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# Political Origins of Financial Structure*

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**Abstract**

There is a growing policy interest in the role of financial structure in promoting development. However, very little is known about how different financial structures emerge and evolve. In this paper we empirically assess the political origins of financial structure. Using difference-in difference estimation and annual data, we study the effects of democratization on financial structure in a sample of 96 countries covering the period 1970 to 2005. Democratization here corresponds to the event of becoming a democracy. We find that democratization leads to a more market-based financial system. Democratic change could also be incremental rather than a one off. To identify the causal effect of incremental democratic change on financial structure we estimate a separate model and find that democracy matters. We also find that countries with substantial democratic capital are more likely to have a market-based financial structure. Our main results are robust to a variety of controls, instrumental variable estimation using commodity price and rainfall as instruments, Arellano-Bond GMM estimation, alternative measures of democracy and financial structure, and across different samples.

*JEL classification*: G20, O10, P16

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## 1 Introduction

The existence of well functioning financial markets are essential for overcoming the effects of information asymmetries and transaction costs that prevent the direct pooling and investment of society's savings. When financial markets work well, empirical evidence suggests that it is not only good for growth but also the growth is more likely to be pro-poor (Levine, 2005; Beck *et al.*, 2007). Even though there is growing consensus on the positive relationship between finance and development, a long standing debate however is on the relative virtues of bank-based and market-based financial systems. The success of market-based systems in the United Kingdom and the United States supports the viewpoint that market-based systems are superior in promoting growth and therefore should be adopted by the emerging market economies in Eastern Europe, Latin America and Asia. However, the role of bank-based systems in the industrialization of Germany and Japan provides a strong counter example. Cross-country evidence on the growth promoting virtues of one system over the other, on the other hand, remains inconclusive (Levine, 2002; Tadesse, 2002).

In spite of a growing policy interest on the role of financial structure in promoting development, very little is known about how different financial structures emerge and evolve. Broadly agreeing with this view Levine (1997, p. 702) writes, "We do not have adequate knowledge of why different financial structures emerge or why financial structures change?" In this paper we empirically assess the origins of financial structure. In particular, we focus on the role of political institutions. Political institutions and the quality of government could influence the nature of information asymmetries and transaction costs and shape financial structure. In a country with non-democratic political institutions the information gap between a politically connected investor and an average saver could be wider because the former could easily seek credit for a bad project using political connections and the latter would be completely oblivious of such risk. In such a situation, a

bank-based system could serve better in solving the information problem. Furthermore, non-democratic governments could use their regulatory powers to create segmented monopolies for banks and thus creating a bank-based system. Banks in return could share a part of their rent resulting from regulated entry with the political elite (Haber, 2008). Such a bank-based system with restricted entry would also benefit the incumbent political elite as this would severely constrain credit access of their political adversaries. The monopoly arrangement between the banks and the political elite however would break down with more political competition as the regulatory and political cost of sustaining the monopoly would increase. As a result, a market-based financial system would start taking over from the monopolistic banks. In summary, theory predicts that democratic political institutions could be one of the major determinants of financial structure.

We find evidence that indeed democratic political institutions matter for financial structure. Using difference-in difference estimation and annual data, we study the effects of democratization or political liberalization on financial structure in a sample of 96 countries covering the period 1970 to 2005. Democratization or political liberalization here corresponds to the event of becoming a democracy. We find that democratization leads to a more market-based financial system. In particular, permanent democratization leads to one third of a sample standard deviation (=0.65, see column 1 table 3) increase in the financial structure activity[1] measure. In other words, permanent democratization explains 35 per cent of the difference in financial structure in the United States (a predominantly market-based country with a score of 0.42) and Germany (a predominantly bank-based country with a score of -1.46) in the year 1995.

Democratic change could also be incremental rather than a one off. To identify the causal effect of incremental democratic change on financial structure we use panel data covering the period 1970 to 2005 and 96 countries. We find that a one unit increase in the democracy score

[1] Section 2 explains the financial structure activity measure. Also see Appendix A1.

(which corresponds to a 20 point increase in POLITY2 scale) leads to 2.9 unit increase in the financial structure activity measure. This is indeed a large effect. The magnitude of the effect is 94 percent of the actual difference in financial structure between the United States (a market-based country) and Mexico (a bank-based country) in 1995. We also find that countries with substantial democratic capital are more likely to have a market-based financial structure. Democratic capital corresponds to a long history of democracy. Our main results are robust to a variety of controls, to instrumental variable estimation using commodity price and rainfall as instruments, Arellano-Bond GMM estimation, alternative measures of democracy and financial structure, as well as across different samples.

We make the following contributions in this paper. First, we present an empirical analysis of the political origins of financial structure. By using difference-in-difference estimation in a macro context we are able to estimate the causal effect of democratization on financial structure. Furthermore, we are also able to estimate the effect of incremental democratic change on financial structure. Our results in this regard are novel. Second, we use panel data for our analysis which is a significant departure from the existing empirical studies on financial structure. To the best of our knowledge, no other studies on the determinants of financial structure use panel data. Third, using commodity price and rainfall as instruments for democracy and income we are able to present credible estimates of the causal effects of democracy on financial structure. The difference-in-difference estimation approach also allows us to present estimates of the causal effects of democratization.

The literature on financial development and economic growth is large.[2] Recently some studies have also looked at the impact of financial structure on economic growth (Levine, 2002; Tadesse, 2002; and Chakraborty and Ray, 2006). The determinants of financial structure literature

[2] See Levine (1997) and Beck and Levine (2005) for a survey of this literature.

however are relatively small. To summarize, it is perhaps fair to say that the following four strands of thought stand out.

The first is the political institutions view of financial structure. The main idea is that non-democratic states create rent for the existing banks by using their political power and regulation to restrict entry. In return, the near monopoly banks share a part of their rents with the political elite. However the control of the banks over the financial sector diminishes with political competition as the political elite are no longer able to restrict entry (Haber, 2008; Wallis, 2008). Haber (2008) show that the above theory explains the difference in financial structure in the United States and Mexico. Political competition in the United States led to a better developed and market-based financial system. In contrast Mexican politics was dominated by a small number of Mexican born Spanish elite who restricted entry into the financial sector. The result was an underdeveloped bank-based financial system. Sylla (2008) also presents a similar explanation for American financial development. He argues that political unification, limited government achieved through horizontal and vertical separation of power, and strong leadership[3] helped achieve the 'financial revolution' in the United States in the late eighteenth century. We however could not locate an empirical study reporting systematic evidence on the role of political institutions in determining financial structure.

The second is the legal origin view of the financial structure pioneered by La Porta *et al.* (1998). The principal idea behind this theory[4] is that the British justice system evolved to protect private property holders against the crown. As a result it puts a lot of emphasis on protecting the rights of the private property holder. In contrast, the French justice system evolved to reduce the discretionary power of the corrupt judiciary. Therefore the state chose to codify legal procedure as much as possibly to make the judiciary close to redundant. In the long-run this resulted into an

[3] Sylla (2008) highlights the role played by the first U.S Treasury Secretary Hamilton in engendering the 'U.S. financial revolution'.

[4]This theory however is contested by many. See for example, Pagano and Volpin (2001) and Rajan and Zingales (2003).

increase in the power of the state vis-à-vis the individual. Therefore, private property rights are relatively weaker in the French legal tradition. Private property rights are crucial to financial development as it protects the rights of the investor. Therefore countries that have acquired British legal tradition through conquest, colonization, or imitation tend to have better financial markets than French legal tradition countries (La Porta *et al.*, 1998; Beck *et al.*, 2003). One can easily extend this theory to include financial structure as countries with better property rights institutions are likely to have more market-based finance than bank-based finance (Demirguc-Kunt and Levine, 2001). We do control for legal origin in our model, first, by including country dummies, and second, by including socialist legal origin dummy.

