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INSTITUTIONS, FIRM FINANCING, AND GROWTH

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Abstract

This paper reviews and synthesizes current knowledge on the role of institutions on firm financing and growth in developing countries. First, the paper presents stylized facts on the different institutional constraints under which firms in developing countries operate. Next, the paper focuses on firm size and age and how firm growth and financing patterns vary for small versus large firms and across firm life cycle in different institutional contexts. Finally the paper looks at the role of institutions versus initial starting characteristics of firms in predicting growth and productivity over the lifecycle and highlights areas needing additional research.

Keywords: Financial development, Institutions, Growth, SMEs

Institutions matter for growth and inclusive development, but despite increasing awareness of the importance of institutions on economic outcomes, there is little evidence on how positive institutional change can be achieved. The Economic Development and Institutions – EDI – research programme aims to fill this knowledge gap by working with some of the finest economic thinkers and social scientists across the globe.

The programme was launched in 2015 and will run for five years. It is made up of four parallel research activities: path-finding papers, institutional diagnostic, coordinated randomised control trials, and case studies. The programme is funded by the UK Department for International Development. For more information see http://edi.opml.co.uk.

1 Introduction

Recent development theory has shown financial development to be a critical determinant of entrepreneurship, innovation, and growth. However, access to finance and its determinants, vary widely across firms and country-level institutions. Financial economists also disagree on the role different types of financial systems, bank versus market based, informal versus formal play in a country's development. Research that analyzes the role of different institutions on firm financing and their differential impact at the firm level is crucial in shaping policy prescriptions for developing countries.

In this paper, we compile and assess the current knowledge on the role of institutions on firm financing and growth in developing countries. In Section 2, we begin with a description of the different institutional constraints facing firms in developing economies. First, we highlight research establishing the link between financial development and economic growth. An extensive body of work in this area included cross-country, industry-level, and firm-level empirical evidence showing that access to external finance has a positive effect on growth. We then discuss the literature in law and finance that has established the importance of legal institutions and property rights protection for financial development and has shown that many developing countries have weak legal institutions that do not support the rights of investors or afford contract protection. Firms and investors in these economies are also impeded by information barriers arising from poor accounting standards and lack of adequate information sharing through credit bureaus and public credit registries. Compounding these constraints is the role of government intervention in the form of state directed lending programs, corruption, and favoring politically connected firms.

In Section 3, we discuss and critique the empirical challenges in development finance research and the different techniques that have evolved to address these challenges including cross-country regressions, instrumental variable approaches, panel data methods, and randomized control trials. We also highlight how data issues and measurement error problems are more serious in development finance research compared to corporate finance research in developed economies.

In Section 4, we focus on corporate finance issues related to the firm and how they are affected by the institutions we discuss in section 2. We detail how firm financing patterns and capital structure choices vary between developed and developing countries. In this section, we also review the literature on financing constraints faced by firms – both accounting measures as well as firms' perceptions of financing constraints - and their impact on firm growth.

Section 5 addresses the prevalence of different financial systems across the world and their relative merits. We begin with a review of the evidence on bank versus market based systems and discuss research that shows that different financial structures may be better at promoting economic activity at different stages of a country's economic development. We also focus on the role played by informal finance and whether it can be a functional substitute to formal finance in developing countries.

In Section 6, we pay close attention to the role of firm size. We begin with a comparison of small versus large firms in growth, productivity, and job creation and how this might vary across developed versus developing countries. We note that firm size distributions in developing economies are dominated by micro and small firms. Small firms, especially informal micro firms, are the biggest creators of employment in many of these countries. However, an examination of the financing patterns across firm sizes reveals that small firms are more

constrained than large firms in access to external finance. This is important since although informal finance is very prevalent in many economies, at the margin it seems to be bank finance that is associated with firm growth. We then review the findings about large firms in developing economies and the evidence on the missing middle in firm size distributions.

In Section 7, we summarize the current knowledge on finance and growth over firm life-cycle and how this varies between developed and developing countries. We examine the role of institutions versus initial starting characteristics of firms in predicting growth and productivity over the life-cycle. This allows us to examine the primacy of institutions over other factors at different stages of a firm's life. In Section 8, we highlight areas that need additional research and conclude with policy implications of the existing body of theoretical and empirical evidence on institutions and firm financing for low income countries.

