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IS THE RELATIONSHIP NON-LINEAR?**

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Abstract

Political economy theories of financial development give no clear indication on how political regime impacts growth. There is evidence of positive, negative and no direct effect of democracy on financial growth. This paper attempts to resolve this controversy by studying the role of nonlinearities using the estimation of smooth models for panel data (PSTR). Our findings offer strong evidence that democracy non-linearly impacts financial development. More specifically, there exists a threshold below which democracy exerts a negative effect on financial development, and beyond which it is growth enhancing for emerging countries.

JEL Classifications: G18; O16; P1

Keywords: *Democracy, Non-linearity, PSTR, Financial development*

ملخص

نظريات الاقتصاد السياسي للتنمية المالية لا تعطي مؤشرا واضحا على آثار نمو النظام السياسي. هناك أدلة إيجابية والسلبية وليس له تأثير مباشر الديمقراطية على النمو المالي. تحاول هذه الورقة لحل هذا الخلاف من خلال دراسة دور اللاخطية باستخدام تقدير نماذج السلس للبيانات اللوحية (PSTR). تقدم النتائج التي توصلنا إليها أدلة قوية على أن الديمقراطية الغير خطية تؤثر على التنمية المالية. وبشكل أكثر تحديدا، هناك عتبة والتي أدناه تكون ممارسات الديمقراطية لها تأثير سلبي على التنمية المالية، وبعدها يكون تعزيز للنمو في البلدان الناشئة.

1. Introduction

The recent democratic transition experience in many Arab countries has revived the debate on whether democracy is beneficial for economic development. At the same time, the global economic crisis has put in question the feasibility of free markets and emphasized the need for a stronger government role. Others claim that neither free markets nor democratic governments will enhance economic performance, and that the authoritarian regimes are better suited to achieve such goals. On the other hand, the political economy theories of financial development stress that financial development (hereafter, FD) depends on the nature of the political regime, namely democratic versus an autocratic regime. According to these theories, narrow political and industrial elites, who control political decisions, may obstruct FD to deny access to finance to new competitors. Hence, changes in patterns of the financial sector development depend on shifts in relative power of these particular groups, which is especially impaired by policy shocks. Similarly, existing literature reported mixed evidence regarding the effects of democracy on financial outcomes. Evidence is reported for positive, negative and non-direct effect of democracy on financial growth.

This paper aims at resolving the controversy on the link between democracy and financial development by considering the potential non-linearity of this relationship. We examine a wide sample of countries, including both developed and emerging economies. Using a large panel of countries allows for investigating whether the impact of democracy is the same or not for industrialized and developing countries. The non-linearity of the relationship between democracy and FD is examined using panel smooth transition (PSTR) models. To our best knowledge, these models have not been applied before to explore this issue, although they seem to be highly relevant. Indeed, such models allow us to examine the development effects of democracy according to its various levels. More specifically, two regimes— low and high democracy—will be endogenously determined, corresponding to two distinct equations. The transition from one regime to the other being smooth and governed by the democracy variable. Through the estimation of these models, we will be able to define the desirable level of democracy, i.e. the threshold value beyond which democracy may have growth-enhancing effects. We also use the generalized method of moments (GMM) estimations the including quadratic democracy interaction term in the estimated equation.

Our research contributes to the existing literature in several ways. First, it is one of the pioneer papers that consider nonlinearities between democracy and financial outcomes. Besides, it is the first paper that uses panel smooth transition regression (PSTR) models to analyse this relationship. Finally, our results show that the relationship between democracy and FD is non-linear.

The remainder of this paper is structured as follows. Section 2 reviews the literature providing theoretical arguments for non-linear effects of democracy on growth. Section 3 describes the data and variables used. The methodology is discussed in Section 4 and results are presented and discussed in Section 5. Section 6 concludes.

2. Literature Review

A large literature highlights the crucial role of political institutions, namely democratic versus autocratic regimes, in shaping economic growth. However, there has been no conclusion as to an inconclusive relationship between democracy and growth. For instance, a literature survey by Doucouliagos and Ulubasoglu (2008) ends up with a wide range of estimates: 16% of democracy estimates are negative and statistically significant, 20% are negative and statistically insignificant, 38% are positive and statistically insignificant and 26% are positive and statistically significant. It seems thus that democracy plays an ambiguous role in generating economic growth. Similarly, the economic literature distinguishes two opposing points of view regarding the economic impact of democracy. The first view supports the growth enhancing

