	(1)	(2)	(3)	(4)
$Debt_{(-1)}$	0.937***	0.974***	0.902***	0.851***
	(0.0662)	(0.0687)	(0.0956)	(0.0760)
Demf	0.568**		2.315*	
	(0.208)		(1.111)	
$Demf^2$			-3.154*	
			(1.634)	
Demp		0.523**		4.764***
		(0.232)		(1.278)
$Demp^2$				-5.129***
				(1.529)
Growth	-0.0208***	-0.0261***	-0.0262**	-0.0126**
	(0.00598)	(0.00438)	(0.0117)	(0.00539)
Inflation	-0.00918**	-0.0132***	-0.00990**	-0.00894**
	(0.00403)	(0.00231)	(0.00452)	(0.00349)
budget	-0.0104*	-0.00243	-0.00972	-0.00431
	(0.00570)	(0.00426)	(0.00854)	(0.00862)
Trade	-0.161	-0.0733	-0.292	0.124
	(0.127)	(0.146)	(0.204)	(0.126)
Unemployment	-0.0104	-0.00744***	-0.00908	-0.0181***
	(0.00809)	(0.00234)	(0.00904)	(0.00264)
Constant	1.168	0.553	1.716*	-0.285
	(0.710)	(0.833)	(0.952)	(0.787)
Observations	142	142	142	142
Number of countries	16	16	16	16
F-stat (p-value)	0	0	0	0
AR(2) test (p-value)	0.507	0.834	0.747	0.539
Hansen J test (p-value)	0.891	0.531	0.865	0.408
Turning point			0.36	0.46
95 % Confidence Interval, Delta method			[0.29, 0.43]	[0.40, 0.52]

Notes: GMM regressions use robust standard errors clustered by country. We employ the two-step GMM estimator with the Windmeijer (2005) finite sample correction for standard errors. To avoid overfitting endogenous variables, we collapse the instrument set as suggested by Roodman (2009). The Hansen and AR(2) tests indicate that we cannot reject the validity of our instruments. *, ** and *** denote significance at the 10, 5 and 1% level, respectively

The results of the control variables imply that economic growth and inflation affect negatively and significantly public debt in all specifications. This highlights the importance of achieving a better economic performance in reducing public debt (Bittencourt, 2015). In addition, it is

worth mentioning that inflation is usually used as a tool to reduce the real value of the debt stock (Reinhart and Sbrancia, 2011). The results reported in column (1) indicate that the variable budget is negatively and significantly associated with public debt. Hence, it is plausible to assume that running a budget surplus reduces public debt stocks. Nevertheless, the significance of this variable disappears in the other specifications. Moreover, we find no evidence that trade openness affects public debt. Furthermore, the results obtained with the Freedom house index show a non-significant effect of unemployment for both linear and non-linear regression. Nevertheless, the variable gains significance with a negative sign when we use the alternative Polity IV measure of democracy.

The Hansen and AR(2) tests indicate that we cannot reject the validity of our instruments (Arellano and Bond, 1991). Hence, our model is well specified and our system-GMM estimations are valid (Blundell and Bond, 2000).

4. Conclusion

This paper contributes to the existing literature on the political determinants of public debt by investigating the effect of democracy on public debt for a sample of 16 Arab countries over the period 2002-2013. Interestingly, two main results are obtained. On one hand, the results suggest a positive linear relationship between democracy and public debt. On the other hand, we find that democracy has a significant non-linear effect on public debt. The effect is positive only for a lower value of democracy, but it becomes negative when democracy reaches a certain threshold. These results are robust to the use of Polity IV index as an alternative measure of democracy.

Our results have the following policy implications: Democracy is expensive and Arab countries that follow this path must be mindful, notably at the initial stages of democratization, of the harmful macroeconomic consequences such a move could have on public finance. In parallel, a certain level of democracy is needed to sustain public debt and improve public finance management. Hence, despite the fact that democracy is taking roots in some Arab countries especially in Tunisia, so many issues need to be defined and resolved, such as improving fiscal transparency, centralizing the budget process and creating an independent fiscal authority responsible for checking and evaluating the accuracy and the transparency of the budget process.

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APPENDIX.

Country list (16 Arab countries)

Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, UAE, Yemen

Table A.1 Variables description and data Sources

Variables	Description	Sources
Debt	The ratio of total public debt stocks to GDP (in logarithm)	Abbas et al., (2010)
Demf	The average of political rights and civil liberties indices. The index is measured on a 1–7 scale, with 1 representing the most democratic and 7 representing the least democratic. The scale is inverted and the index is normalized between zero and one, with higher values indicating a higher level of democracy.	Freedom House
Demp	The Composite Polity Index ranges from -10 to 10. The index is normalized between zero and one, with higher values indicating a higher level of democracy.	Polity IV
Growth	Real GDP per capita growth	WDI
Inflation	Growth of GDP deflator	WDI
Budget	Cash surplus/deficit (% of GDP)	WDI
Trade	The sum of exports and imports of goods and services measured as a percentage share of GDP (in logarithm)	WDI
Unemployment	Unemployment, youth total (% of total labor force ages 15-24) (in logarithm)	WDI

Table A.2 Summary statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Debt	167	3.488874	1.095625	-.5963027	5.203516
Demf	192	.1892361	.1546634	0	.6666667
Demp	192	.2627604	.2136229	0	.8
Growth	192	1.330683	10.16989	-62.21435	104.6576
Inflation	192	8.464953	9.739545	-25.3128	36.67306
Budget	192	2.850464	11.66289	-15.973	43.303
Trade	176	4.445044	.3667664	3.247355	5.170865
Unemployment	192	23.79792	10.50618	.9	52.7

Table A.3 Correlation matrix

	Debt	$Debt_{(-1)}$	Demf	Demp	Growth	Inflation	Budget	Trade	Unemp
Debt	1.0000								
$Debt_{(-1)}$	0.9482	1.0000							
Demf	0.0870	0.0412	1.0000						
Demp	0.4764	0.4700	0.2969	1.0000					
Growth	0.2359	0.3349	-0.1341	0.1584	1.0000				
Inflation	-0.2229	-0.0829	-0.1310	-0.1068	0.1583	1.0000			
Budget	-0.7008	-0.6655	0.0821	-0.4985	-0.1216	0.3141	1.0000		
Trade	-0.2827	-0.2976	0.3310	-0.1467	-0.2834	-0.1307	0.1854	1.0000	
Unemp	0.0944	0.1878	-0.2081	0.3293	0.2811	0.0446	-0.2919	-0.1348	1.0000