2 First generation literature on Institutions, Finance, and Growth

While a detailed review of the theoretical literature on the history of economic thought on financial development and growth is beyond the scope of this paper, we summarize below the findings of this literature on why a financial system matters for economic growth. In particular, a financial system serves the following roles:

Monitoring: Diamond (1984)'s model of delegated monitoring illustrates how financial intermediaries such as banks have an incentive to act as a delegated monitor and produce the information necessary for an efficient allocation of resources. Others focus on how debt contracts lower the cost monitoring firm insiders and reduce free cash flow thereby decreasing managerial slack (e.g. Townsend (1979), Gale and Hellwig (1985), and Aghion, Dewatripont, and Rey (1999)). A large and influential literature since Jensen and Meckling (1976) has also highlighted the role played by stock markets in promoting corporate governance. Stock markets help align managerial incentives with those of owners through the market for corporate control (Scharfstein (1988) and Stein (1988)) and by linking managerial compensation to stock performance (Diamond and Verrecchia (1982)).

Information Production and Capital Allocation: Early finance literature since Schumpeter (1912) has stressed the role played by finance in identifying the best ideas and allocating capital to entrepreneurs with the best chances of undertaking innovative activity (e.g. Goldsmith (1969), McKinnon (1973), and Shaw (1973)). From Goldsmith (1969): finance "accelerates economic growth and improves economic performance to the extent that it facilitates the migration of funds to the best user, i.e., to the place in the economic system where the funds will yield the highest social return" This is possible because financial intermediaries such as banks reduce the costs of acquiring and processing information which improves the ex-ante assessment of investment opportunities leading to better resource allocation and thus accelerating economic growth (e.g. Boyd and Prescott(1986), Greenwood and Jovanovic (1990)). Other literature has stressed the role played by liquid stock markets in information production (Grossman and Stiglitz (1980), Kyle (1984), Merton (1987))[1].

Risk Sharing: One of the most important functions of the financial system is risk sharing. Several papers have shown how financial markets make it easier for people to diversify the risk associated with individual projects, firms, or industries (e.g. Greenwood and Jovanovic (1990), Obstfeld (1994), Devereux and Smith (1994)). While these studies focus on the cross-sectional diversification of risk, Allen and Gale (1997) focus on intertemporal smoothing of risks that cannot be diversified at a given point in time such as macroeconomic shocks. Allen and Gale (1997) show that financial intermediaries facilitate this type of risk sharing by building reserves when the returns on the banks' assets are high and running them down when they are low.

[1] Morck, Yeung, and Yu (2000) provide tests of the information content of stock markets.

Transaction Costs Reduction: Greenwood and Smith (1996) model the link between transaction costs, specialization and innovation and show that financial systems that lower transaction costs facilitate greater specialization, technological innovation, and growth.

Savings Mobilization: Financial systems facilitate the pooling of savings of individuals and disparate investors allowing them to exploit economies of scale and overcome investment indivisibilities. The development of financial intermediaries has long been argued to elicit increased savings (Cameron (1967), McKinnon (1973), Pagano (1993)). In the model by Acemoglu and Zilibotti (1997), an increase in the volume of intermediation is associated with greater mobilization of savings allowing agents to hold a diversified portfolio of risky projects that fosters better resource allocation toward higher return activities

2.1. Empirical Evidence on Finance and Growth

An extensive literature has focused on establishing the empirical linkages between finance and growth. Modern cross-country growth regressions work began with King and Levine (1993) who using data on 80 countries over the 1960-1989 period, reported a strong positive association between financial development and real per capita GDP growth and the rate of physical capital accumulation. Levine and Zervos (1998) showed that stock market liquidity is also a predictor of long-run economic growth and that stock markets provide different services from banks. Figure 1 illustrates the commonly used measures of financial system size and shows a positive correlation between the development of financial systems and level of income.

Following this early work, several papers focused on establishing whether the relationship between financial development and growth was causal. Studies focused on panel data such as Levine, Loayza, and Beck (2000) and Beck, Levine, and Loayza (2000) use a panel GMM estimator to exploit the time series variation in the data and overcome the unobserved country-specific heterogeneity in pure cross-country data regressions. Levine, Loayza, and Beck (2000) also use the La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) measures of legal origin as instrumental variables that explain cross country differences in financial development but are uncorrelated with economic growth beyond their link with financial development. As discussed in LLSV (1998) and Beck, Demirguc-Kunt, and Levine (2005), legal origins such as the English common law that protects the rights of external investors and enforces these rights effectively is associated with greater financial development compared to legal traditions such as French Civil Law that are less protective of investor rights. And since legal traditions spread around the world based on occupation and colonial conquest, they may be plausibly treated to be exogenous.