effects of a democratic political system. It is commonly accepted that greater dispersion of power in democracies decreases the possibility, for advantaged actors, to impose their will on the account of others, increasing thus the overall social well-being. Indeed, elite groups' interests are much more satisfied in centralized and powerful political systems than in decentralized and competitive governments (North and Weingast 1989; North 1990; Olson 1993; Acemoglu 2003). Second, democratic institutions lead to more open markets, encourage greater foreign entrants and help new firms to more efficiently utilize productivity innovations resulting into greater economic performance (Acemoglu 2003). Moreover, Olson (1993) emphasizes the advantages of democratic institutions in securing property and investors' rights, thus giving more incentives for investment (Clague et al. 1996). He deemphasizes the role of autocratic regimes since they are associated with more difficulties to commit credibly to such rights. Particularly, the author shows that conditions that are necessary to guarantee property rights are the same conditions that are required to have a sustainable democracy. Indeed, long-term survival of democracy is conditioned by better protection of civil rights. Besides, according to Acemoglu and Robinson (2000, 2001), democracy represents a credible commitment regarding future redistribution to persons deprived of their rights. This is because it reallocates de jure political power from the elites to the masses. Giving that the poorest segments would hold more power through voting, they will be more able to implement policies that serve the majority interests. Similarly, democracy, by increasing competition and participation in the political system, constrains the government's power to manage and control the financial sector, reduce rent seeking, align the interests of the state to the preferences of the citizen, and thus increases efficiency of financial markets (Haber 2008). Finally, according to Rodrik (2000), democracy generates higher quality of growth since it allows greater predictability and stability. The rationale behind this idea is that the presence of a broad range of decision makers results in greater diversification and hence less risk taking resulting in higher stability and predictability.

The second point of view emphasizes, however, the risks associated with representative and democratic governments. First, Huntington (1968) highlights the negative effects of populist pressure in democracies. Indeed, democracy would hamper investments since it is associated with higher public pressure for immediate consumption. Besides, the willingness of policymakers to gain future voting shares makes the government in democratic systems particularly subject to pressure from interest groups that will attempt to put in place policies that favor specific business sectors or important voting blocs, leading to inefficient redistribution of resources (Olson 1982; Comeau 2003). Alesina and Rodrik (1994) underline the beneficial role of autocratic systems than democratic regimes to oppose pressure from vested interests given that politicians are better able to design policies under authoritarianism (Wade 1990). Finally, under democracy, potential losers, which act as veto players, may represent a threat since they would be able to impede growth-enhancing reforms (Tsebelis 2002).

In an attempt to explain these theoretical sharp contracts, several models that link political institutions to economic outcomes dismiss the simple linear relationship and highlight the role of nonlinearities in the democracy-growth relationship. For example, according to the classical Lipset hypothesis (Lipset 1959), complementary socioeconomic conditions are prerequisites for democracy to evolve. In fact, the impact of democracy on economic outcomes would vary across initial conditions, including the level of development and inequalities, giving rise to heterogeneous treatment effects (Angrist and Pischke 2009). Besides, other explanations of the non-linearity property have been suggested, notably through models that explicitly account for intermediate regimes. In fact, various varieties of democracies could give rise to nonlinearities. Differences in economic impact of democracy may be due to the existence of variations in the impact of a range of varieties of non-democracies, democracies and intermediate regimes on

growth (Haber 2006). Non-linearity is thus based on looking at how the shifts from the least democratic to the most democratic political regime scale affect economic growth (in a potentially non-monotonic way). Accordingly, the literature recognizes two opposing hypothesis regarding economic effects of hybrid regimes.

