

# Bank development, competition, and entrepreneurship: International evidence

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## *Abstract*

This paper uses a panel database for 84 countries over the 2002-2017 period to analyze the importance of bank development and bank market competition for enhancing new business creation. The results show that less bank market competition facilitates the creation of new businesses. Bank development, however, is not associated with a higher entry rate of new businesses. Less bank market competition and lending relationships appear to be a main channel for reducing the cost of debt and overcoming traditional adverse selection and moral hazard problems between banks and newly created firms. The global financial crisis did not modify the positive effect of less bank market competition on new firm registration. The results are robust to controls for equity market development, the ability of banks to hold equity positions in nonfinancial firms, the costs and days required for starting a business, and any other omitted time-invariant variables at country level.

**JEL classification:** G18, G38.

**Keywords:** entrepreneurship, bank development, bank competition, bank crisis.

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## **1. Introduction**

How entrepreneurial firms obtain funding is a key issue in new firm creation. For this reason, entrepreneurial finance literature has gradually increased over recent decades, focusing mainly on the US (Denis, 2004) and on specific sources of financing (Wright et al., 2016; Wu et al., 2016). Greater adverse selection and moral hazard problems in entrepreneurial firms lead the literature to focus on outside equity funding, such as venture capital and business angels, even though research shows that new entrepreneurial firms rely heavily on “traditional” external debt sources, including bank financing (Cassar, 2004; Cumming, 2005; Robb and Robinson, 2014). In this context, empirical evidence shows the relevance of bank development for enhancing entrepreneurship through increased availability of funds (Rajan and Zingales, 1998; Klapper et al., 2006; Aghion et al., 2007). Moreover, not only financial development but also bank market competition may be important for entrepreneurship. Literature on small and medium size firms documents that less bank competition increases the availability of credit by promoting lending relationships that reduce adverse selection and moral hazard problems between banks and small and medium size debtors (Petersen and Rajan, 1994; 1995; Berger and Udell, 2002; Cetorelli and Strahan, 2006). However, the literature does not simultaneously analyze the importance of bank development and competition for entrepreneurship. Therefore, it is not clear if the relevance of bank development for entrepreneurship remains once differences in bank competition are considered.

For the above reasons, this paper aims to provide new empirical evidence on the relative importance of bank development and competition for enhancing the creation of new firms. Additionally, I use data around the onset of the recent global financial crisis to analyze whether the roles of bank development and competition change during banking

crises. Therefore, this paper aims to answer the following questions. What is the relative importance of bank development and competition for enhancing entrepreneurship? Does the role of bank development for entrepreneurship remain after controlling for bank competition? How do banking crises modify the above roles? I use a recent and extensive database on new business registration collected by the World Bank that provides a unique indicator of new business registration, allowing a homogeneous measure of entrepreneurship across countries and over time.

This paper presents several differences from previous empirical studies. First, it jointly analyzes the relevance of bank development and bank competition on new firm entry. Rajan and Zingales, (1998), Klapper et al., (2006), and Aghion et al. (2007) analyze the relevance of bank development but do not control for the influence of bank competition on the rate of new firm creation. However, bank competition may be an important determinant of debt availability for entrepreneurial firms even in developed bank markets. Banking literature highlights that less bank competition may increase debt availability and reduce its cost through the establishment of lending relationships when information asymmetries between banks and borrowers are relevant (Petersen and Rajan, 1994; 1995; Berger and Udell, 2002). The presence of important information asymmetries in entrepreneurial firms may therefore convert less bank competition and lending relationships into a relevant channel for increasing debt availability in these firms. Following these arguments, I test in this paper if less bank competition is useful for increasing a country's rate of new firm creation. Moreover, the relevance of bank development for new firm creation may diminish once we isolate the influence of bank market competition. For this reason, I also test whether or not the influence of bank development on new firm creation remains after controlling for bank competition.

Second, this paper uses an international database and analyzes more countries than previous studies analyzing the effect of financial development on entrepreneurship. The sample includes 84 countries over the 2002-2017 period and uses the recent and extensive database on new business registration collected by the World Bank which provides an indicator of new business registration, allowing for a homogeneous measure of entrepreneurship across countries and over time.<sup>1</sup> This number of 84 countries contrasts with the 41 countries analyzed in Rajan and Zingales (1998), the 23 European countries analyzed in Klapper et al. (2006), and the 16 analyzed in Aghion et al. (2007). A higher number of countries increases the variation in bank development and competition within the sample and, therefore, increases the reliability of the results. It also allows us to control and analyze interaction with other country characteristics such as the ability of banks to hold equity positions in non-financial firms and the administrative costs of new firm registration. Moreover, the use of a panel dataset over the 2002-2017 period reduces concerns on the potential omission of relevant country variables because I include country fixed-effects in all the estimations to control for any time-invariant variable at country level.

Finally, this paper provides evidence on how the roles of bank development and competition in enhancing entrepreneurship change during periods of banking crises. Klapper and Love (2011) provide evidence for the relevance of bank development during banking crises and show that, after the onset of the 2007-2009 global financial crisis,

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<sup>1</sup> Klapper and Love (2014), Klapper et al. (2015), Belitski et al. (2016), and Bermpei et al. (2019) have recently used this database to analyze, respectively, the impact of business reforms, taxes and corruption, and the presence of foreign banks on new firm registration.

countries with more developed banking systems experienced a more intense drop in new firm registration. However, the role played by bank market competition in entrepreneurship during the crisis remains unknown. This analysis is important because it has implications in terms of pro-cyclicality and financial stability. For instance, if a positive effect of less bank competition on entrepreneurship during normal periods turns into a negative one during crises, less bank market competition would increase pro-cyclicality and reduce the benefits of using less market competition to promote entrepreneurship during normal periods. None of the above-mentioned papers analyzes the potential change in the effect of bank competition on entrepreneurship during banking crises.

I provide unique evidence. The findings of this paper do not indicate that a more developed banking system is enough to increase lending to entrepreneurial firms and promote business creation in a country. Rather, I find that it is bank competition that plays an important role for entrepreneurship. In particular, more new businesses are created in countries with less bank competition. The positive effect of less bank competition on new firm creation is consistent with less bank competition allowing banks and firms to reduce their greater adverse selection and moral hazard problems through lending relationships. Less bank competition and lending relationships may therefore help contribute to explain the documented presence of debt in the capital structure of entrepreneurial firms. Additionally, I confirm that the global financial crisis had a more negative impact on entrepreneurship in countries with more developed banking systems. However, I do not find that the crisis changed the average positive influence of less bank market competition on the rate of new firm creation.

The results do not change when I additionally control for the ability of banks to hold equity positions in nonfinancial firms and for the costs, days, and procedures required in each country to register a business. Moreover, there are no significant interactions between less bank competition and these other country variables. This suggests that the positive effect of less competition on new firm creation is independent of affiliation between banking and commerce and of the administrative costs of new firm registration in a country. Equity market development always has a positive influence on the rate of new firm creation, consistent with the relevance of outside equity on financing new businesses. The results are robust to alternative proxies for bank competition, alternative estimation methods, and the inclusion of additional country variables.

The rest of the paper is organized as follows. Section 2 analyzes the related literature and discusses the hypotheses tested in the empirical analysis. Section 3 describes the data, sample, and variables. Section 4 explains the empirical analysis, and Section 5 presents the results and robustness checks. Finally, Section 6 concludes.

## **2. Related literature and hypotheses**

This paper relates to several strands of the literature. First, it relates to the entrepreneurial finance literature analyzing how financial development affects the growth and survival of newly created firms. Empirical evidence suggests that financial development enhances the availability of debt for new businesses. Rajan and Zingales (1998) find in a sample of 41 countries that there are more new establishments in industrial sectors with greater external financing needs in more developed bank and equity markets. Demirgüç-Kunt et al. (2006) show in a firm-level database from 52 countries that greater financial development in a country is associated with greater growth

of incorporated businesses, but they do not analyze the specific relevance of bank market development for enhancing entrepreneurship. Klapper et al. (2006) find in a sample of 23 European countries that firm entry is higher in more financially dependent industries in countries that have higher bank and equity market development. Aghion et al. (2007) show in an industry-level database from 16 countries that both bank and equity market development promote the entry of new firms in industries that are more dependent on external finance. However, the above papers do not analyze whether the influence of bank development remains after controlling for bank market competition.

Second, the paper relates to the literature analyzing the relevance of bank market competition for firms' credit availability. The banking literature suggests two opposing effects of bank competition on firms' credit availability depending on the relevance of information asymmetries. Without information asymmetries, bank competition increases availability and reduces the cost of credit. With information asymmetries, bank competition reduces bank incentives to invest in the acquisition of soft information by establishing close relationships with borrowers. Lending relationships, associated with less bank competition, make debt more available and cheaper for firms by reducing adverse selection and moral hazard problems with banks. Empirical literature confirms the positive effect of less bank competition for increasing credit availability and reducing the cost of debt in small and medium size firms, where information asymmetries are greater than in large ones (Petersen and Rajan, 1994, 1995; Cetorelli and Gambera, 2001; Berger and Udell, 2002). Therefore, less bank market competition appears to be a useful mechanism for reducing the greater adverse selection and moral hazard problems in small and medium size firms.

The even greater information asymmetries in newly created firms lead entrepreneurial finance literature to focus on outside equity as their main source of finance (Denis, 2004). However, empirical evidence indicates that bank debt is a major source of financing for entrepreneurial firms.<sup>2</sup> The relatively large presence of bank debt in the capital structure of entrepreneurial firms suggests that banks use mechanisms to reduce the greater adverse selection and moral hazard problems of such firms. The establishment of lending relationships may be one of these mechanisms. Less bank market competition makes lending relationships more valuable because it increases the ability of entrepreneurial firms and banks to intertemporally share surplus. In a competitive market, the bank establishes interest rates on a period by period basis because it cannot expect to share in the future surplus of the firm. Interest rates are therefore high to compensate for the high risk of the expected cash flows and credit availability is low for entrepreneurial firms. However, in less competitive markets, the ability of entrepreneurial firms and banks to intertemporally share surplus increases the benefits of establishing long-term lending relationships. The bank can backload interest payments over time, subsidizing with a lower interest rate at the initial stage and extracting rents in subsequent years with less risky cash flows (Petersen and Rajan, 1994, 1995). The even greater information asymmetries in entrepreneurial firms than in small and medium size firms lead me to expect that less bank competition has a positive effect on credit availability for

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<sup>2</sup> Robb and Robinson (2004) find in nearly 5,000 US firms that they rely heavily on bank financing. Cassar (2004) shows that 43.5% of the Australian start-ups included in his sample raised their bank debt. Zarutskie (2006) shows that 57.9% of the new US firms in her sample used outside debt. Cumming (2005) shows that debt and equity are both combined in a sample of 3,083 Canadian venture capitalist investments. Hanssens, Deloof, and Vanacker (2016) find, after analyzing firms' debt policies over a period of 15 years after startup, that the debt policy of entrepreneurial firms in Belgium is stable over time. Hirst and Walz (2019) also find that new firms in France rely to a large degree on bank credit. De Bettignies and Duchêne (2015) justify the use of both bank debt and venture capital for financing entrepreneurship.



entrepreneurial firms and promotes the creation of new businesses. Therefore, the hypothesis is:

*H1. Less bank market competition increases the rate of new firm creation*

The lack of incentives to establish lending relationships in competitive credit markets reduces credit availability for entrepreneurial firms in developed and competitive markets. Less bank competition, but not bank development by itself, may therefore be the mechanism through which banks are able to provide more debt to entrepreneurial firms. For this reason, the relevance of bank development for new firm creation may diminish once we isolate the influence of bank market competition. Therefore, the hypothesis on the nexus between bank development and competition is:

*H2. The relevance of bank development for new firm creation diminishes after controlling for bank market competition*

Empirical studies on the effect of bank competition for entrepreneurial firms are scarcer, focus on particular countries, and provide mixed results. Black and Strahan (2002) show that the rate of new incorporations increases following deregulation of branching restrictions in US states, and that deregulation reduces the negative effect of concentration on new incorporations. However, they also find that the formation of new incorporations increases as the share of large banks increases, suggesting a potential negative effect of bank market competition on new firm creation. Similarly, Jackson and Thomas (1995) find a positive association between bank concentration and the rate of new firm creation. Bonaccorsi Di Patti and Dell' Ariccia (2004) find a bell-shaped relationship between bank competition and firm creation in Italy using industry-level data. Cetorelli and Strahan (2006) do not directly analyze the rate of firm entry but find

that lower concentration in local US bank markets is associated with both more firms in operation and a smaller average firm size. More recently, Hasan et al. (2017) show that larger market shares for local cooperative banks in Poland are associated with greater new firm creation. However, the above studies provide evidence on a single country and do not use international samples. They do not control for the relevance of bank and stock market development as alternative variables to bank competition for promoting entrepreneurship through credit supply. Nor do they analyze how the influence of bank development and competition on entrepreneurship changes during periods of banking crises.