The third is the economic development view of financial structure. The principal idea is that rapidly developing economies create additional demand for external finance for the firms. Not all of this additional demand can be catered for by the banks. This leads to the development of market-based financial systems. To illustrate this idea, Boyd and Smith (1998) present a theoretical model where capital accumulation is financed externally through a combination of debt and equity. The role of market-based finance increases as the economy develops. A separate but related story comes from the supply side. Economic development creates opportunities for financial institutions to save on monitoring costs and a market-based system emerges with low levels of monitoring. Chakaraborty and Ray (2007) present a model illustrating the supply side argument. They show that the distribution of wealthy and poor in a society determines its financial structure. Wealthy individuals pose less moral hazard risks relative to poor individuals. Therefore financial institutions can save on monitoring cost by choosing not to monitor the wealthy. The converse is true however with poor individuals. Therefore, developed societies are likely to have market-based financial system. The converse is expected in societies with low income. Empirical studies estimating the causal effects of development on financial structure are rare. Goldsmith (1969) however is an

exception. Goldsmith presents evidence that nonbank financial intermediaries and stock markets grow relative to banks in size and importance as countries expand economically. Goldsmith's evidence is based on data from Germany and the United Kingdom.

Finally, the fourth is the social capital view of financial structure. Countries with high level of social capital suffer less from moral hazard related risks. This allows financial markets to flourish (Guiso *et al.*, 2000). Guiso *et al.* (2000) also finds evidence that social capital and informal rules played a critical role in the financial sector development in Italy. One can easily extend this theory to accommodate financial structure. High level of social capital and low moral hazard related risk allows the financial institutions to save on monitoring cost and non-monitored (market-based) finance flourish relative to monitored (bank-based) finance. We control for social capital in our model by including country fixed effects, and time varying country fixed effects. The time varying country fixed effects control for the time varying but country specific aspects of unobservable such as social capital and culture.

Our paper is related to a large literature on the determinants of financial development. However, it should be noted that our focus is on the determinants of financial structure and not on financial development. Beck and Levine (2005) presents a comprehensive survey of the determinants of financial development literature. La Porta *et al.* (1998) presents the legal origin view. Bhattacharyya and Hodler (2010b) find that natural resources weaken contracting institutions and as a result have detrimental effect on financial development. Beck *et al.* (2003) find that disease environment and legal origin explains majority of the cross-country variation in financial development using a cross-section sample of 70 former colonies. Acemoglu and Johnson (2005) show that the disease environment impacts on financial development through property rights institutions and not contracting institutions. Rajan and Zingales (2003) pose a different view and argue that incumbent financial institutions oppose financial development because it breeds

competition. Therefore incumbents are likely to oppose financial development using their market power. The incumbent's opposition is likely to be weaker when an economy allows cross-border trade and capital flows. Therefore, trade openness and capital flows are likely to promote financial development. They find evidence in support of their hypothesis using data from 24 countries over the period 1913 to 1999. Our paper is also related to a large literature on financial development and economic growth. Levine (1997) and Beck and Levine (2005) presents an excellent survey of this literature.

Our paper is perhaps closest to the recent literature on financial structure and growth. Allen and Gale (2000) provide an excellent analytical comparison of different financial systems and their impact on growth. Levine (2002) using a cross-country dataset covering 48 countries report that financial structure do not matter for growth. Tadesse (2002) in contrast show bank-based system outperforms market-based system in emerging market economies. The converse is noticed in developed economies. In a theory paper, Chakraborty and Ray (2006) show that financial systems emerge through firm-financing choices[5] and neither system is superior to the other in terms of growth. Bank-based system however yields higher investments and lower inequality. The research presented in this paper, however, is different from the abovementioned as we aim to estimate the causal relationship from democratization and democracy to financial structure.

The remainder of the paper is structured as follows. Section 2 discusses the difference-in difference estimation approach and how democratization influences financial structure. Section 3 discusses the impact of incremental changes in democracy and democratic capital on financial structure. Section 4 concludes.

[5] Schmukler and Vesperoni (2001) provide empirical evidence on firms' financing choices using firm level data from emerging economies and find little difference between bank-based and market-based systems. Also see Stulz (2001) who review the literature on financial structure and corporate finance.

## 2 Democratization and Financial Structure

*2.1 Econometric Strategy and Data*

In order to estimate the causal effect of democratization on financial structure we follow the difference-in-difference approach used by Giavazzi and Tabellini (2005). We estimate the following model:

$$FS_{it} = \alpha_i + \beta_t + \gamma Y_{it} + \delta Democratization_{it} + \mathbf{X}'_{\mathbf{it}}\mathbf{\Lambda} + \varepsilon_{it} \quad (1)$$

where $FS_{it}$ is the measure of financial structure in country $i$ at year $t$ with a higher value indicating more market-based finance, $\alpha_i$ is a country dummy variable which controls for country fixed effects, $\beta_t$ is a year dummy variable which controls for time varying common shocks, $Y_{it}$ is log per capita GDP in country $i$ at year $t$, $Democratization_{it}$ is a measure of democratization in country $i$ which takes the value 1 for the years post-democratization and 0 otherwise, and $\mathbf{X_{it}}$ is a vector of other control variables which includes an interaction term between socialist legal origin dummy and democratization and a vector of interaction between the year dummy and continental dummies. Table 3 provides more details on the control variables.

The key coefficient of interest here is $\delta$. Countries experiencing democratization over the sample period are considered to be 'treated' and the others as 'controls'. In particular, the control countries are those that were always democratic or always non-democratic during the sample period of 1970 to 2005. The financial structure in the treated countries before and after the treatment is compared with the financial structure in the control countries during the same time period. Thus the methodology makes use of both within-country as well as between-country variation in the data.

The country and year dummy variables eliminate biases originating from time invariant country characteristics and time varying common shocks which may influence both democratization and financial structure. Following Giavazzi and Tabellini (2005) we also include an interaction term

between democratization and socialist legal origin to control for any systematic effect on financial structure and democratization originating from the transitional economies (former Soviet bloc countries). In addition, interaction terms between the year fixed effects and continental dummies (Asia, Africa, Latin America, and Socialist Legal Origin) are always included in the vector of control variables to make sure that the average treated country is not very different from the average control country. Furthermore, countries those are always democratic or always non-democratic during the sample period are always included in the control group to increase the likelihood that the average treated country is similar to the average control country. True standard errors of $\delta$, the coefficient on democratization, could be an underestimate due to the presence of serial correlation. We follow Giavazzi and Tabellini (2005) to tackle this problem and use clustered standard errors where the clustering is on countries.

Note that the difference-in-difference estimate could be biased if the treatments are not random or if the treated and controlled countries are systematically different from each other. Even though we take several steps discussed above to minimize the likelihood of such a bias, it must be said that the possibility of reverse causality due to omitted time varying factors cannot be ruled out completely in a macro context. Therefore, one should be aware of this caveat while interpreting the results. However, we do find similar results using a more continuous measure of democracy and international commodity price as instrument in section 3 which leads us to believe that our evidence of a causal relationship from democracy to a more market-based financial system is reliable.

How does the difference-in-difference methodology differ from the two standard empirical approaches in the macro literature, namely: a) cross country regression, and b) panel regression? Cross country regression is perhaps the simplest approach which uses financial structure as the dependent variable and democratization as the independent variable. Omitted variable and reverse causation are major limitations of this approach which could potentially bias the estimated

coefficients. Finding good instruments are often regarded as a remedy to this problem. However, good instruments are hard to find. Furthermore, cross-section analysis often throws away useful time variation in the data. Panel regressions in contrast do exploit time series variation in the data. However, this approach relies heavily on untestable and sometimes restrictive identifying assumptions such as the exclusion restrictions. Furthermore, fixed effect models rely only on within-country variation whereas the difference-in-difference approach exploits both within as well as between country variations in the data. One way to circumvent the identification issues in panel regressions is to use valid instruments. We do adopt this strategy in section 3 when we estimate the impact of incremental changes in democracy and democratic capital on financial structure.