The first hypothesis assumes that hybrid regimes are unable to profit from the advantages of pure institutions and just combine their weaknesses. For instance, unlike pure democracies where economic reforms are initiated as a result of political competition, these reforms are differed, in hybrid regimes, since the public pressure on their implementation and the government fear of losing power is lower in the case of important changes in economic institutions. As a consequence, intermediate regimes are associated with lower levels of economic performance (Acemoglu and Robinson 2006). Similarly, although a largely reduced government authority characterizes hybrid regimes, governments still have the ability to influence economic institutions to eliminate the development of potential new power centers. Thus, weak economic institutions may be used as instruments to reduce the economic autonomy of new political actors by making them more reliant on ruling elites and hence keeping control over politics (McMann 2006). Moreover, mixed regimes are often transitory phenomena that are by nature less stable than pure democracies (Gates et al., 2006). In fact, lack of stability enhances uncertainty, which discourages investments. Besides, even if transition to democracy could be seen as a credible commitment to guarantee investors and property rights, there is still a large class of investors that choose to delay investments because they think that in democratic transition countries, politically connected firms keep on playing a crucial role in capturing economic assets. Furthermore, inexperience of voters in democratic transition countries lead some politicians to use different means including the activation of ethnic and religious differences to ensure their election or maintain in office, with greater negative economic effects (Kaplan 2000; Zakaria 2003). However, in consolidated democracies, citizens would no longer respond to the politicians who use ethnic and religious differences to serve their own interests, since they will realize that they have been manipulated by badly intentioned politicians. Besides, hybrid regimes are also qualified as democracies with weak rule of law, where guarantee of political rights is combined with weak warranty of property and individual rights. Under these conditions, mixed regimes tend to undermine growth since they fail to fulfill institutional requirements of pure democracies. With regard to financial development, Rajan and Zingales (2003) show that in such systems, economic elites will hamper the development of the financial sector to protect their monopolistic rents. Definitely, political elites will gain power against economic elites. Thus, depending on the position with respect to the threshold, weak democracy will reflect two different configurations of political elites power. Finally beneficial impact of higher levels of democracy is further explained by the stock of democratic capital concept (Gerring et al. 2005). Particularly, the accumulation of democratic experience contributes to economic growth through two mechanisms: a learning process and a better institutionalization of society. The learning process is related to the management of economic policies in the sense that it leads to more favorable economic policies. Likewise, the accumulation of democratic experience improves institutions since rules are clearly defined and procedures for resolving conflicts of interests are already implemented.

Unlike the former position, the second hypothesis argues that regimes with intermediate level of democracy are better for growth. For instance, Barro (1996) shows that democracy improved growth at a lower level but depressed growth at higher levels. Indeed, in pure dictatorship, an increase in political rights may enhance growth since it will limit autocrat power resulting in fewer rents. Whereas in systems that have already attained a certain degree of democracy, further increase in political rights will rather hold back the economic growth because such increase will encourage public demands for income redistribution with negative impact on

growth. Hence, Barro advocates that moderate democracies are the optimal choice in the tradeoff between governments rent seeking and public desire for redistribution. In the same vein, Plumper and Martin (2003) developed a model through which governments choose an optimal combination between rents and public goods to gather political support. In pure autocracies, government will rationally select rents as an instrument to catch political support. However, an increase in political participation makes rents an increasingly expensive instrument. In such circumstances, government will rather choose public provision of goods as a cheaper and more efficient instrument to assure its survival in power. Hence, the authors show that democracy enhancing growth effects is only possible for moderate levels of political participation. Indeed, compared with semi democracies, a further increase in political rights will push the government to overinvest in the provision of public goods with negative growth effects. Finally, in addition to pressure from interest groups, higher democratic regimes suffer from excessive private and public consumption and lack of sufficient investments leading to negative economic and financial performance (Huntington 1968).

3. The Data

The largest sample consists of 110 developed and developing countries¹ covering the period 1984-2007. The choice of the period was constrained by the data availability. Indeed, data on FD are rarely available before 1980. We exclude the period after the year 2007 to avoid the altering effects of the global economic crisis.

The dependent variable is the level of FD² measured by the following proxies: (1) bank's credit to private sector (Private) which is an indicator of financial intermediation activity and equals financial intermediary credits to the private sector divided by the GDP. (2) Deposit money bank assets to the GDP (Deposit) which equals the ratio of total domestic assets of deposit money banks divided by the GDP. It is an indicator of the overall size of the banking sector. (3) Liquid liabilities to the GDP (Liquid) which equals currency plus demand and interest-bearing of banks and other financial intermediaries divided by the GDP. It is a general indicator of the size of financial intermediaries relative to the size of the economy. (4) Principal components aggregate index comprising the latter indicators (PCA). This aggregate index provides more information on the FD than if one uses only a single indicator. Data on private sector credit are obtained from the World Bank database, while data on alternative measures are provided by the Beck et al. database on FD and structure (2010).

To test the effects of democracy on FD, we use the commonly used Freedom House index as a measure of democracy. It measures freedom according to two broad categories: political rights and civil liberties. The index is the average of the indicators of political rights and civil liberties and ranks countries on a scale from one (highest level of democracy) to seven (lowest level of democracy)³.

Commonly determinants of FD are included in the regressions as control variables. These determinants are: *Real GDP growth (Real growth)*. It is commonly argued that rapid growth should be linked to enhance development of the financial sector. However, the effect of real growth may be reversed according to the 'conditional convergence' theory. Indeed, the theory implies that more developed countries, i.e. countries with higher GDP per capita, tend to have lower rates of credit growth (Levine and Renelt 1992; Easterly and Levine 1997). Hence, faster growing countries are more likely to experience lower levels of FD. Data on real growth are obtained from the World Bank database. *Trade openness (TO)* is the sum of exports and imports in percentage of the GDP. It is argued that international trade openness policies which facilitate

¹ Details on the countries used are reported in appendix 1.