Finally, the paper relates to the extensive literature on banking crises because I analyze whether the role of bank competition for enhancing entrepreneurship changes during periods of banking crises. Kappler and Love (2011) provide evidence for 93 countries showing that most countries experienced a sharp drop in new firm registration during the 2007-2009 global financial crisis and that the decline was more intense in countries with more developed banking systems. In the same line, Bergin et al. (2018) show that financial shocks in the US are associated with a fall in firm entry. Deloof and Vanacker (2018) find that start-ups founded in Belgium during the last global financial crisis used less bank debt, especially in more bank-dependent industries. However, there is no evidence on how bank competition shapes the effect of financial crises on entrepreneurship. Empirical evidence is limited to established firms. The influence usually depends on the relative importance of the supply and demand shocks during the crisis. On the one hand, less bank competition increases the negative impact of the bank supply shock because lending relationships in less competitive markets may create bank dependence and give rise to switching costs for borrowers needing to change lenders

(Slovin et al., 1993; Kang and Stulz, 2000; Chava and Purnanandam, 2011; Carvalho et al., 2015). On the other hand, less bank competition and more lending relationships reduce the negative consequences of demand shocks for borrowers because financially distressed firms have greater credit access from the relationship bank (Hoshi et al., 1991; Berlin and Mester, 1999).

The impact of banking crises on the role of bank market competition for new firm creation is less clear than for established firms. On the one hand, if less bank competition in a country enhances entrepreneurship by facilitating lending relationships between banks and new debtors, I would expect banking crises to have a greater negative effect on entrepreneurship in these countries because the banking crisis impacts more negatively on lending relationships. On the other hand, the demand shock of the crisis leads banks to replace failed debtors with new debtors. Banks in countries with less bank competition may have more incentives to focus on new businesses as they have greater incentives to build new lending relationships. As banking crises are associated with reductions in both bank credit supply and firms' demand (Ivashina and Scharfstein, 2010; Kahle and Stulz, 2013), which of the above two effects dominates during the global financial crisis is an empirical question. Therefore, the empirical analysis in this paper will test the net effect of the following two hypotheses:

*H3a. Less bank market competition increases the negative impact of the supply shock of a banking crisis on new firm creation.*

*H3b. Less bank market competition reduces the negative impact of the demand shock of a banking crisis on new firm creation.*

### **3. Data and methodology**

#### *3.1. Data*

Data on the rate of new firm registration across countries comes from the Entrepreneurship database included in the Doing Business Dataset collected by the World Bank.<sup>3</sup> Country-level data on bank development and competition comes from the Global Financial Development Database (GFDD) also collected by the World Bank. The GFDD also provides information on control variables such as equity market development, the efficiency and risk of the banking system, and macroeconomic variables. Information on bank regulatory variables comes from the World Bank's Bank Regulation and Supervision Database. Data on institutional variables comes from the World Bank Institute's Governance Group. Finally, information on countries suffering systemic and borderline crises and on dates for the crisis periods comes from Laeven and Valencia (2018). I initially considered the 124 countries included in the World Bank's Doing Business Report. The lack of information for some of the explanatory variables reduced the final sample until I reached an unbalanced panel of a maximum of 84 countries over the 2002-2017 period.

#### *3.2. Empirical strategy*

I run estimations using country-level data with the rate of new firm registration as the dependent variable. I regress new firm registration on bank development and market competition. The basic model explicitly controls for equity market development, the efficiency and risk of the bank system, institutions, and macroeconomic variables, and

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<sup>3</sup> The complete database is available at: <http://www.doingbusiness.org/data/exploretopics/entrepreneurship>.

includes a set of dummy variables to control for omitted time-invariant variables. The basic model is:

$$\begin{aligned}
 \text{New firm registration}_{i,t} = & \alpha_0 + \alpha_1 \text{Bank development}_{i,t-1} \\
 & + \alpha_2 \text{Bank market competition}_{i,t-1} \\
 & + \alpha_3 \text{Control variables}_{i,t-1} \\
 & + \mu_i + T_t + \varepsilon_{i,t}
 \end{aligned}
 \tag{1}$$

where  $i$  refers to countries and  $t$  to years. *New firm registration* $_{i,t}$  is the rate of new firm creation in country  $i$  in year  $t$ . *Bank development* and *Bank market competition* are the main explanatory variables in this study. Positive signs of  $\alpha_1$  and  $\alpha_2$  would indicate that both bank development and market competition are associated with a higher rate of new firm creation. I explicitly control for other country characteristics potentially affecting entrepreneurship (*Control variables*). I use one lag of the explanatory variables to control for their potential endogeneity and to reduce problems related to reverse causality between entrepreneurship and explanatory variables.

The availability of a panel data set allows us to control for any omitted country variables (observed and unobserved) provided they do not vary over time. To do this, I allow each country to have its own country-specific error term ( $\mu_i$ ), i.e., I include country fixed effects to capture the influence of any time-invariant omitted variable affecting the level of new firm registration. I also include time dummies, ( $T_t$ ), to control for any global change in the macroeconomic environment that may affect new firm registration in all countries in a particular year. This is important because the data covers the period of the global financial crisis and Graph 1 shows that the number of new registrations dropped in 2009. The time dummies capture the average drop in registration in the year of the crisis, relative to previous years, and eliminate the confounding impact of the crisis. They

also capture global registration trends and the general increase over time in the number of registered new businesses. Finally, I estimate this model with errors clustered at country level to capture any serial correlation of errors within a country (Petersen, 2009).

### *3.3. Variables*

I now describe in detail only the proxies for the main variables: entrepreneurship, bank development, and bank market competition. Table A1 in the Appendix describes in more detail all the variables used in the empirical analysis and their sources. Most of the control variables are self-explanatory and have been used in other cross-country studies. Table 1 reports the overall descriptive statistics and correlations whereas Table A2 in the Appendix reports the mean value per country for each variable.

#### *3.3.1. Entrepreneurship*

I use data for entrepreneurship from the World Bank's Doing Business report. Entrepreneurship is measured by the new business entry density (*New firm registration*), calculated as the ratio of newly registered limited liability firms per 1,000 people of working age (aged 15-64). The data includes only new corporations, defined here as private companies with limited liability. This is the most prevalent formal business form in most countries around the world (Doing Business, 2010) and Bonaccorsi Di Patti and Dell'Ariccia (2004), Kappler et al. (2006), Aghion et al. (2007), Klapper and Love (2014, Klapper et al. (2015), Belitski et al. (2016), Hasan et al. (2017), and Bermpei et al. (2019), among others, have used similar proxies for new firm creation to the one in this study. However, the measure of new firm creation used in the paper also has limitations. It does not reflect all the entrepreneurial activity in a country because it does not capture informal entrepreneurship or types of new corporations different to private companies with limited

liability. *New firm registration* has a mean value of 3.8113 in the sample and ranges from a minimum of 0.0081 in Bhutan to a maximum mean value of 21.7044 in Cyprus.

### 3.3.2. *Bank development and competition*

I use the ratio of private credit by deposit money banks to GDP as the proxy for bank market development (*Bank development*) following previous studies (Demirgüç-Kunt and Levine, 2001). Graph 1 shows the evolution of *New firm registration* over the 2002-2017 period separately for countries whose *Bank development* is above and below the median in the sample. Although the time evolution is similar in countries with high and low bank development, new firm creation is greater in countries with higher bank development for all the years in the analysis period. Graph 1 also shows a reduction in the rate of new firm registration in 2009, after the onset of the global financial crisis, in both groups of countries, which is greater in countries with high bank development.

INSERT GRAPH 1 ABOUT HERE

I use three alternative proxies for countries' bank competition: the Boone indicator, the net interest margin, and bank market concentration. The Boone indicator is a measure of the degree of competition based on profit efficiency in the banking market (*Boone*). It is calculated as the elasticity of profits to marginal costs. An increase in the Boone indicator implies a deterioration in the competitive conduct of financial intermediaries. The net interest margin is the difference between the lending rate and the deposit rate. The lending rate is the rate charged by banks on loans to the private sector, and the deposit interest rate is the rate offered by commercial banks on three-month deposits (*Margin*). Finally, as an indicator of bank concentration, I use the assets of the three largest commercial banks as a share of total commercial banking assets (*Bank concentration*).

Higher values in these three variables (*Boone*, *Margin*, and *Bank concentration*) indicate less bank competition. Panel B in Table 1 shows that the rate of new firm registration is negatively correlated with *Boone* and *Margin*, but is positively correlated with *Bank concentration*.

### 3.3.3. Regulatory variables

I use three regulatory variables potentially affecting entrepreneurship as control variables: 1) *Restbanking* measures legal restrictions on the ability of banks to own and control nonfinancial firms. This variable varies from 1 to 4, with higher values indicating more legal restrictions for banks on acquiring an equity investment in nonfinancial firms. Bank equity stakes in nonfinancial firms may be an alternative to less bank market competition to reduce traditional adverse selection and moral hazard problems between creditors and debtors. 2) I consider the administrative costs to register a business. I use the natural logarithm of all official fees and fees for legal or professional services if such services are required by law. These costs are measured as a percentage of the economy's income per capita ( $\ln(\text{cost start})$ ). 3) Finally, I include the natural logarithm of the time needed to register a business. The measure captures the median duration that incorporation lawyers indicate is necessary to complete a procedure ( $\ln(\text{time required})$ ). I expect that both  $\ln(\text{cost start})$  and  $\ln(\text{time required})$  are negatively associated with the rate of new firm registration.

### 3.3.4. Other control variables

All the regressions include the following additional control variables. 1) Equity market development measured as the percentage of stock market capitalization over GDP (*Equity market development*). A more developed equity market may be related to a greater



presence of venture capital and other providers of external funds in a country. For this reason, I predict a positive coefficient for *Equity market development*. 2) Banking system efficiency measured as the ratio of overhead costs to total assets (*Overhead costs*). A less efficient banking system (higher overhead costs) may be associated with a lower rate of creation of new businesses. 3) Risk of the banking system measured as the Z-score of the national banking system (*Z-score*). The Z-score is defined as the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. A higher Z-score indicates that the national banking system is more stable because it is inversely related to the probability of insolvency. A negative coefficient for this variable is expected because a more stable banking system may be associated with providing less financing to new and riskier businesses. 4) The rule of law (*Rule of law*) as proxy for country's institutions. As the law and finance literature indicates that a country's institutions are important determinants of new firm creation and financial development, I check that the results hold when I omit the rule of law from the regressions to avoid potential correlation with the proxies for equity and bank market development (La Porta et al., 1998) . 5) Finally, all the regressions include three macroeconomic variables: real gross domestic product growth (*GDPgrowth*), the natural logarithm of gross domestic product per capita (*LnGDPpc*), and the inflation rate (*Inflation*) of country  $j$  in year  $t$ .