Note that the underlying democracy measure used to calculate $Democratization_{it}$ is POLITY2 score from the Polity IV database, which is described by Marshall and Jaggers (2002). This database reports democracy and autocracy scores, which both vary between 0 and 10 with 10 being the most democratic or most autocratic, respectively. The democracy score measures competition and openness in the electoral process, and the autocracy score measures suppression of competitiveness over executive recruitment, lack of constraints on the executive, and regulation of participation. Note that the democracy and autocracy scales do not share any categories in common. The POLITY2 score is the difference between democracy and autocracy scores which runs between -10 and +10. Following Giavazzi and Tabellini (2005) we define democratization ($Democratization_{it} = 1$) in a country if it's POLITY2 score turns from negative to positive. However, not all democratic change is permanent. We consider two types of democratization here. First, we consider democratization episodes that are not subsequently reversed. It is denoted by the treatment 'PERMANENT' in table 3. Second, we consider both temporary and permanent democratization episodes as long as they last at least four years. This is in line with the expectation that it takes time for democratic change to influence financial structure. It is denoted by the

treatment 'ALL' in table 3. Note that in situations where the democratic change last less than four years, we ignore such change and code it is if it did not occur. Furthermore, following Giavazzi and Tabellini (2005) we also discard democratic change that took place in the last three years of the sample. The dependent variable in such situations is set to be missing. Table 1 presents a complete list of countries and years when the treatment is 'PERMANENT' and table 2 panel A reports summary statistics.

We use three measures of financial structure. First, is a measure of financial structure activity ( $FSA_{it}$ ) which is defined as the log of the ratio of 'stock market total value traded ratio' and 'bank credit ratio'. Levine (2002) classifies this as a measure of financial structure activity ( $FSA_{it}$ ) as it compares the activity of stock markets relative to that of banks. The 'stock market total value traded ratio' is defined as the value of domestic equities traded on domestic exchanges divided by GDP; and 'bank credit ratio' is defined as the value of deposit money banks credit to the private sector divided by GDP. Second, is a measure of financial structure size ( $FSS_{it}$ ) which is defined as the log of the ratio of 'stock market capitalization ratio' and 'bank credit ratio'. Third, is a measure of financial structure efficiency ( $FSE_{it}$ ) which is defined as the log of the ratio of 'stock market capitalization ratio' and 'bank overhead costs'. The size index measures relative size of the financial markets and the efficiency index captures relative efficiency. Levine (2002) provides a detailed account of these variables and Appendix A.1 provides definitions of all the measures of financial structure. $FSE_{it}$ and $FSA_{it}$ are correlated with a correlation coefficient of 0.87 and $FSS_{it}$ and $FSA_{it}$ are correlated with a correlation coefficient of 0.60. In our dataset Portugal in 1980 is the most bank-based country and United States in 2000 is the most market-based country. Table 2, panel A presents summary statistics of these variables.

We also control for log GDP per capita in order to account for the economic development view of financial structure proposed by Goldsmith (1969), Boyd and Smith (1998), and Chakraborty and Ray (2007). The GDP per capita PPP data is sources from the World Bank.

*2.2 Evidence*

Figure 1 presents bar charts of financial structure activity (*FSA*) in democracies, non-democracies and all countries in the sample over the period 1970 to 2005. Countries with a positive POLITY2 score are classified as democracies and the rest as non-democracies. The data shows that democracies are systematically more bank based than non-democracies over all periods except for the 1970s. Furthermore, the data also shows that there is a global trend in moving more towards bank based financial structure since the 1970s.

Table 3 presents the results of difference-in-difference estimates. Column 1 reports the impact of permanent democratization or treatments that are subsequently not reversed. The coefficient estimate suggest that democratization increases the financial structure activity measure ($FSA_{it}$) by 0.65. To put this into perspective, democratization moves financial structure towards a more market-based system by a magnitude of 0.65 which is 35 percent of the difference in $FSA_{it}$ scores in USA ($FSA_{USA1995} = 0.42$) and Germany ($FSA_{GER1995} = -1.46$) in 1995. Figure 2 also plots this permanent treatment. Column 2 estimates the effect of all treatments where democratization could be both permanent as well as temporary as long as they last for at least four years. The magnitude of the coefficient increases to 0.76.

In column 3 we investigate the timing of these effects by replacing democratization with a dummy variable equal to 1 in the 3 years preceding democratization, a dummy variable equal to 1 in the year of democratization and in the following 3 years, and a dummy variable equal to 1 from year 4 after democratization and onwards. We find no significant effect of the 3 years prior to democratization. However the movement towards a more market based system shows up

immediately after democratization (see coefficient on *3 Year post Democratization*) and it also has a lasting impact on financial structure (see coefficient on *4 Year onwards post Democratization*). In columns 4 – 9 we deal with size and efficiency measures of financial structure and the results are qualitatively similar.

In summary, the evidence suggests that democratization triggers a move towards a more market based financial systems. The transition to a more market based financial system starts immediately after democratization and it also appears to have a lasting impact. The latter is consistent with the findings reported in section 3 on the impact of democratic capital.

## 3 Democracy, Democratic Capital and Financial Structure

### *3.1 Econometric Strategy and Data*

Democratic change could also be incremental rather than a one off. Therefore an ordinal measure of democracy would allow us to distinguish between different shades of democracy. In this section we test the effect of incremental democratic change on financial structure. Furthermore, we also test the impact of democratic capital on financial structure. We use panel data covering the period 1970 to 2005 and 96 countries in the following empirical model. The list of countries is identical to section 2 (see table 1). Note that due to data limitations not all specifications cover exactly 96 countries and in most specifications the panel is unbalanced.

$$FS_{it} = \alpha_i + \beta_i t + \phi_t + \gamma_1 D_{it-5} + \gamma_2 Y_{it-5} + \varepsilon_{it} \qquad (2)$$

High frequency macro data is often noisy. In order to smooth out business cycle fluctuations or any other noise we use five year averages in our main specification reported in table 4, column 3. However, there is a trade off as this could amount to throwing away useful information. Note that five year averages here are in contrast to section 2 (see table 3) where we use annual data in order to successfully implement the difference-in-difference estimation strategy in a macro context.

Nevertheless, we also test our model using annual data and our result remains qualitatively unaffected (see table 4, column 4).

In model 2, $FS_{it}$ is the measure of financial structure in country $i$ averaged over years $t-4$ to $t$ with a higher value indicating more market-based finance. It is related to a country specific fixed effect plus time trend ($\alpha_i + \beta_i t$) which control for both time invariant as well as time varying country specific unobservable[6], a time varying shock that affects all countries ($\phi_t$), democracy score $D_{it-5}$ averaged over years $t-9$ to $t-5$, and income measured by log GDP per capita $Y_{it-5}$ averaged over years $t-9$ to $t-5$.

The main variable of interest is $D_{it-5}$ and therefore $\gamma_1$ is our focus parameter. We expect $\gamma_1$ to be positive and statistically significant, as theory predicts that incremental democratic change should favor market-based financial systems (Haber, 2008 and Wallis, 2008). Log GDP per capita controls for the economic development view of financial structure (see Goldsmith, 1969; Boyd and Smith, 1998; and Chakraborty and Ray, 2007).

Similar to section 2 we use all three measures of financial structure. However, in table 4 we use the financial structure activity ($FSA_{it}$) as our main measure. The advantage of using $FSA_{it}$ is that it provides the maximum sample size. Nevertheless, we also use other measures of financial structure in table 7.

In order to estimate the causal impact of Incremental democratic change on financial structure we certainly need to address the concern of endogeneity as financial structure may also influence democratization. In a country with predominantly market based financial system it could be easier for the opposition politicians to gain access to finance in order to finance their campaigns. This could lead to democratic change. In such situation, estimating model (2) using the ordinary

[6] Note that country specific unobservable such as culture and social capital could evolve over time. However, factors such as legal or colonial origin are time invariant.

least squares (OLS) estimation method would produce a biased estimate. In order to address such concern we estimate the model using lagged democracy and lagged GDP per capita as instruments (see table 4, column 6). We also estimate the model using international commodity price ( $P_{it-5}$ ) and log rainfall ($\text{Rainfall}_{\text{t-5}}$) as instruments for $D_{it-5}$ and $Y_{it-5}$ respectively (see table 4, column 7). In order for these instruments to be valid, they would need to be correlated with the suspected endogenous variables ( $D_{it-5}$ and $Y_{it-5}$ ) but are uncorrelated with the error term $\varepsilon_{it}$ in the model. In other words, these variables would have to affect financial structure exclusively through the democracy and income channels. We find that the instruments are correlated with the suspected endogenous variables (see table 5). They are also exogenous as rainfall is geography based and commodity price is driven by global demand exogenous to individual countries. It is also unlikely that they would affect financial structure through any other channel. Therefore, the chance of violating the exclusion restriction is fairly low. Furthermore, we estimate the model using the Limited Information Maximum Likelihood (LIML) Fuller 1 Instrumental Variable (IV) method which is robust to weak instruments. Finally, in order to be sure that we have addressed enodgeneity adequately we estimate the model using the Arellano-Bond GMM. The result remains qualitatively unchanged.