² All measures of FD are de-trended to consider potential trend effects.

³ For interpretation purposes, we rescale the index to lie between one and seven with higher value indicating a greater degree of democracy.

the development of the financial sector. Indeed, trade liberalization will necessary carry new enterprises on the local market creating thus more competition and reducing the incumbents' rents. These later will have their cash flow decreased and will be constrained to rely on external finance resources. This will boost the development of the financial sector (Rajan and Zingales 2003). We would therefore expect a positive coefficient for (TO). Data on this variable are obtained from the World Bank database. The *capital openness (KO)* index developed by Chinn and Ito (2010). Theory advocates the positive effects of financial liberalization on FD. Indeed, financial openness allows investors to be engaged in more diversified activities and should reduce the cost of capital leading thus to increase its availability to investors. *Government spending (Gov exp)* is the total government consumption expenditure divided by the GDP. It captures the effect of the fiscal policy. The effect is ambiguous. First, it is argued that government size is positively associated with government institutions (La Porta et al. 1999). Thus, increased government spending should enhance the development of the financial sector since it is linked to better property rights and contract enforcement, which will encourage investment and financial growth. Besides, increased government spending on economic and physical infrastructure will reduce production costs and encourage investments (Abdullah 2000; Al-Yousif 2000; Rajan and Sharma 2008; Cooray 2009). However, when government finances its expenditure through borrowing (especially from banks), it will be done on the expense of the private sector, leading thus to reduced private investment. Many studies (Laudau 1986; Barro 1991; Folster and Henrekson 2001) suggest that large government expenditure would have negative impact on economic growth. Data on government expenditure are from the World Bank database. \square *Regime stability (RS)* is measured by the variable "durable" and defined as the number of years that have elapsed since a major regime transition. The inclusion of this variable is based on the evidence that investors in stable governments fear expropriation and thus prefer to hold physical assets rather than to invest in financial assets. Therefore, to promote FD, investors need a minimum level of trust and confidence regarding the stability of the government. So we expect political stability to have a positive effect on FD. Data on democracy durability come from the Polity IV database.

4. Methodology

Most empirical papers indirectly assume the impact of democracy along the entire time span to be constant and homogeneous among the countries in the sample. Since the absorptive capacity of a country can improve, i.e. the benefits associated with democracy can intensify, as the democracy is consolidated. It is thus reasonable to assume that the democracy impact is not constant, but rather country or/and time varying. To investigate the potential non-linearity of the relationship between democracy and FD, we use the PSTR models developed by Gonzalez et al. (2005) and Fok et al. (2005). These models have several interesting features that make them suitable for our purposes. First, the observations in the panel are divided into a small number of homogenous groups or "regimes", with different coefficients depending on the regimes. Second, regression coefficients are allowed to change gradually when moving from one group to another: PSTR is a regime-switching model where the transition from one regime to the other is smooth rather than discrete. Finally, individuals are allowed to change between groups over time according to changes in the threshold variable.

More specifically, we consider the following model:

$$Y_{it} = \alpha_i + \beta_0 Democ_{it} + \beta_1 Democ_{it} g(q_{it}; \gamma; c) + \beta_2 Z_{it} + e_{it} \quad (1)$$

where Y_{it} is the level of financial development and $Democ$ is the freedom house measure of democracy at country i at time t , for $i = 1, \dots, N$, and $t = 1, \dots, T$. α_i represents an individual fixed effect, while Z_{it} is a k -dimensional vector of financial development determinants usually considered in the literature. In links to Granger and Terasvirta (1993) and Gonzalez et al.

(2005), the transition function $g(\cdot)$ is a continuous function of the transition variable q_{it} , bounded between 0 and 1:

$$g(q_{it}; \gamma; c) = (1 + \exp(-\gamma \prod_{j=1}^m (q_{it} - c_j)))^{-1} \quad (2)$$

With $\gamma > 0$ and $c_1 \leq c_2 \leq \dots \leq c_m$, where γ is the slope of the transition function and $c = (c_1, \dots, c_m)'$ is an m dimensional vector of threshold (or “location”) parameters. For $m = 1$, namely the case we will focus on⁴, there is one threshold of democracy level, around which the effect of $Democ_{it}$ on Y_{it} is non-linear. This non-linear effect is represented by a continuum of parameters between two extreme regimes. The first extreme regime corresponds to $g(\cdot) = 0$ and is associated with low values of q_{it} , while the second regime corresponds to $g(\cdot) = 1$ and is associated with high values of q_{it} . Therefore, as q_{it} increases, the effect of democracy evolves from β_0 to $\beta_0 + \beta_1$ following a single monotonic transition centered on the value c of q_{it} ⁵. In other words, according to the value of the democracy index, democracy has a different impact (elasticity) on FD: PSTR model allows us to investigate if non-linearity in the elasticity could be associated with changes in the democracy level. Indeed, whereas the elasticity in a linear model is constant and equal to β_0 in Eq. (1), in the PSTR model the elasticities vary between countries and time according to the value of the transition function. Particularly, between the two extreme regimes, the elasticity of FD to democracy for country i at time t is defined as a weighted average of the parameters β_0 and β_1 :