The potential omission of relevant control variables is always an important concern in cross-sectional studies. The use of a fixed-effects model in this paper reduces this concern because fixed effects control for any time-invariant country variable. For instance, empirical evidence shows the relevance of formal and informal institutions for entrepreneurship (Levie et al., 2004; Simón-Moya et al., 2014; Williams and Vorley,

2015). A fixed-effect model is useful to control for such variables because they usually vary across countries and are stable over time within a country.<sup>4</sup>

INSERT TABLE 1 ABOUT HERE

#### **4. Empirical results**

##### *4.1. Bank development, bank market competition, and entrepreneurship*

I initially analyze the influence of bank development on new firm registration without explicitly controlling for bank competition. This procedure reduces the risk of any potential correlation between bank development and bank competition confounding the specific influence of each variable on the rate of new firm creation. Table 2 reports the results. The results indicate that development of the banking system does not have a significant influence on the rate of new firm registration. The coefficients of *Bank development* are not significant at conventional levels in all the estimations. They are not significant at conventional levels in column (1) even when I only control for macroeconomic variables. They remain non-significant in columns (2) and (3) when I control for additional country variables capturing bank efficiency, bank risk, institutional quality, and equity market development. As the law and finance literature suggests that institutional quality is a key determinant of financial development, I check that the results

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<sup>4</sup> Anyway, I check the robustness of the results when I include additional control variables. In particular, I include all the components of the World Governance Indicators elaborated by the World Bank (Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Control of Corruption) and the country's ratio of government spending to GDP to control, respectively, for alternative characteristics of institutional quality and the presence of the state in the economy. The results do not change compared to those reported in the paper and these additional explanatory variables do not have significant coefficients.

hold in column (4) when I exclude *Rule of law* to avoid biases caused by a potential correlation between the proxies for institutional quality and the two proxies for financial development (*Bank development* and *Equity market development*). The results also remain in column (5) when I exclude countries suffering systemic banking crises and in column (6) when I additionally exclude countries suffering a borderline crisis.

The coefficients of the control variables are as expected. More developed equity markets are associated with a higher rate of new firm registration because the coefficients of *Equity market development* are positive and significant in all the estimations. This finding may be explained by the fact that countries with more developed financial markets also have more venture capital and other external providers that are better equipped at providing the valuable screening and monitoring that entrepreneurs require to establish new ventures. Moreover, more developed equity markets give firms greater access to long-term financing, which provides entrepreneurs starting firms with a greater choice of technology and organizational forms (Demirgüç-Kunt and Maksimovic, 2002; Denis, 2004). The *Rule of law* coefficient is positive and significant in column (2). Its coefficients in the remaining regressions are not statistically significant at conventional levels. The significance of *Rule of law* in column (2), when the proxy for equity market development is omitted from the regressions, is consistent with a better rule of law promoting greater equity market development, following the arguments of La Porta et al. (1998). *Equity market development* may subsume the positive effect of institutional quality on the rate of new firm creation and explain the non-significant coefficients of *Rule of law* when both variables are included in the regressions. I do not find a significant influence for the ratio of overhead costs, the stability of the banking system (*Z-score*),

and the natural logarithm of GDP per capita. Finally, the rate of new firm registration is positively associated with GDP growth and the inflation rate.

INSERT TABLE 2 ABOUT HERE

The average non-significant influence of bank development on entrepreneurship does not mean that the banking system is not important for entrepreneurship in all circumstances. Less bank market competition may be one of the characteristics of the banking system that promotes entrepreneurship by reducing information problems between banks and new firms. Lending relationship literature emphasizes that stronger banks are more likely to finance firms with adverse selection and moral hazard problems when less competitive markets allow banks to internalize the benefits of assisting firms (Petersen and Rajan, 1995).

I now include bank competition in the regressions to test its influence on the rate of new firm registration. Table 3 reports the results. I find a positive influence of less bank competition on the rate of new firm registration. The coefficients of the proxies negatively related to bank competition are positive and significant in all the regressions. This indicates that less bank competition is associated with a higher rate of new firm registration. The results do not change when I exclude *Bank development* from the regressions reported in columns (1), (4), and (7) to avoid potential correlation problems between bank development and competition. These results indicate that less bank competition is associated with a higher rate of new firm registration. I include the square of bank market competition (*Bank competitionSQ*) to test potential non-linear effects of bank market competition in regressions reported in columns (3), (6), and (9). The non-significant coefficients of *Bank competitionSQ* in these estimations suggest that the positive influence of less bank competition on new firm registration does not change

above a given level of bank market competition. The positive impact of less bank competition on the rate of new firm registration is also economically important. For instance, using the coefficients in column (2) of Table 3, a one-standard deviation increase in the Boone indicator (0.1801) would cause an increase in the rate of new firm registration of 5.03%. Similar to the results reported in table 2, the coefficients of *Bank development* remain not significant at conventional levels, and higher stock market development, higher GDP growth, and a higher inflation rate are associated with a higher rate of new firm creation. Other control variables do not have statistically significant coefficients.

The positive influence of less bank competition on the rate of new firm registration is consistent with greater incentives to invest in the acquisition of soft information by establishing close relationships with borrowers over time (relationship banking) in countries with less bank competition (Petersen and Rajan, 1994, 1995; Boot, 2000; Dell’Ariccia and Marquez, 2004). Less bank competition might facilitate the availability of credit to new businesses and raise the rate of new firm registration. Less bank market competition is even more important than bank development to promote business creation. In fact, I find that a more developed banking system is not in itself enough to promote lending to entrepreneurial firms and increase the rate of new firm registration in a country.

INSERT TABLE 3 ABOUT HERE

#### *4.2. Controlling for bank ownership of non-financial firms*

I now control for the possibility that the influence attributed to less bank competition may be caused by the ability of banks to own equity in non-financial firms. Bank equity stakes in non-financial firms are allowed in different degrees across countries

and the main argument in their favor is their usefulness for reducing conflicts of interest and information asymmetries between banks and borrowers. When a bank holds both the equity and debt of a firm, under-investment and risk-shifting conflicts between shareholders and debtholders decrease (Jensen, 1986; Prowse, 1990). Furthermore, by taking equity in a firm, a bank can access new information about the firm's quality and become an insider. Empirical evidence shows that bank equity stakes in non-financial firms help firms to obtain additional debt from the bank (Petersen and Rajan, 1994; Berger and Udell, 2002). Similarly, regulation allowing banks to acquire equity in non-financial firms might facilitate the creation of new firms by reducing the adverse selection and moral hazard that constrain access to finance for new businesses. Omission of this variable might therefore bias the results if less bank market competition is correlated with regulation allowing banks to take equity in their debtors. Moreover, I analyze potential interactions between bank competition and regulation on the ability of banks to hold equity stakes in non-financial firms because both variables might be substitutes or complements or might independently reduce adverse selection and moral hazard problems between banks and entrepreneurial firms, affecting the rate of new firm creation.

I now use the country's legal restrictions on the ability of banks to own and control non-financial firms provided by the World Bank's Bank Regulation and Supervision database (*Restbankowing*). This variable takes values from 1 to 4, with higher values indicating stricter restrictions on banks owning and controlling non-financial firms. The World Bank collects data for this variable in four different time periods. I focus on changes in levels of the variable because I specially need to control for time variation in the regulation of bank equity stakes once the fixed-effect model has captured the effect

of any time-invariant variable. I include in the regression a dummy variable that equals 0 for the years before the change in *Restbankowing* and adds 1 (-1) after any increase (decrease) in the level of legal restrictions on the ability of banks to own and control non-financial firms (*Restbankowing\_Change*). For countries that did not experience a change in their legal restrictions, the dummy variable is always 0. This procedure is a difference-in-difference analysis for the effect of changes in legal restrictions on the ability of banks to own and control non-financial firms, with countries not experiencing changes in such legal restrictions acting as the control group.

Table 4 presents the results. The lack of data for legal restrictions on the ability of banks to own and control non-financial firms reduces the initial sample from 742 observations in 84 countries to 628 observations in 80 countries. The coefficients of *Restbankowing\_Change* are non-significant at conventional levels in all the estimations. The coefficients of the interaction between *Bank competition* and *Restbankowing\_Change* are also non-significant at conventional levels in all the estimations. The coefficients for *Bank competition* continue to be positive and significant in columns (1)-(6) when I use *Boone* and *Margin* as proxies inversely related to bank competition. Although positive, the coefficients of *Bank competition* are non-significant at conventional levels in columns (7)-(9) when I use bank concentration as a proxy inversely related to bank competition. The mostly positive and statistically significant coefficients of *Bank competition* indicate that less bank market competition keeps its positive effect on the rate of new firm registration after controlling for differences across countries in the ability of banks to own and control non-financial firms. Moreover, the non-significant coefficients of the interaction terms suggest that the positive effect of less

bank competition is independent of the affiliation of banking and commerce through equity stakes in a country.<sup>5</sup>

INSERT TABLE 4 ABOUT HERE

#### 4.3. *Controlling for the costs of firm registration*

I now explicitly control for changes over time in the costs and days required to register a business. Kappler and Love (2014) show that many countries have been undertaking reforms of the registration process, aiming to reduce its cost, especially since the onset of the global financial crisis. They find that large reforms, reducing costs by more than 60%, increase the rate of new firm creation. Klapper et al. (2006) find that higher costs and longer procedures to register a business hamper the creation of new firms in a sample of 28 European countries. Following the above evidence, I include  $\ln(\text{cost start})$  and  $\ln(\text{time required})$  in the regressions to control, respectively, for time changes in the costs and days required to register a business in each country. Annual data for these variables come from the Doing Business dataset. I also include interactions of *Bank competition* with  $\ln(\text{cost start})$  and  $\ln(\text{time required})$  to analyze if the positive effect of less bank competition on the rate of new firm creations increases, diminishes, or is not affected depending on the country's cost of firm registration. Table 5 reports the results.

The significant and negative coefficients of  $\ln(\text{cost start})$  in all the estimations are consistent with a higher business registration cost reducing the creation of new businesses. The coefficients of  $\ln(\text{time required})$  are not significant at conventional

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<sup>5</sup> I check that the results are similar when I include the variable *Restbankowing* in levels instead of focusing on its changes over time.



levels. The coefficients of *Bank competition* are positive and statistically significant at conventional levels in most of the estimations. The coefficient of *Bank competition* is positive, but non-significant only in column (5) when I use bank concentration as a proxy inversely related to bank market competition. The coefficients of the interaction terms are always statistically non-significant. These results confirm the relevance of less bank market competition for enhancing the creation of new businesses, even after controlling for the costs and days required to register a business. Moreover, the effect of bank competition on new firm creation does not vary across countries depending on the cost of firm registration. Similar to previous tables, higher stock market development and GDP growth continue to be associated with a higher rate of new firm creation.

INSERT TABLE 5 ABOUT HERE

#### 4.4. *The impact of the global financial crisis*

I analyze in this section how the global financial crisis impacts on the influence of bank market competition and financial development on the rate of new firm registration. I include in the regressions additional interaction terms between a dummy capturing the years after the onset of the global financial crisis (*Crisis*) and the variables measuring bank market competition and financial development. Table 6 reports the results.