The democracy measure $D_{it-5}$ is calculated using the Polity IV database. The POLITY2 score which runs between -10 and +10 is averaged over the period $t-9$ to $t-5$. We rescale these averages such that $D_{it-5}$ ranges from 0 to 1, with higher values implying better democratic institutions. In particular, $D_{it-5}=0$ if the averaged POLITY2 score is -10, and $D_{it-5}=1$ if the averaged POLITY2 score is +10. Averaged over the sample period, Oman, Qatar, and Saudi Arabia are the least democratic countries with average values 0. There are various countries with an average value of 1 including more market-based democracies of Australia, Canada, United

Kingdom, and the United States. We notice that the average democracy score across countries have improved from 0.38 in 1970 to 0.65 in 2005. The dispersion in democracy score across countries have also declined from 0.36 to 0.32 over our sample period.

This measure suits our purpose here because of the following reasons. First, $D_{it-5}$ or POLITY2 is widely used as a measure of democracy. Persson and Tabellini (2006), Collier and Hoeffler (2009), Bhattacharyya (2009), and Bhattacharyya and Hodler (2010a, b), Bhattacharyya and Collier (2011) are some recent examples. Nevertheless, we also use Freedom House democracy index, Cheibub and Gandhi democracy index, and Vanhanen's democracy index as alternative measures of democracy in table 6. Second, it is also an ordinal measure and therefore it allows us to distinguish between different shades of democracy. This fits our objective of capturing how incremental democratic change influences financial structure.

In order to estimate the effect of democratic capital on financial structure we also use fraction of years a country is democratic since 1950 ( $d_{it}$ ) as a measure of democracy. Long running democracies or democratic capital could be important as political change often takes a long time to show effects. Countries with a positive POLITY2 score for a particular year are classified as democratic and coded 1. Countries with a negative or zero POLITY2 score for a particular year are classified non-democratic and coded 0. Then for each year we calculate the fraction of years a country has been democratic since 1950.

Panel B of table 2 reports summary statistics of all the major variables used in this section.

*3.2 Evidence*

In table 4 column 1, we start by relating $D_{it-5}$ to financial structure activity ( $FSA_{it}$ ). We find that democracy is associated with more market based financial systems. Figure 3 also plots this relationship. This correlation however could be driven by omitted factors such as the level of

development. Therefore, in column 2 we control for log GDP per capita ($Y_{it-5}$) and we find and we find that both $Y_{it-5}$ and $D_{it-5}$ are associated with market based finance. Financial structure could also be dependent on country specific unobservable such as culture, legal and colonial origin, and social capital. It could also be driven by global shocks. In column 3, we control for country specific fixed effects plus time trend and year fixed effects and find that the effect of democracy on financial structure survives. However, income no longer seems to have an effect. The magnitude of the coefficient on $D_{it-5}$ is 2.93 and it is statistically significant. In order to put the magnitude of this coefficient into perspective we compare financial structure in Mexico and the United States. The choice of countries is deliberate in order to be consistent with Haber's (2008) narrative on the political origins of financial structure in these two countries. The difference in actual democracy score between the two countries in 1990 is $D_{USA1990} - D_{MEX1990} = 1 - 0.5 = 0.5$ which translates into a difference of 10 points on the POLITY2 scale with POLITY2 (USA) = +10 and POLITY2 (MEX) = 0. With this difference in democracy score the model predicts that *ceteris paribus* the difference in financial structure activity between the two countries in 1995 would be $\hat{\gamma}_1 \times [D_{USA1990} - D_{MEX1990}] = 2.93 \times 0.5 \approx 1.47$. The actual difference however is $FSA_{USA1995} - FSA_{MEX1995} = 0.42 - (-1.14) = 1.56$. Therefore, the model explains approximately 94 percent of the actual difference in financial structure between the United States and Mexico in 1995.

Note that we use five year averages here in order to smooth out business cycle fluctuations and noise in macro data. However, this could also imply throwing out useful information. In order to be certain we use annual data in column 4 and our results remain qualitatively unchanged.

In column 5 we test the impact of democratic capital by replacing $D_{it-5}$ by the fraction of years a country has been democratic since 1950 ($d_{it-5}$). The theoretical prior here is that a longer running democracy could be important. Furthermore, being a long run measure $d_{it-5}$ is better able to

tackle reverse causality. We find that the result remains qualitatively unchanged. Democratic change yields more market-based financial systems.

In columns 5 and 6, we put our results under further scrutiny. We use the following two strategies in order to address reverse causality concerns. First, we use lagged democracy ($D_{it-10}$) and lagged income ($Y_{it-10}$) as instruments for $D_{it-5}$ and $Y_{it-5}$ respectively. Second, we use international commodity price ($P_{it-5}$) and log rainfall as instruments for $D_{it-5}$ and $Y_{it-5}$ respectively. Our main result remains unaltered. Table 5 reports the first stage regressions when international commodity price and rainfall are used as instruments. In column 7 we estimate a dynamic model using the Arellano and Bond GMM. We find that on average democratic change leads to a movement towards market based financial system.

In Tables 6 and 7 we check the robustness of our result using alternative measures of democracy (table 6) and alternative measures of financial structure (table 7). The main result remains qualitatively unchanged. In table 6 we use Freedom House democracy index, Cheibub and Gandhi democracy index, and Vanhanen's democracy index as alternatives. In table 7 we use size, efficiency and aggregate measures of financial structure. The aggregate measure is defined as the first principal component of the activity ($FSA_{it}$), size ($FSS_{it}$) and efficiency ($FSE_{it}$) measures of financial structure.

Table 8 tests whether the effect of democracy on financial structure is heterogeneous depending on the income class of a country. We divide the sample into high income, middle income, low income, and very low income countries and find that the democracy effect is significant for both high income and low income countries. However, for middle income countries the effect is not significant. For very low income countries we observe the effect running in the opposite direction. In other words, democratic change for very low income countries yield bank

based financial systems. This could be due to the scarcity of capital in these countries. Perhaps below a certain threshold level of income there is not enough capital in the country to set up a market-based financial system.

Note that country specific fixed effect plus time trend ($\alpha_i + \beta_i t$) and the time varying common shock ($\phi_t$) in our main model controls for omitted variable bias. However, in order to be certain that we have tackled omitted variable concerns adequately we test the robustness of our results using additional covariates in table 9. In columns 1 – 3 we add foreign direct investments, trade liberalization index and trade share respectively. Rajan and Zingales (2003) argue that trade liberalization and foreign investments help ease the grip of the elite on the financial markets and hence are beneficial for financial market development. Therefore one would expect countries open to trade and capital flows are likely to be more market-based. Our basic result survives in all three occasions. In column 4 we introduce schooling as an additional control. High level of schooling may enable citizens to handle transactions in a complex market-based financial system. Our result survives. Column 5 uses Gini coefficient as an additional control. Chakraborty and Ray (2007) present a theoretical model showing that highly skewed wealth distribution is a hindrance towards market-based financial development. Our result remains unaltered in spite of a reduction in sample size. Beck (2011) show that resource rich countries are predominantly bank based as resource rich country governments typically deposit resource revenue with local banks. In column 6 we use resource rent per capita as an additional control and our result is unaltered.

Finally in table 10 we test whether our result suffers from continental heterogeneity. In columns 1-6 we take out countries belonging to Africa, Asia, Europe, the Americas, Neo-Europe[7], and the OECD from the base sample respectively. Furthermore, we also test for outliers using the

[7] Neo-Europe includes all Anglo-Saxon countries outside Europe: Australia, Canada, New Zealand, and the United States.

Cook's distance, DFITS, and Welsch distance formula in columns 7 – 9. In column 10 we exclude major oil producers (ten largest oil producers according to the CIA World Factbook) from the sample. Our result survives on all occasions.

Therefore, in summary, democratic change and democratic capital seem to matter for financial structure. More democratic political institutions appear to yield more market-based financial system.