$$dY_{it}/d Democ_{it} = \beta_0 + \beta_1 \times g(q_{it}; \gamma; c) \quad (3)$$

If each country i exhibits a different value of the transition variable at time t , the elasticity will then be different for each country. Similarly, if a given country has a varying q_{it} , then its elasticity will be time varying.

Following Gonzalez et al. (2005), we perform a homogeneity test before estimating an equation (1). This test indicates whether a PSTR model is suited to evaluate the effect of democracy on FD. In addition it allows selecting between the logistic and the exponential specification of the transition function. Finally, robustness checks will be performed by comparing the results of the PSTR model with the generalized method of moments (GMM) estimations (Arellano & Bond 1991; Blundell & Bond 1998) of a single FD equation including interaction terms:

$$Y_{it} = \alpha_i + \beta_0 Democ_{it} + \beta_1 Democ_{it}^2 + \beta_2 Z_{it} + e_{it} \quad (4)$$

Where the variables are defined exactly as in Eq. (1). Eq. (4) includes a quadratic interaction term to account for non-linear FD effects of the threshold variable, namely the level of democracy. Second, to ensure that our results are not driven by fully democratic or fully autocratic regimes, we remove from our sample respectively countries having a democracy score higher than 6.5 then countries having a score less than 2.5. Finally, as a robustness test, we use the polity 2 index as an alternative measure of democracy.

5. The Results

The results of the homogeneity tests are reported in Table 1. We display the p-values of the Lagrange multiplier and Fisher-type tests for the null hypothesis of linearity against the alternative of a logistic ($m = 1$) specification. We report the homogeneity tests for the whole

⁴ Gonzalez et al. (2005) consider that it is sufficient to consider $m = 1$ or $m = 2$, as these values allow for commonly encountered types of variation in the parameters. Although, there are some theoretical arguments in our specific case to justify a U or inverted U elasticity of FD with respect to $Democ$, we found that the rejection of linearity is stronger for $m = 1$, thus the logistic specification is preferred to the exponential one.

⁵ Note that if $\gamma \rightarrow 1$, the function $g(\cdot)$ becomes an indicator function $I[q_{it} > c]$, and the PSTR is then equivalent to a two-regime PTR. Conversely, if $\gamma \rightarrow 0$, the model is a standard linear model with individual effects – the within model – with constant and homogeneous elasticity.

sample of countries and then by the subgroups of high income and middle and low-income countries. This is because we suspect important disparities among countries, namely between advanced economies, regarding democracy's growth effects. Our findings indicate that the null of homogeneity is rejected at the 1% significance level for the whole sample as well as for low and middle-income subsamples. Hence, the results prove that democracy impacts FD differently, depending on the level of the democracy. However, the homogeneity hypothesis is accepted for high-income countries. The impact of democracy on FD is therefore linear in developed countries. The finding of a non-linear effect for developed countries is not surprising, given that high-income economies are highly democratic and are already located beyond the threshold value.

In the second step, we perform the PSTR regressions according to equation (1), with estimations reported respectively in Tables 2 and 3 for the whole sample of countries and then for low and middle income subsamples. Starting with a general comment relating to the control variables for the two considered samples, the majority of the explicative variables, except real growth variable, have the expected sign, regardless of specification used.