The coefficients of *Bank competition* are positive in all the estimations, but are only statistically significant at conventional levels in columns (1) - (2) when the Boone indicator is used as a proxy for less bank competition. The coefficients of *Crisis \*Bank competition* are never significant at conventional levels. These non-significant coefficients indicate that the positive role of less bank competition for increasing the rate of new firm registration does not change after the onset of banking crises.

The non-significant coefficients of *Bank development* and the significant negative coefficients of *Crisis\*Bank development* in all the estimations suggest that the greater reduction in bank credit supply in countries with greater bank development impacted negatively on the rate of new firm registration. This result is consistent with the findings of Kappler and Love (2011). The significant positive coefficients of *Equity market development* and *Crisis\* Equity market development* in all the estimations indicate that the positive effect of equity market development on the rate of new business creation increased after the onset of the global financial crisis. These results are consistent with Levine et al. (2016). They show that stock markets act as a spare tire for the banking system during banking crises and promote greater substitution of bank loans with equity issues during banking crises in publicly-traded firms. Similarly, I find that the relative importance of equity market development versus bank development for enhancing entrepreneurship increases after periods of banking crises.

INSERT TABLE 6 ABOUT HERE

#### *4.5. Additional robustness*

I now report the main results using GMM estimations as an additional control for the endogeneity of the explanatory variables. In particular, I apply a two-step system-GMM (Arellano and Bover, 1995; Blundell and Bond, 1998). These estimations provide a robustness check for the endogeneity of the regressors because they use instruments based on additional lagged values of the explanatory variables.<sup>6</sup> Additionally, GMM estimations control for autoregression in the entrepreneurship data by using one lag of the

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<sup>6</sup> I use one lag of the explanatory variables in the fixed-effects estimations to control for endogeneity and lagged values of the explanatory variables from t-1 to t-3 as instruments in the GMM estimations.

dependent variable as an explanatory variable. This control is important if entrepreneurial activity displays persistence.

Table 7 reports the results. To save space, I report results using the Boone indicator as a proxy that is inversely related to bank market competition. Two conditions are required for the instruments in GMM estimations to be valid: 1) no correlation with the error term (the statistically insignificant values of the Hansen J-statistic confirm this assumption); 2) no second-order serial correlation in the first difference residual. I employ the  $m_2$  statistic developed by Arellano and Bond (1991) to test for a lack of second-order serial correlation in the first-difference residual. The insignificant values of the  $m_2$  statistic in most of the estimations indicates that instruments mostly verify the condition. However, the statistically significant value of  $m_2$  in column (4) suggests autocorrelation problems and obliges us to be cautious with these estimations. For this reason, I only use them as a robustness check.

The positive and statistically significant coefficients of *New firm registration<sub>t-1</sub>* in all the estimations suggest that the rate of new firm creation persists over time. Similar to the fixed-effects estimations, the *Boone* coefficients remain positive and statistically significant in all the estimations. However, the coefficients of *Bank development* are negative and significant in columns (1)-(4). These negative coefficients could be caused by the relevance of the global financial crisis in the analysis period. In fact, the coefficients of *Bank development* become insignificant in columns (5) and (6) when I explicitly control for the crisis dummy variable. Similar to the fixed-effect estimations, the results of GMM estimations indicate that the influence of bank competition does not vary across countries depending on the ability of banks to take equity stakes in non-financial firms and the costs of firm registration. Nor does the positive effect of less bank

competition on the rate of new firm creation change during periods of banking crises. Higher rates of new firm creation also continue to be associated with lower costs of firm registration and greater stock market development in the GMM estimations.

INSERT TABLE 7 ABOUT HERE

## **5. Conclusions**

This paper analyzes the relevance of bank development and bank market competition for enhancing new firm creation in a panel database of 84 countries over the 2002-2017 period. The results show that less bank market competition is associated with a higher rate of new firm creation. However, bank development is not associated with a higher rate of new firm creation. These results indicate that a more developed banking system is not in itself sufficient to increase lending to entrepreneurial firms and promote new firm creation. They suggest that less bank competition is more important for promoting new firm creation. The lack of market competition provides incentives to banks and entrepreneurial firms to build lending relationships that allow them to intertemporally share the surplus and reduce adverse selection and moral hazard problems. This mechanism in less competitive bank markets helps explain why entrepreneurial firms widely use debt in their capital structure.

The results hold after controlling for alternative mechanisms available to banks to reduce information asymmetries in entrepreneurial firms. In particular, the ability of banks to own equity in non-financial firms is not related to the rate of new firm creation, and less bank competition retains its positive influence after controlling for this ability in banks. The results also hold after controlling for the costs and time required to start a

business in a particular country. Moreover, the positive influence of less bank competition on the rate of new firm creation does not either vary across countries depending on the above two variables. Finally, the results hold when I control for equity market development and use both structural and non-structural measures of bank market competition.

These results have important policy implications. Bank market competition has received attention from regulators aiming to find an optimal trade-off between its benefits and costs. Bank market competition reduces the cost of capital for established firms with lower information asymmetries. However, literature traditionally highlights that bank market competition reduces financial stability and credit availability in younger firms. I now add a new cost of bank competition in that it reduces the rate of new firm creation. Therefore, regulation reducing bank competition and promoting lending relationships would be especially useful in countries with low rates of new firm creation. Moreover, the benefits of less bank competition for promoting new firm creation remain even if the country uses alternative mechanisms to reduce adverse selection and moral hazard problems between banks and entrepreneurial firms, such as the affiliation of banking and commerce through bank equity stakes. The positive benefits of less bank competition on new firm creation also remain whatever the administrative costs for new firm registration. Finally, the fact that this positive effect of less bank competition remains after the onset of banking crises is another advantage because it indicates that less bank competition does not increase pro-cyclicality or exacerbate financial cycles. On the contrary, it reinforces the advantages of using regulation limiting bank competition as a policy to promote new firm creation in a country.

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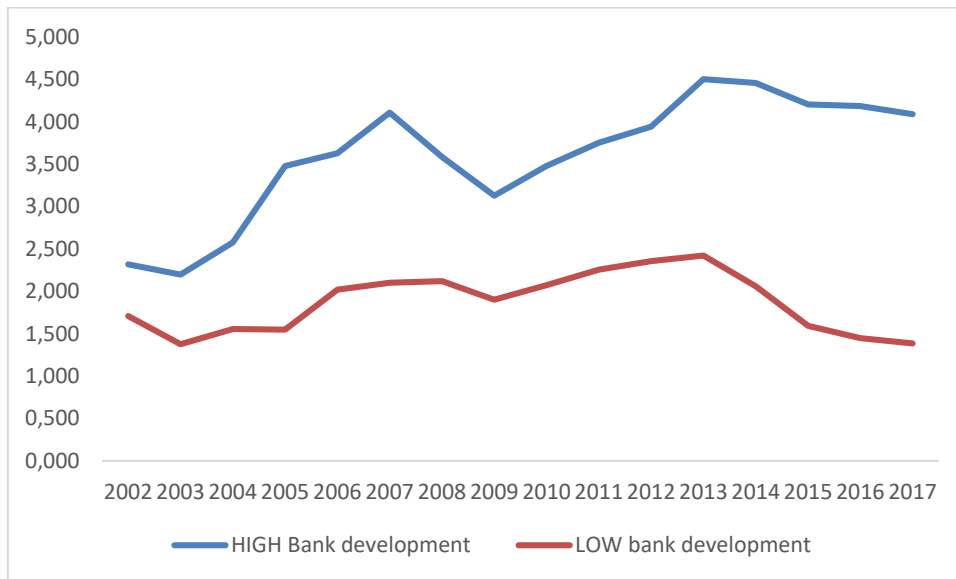
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**Graph 1**  
**New firm registration and bank development**



**Table 1**  
**Descriptive statistics and correlations**

Panel A reports the overall descriptive statistics and Panel B reports correlations between all the variables. The definition and source of each variable is indicated in Table A1 in the Appendix.

Panel A: Overall descriptive statistics															
	New firm registration	Bank development	Boone	Margin	Bank concentration	Restbankowing	Ln(cost start)	Ln(time required)	Equity market development	Overhead costs	Z-score	Rule of law	GDP growth	LnGDPpc	Inflation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Mean	3.7640	62.1460	-0.1019	6.3775	69.9276	2.4140	2.1162	2.9871	64.3463	3.4982	11.1076	0.3979	2.1994	8.9060	0.2382
Std. Dev.	4.9906	44.0135	0.1801	5.3415	18.3190	0.7951	1.3006	0.9412	112.6065	4.1647	7.9348	0.9145	24.2131	1.3829	4.8370
Median	2.2384	48.6376	-0.0660	4.7742	70.5186	2	2.1804	3.0445	36.9187	2.5750	9.5888	0.4333	0.0364	8.9307	0.0366
Minimum	0.0081	2.7235	-2.0000	-1.3723	22.5347	1	-2.3026	-0.6931	0.0095	0.1727	-13.1307	-1.6159	-0.9982	5.3534	-0.5144
Maximum	39.001	261.4806	0.3948	37.7546	1	4	5.6138	5.1985	1086.478	83.3140	40.7535	2.0157	402.039	11.2113	131.7633

Panel B: Correlations															
	New firm registration	Bank development	Boone	Margin	Bank concentration	Restbankowing	Ln(cost start)	Ln(time required)	Equity market development	Overhead costs	Z-score	Rule of law	GDP growth	LnGDPpc	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Bank development	0.4917***														
Boone	-0.1862***	-0.1214***													
Margin	-0.1686***	-0.3995***	-0.0893**												
Bank Concentration	0.1906***	0.2666***	0.0459	-0.0633*											
Restbankowing	-0.1028***	-0.1376***	0.0974**	0.0920**	-0.0723										
Ln(coststart)	-0.4215***	-0.4073***	0.1256***	0.2229***	-0.2456***	0.3079***									
Ln(time required)	-0.3646***	-0.4059***	-0.0896**	0.3345***	-0.2406***	0.1550***	0.5450**								
Equity market development	0.4290***	0.4285***	-0.0889*	-0.1293***	0.1158***	-0.0802**	-0.2598***	-0.2415***							
Overhead costs	-0.0942**	-0.3526***	0.0142	0.2443***	-0.2807***	0.1070**	0.1688***	0.1782***	-0.1141***						
Z-score	0.0335	0.1427***	0.0317	0.0177	0.2111***	-0.0068	-0.1555***	-0.1511***	0.1889***	-0.1710***					
Rule of law	0.3375***	0.6713***	-0.0628*	-0.4926***	0.4172***	-0.1990***	-0.5691***	-0.4063***	0.2955***	-0.4041***	0.1850***				
GDP growth	-0.0171	0.0454	0.0070	0.0012	0.0005	-0.0015	0.2219***	0.1949***	-0.0138	-0.0276	0.0019	0.0411			
LnGDPpc	0.2969***	0.6510***	-0.0506	-0.4649***	0.2561***	-0.2358***	-0.6041***	-0.4177***	0.2856***	-0.3467***	0.1932***	0.8081***	0.0549		
Inflation	-0.0260	-0.0504	-0.0079	0.1103	-0.0173	0.0456	0.3063***	0.2603***	-0.0205	0.0638*	-0.0423	-0.0345	0.0075	-0.0697*	

**Table 2**  
**Bank development and new firm registration**

This table reports results for model [1]. The dependent variable is *New firm registration*, defined as the ratio of newly registered limited liability firms per 1,000 people of working age (aged 15-64). *Bank development* is the ratio of private credit of deposit money banks to GDP. *Equity market development* is the ratio of stock market capitalization divided by the country's GDP; *Overhead costs* is the ratio of overhead costs as a proxy for the efficiency of the national banking system. *Z-score* is the Z-score of the national banking system, defined as the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. *Rule of law* measures law enforcement in the country. *GDPgrowth* is the real domestic product growth; *LnGDPpc* is the natural logarithm of GDP per capita; *Inflation* is the inflation rate. Regressions include time dummy variables and control for country fixed effects. Additionally, standard errors are clustered at country level. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% respectively.