## 4 Conclusions

There is a growing policy interest in the role of financial structure in promoting development. However, very little is known about how different financial structures emerge and evolve. In this paper we empirically assess the origins of financial structure. In particular, we focus on the role of political institutions and argue that indeed the quality of government matters for financial development and the shape financial structure. Using difference-in difference estimation and annual data, we study the effects of democratization or political liberalization on financial structure in a sample of 96 countries covering the period 1970 to 2005. Democratization or political liberalization here corresponds to the event of becoming a democracy. We find that democratization leads to a more market-based financial system. Democratic change could also be incremental rather than a one off. To identify the causal effect of incremental democratic change on financial structure we use panel data covering the period 1970 to 2005 and 96 countries. We find that a one unit increase in the democracy score leads to 2.9 unit increase in the financial structure activity measure. We also find that countries with substantial democratic capital are more likely to have a market-based financial structure. Our main results appear to be robust to a variety of tests.

There is a growing consensus among researchers in social science that political institutions and the quality of government play a crucial role in economic development. Our findings lend support to this view. It shows that policies are not random but an outcome of the quality and nature

of political institutions. Political institutions through policy not only determine the level of financial development (Haber, 2008) it also shapes financial structure. Arguable financial structure is an important cog in the wheel of economic development (Levine, 2002; Tadesse, 2002). Therefore, one implication of the study is that there are strong economic incentives for political reforms and democratization.

## Appendix A

### A.1 Data description

*Financial Structure – Activity* ($FSA_{it}$): Log of the stock market total value traded ratio to bank credit ratio. Stock market total value traded ratio equals the value of domestic equities traded o domestic stock exchanges divided by GDP. Bank credit ratio is the deposit money bank credit as a share of GDP. *Source:* Beck *et al.* (2000).

*Financial Structure – Size* ($FSS_{it}$): Log of the stock market capitalization ratio to bank credit ratio. *Source:* Beck *et al.* (2000).

*Financial Structure – Efficiency* ($FSE_{it}$): Log of the stock market capitalization ratio to bank overhead costs. *Source:* Beck *et al.* (2000).

*Financial Structure – Aggregate* ($FSAGG_{it}$): First principal component of $FSA_{it}$, $FSS_{it}$, and $FSE_{it}$.

*Income* ($Y_{it-5}$): Log GDP per capita PPP (current international $). *Source:* WDI Online, The World Bank Group.

*Democratization*: Calculated using POLITY2 (see section 2.1 for details).

*Log Rainfall Lagged* ($RAIN_{it-5}$): Log of Annual Precipitation. This data is approved by the International Panel on Climate Change (IPCC). *Source:* Mitchell *et al.* (2003).

*Democracy* ($D_{it-5}$): $D_{it-5}$ is the average POLITY2 coding (5 year averages) from the Polity IV dataset. It is defined as the difference between democracy and autocracy scores. The original variable varies between -10 and 10. Here we rescale it to 0 and 1 with 1 being the most democratic. *Source:* Polity IV.

*Fraction of Years Democratic since 1950* ($d_{it-5}$): $d_{it-5}$ is generated by using the POLITY2 coding from the Polity IV dataset. A country is democratic if POLITY2 is positive. $d_{it-5}$ denotes the fraction of democratic years over the period 1950 to $t-5$. *Source:* Polity IV.

*Freedom House Democracy Index Lagged* ($D_{it-5}^{FH}$): $D_{it-5}^{FH}$ is the democracy index from Freedom House. The original variable varies between 1 and 7 with 1 being the most democratic. Here we rescale it to 0 and 1 with 1 being the most democratic. *Source:* Freedom House.

*Cheibub and Gandhi Democracy Index* ($CDI_{it-5}$): $CDI_{it-5}$ runs between 0 and 100 with 100 indicating more democratic. It takes into account whether the executive and the legislature is directly or indirectly elected by popular vote, multiple parties are allowed, there is de facto existence of multiple parties outside of regime front, there are multiple parties within the legislature, and there has been no consolidation of incumbent advantage (e.g. unconstitutional closing of the lower house or extension of incumbent's term by postponing of subsequent elections). *Source:* Cheibub and Gandhi (2004).

*Vanhanen's Democracy Index* ($VDI_{it-5}$): The index runs between 0 and 100 with 100 implying more democratic.

*Log Resource Rent per capita*: log of the rent from natural resource (which includes energy, minerals, and forestry) per capita which is defined as the price minus the average extraction cost. The data are described in Hamilton and Clemens (1999). *Source:* World Bank Adjusted Net Savings Dataset.

*Trade Share*: Total volume of trade as a share of GDP. *Source:* WDI Online, The World Bank Group.

*Foreign Direct Investments*: Net inflow of foreign direct investment as a share of GDP. *Source:* WDI Online, The World Bank Group.

*Sachs and Warner Trade Liberalization Index*: Fraction of years open between $t-4$ and $t$. *Source:* Wacziarg and Welch (2003).

*Gini Coefficient*: Inequality measured by Gini Coefficient in percentage points as calculated by WIDER. *Source:* World Income Inequality Database version 2 (WIID2), UNU-WIDER.

*Schooling*: Average schooling years of the aged over 25 in the total population. This is measured at five year intervals from 1970-2000. *Source*: Barro and Lee (2000).

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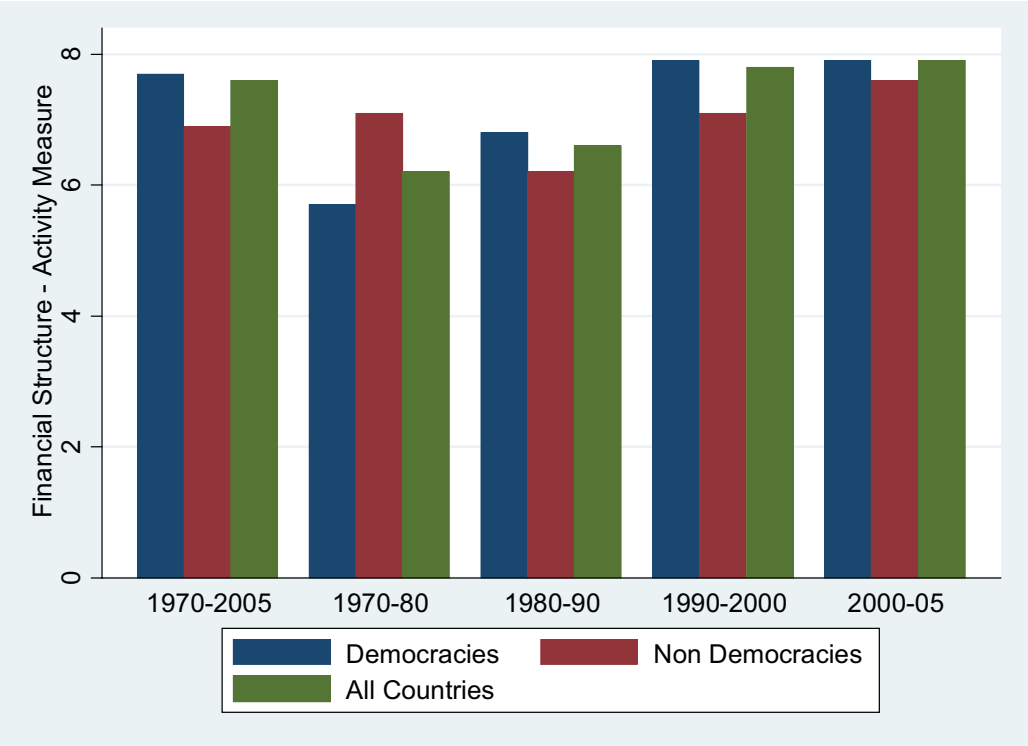
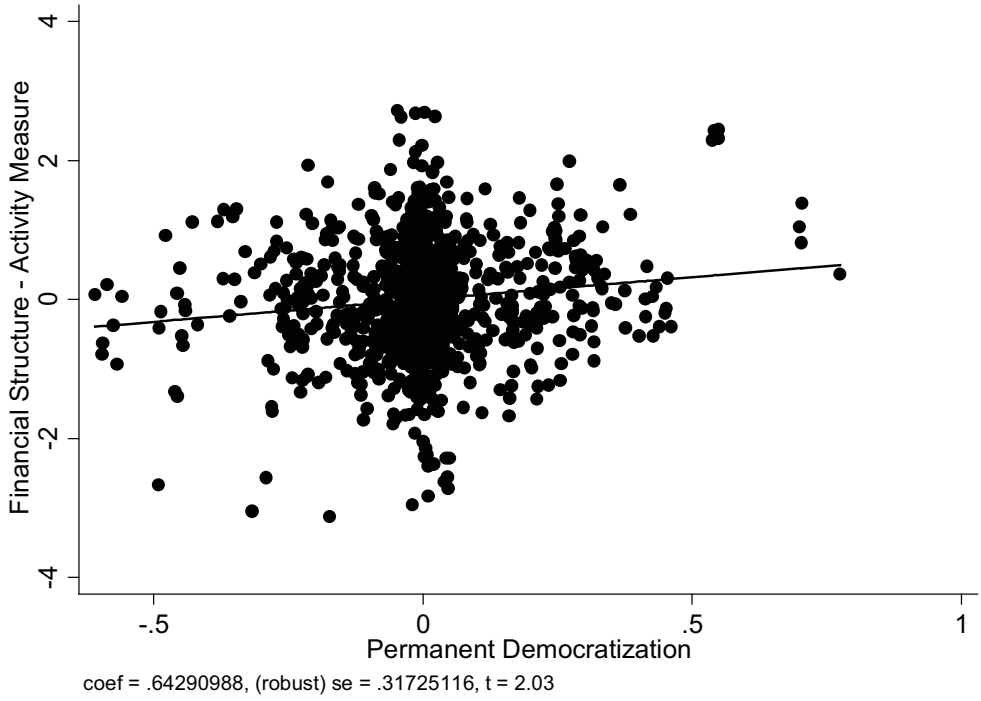
**Figure 1: Financial Structure in Democracies and Non-democracies**