For the variable of interest, results reveal that the direct impact of democracy on FD, measured by β_0 , is negative and significant (at the 1% level) through all the regressions. This result is in line with the existing empirical literature, which found a significant negative impact of democracy on growth. The second line in Tables 2 and 3 offers some further insights: democracy's effects on FD appear to be strongly non-linear. Particularly, the impact of democracy is conditional on the democracy level. More precisely, the β_1 coefficient, associated with the non-linear component of the model, is always positive and significant at the 1% level, with values ranging between 0.019 and 0.103. Given the underlying logistic function, this result implies that the elasticity of FD with respect to democracy varies from β_0 to β_1 , as the democracy index ranges from low to high values. The shift between these two extreme regimes occurs around the associated endogenous location parameter c . First, considering the full sample of countries (Table 2), the estimated threshold for the democracy is about 6. In the first regime, our results indicate that the effect of democracy on FD is negative for democracy levels below 6. However, results strongly differ for high democracy level sample (i.e. democracy higher than 6). Indeed, in these pure democratic regimes, the impact of democracy on FD is positive and significant: in the extreme case (when $g(q_{it}; \gamma; c) = 1$), other things being equal, an increase in the democracy level of 1% contributes to a boost in FD ranging between 0.02% to 0.07% points⁶, depending on the specification. There is, however, a continuum of points between these two extreme cases. Indeed, between these two values, the elasticity is defined as a weighted average of the parameters β_0 and β_1 . It is therefore preferable to interpret: (i) the sign of these coefficients, which indicates an increase or a decrease of the elasticity with the value of the threshold variable, and (ii) the time varying and individual elasticity of the FD with respect to the democracy level (Colletaz and Hurlin 2006).

This global result may however disguise important disparities among countries. Table 3 highlights many interesting results. First, the threshold value of democracy in emerging economies is on average the same as found in the whole sample. Particularly, in emerging economies, a positive effect of democracy on FD, is only observed beyond a given threshold. To further analyze the results, the slope of the transition function should also be examined. The higher the value of γ , the sharper is the shift from one extreme regime to another. Referring to Table 3 and Figure 1, where we plotted the elasticities related to different measures of FD⁷, the

⁶ Remember that the coefficient in the second regime is equal to $\beta_0 + \beta_1$ in Eq. (1).

⁷ Given the high number of countries in the sample, it would be confusing to precisely locate each of them in Figure 1. However, referring to the available Freedom House database, it is quite straightforward to compare the score of any country with the endogenous threshold parameter. Similarly, considering the time-varying impact of democracy for a given country, it

slope appears to be smooth regardless of the FD measure used. Consider a country whose democracy indicator is just below the threshold value of 6. According to the smooth transition function, any improvement in the democratic level will result in a very gradual increase in the development of the financial sector (from -0.073 to eventually 0.073, when we use the PCA measure). As opposed to the sharp transition, any effort to improve institutional democratic quality, even for a country, which is far below the threshold value, will always be rewarded (by a gradual increase in the marginal effect of democracy). Thus, the shape of the transition function and the location of a country with respect to the threshold value allow us to anticipate the effectiveness of democratic reforms in terms of FD. Due to a smooth marginal effect, improving democratic quality in emerging economies is valuable in terms of absorptive capacity, even if the country is far below the corresponding threshold value.

Our results underline the need to address various democracy levels in explaining the heterogeneous impact of democracy on FD. Results imply that without a consolidated democracy, countries cannot benefit from a shift toward a democratic political system and any political change, if not carried to extreme lengths, would be destructive to growth. Hence, the accumulation of democratic experience appears to be vital for democracy to become growth enhancing. Our results are consistent with Gerring et al. (2005) who show that the stock of democratic capital is growth enhancing through a learning process relating to the management of economic policies, and a better institutionalization of society. The learning process allows designing more favorable economic policies. Likewise, the accumulation of democratic experience improves institutions since rules are clearly defined and procedures for resolving conflicts of interests are already implemented.

Finally⁸, the GMM estimations confirm the robustness of the PSTR results. While explicitly taking into account the endogeneity of democracy, all interaction terms associated with the democracy variable are positive and significant, confirming the non-linear effect on FD. In addition, as in the PSTR regression, democracy has a negative significant effect on FD. These results corroborate our conclusion that democracy is growth enhancing only in countries having reached a consolidated level of democracy. Moreover, our results stand unchanged when using the polity 2 measure of democracy or when removing fully democratic and fully autocratic countries from our sample.

6. Conclusion

Empirical literature on growth and democracy gives no clear indication as to how political regime impacts growth. There is evidence of positive, negative and no direct effect of democracy on growth. This paper attempts to resolve this controversy by considering the role of nonlinearities in the democracy-FD nexus. Relying upon the estimation of smooth transition models and GMM for panel data, this paper investigates the FD effects of democracy on a wide sample of countries (high, middle and low income economies). After conducting a wide range of specification tests, results give strong support for the presence of nonlinearities in the democracy and FD relationship. More specifically, there is a threshold beyond which democracy exerts a positive effect on FD, with the average estimate, depending on the specification, is equal to 6. Moreover, we found a linear effect of democracy on FD in high-income countries, which is not surprising, given that high-income economies are highly democratic and are already located beyond the threshold value. These results are robust to the retained methodology since similar findings are obtained using the GMM estimator including quadratic interaction terms. Our results are also robust to changes in democracy measure and sample composition.

is possible to restore the evolution of the elasticity of FD with respect to Democ, conditional on the evolution of the democracy level.