	Dependent variable: New firm registration					
	All countries				Countries without systemic crises	Countries without systemic or borderline crises
	(1)	(2)	(3)	(4)	(5)	(6)
Bank development <sub>t-1</sub>	0.0096 (0.66)	0.0095 (0.65)	-0.0029 (-0.51)	-0.0028 (-0.47)	0.00004 (0.01)	0.0014 (0.19)
Equity market development <sub>t-1</sub>			0.0166*** (7.81)	0.0168*** (8.01)	0.0164*** (7.96)	0.0164*** (9.50)
Overhead costs <sub>t-1</sub>		0.0065 (0.27)	-0.0009 (-0.07)	-0.0008 (-0.07)	0.0007 (0.05)	0.0779 (0.72)
Z-score <sub>t-1</sub>		-0.01617 (-0.70)	-0.0283 (-1.37)	-0.0289 (-1.37)	-0.0419 (-1.54)	-0.0470 (-1.65)
Rule of law <sub>t-1</sub>		1.3263* (1.80)	0.5771 (0.95)		0.2577 (0.38)	0.2391 (0.32)
GDPgrowth <sub>t-1</sub>	0.0084*** (3.20)	0.0080*** (3.18)	0.0071*** (3.50)	0.0074*** (3.51)	0.0094*** (4.26)	0.0185*** (3.58)
LnGDPpc <sub>t-1</sub>	0.0541 (0.19)	0.0858 (0.31)	-0.0574 (-0.31)	-0.0582 (-0.31)	0.0632 (0.22)	0.1206 (0.42)
Inflation <sub>t-1</sub>	0.0101*** (3.06)	0.0081*** (2.81)	0.0091*** (3.17)	0.0099*** (3.42)	0.0103*** (3.41)	0.0103*** (2.79)
Intercept	0.8604 (0.38)	0.3322 (0.15)	2.2050 (1.28)	4.3300** (2.57)	1.0528 (0.40)	2.6986 (1.10)
Country-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
Cluster country-level	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.1480	0.1557	0.3269	0.3257	0.3463	0.3540
F- Test	7.33***	5.83***	22.73***	23.00***	35.57***	48.35***
# Obs	742	742	742	742	636	546
# Countries	84	84	84	84	72	64

**Table 3. Bank market competition, bank development, and new firm registration**

This table reports results for model [1]. The dependent variable is *New firm registration*, defined as the ratio of newly registered limited liability firms per 1,000 people of working age (aged 15-64). I use three proxies for *Bank competition*: the Boone indicator (*Boone*), the net interest margin (*Margin*), and bank market concentration (*Bank concentration*). Higher levels of these variables indicate less bank market competition. *Bank competitionSQ* is the square of the particular proxy for bank market competition. *Bank development* is the ratio of private credit of deposit money banks to GDP. *Equity market development* is the ratio of stock market capitalization divided by country's GDP; *Overhead costs* is the ratio of overhead costs as a proxy for the efficiency of the national banking system. *Z-score* is the Z-score of the national banking system, defined as the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. *Rule of law* measures law enforcement in the country. *GDPgrowth* is real domestic product growth; *LnGDPpc* is the natural logarithm of GDP per capita; *Inflation* is the inflation rate. Regressions include time dummy variables and control for country fixed effects. Additionally, standard errors are clustered at country level. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% respectively.

	Dependent variable: New firm registration								
	Boone			Margin			Bank concentration		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bank competition <sub>t-1</sub>	1.0582** (2.07)	1.0506** (2.04)	1.6883* (1.89)	0.0868** (2.11)	0.0879** (2.13)	0.1342* (1.67)	0.0141** (1.81)	0.0139* (1.80)	0.0086 (0.18)
Bank competitionSQ <sub>t-1</sub>			0.5916 (1.05)			-0.0019 (-0.95)			0.00004 (0.10)
Bank development <sub>t-1</sub>		-0.0027 (-0.46)	-0.0027 (-0.46)		-0.0034 (-0.58)	-0.0038 (-0.64)		-0.0020 (-0.35)	-0.0020 (-0.35)
Equity market development <sub>t-1</sub>	0.0165*** (7.31)	0.0166*** (7.86)	0.0166*** (7.84)	0.0162*** (7.54)	0.0164*** (8.12)	0.0165*** (8.28)	0.0167*** (7.32)	0.0169*** (7.76)	0.0169*** (7.73)
Overhead costs <sub>t-1</sub>	-0.0020 (-0.17)	-0.0027 (-0.24)	-0.0017 (-0.14)	-0.0003 (-0.03)	-0.0013 (-0.11)	-0.0004 (-0.03)	0.0003 (0.03)	-0.0002 (-0.02)	-0.0002 (-0.01)
Z-score <sub>t-1</sub>	-0.0299 (-1.50)	-0.0292 (-1.47)	-0.0296 (-1.51)	-0.0338 (-1.63)	-0.0330 (-1.60)	-0.0326 (-1.60)	-0.0270 (-1.25)	-0.0266 (-1.23)	-0.0269 (-1.19)
Rule of law <sub>t-1</sub>	0.5175 (0.88)	0.5260 (0.89)	0.4979 (0.85)	0.8513 (1.24)	0.8650 (1.25)	0.8543 (1.22)	0.3936 (0.66)	0.4026 (0.67)	0.4073 (0.66)
GDPgrowth <sub>t-1</sub>	0.0069*** (3.40)	0.0069*** (3.46)	0.0069*** (3.45)	0.0062*** (3.15)	0.0062*** (3.22)	0.0059*** (3.07)	0.0071*** (3.70)	0.0071*** (3.73)	0.0072*** (3.28)
LnGDPpc <sub>t-1</sub>	-0.1060 (-0.72)	-0.0568 (-0.30)	-0.0643 (-0.33)	-0.0811 (-0.50)	-0.0179 (-0.09)	-0.0086 (-0.04)	-0.1462 (-0.97)	-0.1086 (-0.58)	-0.1068 (-0.55)
Inflation <sub>t-1</sub>	0.0090*** (3.16)	0.0091*** (3.21)	0.0092*** (3.23)	0.0041 (1.42)	0.0042 (1.46)	0.0051* (1.76)	0.0097*** (3.28)	0.0097*** (3.31)	0.0098*** (3.16)
Intercept	2.6641* (1.79)	2.3672** (1.37)	2.4933 (1.44)	1.5709 (0.86)	1.1815 (0.60)	0.9524 (0.45)	1.9387 (1.24)	1.7253 (0.98)	1.8809 (1.21)
Country-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster country-level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.3308	0.3312	0.3321	0.3333	0.3339	0.3347	0.3319	0.3321	0.3322
F- Test	17.94***	22.85***	21.83***	20.96***	27.26***	28.07***	18.16***	24.28***	26.05***
# Obs	742	742	742	742	742	742	742	742	742
# Countries	84	84	84	84	84	84	84	84	84

**Table 4**

**Bank market competition and new firm creation: controlling for the ability of banks to own non-financial firms**

This table reports results for model [1]. The dependent variable is *New firm registration*, defined as the ratio of newly registered limited liability firms per 1,000 people of working age (aged 15-64). I use three proxies for *Bank competition*: the Boone indicator (*Boone*), the net interest margin (*Margin*), and bank market concentration (*Bank concentration*). Higher levels of these variables indicate less bank market competition. *Bank development* is the ratio of private credit of deposit money banks to GDP. *Restbanking\_Change* measures the change in the level of the legal restrictions for banks on holding equity positions in non-financial firms. *Equity market development* is the ratio of stock market capitalization divided by the country's GDP; *Overhead costs* is the ratio of the overhead costs as a proxy for the efficiency of the national banking system. *Z-score* is the Z-score of the national banking system, defined as the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. *Rule of law* measures law enforcement in the country. *GDPgrowth* is the real domestic product growth; *LnGDPpc* is the natural logarithm of GDP per capita; *Inflation* is the inflation rate. Regressions include time dummy variables and control for country fixed effects. Additionally, standard errors are clustered at country level. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% respectively.

	Dependent variable: New firm registration								
	Boone			Margin			Bank concentration		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Bank competition <sub>t-1</sub>	1.5706*** (2.72)	1.5276** (2.64)	1.4231** (2.49)	0.1123** (2.39)	0.1110** (2.36)	0.1208** (2.53)	0.0082 (1.04)	0.0081 (1.02)	0.0086 (1.09)
Bank development <sub>t-1</sub>	-0.0051 (-1.06)	-0.0049 (-1.04)	-0.0048 (-1.02)	-0.0054 (-1.01)	-0.0053 (-0.99)	-0.0055 (-1.05)	-0.0050 (-0.99)	-0.0049 (-0.97)	-0.0050 (-1.01)
Restbanking_Change		-0.0289 (-0.16)	-0.0072 (-0.04)		-0.0403 (-0.22)	-0.2760 (-0.96)		-0.0623 (-0.33)	-0.5096 (-1.22)
Bank competition <sub>t-1</sub> *Restbanking_Change			0.3696 (0.85)			0.0388 (1.42)			0.0066 (0.91)
Equity market development <sub>t-1</sub>	0.0102*** (3.57)	0.0103*** (3.70)	0.0103*** (3.65)	0.0106*** (4.03)	0.0107*** (4.15)	0.0106*** (4.09)	0.0107*** (3.67)	0.0108*** (3.81)	0.0107*** (3.68)
Overhead costs <sub>t-1</sub>	-0.0169 (-0.22)	-0.0173 (-0.74)	-0.0188 (-0.82)	-0.0172 (-0.75)	-0.0176 (-0.77)	-0.0178 (-0.78)	-0.0125 (-0.54)	-0.0130 (-0.56)	-0.0111 (-0.47)
Z-score <sub>t-1</sub>	-0.0268 (-1.36)	-0.0279 (-1.43)	-0.0291 (-1.47)	-0.0272 (-1.31)	-0.0283 (-1.37)	-0.0274 (-1.33)	-0.0236 (-1.12)	-0.0248 (-1.19)	0.0252 (-1.21)
Rule of law <sub>t-1</sub>	0.4908 (0.70)	0.4845 (0.69)	0.4816 (0.68)	0.8438 (1.13)	0.8346 (1.11)	0.7967 (1.05)	0.4852 (0.68)	0.4818 (0.67)	0.5163 (0.72)
GDPgrowth <sub>t-1</sub>	0.0078*** (3.11)	0.0077*** (3.09)	0.0076*** (3.06)	0.0066*** (2.65)	0.0066** (2.64)	0.0063** (2.55)	0.0082*** (3.04)	0.0081*** (3.03)	0.0082*** (3.01)
LnGDPpc <sub>t-1</sub>	0.0851 (0.42)	0.0856 (0.43)	0.0892 (0.44)	0.1015 (0.54)	0.1019 (0.55)	0.1267 (0.66)	0.0746 (0.40)	0.0752 (0.41)	0.0834 (0.45)
Inflation <sub>t-1</sub>	-0.3581 (-0.66)	-0.3612 (-0.66)	-0.3507 (-0.65)	-0.2998 (-0.53)	-0.3015 (-0.53)	-0.2288 (-0.40)	-0.4352 (-0.78)	-0.4341 (-0.78)	-0.4348 (-0.78)
Intercept	1.6576 (0.81)	1.7611 (0.88)	1.7217 (0.86)	0.3911 (0.17)	0.4682 (0.22)	0.2058 (0.09)	1.0147 (0.48)	1.0373 (0.50)	0.9336 (0.45)
Country-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Cluster country-level	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.1930	0.1929	0.1936	0.1957	0.1958	0.1980	0.1865	0.188	0.1880
F- Test	5.23***	5.11***	4.73***	5.64***	5.84***	5.43***	4.48***	4.56***	4.79***
# Obs	628	628	628	628	628	628	628	628	628
# Countries	80	80	80	80	80	80	80	80	80

**Table 5**  
**Bank market competition and new firm creation: controlling for the costs of firm registration**

This table reports results for model [1]. The dependent variable is *New firm registration*, defined as the ratio of newly registered limited liability firms per 1,000 people of working age (aged 15-64). I use three proxies for *Bank competition*: the Boone indicator (*Boone*), the net interest margin (*Margin*), and bank market concentration (*Bank concentration*). Higher levels of these variables indicate less bank market competition. *Bank development* is the ratio of private credit of deposit money banks to GDP. *Ln(cost start)* is the natural logarithm of the costs to register a business. *Ln(time required)* is the natural logarithm of the days needed to register a business. *Equity market development* is the ratio of stock market capitalization divided by the country's GDP; *Overhead costs* is the ratio of the overhead costs as a proxy for the efficiency of the national banking system. *Z-score* is the Z-score of the national banking system, defined as the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. *Rule of law* measures law enforcement in the country. *GDPgrowth* is the real domestic product growth; *LnGDPpc* is the natural logarithm of GDP per capita; *Inflation* is the inflation rate. Regressions include time dummy variables and control for country fixed effects. Additionally, standard errors are clustered at country level. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% respectively.