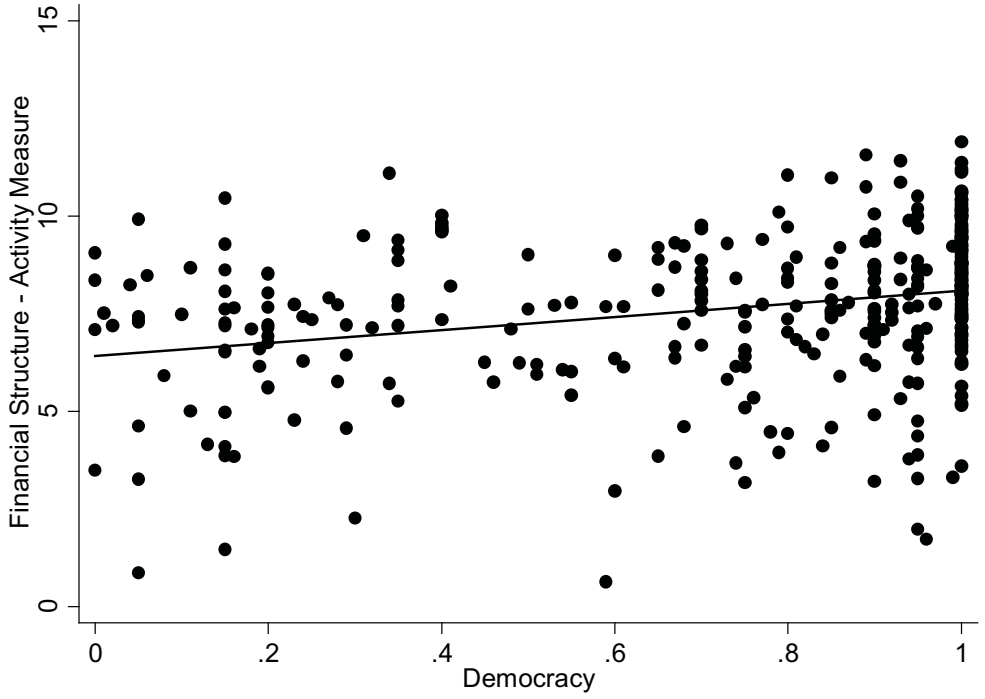

**Note:** Financial structure activity here is measured as $FSA_{it}+10$ to convert the negative values of $FSA_{it}$ to positive without loss of generality.

**Figure 2: Democratization and Financial Structure**



**Note:** The added-variable (or partial) plot presented above is the diagrammatic representations of the coefficient estimate in regression reported in table 3 column 1 using the difference-in difference estimation method.

**Figure 3: Democracy and Financial Structure**




**Note:** Financial structure activity here is measured as $FSA_{it}+10$ to convert the negative values of $FSA_{it}$ to positive without loss of generality. Democracy here is measured by the continuous POLITY2 variable which runs between -10 and +10. The POLITY2 measure is normalized to run between 0 and 1 here.

**Table 1. Countries and Years of Permanent Democratization**

| **Control Countries: Countries that Received no Treatment (ie., always democratic or always non-democratic)** |
|---|
| Australia, Austria, Bahrain, Belgium, Botswana, Canada, Colombia, Costa Rica, Ivory Coast, Cyprus, Denmark, Egypt, Finland, France, Germany, Greece, India, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Malaysia, Mauritius, Morocco, Netherlands, New Zealand, Norway, Oman, Pakistan, Papua New Guinea, Portugal, Saudi Arabia, Singapore, South Africa, Sri Lanka, Swaziland, Sweden, Switzerland, Trinidad and Tobago, Tunisia, Uganda, United Kingdom, United States of America, Venezuela, Zimbabwe. |
| **Treated Countries (Year): Countries that Permanently Democratized with the year of Democratization** |
| Argentina (1983), Armenia (1998), Bangladesh (1991), Bolivia (1982), Brazil (1985), Bulgaria (1990), Chile (1989), Croatia (1999), Czech Republic (1990), Ecuador (1979), El Salvador (1982), Estonia (1991), Fiji (1990), Georgia (1991), Ghana (1996), Guatemala (1986), Hungary (1989), Indonesia (1999), Iran (1997), Republic of Korea (1987), Latvia (1991), Lithuania (1991), Macedonia (1991), Malawi (1994), Mexico (1994), Moldova (1991), Mongolia (1990), Nepal (1990), Nigeria (1999), Panama (1989), Paraguay (1989), Peru (1993), Philippines (1986), Poland (1989), Romania (1990), Russian Federation (1992), Serbia and Montenegro (2000), Slovak Republic (1990), Slovenia (1991), Spain (1976), Tanzania (2000), Thailand (1992), Turkey (1983), Uruguay (1985), Zambia (1991). |

**Table 2. Summary Statistics**

| Variable | Number of obs. | Mean | Standard Deviation (overall) | Standard Deviation (between countries) | Standard Deviation (within countries) | Within and Between Standard Deviation Ratio (%) | Minimum | Maximum |
|---|---|---|---|---|---|---|---|---|
| **Panel A: Annual Data** | | | | | | | | |
| *Financial Structure Activity* $[ FSA_{it} ]$ | 1792 | -2.43 | 2.11 | 1.82 | 1.35 | 74 | -12.99 | 2.42 |
| *Financial Structure Size* $[ FSS_{it} ]$ | 1742 | -0.59 | 1.11 | 0.91 | 0.77 | 85 | -6.20 | 2.10 |
| *Financial Structure Efficiency* $[ FSE_{it} ]$ | 1568 | 0.27 | 2.75 | 2.68 | 1.14 | 43 | -12.05 | 5.86 |
| *Democratization (PERMANENT)* | 5179 | 0.32 | 0.47 | 0.38 | 0.28 | 74 | 0 | 1 |
| *Democratization (ALL)* | 5179 | 0.41 | 0.49 | 0.38 | 0.31 | 82 | 0 | 1 |
| *Log GDP per capita* | 5542 | 7.50 | 1.54 | 1.49 | 0.26 | 17 | 4.03 | 10.87 |
| **Panel B: 5 Year Average** | | | | | | | | |
| *Fin. Structure Act* $[ FSA_{it} ]$ | 249 | -2.51 | 1.94 | 1.63 | 1.19 | 73 | -9.35 | 1.90 |
| *Fin. Structure Size* $[ FSS_{it} ]$ | 244 | -0.67 | 1.15 | 0.99 | 0.74 | 75 | -5.09 | 1.80 |
| *Fin. Structure Eff.* $[ FSE_{it} ]$ | 207 | 0.16 | 2.56 | 2.58 | 0.83 | 32 | -6.11 | 5.30 |
| *Democracy lagged* $[ D_{it-5} ]$ | 926 | 0.51 | 0.37 | 0.29 | 0.22 | 77 | 0 | 1 |
| *Fraction of years Democratic since 1950 Lagged* $[ d_{it-5} ]$ | 926 | 0.28 | 0.38 | 0.37 | 0.06 | 16 | 0 | 1 |
| *Log GDP per capita Lagged* $[ Y_{it-5} ]$ | 1684 | 7.67 | 1.36 | 5.39 | 5.24 | 97 | 4.08 | 10.87 |
| *Commodity Price* $[ P_{it-5} ]$ | 808 | 11.4 | 8.0 | 6.9 | 3.9 | 57 | 0.5 | 64.5 |