⁸ Results are not reported but are available upon request.

Our findings have important implications: from a theoretical standpoint, this is part of a larger problem of institutional transplantation, and our study intends to facilitate its understanding. It helps explain empirical contradicting results studying the link between democracy and FD. From a policy perspective, our results suggest that beyond the establishment of a democratic government, young democracies as well as democratic transition countries should work on the consolidation of the democracy by increasing political competition, enhancing political rights and maintaining effective democratic principles to develop their financial sector.

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Figure 1: Elasticities of Various FD Measures with Respect To Democracy

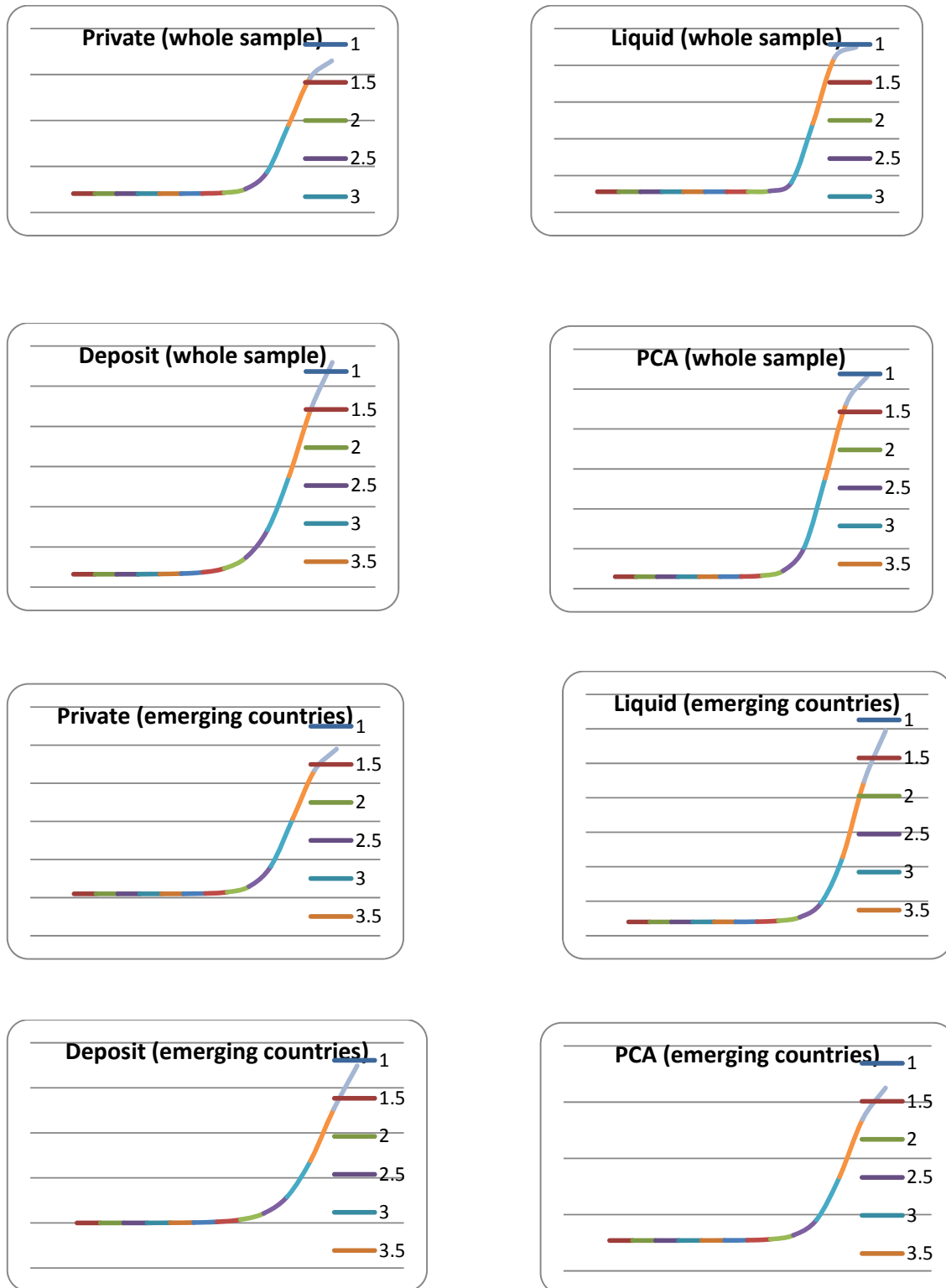


Table 1: LM and F Tests of Homogeneity (P-values)

	Whole sample	Emerging economies	Advanced economies
LM test	1.71355 e-010	7.67150 e-019	0.80721
F test	4.14030 e-010	2.41759 e-018	0.81198

Note: Homogeneity tests are applied using the PCA measure of FD.