	Dependent variable: New firm registration					
	Boone		Margin		Bank Concentration	
	(1)	(2)	(3)	(4)	(5)	(6)
Bank competition <sub>t-1</sub>	0.9674*	4.9729**	0.1118**	0.2029*	0.0103	0.0103*
	(1.72)	(2.43)	(2.62)	(1.95)	(1.28)	(1.86)
Bank development <sub>t-1</sub>	0.0001	0.0010	0.0025	0.0026	0.0003	0.0005
	(0.01)	(0.05)	(0.13)	(0.13)	(0.01)	(0.03)
Ln (cost start) <sub>t-1</sub>	-0.8634***	-0.9782***	-0.8103**	-0.8147**	-0.8335***	-0.3325
	(-2.89)	(-2.93)	(-2.62)	(-2.23)	(-2.75)	(-0.63)
Ln (time required) <sub>t-1</sub>	0.1032	0.0057	0.0677	0.1663	0.1040	0.5435
	(0.33)	(0.02)	(0.22)	(0.44)	(0.34)	(0.75)
Bank competition <sub>t-1</sub> * Ln (cost start) <sub>t-1</sub>		-0.7241		-0.0020		-0.0066
		(-1.59)		(-0.07)		(-0.94)
Bank competition <sub>t-1</sub> * Ln (time required) <sub>t-1</sub>		-0.8892		-0.0228		-0.0055
		(-1.38)		(-0.89)		(-0.67)
Equity market development <sub>t-1</sub>	0.0175***	0.0176***	0.0175***	0.0176***	0.0178***	0.0183***
	(5.55)	(5.51)	(6.11)	(6.23)	(5.56)	(5.82)
Overhead costs <sub>t-1</sub>	0.0005	0.0011	0.0009	0.0014	0.0019	0.0035
	(0.04)	(0.08)	(0.07)	(0.11)	(0.12)	(0.23)
Z-score <sub>t-1</sub>	0.0121	0.0113	0.0031	0.0017	0.0151	0.0184
	(0.58)	(0.54)	(0.16)	(0.09)	(0.70)	(0.53)
Rule of law <sub>t-1</sub>	0.0959	0.0018	0.2515	0.2038	0.0413	0.1396
	(0.15)	(0.01)	(0.39)	(0.30)	(0.06)	(0.22)
GDPgrowth <sub>t-1</sub>	2.8231*	2.7083*	3.2399**	3.2883**	2.5500*	2.1744
	(1.88)	(1.77)	(2.09)	(2.12)	(1.77)	(1.43)
LnGDPpc <sub>t-1</sub>	0.2037	0.1706	1.1863	1.2076	0.2063	0.4155
	(0.16)	(0.14)	(0.85)	(0.83)	(0.16)	(0.32)
Inflation <sub>t-1</sub>	1.9029	1.7416	1.7444	1.7400	1.9217	1.5231
	(0.96)	(0.92)	(0.84)	(0.84)	(0.92)	(0.77)
Intercept	1.8007	2.6762	-7.7400	-8.2913	0.8003	-3.7221
	(0.16)	(0.26)	(-0.63)	(-0.65)	(0.07)	(-0.34)
Country-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
Cluster country-level	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.3375	0.3539	0.3472	0.3489	0.3358	0.3429
F- Test	12.76***	9.90***	15.95***	14.19***	11.99***	11.01***
# Obs	650	650	650	650	650	650
# Countries	75	75	75	75	75	75

**Table 6**  
**The impact of the global financial crisis**

This table reports results for model [1]. The dependent variable is *New firm registration*, defined as the ratio of newly registered limited liability firms per 1,000 people of working age (aged 15-64). I use three proxies for *Bank competition*: the Boone indicator (*Boone*), the net interest margin (*Margin*), and bank market concentration (*Bank concentration*). Higher levels of these variables indicate less bank market competition. *Bank development* is the ratio of private credit of deposit money banks to GDP. *Equity market development* is the ratio of stock market capitalization divided by the country's GDP. *Crisis* is a dummy variable that takes the value of one for years after the onset of the global financial crisis and zero otherwise. *Overhead costs* is the ratio of the overhead costs as a proxy for the efficiency of the national banking system. *Z-score* is the Z-score of the national banking system, defined as the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. Rule of law measures law enforcement in the country. *GDPgrowth* is the real domestic product growth; *LnGDPpc* is the natural logarithm of GDP per capita; *Inflation* is the inflation rate. Regressions include time dummy variables and control for country fixed effects. Additionally, standard errors are clustered at country level. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% respectively.

	Dependent variable: New firm registration					
	Boone		Margin		Bank Concentration	
	(1)	(2)	(3)	(4)	(5)	(6)
Bank competition <sub>t-1</sub>	2.0992*** (2.70)	2.0032** (2.27)	0.0452 (1.09)	0.0419 (1.00)	0.0076 (0.82)	0.0086 (0.98)
Bank development <sub>t-1</sub>	-0.0013 (-0.25)	0.0081 (1.01)	-0.0006 (-0.10)	0.0074 (0.89)	-0.0021 (-0.40)	0.0103 (1.14)
Equity market development <sub>t-1</sub>	0.0173*** (8.95)	0.0081*** (4.23)	0.0175*** (9.26)	0.0082*** (4.84)	0.0180*** (9.71)	0.0089*** (5.89)
Crisis* Bank competition <sub>t-1</sub>	-1.0751 (-1.22)	-0.8957 (-1.01)	0.0289 (1.56)	0.0138 (0.94)	0.0062 (1.51)	0.0079* (1.87)
Crisis* Bank development <sub>t-1</sub>		-0.0119* (-1.77)		-0.0106* (-1.71)		-0.0151** (-2.07)
Crisis* Equity market development <sub>t-1</sub>		0.0104*** (6.22)		0.0104*** (6.62)		0.0104*** (7.71)
Overhead costs <sub>t-1</sub>	-0.0067 (-0.67)	-0.0179** (-1.99)	-0.0051 (-0.48)	-0.0162* (-1.95)	-0.0019 (-0.17)	-0.0123* (-1.73)
Z-score <sub>t-1</sub>	-0.0268* (-1.73)	-0.0261 (-1.41)	-0.0286 (-1.65)	-0.0261 (-1.32)	-0.0203 (-1.05)	-0.0218 (-1.09)
Rule of law <sub>t-1</sub>	1.1881* (1.80)	1.3096* (1.89)	1.3751* (1.82)	1.5278* (1.94)	0.9779 (1.49)	1.0320 (1.65)
GDPgrowth <sub>t-1</sub>	0.0011 (0.80)	0.0001 (0.05)	0.0007 (0.48)	-0.0002 (-0.10)	0.0013 (1.14)	0.0001 (0.11)
LnGDPpc <sub>t-1</sub>	-0.0454 (-0.25)	-0.0809 (-0.57)	-0.0527 (-0.28)	-0.0647 (-0.46)	-0.0822 (-0.49)	-0.1709 (-1.18)
Inflation <sub>t-1</sub>	-0.0009 (-0.93)	-0.0019 (-1.66)	-0.0035 (-1.32)	-0.0046* (1.76)	-0.0010 (-1.10)	-0.0016 (-1.41)
Crisis	0.2682** (1.99)	0.3619* (1.80)	0.2699* (1.71)	0.3648 (1.58)	0.1133 (0.57)	0.2522 (1.34)
Intercept	3.0086** (2.07)	3.3353*** (2.99)	2.4198 (1.50)	2.6218** (2.18)	2.5137 (1.51)	3.1343** (2.55)
Country-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy variables	No	No	No	No	No	No
Cluster country-level	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.2683	0.3297	0.2614	0.3221	0.2661	0.3279
F- Test	24.32***	189.93***	23.49***	178.26***	26.03***	248.62***
# Obs	742	742	742	742	742	742
# Countries	84	84	84	84	84	84



**Table 7**  
**Bank market competition and new firm creation. GMM estimations**

Regressions are estimated using the two-step GMM system estimator for panel data. The dependent variable is *New firm registration*, defined as the ratio of newly registered limited liability firms per 1,000 people of working age (aged 15-64). As explanatory variables, I include one lag of the dependent variable (*New firm registration*<sub>t-1</sub>). I use the Boone indicator (*Boone*) as proxy inversely related to bank market competition. *Bank development* is the ratio of private credit of deposit money banks to GDP. *Restbankowing\_Change* measures the change in the level of the legal restrictions for banks on holding equity positions in non-financial firms. *Ln(cost start)* is the natural logarithm of the costs to register a business. *Crisis* is a dummy variable that takes the value of one for years after the onset of the global financial crisis and zero otherwise. *Equity market development* is the ratio of stock market capitalization divided by the country's GDP; *Overhead costs* is the ratio of the overhead costs as a proxy for the efficiency of the national banking system. *Z-score* is the Z-score of the national banking system, defined as the return on assets plus the capital asset ratio divided by the standard deviation of asset returns. *Rule of law* measures law enforcement in the country. *GDPgrowth* is the real domestic product growth; *LnGDPpc* is the natural logarithm of GDP per capita. *Inflation* is the inflation rate. All regressions include country-fixed effects and regressions in columns (1)-(4) also include time dummy variables. Additionally, standard errors are clustered at country level. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% respectively.