A second approach to addressing causality has been to use micro data at the industry and firm level. In an influential study, Rajan and Zingales (1998) argue that industries that are naturally more heavily dependent on external finance should benefit disproportionately more from greater financial development than industries that are not naturally heavy users of external finance. They first use the extent to which industries in the US depend on external finance to develop an industry index of external finance, based on the assumption that since U.S. financial markets are developed, sophisticated, have fewer market imperfections and relatively open they should allow US firms to achieve their

desired financial structure. Thus assuming that there are technological reasons why some industries depend more on external finance than others, the RZ index offers an exogenous way to identify the extent of external dependence of an industry anywhere in the world. The methodology does not require that the US markets are perfect but rather that market imperfections in the US do not distort the ranking of industries in terms of their technological dependence on external financing. Next they use a difference in difference approach where they use variation across industries in their dependence on external finance and variation across countries in their level of financial development to assess the impact of finance on industry growth[2]. Wurgler (2000) also employs industry-level data and computes investment elasticity that shows that countries with higher levels of financial development are better able than countries with lower levels at increasing (decreasing) investment in growing (declining) industries.

Demirguc-Kunt and Maksimovic (1998) adopt a more micro level approach by using a financial planning model that allows them to calculate how fast firms could be expected to grow without external finance but instead only with retained earnings and cash from operations. They first show that the extent to which firms are able to grow faster than this internally financed growth rate is a function of the dependence of firm's growth on external finance as measured by the proportions of increases in total assets financed by long-term debt and newly issued shares. They then also establish that the proportion of firms that grow at rates exceeding the non- externally-financed rate is positively associated with stock market liquidity, banking system size and the perceived efficiency of the legal system.

Other approaches have been to use regional analysis within a country. Guiso, Sapienza, and Zingales (2004) examine differences in financial development across regions in Italy, particularly on small firms and entrepreneurship and find that local financial development matters for economic success.

Taken as a whole, the bulk of existing research has shown that countries with better functioning banks and markets grow faster even after accounting for endogeneity. The work on the channels through which finance should affect growth has been more limited. Levine, Loayza, and Beck (2000) shown that financial sector development helps economic growth through more efficient resource allocation rather than through increases in the scale of investment or savings mobilization. Bekaert, Harvey, and Lundblad (2001, 2005) focus on financial liberalization and in a cross-country setting show that liberalization boosts economic growth by improving the allocation of resources and the investment rate.

Other studies have focused on establishing a link between finance and innovation. In a cross-country setting, Hsu, Tian, and Xu (2014) show that financial market development

[2] Fisman and Love (2007) critique the Rajan and Zingales (1998) methodology as not measuring the extent to which financial systems foster growth of inherently financially dependent industries but rather measuring whether financial intermediaries allow firms to respond to global shocks to growth opportunities. Notwithstanding, the methodology has found extensive use in finance. Beck (2002, 2003) use the methodology to show that financial development influences the structure of trade balances; Cetorelli and Gambera (2001) use it to show that bank concentration promotes growth of industries that are heavy users of external finance; Claessens and Levine (2005) build on Rajan- Zingales to examine the joint impact of financial development and property rights protection on access to finance; and Beck, Demirguc-Kunt, and Levine (2004) show that industries that are naturally composed of smaller firms grow faster in countries with better-developed financial systems.

affects technological innovation using data on 32 developed and emerging countries. Using patent data on large publicly traded US corporations, Atansosov (2015) shows that arm's length financing such as public debt and equity is associated with greater innovation and higher-quality innovation than relationship based banking. While these studies have focused on large publicly traded firms, Ayyagari, Demirguc-Kunt, and Maksimovic (2011) use Enterprise Surveys (from the World Bank) across 47 developing economies and find that the externally financed proportion of a firm's investment expenditures is positively related to firm innovation, controlling for investment opportunities The highlight in their paper is that they define innovation broadly to include not only core innovation activities, such as introducing new product lines and new technology, but also sourcing decisions that affect the overall organization of firms activities, and other types of activities that promote knowledge transfers, such as signing joint ventures with foreign partners and obtaining new licensing agreements, all of which reflect overall firm dynamism.

Other studies such as Klapper, Laeven, and Rajan (2006) identify an entrepreneurship channel through which finance affects growth. They use data on more than 3 million firms across Europe across the Amadeus database and find that facilitating easier access to external finance via accounting standards and property rights protection is positively related to the number of start-ups.

2.2. Legal traditions and Property Rights

The finding that financial development has a causal impact on growth raises the critical question of why is it that some countries have well-developed financing systems whereas others do not. In a series of papers on the Law and Finance view, La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998, 2000, henceforth LLSV) advance the idea that in countries where legal systems support private contractual agreements, enforce property rights, and protect the rights of shareholders and creditors, investors are more willing to finance firms leading to more developed stock markets and banking systems. This view follows naturally from corporate finance theory that stresses that a firm is a nexus of contracts (Jensen and Meckling, 1976) and laws and the degree to which courts enforce these laws shapes the types of contracts used to address agency problems. This literature also recognizes that countries' laws are typically transplanted from a Few legal traditions – English common law, French Civil law, German Civil law, and Scandinavian Civil Law – though imitation, conquest, or imperialism.