**Table 3: Democratization and Financial Structure: Difference-in-Difference Estimates**

| **Dependent Variables** | **Financial Structure Activity [ $FSA_{it}$ ]** | | | **Financial Structure Size [ $FSS_{it}$ ]** | | | **Financial Structure Efficiency [ $FSE_{it}$ ]** | | |
|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| *Democratization* | 0.65** | 0.76** | | 0.50** | 0.45* | | 0.91** | 0.95** | |
| | (0.31) | (0.32) | | (0.25) | (0.26) | | (0.42) | (0.43) | |
| *3 Year pre Democratization* | | | -0.10 | | | -0.09 | | | -0.19 |
| | | | (0.36) | | | (0.19) | | | (0.43) |
| *3 Year post Democratization* | | | 0.74* | | | 0.65* | | | 0.65* |
| | | | (0.40) | | | (0.34) | | | (0.35) |
| *4 Year onwards post Democratization* | | | 0.57** | | | 0.35* | | | 0.45* |
| | | | (0.28) | | | (0.19) | | | (0.24) |
| **Treatment** | PERMANENT | ALL | PERMANENT | PERMANENT | ALL | PERMANENT | PERMANENT | ALL | PERMANENT |
| *Y × Continents* | YES | YES | NO | YES | YES | NO | YES | YES | NO |
| **Controls:** | *Country Dummies, Year Dummies, Socialist Legal Origin × Democratization, Log GDP per capita* | | | | | | | | |
| Countries | 96 | 96 | 96 | 97 | 97 | 97 | 100 | 100 | 100 |
| Observations | 1218 | 1218 | 1218 | 1176 | 1176 | 1176 | 978 | 978 | 978 |
| Adjusted $R^2$ | 0.85 | 0.83 | 0.85 | 0.82 | 0.83 | 0.82 | 0.91 | 0.91 | 0.91 |

**Notes:** ***, **, and * indicates significance level at 1%, 5%, and 10% respectively against a two sided alternative. Figures in the parentheses are cluster standard errors, and they are robust to arbitrary heteroskedasticity and arbitrary intra-group correlation. Sample years are every year from 1970 to 2005.

*Democratization* = 1 after democratization (ie., Polity 2 score turning positive). We consider two types of democratization. First, we consider democratization episodes that are not subsequently reversed. It is denoted by the Treatment 'PERMANENT'. Second, we consider both temporary and permanent democratization episodes as long as they lasted at least four years. It is denoted by the Treatment 'ALL'.

*3 Year pre Democratization* = 1 in the 3 years preceding democratization.

*3 Year post Democratization* = 1 in the year of democratization and in the 3 following years.

*4 Year onwards post Democratization* = 1 from the 4$^{th}$ year and onwards after democratization.

*Y × Continents*: Y are dummy variables for years and continents are dummy variables for Asia, Africa, Latin America, and *Socialist Legal Origin*.

Regressions always include country and year fixed effects, dummy variable for socialist legal origin interacted with *democratization*, log GDP per capita and an intercept.

**Table 4: Democracy, Democratic Capital and Financial Structure**

| | **Dependent Variable: Financial Structure Activity [ $FSA_{it}$ ]** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) Annual Data | (5) | (6) | (7) | (8) |
| | **OLS Estimates** | | | | | **LIML Fuller 1 IV Estimates** | | **Arellano-Bond** |
| *Democracy lagged* $[D_{it-5}/D_{it-1}]$ | 1.71*** (0.36) | 0.85** (0.39) | 2.93** (1.21) | 1.17** (0.61) | | 3.26** (1.68) | 2.01** (0.91) | 2.08** (0.98) |
| $[d_{it-5}]$ | | | | | 12.03** (5.47) | | | |
| $[Y_{it-5}/Y_{it-1}]$ | | 0.43** (0.09) | -0.57 (3.65) | -0.13 (0.88) | -2.75 (3.57) | -0.57 (3.65) | -5.83 (3.87) | -1.46 (1.10) |
| $FSA_{it-5}$ | | | | | | | | 0.47*** (0.13) |
| *F*-stat on EI | | | | | | 23.1/19.6 | 33.4/17.9 | |
| Partial $R^2$ EI | | | | | | 0.29/0.23 | 0.36/0.24 | |
| Stock-Yogo | | | | | | 8.03/15.5 | 8.03/15.5 | |
| Hansen test | | | | | | | | 0.57 |
| AR(1)Test | | | | | | | | 0.01 |
| AR(2)Test | | | | | | | | 0.37 |
| **Controls:** | | | Country Dummies, Country Dummies × Time Trend, Year Dummies | | | | | |
| **Instruments:** | | | | | | $D_{it-10}$ , $Y_{it-10}$ | Commodity Price [ $P_{it-5}$ ], $\text{Rainfall}_{t-5}$ | |
| Countries | 96 | 96 | 96 | 96 | 96 | 92 | 88 | 71 |
| Observations | 238 | 238 | 238 | 1310 | 238 | 229 | 231 | 138 |
| Adjusted $R^2$ | 0.08 | 0.16 | 0.95 | 0.87 | 0.95 | -- | -- | 0.97 |

**Notes:** ***, **, and * indicates significance level at 1%, 5%, and 10% respectively against a two sided alternative. Figures in the parentheses are cluster standard errors, and they are robust to arbitrary heteroskedasticity and arbitrary intra-group correlation. All regressions are carried out with an intercept. Sample years are every fifth year (averages) from 1970 to 2005. '*F*-stat on EI', 'Partial $R^2$ EI' and 'Stock-Yogo' indicates *F*-statistic on excluded instruments, Partial $R^2$ on excluded instruments and Stock-Yogo critical values respectively. Fuller's modified LIML estimator with $\alpha = 1$ (correction parameter proposed by Hausman et al., (2005) is used in columns (5) and (6). Reported Stock-Yogo critical values in columns (5) and (6) are the 5 percent significance level critical values for weak instruments tests based on, respectively, 30 percent and 5 percent maximal Fuller relative bias. The null of weak instruments is rejected in the case that the *F*-statistic on the excluded instruments exceeds the Stock-Yogo critical value/s. Note that the Sargan/Hansen overidentification test for all instruments is not reported in columns (5) and (6) as we have exactly identified systems. In column (7) Hansen test is the test of the $H_0$: the instruments as a group are exogenous. Hansen test p-value from two step Arellano & Bond estimations is reported which is robust to heteroskedasticity or autocorrelation. P-value of Arellano and Bond AR(1) & AR(2) tests in residuals are also reported. Note that to pass these tests, one has to reject the null of no AR(1) and fail to reject the null of no AR(2).

*$[d_{it-5}]$=Fraction of years Democratic since 1950 Lagged, $[Y_{it-5}/Y_{it-1}]$=Log GDP per capita lagged*

**Table 5: Democracy and Financial Structure: First Stage Regressions**

| | **Democracy lagged [ $D_{it-5}$ ]** | **Log GDP per capita Lagged [ $Y_{it-5}$ ]** |
|---|---|---|
| | **OLS Estimates** | |
| | (1) | (2) |
| Commodity Price [ $P_{it-5}$ ] | -0.33** | 0.54 |
| | (0.18) | (0.40) |
| $Rainfall_{t-5}$ | -0.14 | 0.39*** |
| | (0.14) | (0.12) |
| **Controls:** | Country Dummies, Country Dummies × Time Trend, Year Dummies | |
| Countries | 88 | 88 |
| Observations | 231 | 231 |
| Adjusted $R^2$ | 0.97 | 0.97 |

**Notes:** ***, **, and * indicates significance level at 1%, 5%, and 10% respectively against a two sided alternative. Figures in the parentheses are cluster standard errors and they are robust to arbitrary heteroskedasticity and arbitrary intra-group correlation. Sample years are every fifth year from 1970 to 2005.