	Dependent variable: New firm registration					
	(1)	(2)	(3)	(4)	(5)	(6)
New firm registration <sub>t-1</sub>	1.1651*** (78.01)	1.1580*** (71.71)	1.1331*** (35.68)	1.0478*** (32.57)	1.1696*** (18.82)	0.7977*** (26.14)
Boone	3.3761*** (9.24)	2.6292*** (5.73)	2.4534** (2.16)	2.1758** (2.43)	4.2108* (1.78)	1.6123*** (2.94)
BooneSQ		0.2053 (0.22)				
Bank development	-0.0177*** (-4.69)	-0.0180*** (-4.56)	-0.0081* (-1.69)	-0.0164*** (-3.01)	-0.0170 (-0.80)	0.0001 (0.01)
Restbankowing_Change			-0.1930 (-0.97)			
Restbankowing_Change * Boone			0.2790 (0.19)			
Ln (cost start)				-0.3684** (-2.45)		
Ln (cost start)* Boone				-0.5853 (-1.01)		
Crisis* Boone					1.3103 (0.57)	-0.1112 (-0.17)
Crisis* Bank development						-0.0038 (-1.11)
Crisis* Equity market development						0.0048*** (5.09)
Equity market development	0.0017** (2.43)	0.0018** (2.41)	0.0003 (0.33)	0.0043*** (3.78)	0.0042 (1.57)	0.0026 (2.78)
Overhead costs	-0.0039 (-0.37)	-0.0028 (-0.26)	0.0246 (0.58)	-0.0027 (-0.05)	-0.0066 (-0.17)	0.0202 (1.74)
Z-score	0.0435*** (3.14)	0.0323** (2.21)	0.0575*** (3.30)	0.0127 (0.74)	0.0275 (0.50)	-0.0010 (-0.05)
Rule of law	0.2811 (1.04)	0.3071 (1.10)	0.1539 (0.33)	0.4725 (1.19)	-2.9132 (-0.86)	-1.8050*** (-3.11)
GDPgrowth	-3.5393** (-2.10)	-4.1872*** (2.61)	1.2724 (0.34)	-1.5048 (-0.62)	10.8510 (1.37)	9.2476*** (4.51)
LnGDPpc	0.0056 (0.04)	-0.0498 (-0.36)	0.1768 (0.79)	-0.2056 (-1.06)	1.4537 (0.77)	1.0524*** (2.85)
Inflation	5.1674*** (2.73)	3.0247 (1.51)	6.4886 (1.47)	1.9218 (0.61)	-12.1276 (-0.45)	-12.9950** (-2.38)
Crisis					0.0735 (0.13)	0.0566 (0.19)
Country-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy variables	Yes	Yes	Yes	Yes	No	No
m1 statistic	-3.00***	-2.84***	-2.56***	-2.32**	-2.26**	-1.87**
m2 statistic	-1.38	-1.38	-1.16	-1.95*	-1.48	-1.38
Hansen J statistic	22.02 (26)	19.74 (25)	10.43 (16)	18.51 (14)	16.45 (23)	24.88 (27)
# Obs	644	644	546	626	644	644
# Countries	75	75	70	75	75	75

## Appendix

### Table A1. Variable definitions and data sources

This table defines the variables used in the paper and their source

NAME	DEFINITION	SOURCE
<b>Entrepreneurship</b>		
<i>New firm registration</i>	The annual ratio of newly registered limited liability firms per 1,000 people of working age (aged 15-64).	Entrepreneurship Database. World Bank. Doing Business
<b>Bank development and market competition</b>		
<i>Bank development</i>	The annual ratio of private credit of deposit money banks to GDP.	Global Financial Development Database (GFDD). World Bank.
<i>Boone</i>	A measure of the degree of competition, calculated as elasticity of profits to marginal costs. To obtain elasticity, the log of profits (measured by return on assets) is regressed on the log of marginal costs. The estimated coefficient (computed from the first derivative of a trans-log cost function) is elasticity. The rationale behind the indicator is that higher profits are achieved by more efficient banks. Hence, the more negative the Boone indicator, the higher the degree of competition because the reallocation effect is stronger. Estimations of the Boone indicator in this database follow the methodology used by Schaeck and Čihák (2010) with a modification because marginal costs are used instead of average costs. Regional estimates of the Boone indicator pool the bank data by regions (for more information, see Hay and Liu 1997; Boone 2001; Boone, Griffith, and Harrison 2005). Calculated from underlying bank-by-bank data from Bankscope.	Global Financial Development Database (GFDD). World Bank.
<i>Margin</i>	Difference between lending rate and deposit rate. Lending rate is the rate charged by banks on loans to the private sector and deposit interest rate is the rate offered by commercial banks on three-month deposits. A higher margin would indicate less bank market competition.	Global Financial Development Database (GFDD). World Bank.
<i>Bank concentration</i>	Assets of the three largest commercial banks as a share of total commercial banking assets. Total assets include total earning assets, cash and due from banks, foreclosed real estate, fixed assets, goodwill, other intangibles, current tax assets, deferred tax assets, discontinued operations and other assets. A higher bank concentration is associated with less bank market competition.	Global Financial Development Database (GFDD). World Bank.
<b>Regulatory variables</b>		
<i>Restbankowing</i>	Restrictions on the mixing of banking and commerce, indicating whether bank ownership and control of non-financial firms are: (1) unrestricted, (2) permitted, (3) restricted, or (4) prohibited. This variable ranges from a minimum value of 1 to a maximum value of 4. Higher values of <i>Restbankowing</i> indicate more restrictions on the ability of banks to hold equity positions in non-financial firms.	World Bank's Bank Regulation and Supervision database
<i>Restbankowing_Change</i>	Dummy variable capturing changes in <i>Restbankowing</i> . It takes the value zero for the years before any change in <i>Restbankowing</i> , and adds one (minus one) after any increase (decrease) in the level of <i>Restbankowing</i> .	World Bank's Bank Regulation and Supervision database
<i>Ln (cost start)</i>	The natural logarithm of the costs to register a business. Cost is recorded as a percentage of the economy's income per capita. It includes all official fees and fees for legal or professional services if such services are required by law.	Doing Business
<i>Ln (time required)</i>	The natural logarithm of the days needed to register a business. The measure captures the median duration that incorporation lawyers indicate is necessary to complete a procedure.	Doing Business
<b>Country-level control variables</b>		
<i>Equity market development</i>	The annual ratio of stock market capitalization to GDP	Global Financial Development Database (GFDD). World Bank.
<i>Overhead costs</i>	Bank overhead cost to total assets, i.e., operating expenses of a bank as a share of the value of all assets held. Total assets include total earning assets, cash and due from banks, foreclosed real estate, fixed assets, goodwill, other intangibles, current tax assets, deferred tax assets, discontinued operations and other assets.	Global Financial Development Database (GFDD). World Bank.

<i>Zscore</i>	This captures the probability of default of a country's banking system. Z-score compares the buffer of a country's banking system (capitalization and returns) with the volatility of those returns. It is estimated as $(ROA + (equity/assets)) / sd(ROA)$ ; $sd(ROA)$ is the standard deviation of ROA. ROA, equity, and assets are country-level aggregate figures. Calculated from underlying unconsolidated bank-by-bank data from Bankscope.	Global Financial Development Database (GFDD). World Bank.
<i>Rule of law</i>	This captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	Worldwide Governance Indicators. World Bank.
<i>Crisis</i>	A dummy variable that takes zero for years before the onset of the global financial crisis and one for the period after the onset of the crisis.	Laeven and Valencia (2012)
<i>GDPgrowth</i>	Annual growth in gross domestic product.	Global Financial Development Database (GFDD). World Bank.
<i>InGDPpc</i>	The natural logarithm of gross domestic product per capita.	Global Financial Development Database (GFDD). World Bank.
<i>Inflation</i>	Annual rate of inflation.	Global Financial Development Database (GFDD). World Bank.

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**Table A2. Mean values per country**

The table shows by country the mean value of each variable. The definition and source of each variable are indicated in Table A1.

	New firm registration	Bank development	Boone	Margin	Bank concentration	Restbanking	Ln(cost start)	Ln(time required)	Equity market development	Overhead costs	Bank Z-score	Rule of law	GDP growth	LnGDP per capita	Inflation
Argentina	0.4833	10.8715	-0.1532	4.4967	40.07251	3	2.5730	3.3788	13.5880	5.6502	4.9857	-0.7092	4.2752	8.7524	0.0465
Armenia	1.2605	15.5680	-0.1274	10.9365	59.1810	1.5	1.4429	2.6608	1.0120	4.7350	10.9137	-0.4104	0.1209	7.4787	0.0391
Australia	10.0184	105.6286	0.0139	3.2919	72.7675	2.2	0.0675	1.0074	104.2133	1.3730	9.0611	1.7479	0.1404	10.4610	0.0196
Austria	0.7105	92.1401	-0.0108	3.3371	61.2118	2	1.4383	3.2082	31.2199	1.5337	26.2313	1.8688	0.0131	10.5916	0.0201
Bangladesh	0.0759	31.3016	-0.0545	5.0981	70.1668	3.7143	3.6365	3.8281	12.5923	2.5267	2.8162	-0.8637	1.6423	6.2642	0.0546
Belarus	0.1662	65.7327	-0.0336	12.7917	80.1463	3			65.7327	1.1437	8.4718	-1.0194	0.0046	10.4545	0.0218
Belgium	1.9359	60.0900	-0.0426	6.7056	85.7066	2.375	1.8035	1.8925	62.2280	0.8103	8.0751	1.3265	0.0183	10.5441	0.0242
Bhutan	0.0081	55.1618	-0.0138	8.2500	54.7887	3			19.6104	5.4515	10.5605	0.1782	0.0221	6.8891	0.0092
Bolivia	0.4326	36.0934	-0.0645	8.8187	63.3434	4	4.7734	3.9290	17.2083	5.5885	11.6974	-0.8921	0.0416	7.0289	0.0609
Bosnia and Herzegovina	0.7261	52.4070	-0.0197	4.2977	52.2264	3	3.0048	4.4955	17.2144	3.4365	5.9043	-0.3696	0.0112	8.1271	0.0240
Bostwana	7.9936	22.2494	-0.1195	6.5583	73.8218	1.8333	1.2614	4.3630	31.6166	4.2900	8.5706	0.6197	-0.0451	8.6285	0.0704
Brazil	2.9109	48.3967	-0.2718	31.3046	57.5591	2	1.9705	4.8185	55.1184	3.7838	11.2963	-0.2221	0.0343	8.5948	0.0540
Bulgaria	7.7541	66.1425	-0.2266	6.4749	51.5408	2	1.0789	3.4512	21.0353	2.5982	4.8134	-0.1159	0.0182	8.4608	0.0539
Canada	0.9168	123.2278	-0.1185	3.6111	83.1082	2	-0.3473	1.3281	117.0631	2.1478	16.4358	1.7420	0.0242	10.4940	0.0192
Chile	4.3620	68.1908	0.0024	3.7529	70.7254	3.8571	1.5536	2.8578	96.2829	2.5309	8.7448	1.3028	-0.0430	8.8477	0.0279
Colombia	1.4550	29.5637	-0.1474	6.9520	53.2188	3.5555	2.7087	3.1333	42.7162	5.3736	7.1997	-0.4686	0.0496	8.2483	0.0454
Costa Rica	1.2868	37.8036	-0.3476	12.6583	59.2231	3.7272	2.5176	4.3713	6.4208	5.2215	18.4906	0.4878	0.0447	8.5296	0.0457
Croatia	3.0695	58.1790	-0.1083	8.4417	56.5202	2	2.3326	3.0818	43.2101	2.4490	4.7187	0.0964	0.0159	9.2638	0.0293
Cyprus	21.7044	186.9345	-0.2013	2.9940	85.0792	3	2.5439	2.0794	36.8332	2.5768	4.8046	1.0393	-0.0522	10.0433	0.0218
Czech Republic	2.5023	46.6700	-0.1366	4.5931	68.3350	3	2.2375	3.1222	24.5859	2.2931	4.6277	0.8597	-0.0136	9.6323	0.0209
Denmark	3.3900	138.9194	-0.1283	4.7000	86.1833	3			46.8981	1.2740	10.2704	1.8733	402.039	10.7499	0.2043
Estonia	11.7504	69.4023	-0.0905	3.7827	96.3111	2	1.1002	2.6895	23.2182	1.9762	7.5253	1.0227	0.0447	9.2522	0.1605
Finland	3.0770	73.7287	-0.2582	2.2359	94.1125	2.4167	0.0545	2.7185	86.5436	0.7573	12.8633	1.9458	-0.0627	10.5680	0.0194
France	3.0642	87.6140	-0.0178	4.2653	63.3842	2.167	0.0144	2.0193	74.2498	0.8126	11.0800	1.4370	0.0097	10.4715	0.0151
Georgia	2.8153	28.1263	0.0644	9.6800	83.7702	3	2.0104	2.1281	10.2506	6.3185	7.5620	-0.5271	-0.0280	7.7140	0.0240
Germany	1.2499	90.3935	-0.0447	3.5372	79.1150	2	1.7229	3.0097	39.5254	1.6049	13.0374	1.6694	25.0959	10.1684	0.1832
Greece	0.88538	80.6427	-0.0771	5.2684	73.7249	2	2.8009	3.2863	50.8418	2.3875	3.0178	0.7420	0.0141	10.0281	0.0221
Haiti	0.0312	33.8134	-0.0666	13.7917	49.5600				684.3944	3.7310	27.2617	-1.6159	0.0390	7.1247	0.0881
Hong Kong	20.7210	146.5684	-0.3107	4.8213	71.6339	2	0.7894	1.8836	714.1007	2.6849	15.1033	1.54584	0.0884	10.1735	0.0570
Hungary	4.4805	54.5678	-0.1424	2.5346	76.1108	2.3077	2.5957	2.6046	23.9378	4.5056	4.7026	0.8149	0.4678	9.4271	0.0549
Indonesia	0.2113	22.8203	0.0447	5.4345	47.2465	3.7273	4.0273	4.5031	30.4704	3.4551	2.9770	-0.6997	0.0863	7.2375	0.1544
Ireland	6.1220	93.7491	0.0444	2.6681	83.8762	2	2.1139	2.8904	51.8316	0.2615	5.4351	1.5316	0.0548	10.8013	0.0233
Israel	3.3319	78.5199	0.0519	3.4759	77.6205	2.6428	1.5079	2.8855	71.0703	2.1581	23.7683	0.9183	-0.0325	10.0305	0.0200
Italy	2.1625	79.8018	-0.0066	3.5490	57.8357	2.7692	2.9093	2.3410	34.3124	1.8794	13.9762	0.4490	13.3287	10.3445	0.1164
Jamaica	1.1423	34.9793	-0.0719	11.3333	85.1272	2.6666	2.1657	2.3236	71.6036	5.0586	5.7365	-0.4575	0.0048	8.5351	0.1042
Japan	0.1125	103.7195	-0.0039	1.0861	42.4385	3	2.0544	2.9413	82.5358	0.8205	12.4485	1.3530	0.0051	10.5043	0.0030