Table 2: PSTR Estimates of FD with Respect to Democracy, Whole Sample

	Private	Liquid	Deposit	PCA
B ₀ : Democ	-0.0159*** (0.00054123)	-0.0072** (0.02629724)	-0.0134*** (0.00385377)	-0.034** (0.03727049)
B ₁ : Democ x g (.)	0.0299*** (0.00000000)	0.0198*** (0.00000000)	0.0308*** (0.00000000)	0.104*** (0.00000000)
Loc. Parameter (c)	5.99 (0.00000000)	6.024 (0.00000000)	6.19 (0.00000033)	6.03 (0.00000000)
Slope parameter (γ)	3.35	5.15	2.20	3.42
Control variables:				
RS	0.0025*** (0.00000000)	0.0016*** (0.00000000)	0.0024*** (0.00000000)	0.0097*** (0.00000000)
KO	0.0072** (0.02049177)	-0.0052** (0.01788891)	0.0081*** (0.00490851)	0.0221** (0.03312091)
Real growth	-0.0032*** (0.00000060)	-0.0031*** (0.00000000)	-0.0041*** (0.00000000)	-0.0149*** (0.00000000)
Gov.exp	0.0049*** (0.00000021)	0.0033*** (0.00000097)	0.0064*** (0.00000000)	0.01909*** (0.00000000)
TO	0.00009 (0.57564022)	0.00069*** (0.00000008)	0.00009 (0.55061101)	0.0015** (0.01123947)
AIC criterion	-4.05772	-4.81519	-4.27684	-1.72998
Sum of Squared Residuals	40.041	18.124	31.092	390.754
Number of obs.	2334	2254	2257	2222

Note: c and γ respectively denote the estimated location parameters and estimated slope parameters in Eq. (1)

Table 3: PSTR Estimates of FD with Respect to Democracy, Emerging Sample

	Private	Liquid	Deposit	PCA
B ₀ : Democ	-0.029*** (0.00000000)	-0.013*** (0.00000732)	-0.020*** (0.00000000)	-0.073*** (0.00000001)
B ₁ : Democ x g (.)	0.040*** (0.00000000)	0.031*** (0.00000000)	0.043*** (0.00000000)	0.147*** (0.00000000)
Loc. Parameter (c)	6.01 (0.00000000)	6.28 (0.00000001)	6.34 (0.00006896)	6.16 (0.00000000)
Slope parameter (γ)	2.96	2.96	2.21	2.95
Control variables:				
RS	-0.0004 (0.15863910)	0.0005** (0.04382718)	0.0008*** (0.00252646)	0.0013 (0.19080907)
KO	0.00109 (0.68916745)	-0.0030 (0.16284217)	0.0056*** (0.02085359)	0.0121 (0.18095562)
Real growth	-0.0021*** (0.00013106)	-0.0024*** (0.00000032)	-0.0034*** (0.00000000)	-0.0110*** (0.00000001)
Gov.exp	0.0054*** (0.00000000)	0.0035*** (0.00000021)	0.0069*** (0.00000000)	0.0206*** (0.00000000)
TO	0.0001 (0.49484142)	0.0007*** (0.00000012)	0.00001 (0.91102210)	0.0016*** (0.00319423)
AIC criterion	-4.56392	-5.08160	-4.88335	-2.26284
Sum of Squared Residuals	17.800	10.209	12.418	167.745
Number of obs.	1726	1662	1658	1630

Note: c and γ respectively denote the estimated location parameters and estimated slope parameters in Eq. (1)

Appendix 1

Countries in the largest sample are: Albania, Algeria, Angola, Argentina, Australia, Austria, Bangladesh, Belgium, Benin, Bhutan, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Chile, Colombia, Congo, Costa Rica, Croatia, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Ireland , Israel, Italy, Jamaica , Japan, Jordan, Kenya, Korea, South, Laos, Lesotho, Libya, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Mongolia, Morocco, Mozambique, Nepal, Netherlands, New Zealand, Niger, Norway, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Rwanda, Senegal, Seychelles, Sierra Leone, Singapore, Solomon Islands, South Africa, Spain, Sri Lanka, Sudan, Swaziland, Sweden, Switzerland, Syria, Tanzania, Thailand, Togo, Trinidad And Tobago, Tunisia, Turkey, Uganda, United Kingdom, United States, Uruguay, Venezuela, Zambia.