**Table 6: Democracy and Financial Structure: Alternative Measures of Democracy**

| | **Dependent Variable: Financial Structure Activity [ $FSA_{it}$ ]** | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| | **OLS Estimates** | | |
| Democracy Freedom House Lagged ( $D_{it-5}^{FH}$ ) | 0.64** | | |
| | (0.33) | | |
| Cheibub and Gandhi Democracy Index ( $CDI_{it-5}$ ) | | 0.017** | |
| | | (0.007) | |
| Vanhanen's Democracy Index Lagged ( $VDI_{it-5}$ ) | | | 0.06** |
| | | | (0.03) |
| ***Controls:*** | Log GDP per capita Lagged [ $Y_{it-5}$ ], Country Dummies, Country Dummies × Time Trend, Year Dummies | | |
| Countries | 95 | 95 | 95 |
| Observations | 242 | 245 | 243 |
| Adjusted $R^2$ | 0.96 | 0.95 | 0.95 |

**Notes:** ***, **, and * indicates significance level at 1%, 5%, and 10% respectively against a two sided alternative. Figures in the parentheses are cluster standard errors and they are robust to arbitrary heteroskedasticity and arbitrary intra-group correlation. All the regressions reported above are carried out with an intercept. Sample years are from 1970 to 2005.

**Table 7: Democracy and Financial Structure: Alternative Measures of Financial Structure**

| | **Financial Structure – Size [ $FSS_{it}$ ]** | **Financial Structure – Efficiency [ $FSE_{it}$ ]** | **Financial Structure – Aggregate [ $FSAGG_{it}$ ]** |
|---|---|---|---|
| | (1) | (2) | (3) |
| | **OLS Estimates** | | |
| *Democracy lagged [ $D_{it-5}$ ]* | 1.49*<br>(0.86) | 5.50**<br>(2.67) | 4.32***<br>(1.15) |
| ***Controls:*** | Log GDP per capita Lagged [ $Y_{it-5}$ ], Country Dummies, Country Dummies × Time Trend, Year Dummies | | |
| Countries | 94 | 97 | 89 |
| Observations | 236 | 193 | 177 |
| Adjusted $R^2$ | 0.95 | 0.97 | 0.95 |

**Notes:** ***, **, and * indicates significance level at 1%, 5%, and 10% respectively against a two sided alternative. Figures in the parentheses are cluster standard errors and they are robust to arbitrary heteroskedasticity and arbitrary intra-group correlation. All the regressions reported above are carried out with an intercept. Sample years are from 1970 to 2005.

**Table 8: Democracy and Financial Structure across Income Levels**

| | **Dependent Variable: Financial Structure Activity [ $FSA_{it}$ ]** |
|---|---|
| $D_{it-5}$ × *High Income* | 3.73**<br>(1.65) |
| $D_{it-5}$ × *Middle Income* | -4.47<br>(10.88) |
| $D_{it-5}$ × *Low Income* | 4.64***<br>(0.88) |
| $D_{it-5}$ × *Very Low Income* | -6.90***<br>(1.20) |
| *High Income* | 6.43***<br>(2.59) |
| *Middle Income* | 29.8**<br>(14.1) |
| *Low Income* | 12.2**<br>(5.54) |
| ***Controls:*** | Log GDP per capita Lagged [ $Y_{it-5}$ ], Country Dummies, Country Dummies × Time Trend, Year Dummies |
| Countries | 96 |
| Observations | 238 |
| Adjusted $R^2$ | 0.96 |

**Notes:** ***, **, and * indicate significance level at 1%, 5%, and 10% respectively against a two sided alternative. Figures in parentheses are clustered standard errors and they are robust to arbitrary heteroskedasticity and arbitrary intra-group correlation. Sample years are every fifth year from 1970 to 2005. High Income is a dummy for per capita GDP in 2000 being 10,000 constant 1996 international dollars or more; Middle Income for between 5,000 and 10,000; Low Income for between 2,500 and 5,000; Very Low Income for less than 2,500.

**Table 9: Democracy and Financial Structure: Robustness with Additional Covariates**

| | **Dependent Variable: Financial Structure Activity [ $FSA_{it}$ ]** | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | **OLS Estimates** | | | | | |
| *Democracy lagged [ $D_{it-5}$ ]* | 4.24*** (1.15) | 4.31*** (1.17) | 4.31*** (1.02) | 4.32*** (1.07) | 5.90* (3.58) | 4.26*** (1.15) |
| **Controls:** | Log GDP per capita Lagged [ $Y_{it-5}$ ], Country Dummies, Country Dummies × Time Trend, Year Dummies | | | | | |
| **Additional Controls:** | Foreign direct investments | Sachs & Warner trade liberalization index | Trade share | Schooling | Gini coefficient | Resource rent per capita |
| Countries | 86 | 83 | 87 | 67 | 70 | 85 |
| Observations | 172 | 167 | 173 | 145 | 111 | 170 |
| Adjusted $R^2$ | 0.97 | 0.99 | 0.98 | 0.99 | 0.96 | 0.97 |

**Notes:** ***, **, and * indicates significance level at 1%, 5%, and 10% respectively against a two sided alternative. Figures in the parentheses are cluster standard errors, and they are robust to arbitrary heteroskedasticity and arbitrary intra-group correlation. All the regressions reported above are carried out without an intercept. Sample years are from 1970 to 2005.

**Table 10: Democracy and Financial Structure: Robustness with Alternative Samples**

| | **Dependent Variable: Financial Structure Activity [ $FSA_{it}$ ]** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| | **OLS Estimates** | | | | | | | | | |
| *Democracy lagged* [ $D_{it-5}$ ] | 4.31*** (1.09) | 3.97** (1.60) | 4.24*** (1.46) | 4.44*** (1.37) | 4.34*** (1.15) | 4.54*** (1.50) | 3.14** (1.23) | 2.93** (1.22) | 3.14** (1.23) | 3.26*** (1.07) |
| **Controls:** | Log GDP per capita Lagged [ $Y_{it-5}$ ], Country Dummies, Country Dummies × Time Trend, Year Dummies | | | | | | | | | |
| **Omitted Observations:** | Base sample without Africa | Base sample without Asia | Base sample without Europe | Base sample without the Americas | Base sample without Neo-Europe | Base sample without OECD | Obs. Omitted using Cook's Distance | Obs. Omitted using DFITS | Obs. Omitted using Welsch Distance | Base sample without Major Oil Producers |
| Countries | 73 | 67 | 56 | 70 | 88 | 59 | 86 | 87 | 86 | 86 |
| Observations | 146 | 135 | 105 | 137 | 201 | 103 | 213 | 216 | 213 | 202 |
| Adjusted $R^2$ | 0.98 | 0.93 | 0.99 | 0.94 | 0.97 | 0.97 | 0.98 | 0.97 | 0.98 | 0.98 |

**Notes:** ***, **, and * indicates significance level at 1%, 5%, and 10% respectively against a two sided alternative. Figures in the parentheses are cluster standard errors and they are robust to arbitrary heteroskedasticity and arbitrary intra-group correlation. All the regressions reported above are carried out without an intercept. Sample years are every fifth year from 1970 to 2005. In column 5, Neo-Europe includes Australia, Canada, New Zealand, and the United States. In column 6, omit if $|Cooksd_i| > 4/n$; in column 7, omit if $|DFITS_i| > 2\sqrt{k/n}$; and in column 8, omit if $|Welschd_i| > 3\sqrt{k}$ formulas are used (see Belsley et al. 1980). Here $n$ is the number of observation and $k$ is the number of independent variables including the intercept. In column 10, we exclude the ten largest oil exporters according to the CIA World Factbook.