Jordan	0.6682	69.1433	-0.0539	4.7800	90.0933	3	3.7198	2.8267	129.0263	2.0126	27.9477	0.3478	0.0007	7.8400	0.0774
Kenya	0.5560	25.2081	-0.1060	9.4026	53.5490	2.4	3.9058	3.9413	29.6468	6.8860	11.9309	-0.9023	0.0512	6.2784	0.1196
South Korea	1.9548	97.5961	0.0130	1.6844	71.0533	2	2.7229	2.0586	85.7899	1.2881	8.8765	0.9608	0.0380	10.0010	0.0219
Kyrgyz Republic	0.9452	10.8979	-0.1096	22.6415	83.6225	3	1.7781	2.8379	2.0701	5.9133	22.5705	-1.2586	0.0352	6.2939	0.1029
Latvia	7.8790	66.0056	-0.7194	4.7455	56.2023	2	1.2618	2.7585	8.6215	2.3613	2.5104	0.6855	0.0599	8.9921	0.0639
Lithuania	2.2017	41.9194	-0.0095	3.5992	70.9029	2	1.1485	3.2342	32.6855	2.5224	5.1396	0.5574	0.0136	9.2335	0.0247
Macedonia	4.9626	36.3836	-0.0734	4.3124	73.2630	2	1.1922	2.1741	11.5777	3.4526	5.7234	-0.3507	0.0381	8.1606	0.0299
Malawi	0.0683	24.6329	-0.0628	22.2164	88.5132	2.75	4.9702	3.6410	31.8567	8.0923	9.5901	-0.2298	0.0478	5.9042	0.1022
Malaysia	2.3464	106.5914	-0.0250	2.6599	78.9632	3	2.8893	2.9504	133.1704	1.1706	14.3869	0.5220	10.2330	8.7083	0.0328
Malta	12.9481	111.8034	-0.1241	2.6933	91.0061	2.5714	2.5546	3.6506	48.6557	1.4969	17.2570	1.4333	0.0186	9.6866	0.0204
Mauritius	5.7528	15.2304	-0.0813	11.3225	66.3848	2			17.4870	4.6910	18.8834	0.9491	-0.0197	8.9380	0.0441
México	0.7912	16.8196	-0.0554	4.2940	54.6878	2	3.1019	2.5065	31.4575	3.5807	19.9613	-0.5169	0.0248	9.0007	0.0419
Mongolia	5.0738	34.1678	-0.0375	10.6610	89.8296		1.5922	2.5561	7.5371	2.5173	26.2683	-0.2990	0.0874	7.0953	0.1153
Montenegro	6.8352	61.0745	-0.0120	5.6951	72.8872	2	1.1933	2.6847	75.3722	3.7291	4.4570	-0.0790	0.0335	8.4021	0.0401
Morocco	0.6259	45.9561	-0.0324	8.3089	66.7289	3	2.8312	2.8417	30.9347	2.3957	33.7192	-0.0420	2.0413	7.5207	0.2418
Namibia	0.6949	44.8024	0.0561	5.2159	82.2687	4	2.9718	4.3516	2.1384	4.3863	9.1504	0.1544	0.0397	7.9593	0.0593
Nepal	0.4782	40.8052	-0.0570	4.9187	46.2907	1	4.1870	3.4340	33.3331	2.5527	1.6493	-0.6984	-0.0646	6.2785	0.0333
Netherlands	3.3432	114.1377	0.0144	-0.0039	84.6771	1.3	2.0071	2.0677	80.5370	1.0274	10.4496	1.7769	0.0139	10.6660	0.0180
New Zealand	18.1365	133.9380	-0.4392	1.5563	83.2855	1.2	-1.3322	0.5781	35.2033	1.4604	19.2336	1.8550	0.0146	10.2457	0.0303
Nigeria	0.6429	19.7717	-0.0184	7.4153	57.5208	2.2857	4.5486	3.4065	18.3489	7.1308	1.7289	-1.2194	0.0251	7.0795	0.0636
Norway	6.5950	75.1690	0.0901	2.3000	94.2499	2.4	1.0567	2.4515	48.5455	1.5841	6.8481	1.9169	1.6297	11.0869	0.0456
Oman	1.3838	32.4355	-0.0262	4.1676	78.9574	2.8888	1.4094	3.2721	33.2581	2.3551	15.7383	0.5444	-0.0452	9.1115	0.1072
Panama	16.1176	75.5531	-0.1434	5.0847	58.3876	2.2	2.5118	2.6331	29.3545	2.7679	25.0791	-0.1311	0.2627	8.5558	0.0644
Peru	2.1282	22.7920	-0.0977	18.3742	80.2297	2.3846	2.9481	3.8908	40.4406	4.4297	14.9219	-0.6384	0.0356	8.0707	0.0421
Philippines	0.2454	27.6621	-0.0487	4.3801	61.2199	2	3.1041	3.7506	44.7116	3.4679	16.6538	-0.4855	-0.0119	7.3008	0.0297
Poland	0.6669	35.5767	-0.1182	4.7261	59.2554	1.3333	2.8899	3.8542	32.7879	3.5634	7.9825	0.4794	0.0494	9.0958	0.0212
Portugal	4.2579	140.0698	-0.0602	5.1487	88.2472	3	1.7994	2.4009	36.1917	1.3476	10.5735	1.0779	-0.0014	9.8435	0.0196
Qatar	1.9254	35.8421	-0.0129	3.5480	88.1753	2.1667	1.7097	2.1059	96.2597	1.1218	28.5839	0.8309	0.1349	10.9711	0.0542
Romania	4.9675	24.8911	-0.0947	10.1195	62.5120	2.75	1.4724	2.4377	10.7686	4.2723	4.5239	-0.0941	-0.0386	8.5191	0.1101
Russian Federation	4.3814	33.9055	-0.0373	6.1070	30.5885	2	1.1543	3.2164	52.5943	17.8480	7.0297	-0.8431	25.3404	8.6833	0.0863
Serbia	1.9086	34.4868	-0.4106	8.9038	40.0838	2.75	2.2058	2.9719	28.0844	11.1234	11.8570	-0.5322	0.0316	8.2700	0.1022
Sierra Leone	0.0969	107.9267	0	16.5000	95.9464				147.5529	0.1727	11.4106	-1.4690	-0.0118	10.0869	-0.0059
Singapore	6.7685	95.0122	-0.1167	4.9167	90.9679	3.2222	-0.2716	1.3419	198.1518	1.8781	20.1104	1.6556	0.1295	10.2861	0.0403
Slovak Republic	3.7102	38.3530	-0.0414	5.9651	74.2071	2.3077	1.1549	3.2221	67.3744	2.7579	11.4406	0.4564	0.0910	9.4907	0.0361
Slovenia	3.5103	63.1513	-0.3365	3.7475	62.6695	1.9167	1.6434	3.0741	24.6874	2.3174	3.2349	0.9562	7.4587	9.8349	0.0785
South Africa	2.7119	71.0627	-0.1510	3.6661	80.4466	1.6250	1.1242	3.8708	226.9558	3.1575	12.1839	0.1113	0.0328	8.6744	0.0620
Spain	3.4603	133.4340	-0.5098	5.1237	74.2592	1.3571	2.3763	3.9202	76.0567	1.6025	14.1071	1.1393	3.6423	9.9398	0.0925
Sri Lanka	0.4112	27.6221	-0.1660	4.4168	63.0857	1	3.4716	3.5322	23.0543	3.6361	11.4418	-0.0025	0.0611	7.3576	0.0930
Suriname	0.7075	11.0874	-0.7228	13.8667	100				6.8805	5.7337	5.1126	-0.1920	0.0012	7.6923	0.1078
Sweden	3.2447	103.5489	-0.0807	3.1270	95.0084	1.6	-0.3567	2.7726	117.2918	1.3858	6.9318	1.8367	0.0054	10.6791	0.0018

Switzerland	2.4947	151.1285	-0.0715	2.6092	89.2398	1.7272	1.2653	2.8421	211.7445	1.8580	9.7265	1.8510	1.3690	10.9397	0.0529
Thailand	0.7307	98.4762	-0.0370	4.3241	46.4907	2	2.3632	3.4495	70.8117	1.9992	3.1873	-0.1235	0.0359	8.1111	0.0289
Tonga	1.6207	30.1480	-0.0760	5.8731	70.6849	2			41.4475	4.2034	18.1476	0.2572	0.0381	9.0903	0.0317
Uganda	0.6277	8.7348	-0.0611	11.4170	67.7621	2	4.6585	3.4895	4.1883	6.7190	2.0523	-0.5558	-0.0542	5.9845	0.1311
Ukraine	0.9498	32.9249	-0.1216	8.1749	61.8692	2	2.4082	3.4716	27.2805	4.7153	6.54701	-0.7728	0.0693	7.5504	0.1357
Uruguay	3.1716	23.4964	0.1531	8.9424	61.2950	3	3.6521	3.4398	0.4746	5.9907	3.3394	0.5608	0.0576	8.7141	0.0727
Vanuatu	5.0653	10.4901	-0.1732	7.5625	43.2604	3			5.6247	9.6282	9.7735	0.2397	0.0572	8.5789	0.1228
Zambia	0.8574	8.4891	-0.1163	15.2538	61.5044	4	3.3878	3.3333	23.7843	9.0025	2.2713	-0.5016	0.0475	6.6185	13.3762