There are two dominant views on how legal origin may influence financial development (Hayek, 1960). First is the Political channel where scholars argue that legal traditions differ in the emphasis they place on protecting the rights of private investors versus the State, which forms the foundation for financial development. Common-law countries give investors the strongest legal rights whereas French-civil-law countries have the weakest protection and thus common-law countries have better developed financial systems. The second is the Adaptability mechanism which argues that legal systems that were quick to adapt to changing circumstances were more able to meet the financial needs of the economy (Merryman, 1985). Thus legal systems that embrace case law and judicial discretion (e.g. Common-law traditions) tend to adapt more efficiently to changing conditions than those that adhere to formalistic procedures. Beck, Demirguc-Kunt, and

Levine (2005) find more support for the adapatability channel than the political channel. Related to adaptability, Djankov et al (2003) focus on judicial formalism and find that legal formalism is lower in common law countries and less legal formalism is associated with less corruption. Acemoglu and Johnson (2005) use legal origin as an instrument for legal formalism and find that the exogenous component of legal formalism is associated with stock market development, i.e. greater legal formalism lowers stock market development consistent with the adaptability mechanism.

While the LLSV papers are mostly cross-country studies, there is significant microeconomic-based work relating investor protection laws and corporate financing decisions of firms. Demirguc-Kunt and Maksimovic (1998) show that countries with better investor rights have better functioning financial systems that fund faster growing firms. Other studies link stronger investor protection laws to higher corporate valuations (e.g. Claessens, et al., (2002), LLSV (2002), and Caprio, et al, (2003)), ownership concentration and private benefits of corporate control (e.g. Claessens et al. 2000; LLS, 1999; Zingales, 1994; Dyck and Zinglaes, 2003), cross-firm and cross-industry capital allocation (Wurgler, 2000; Beck and Levine, 2002), the informational efficiency of stock prices (Morck, Yeung, and Yu, 2000), financial fragility (Johnson, et al., 2000), and corporate governance ratings (Doidge, Karolyi, and Stulz, 2004).

The Law and Finance view however is not without its sceptics. Some researchers emphasize the political roots of legal institutions and argue that politics determines the degree of investor protection laws and hence the development of financial markets (see Rajan and Zingales (2003), Haber (2004), Haber, Maurer, and Razo (2003), Pagano and Volpin (2001), and Roe (1994)). Scholars highlighting culture (e.g. Stulz and Williamson (2003)) highlight the role of religion in shaping creditor rights while Guiso, Sapienza, and Zingales (2004) highlight the role of social capital in shaping financial systems. Most significantly, the geography/endowment view put forth by Diamond, 1997; Engerman and Sokoloff, 1997; 2002; Acemoglu, Johnson, and Robinson, 2001; 2002 emphasize the critical role of differences in geography and disease environment that have shaped institutional development. Others including Easterly and Levine (1997), Tavares and Wacziarg (2001), and Alesina et al. (2003) argue that the extent of ethnic fractionalization in a county has a negative effect on economic growth and quality of government.

Ayyagari, Demirguc-Kunt, and Maksimovic (2008, 2012) run an empirical horse-race between the various theories to test which institutional theory best explains the variation in property rights protection as perceived by firms and find maximum support for ethnic fractionalization. Using the World Business Environment Survey which surveys firms across 62 developing countries on their perceptions of how well protected their property rights are in practice, they also show that the dominance of the Law and Finance view in explaining property rights variation depends critically on sample selection, specifically with the inclusion of former Socialist economies, which arguably have more in common than just legal tradition.

Overall there has been an active debate in the literature on the role of legal institutions in shaping financial development with several alternate theories being put forward. In addition, some studies have questioned the fundamental premise that stronger creditor rights is always linked to greater financial development and access to finance. Using the

passage of a secured transactions law which strengthened creditor rights in India as a natural experiment, Vig (2013) shows that there is a threshold level of creditor rights beyond which strengthening creditor rights leads to reduction in the quantity of secured debt. Acharya, Amihud, and Litov (2011) also show that stronger creditor rights in bankruptcy induces firms to engage in reduced risk taking which in turn decreases value. Thus the differential impact of stronger creditor rights on different types of firms is an active area of research.

2.3. Information quality and availability

A firm's information environment plays a critical role in financing (both access to credit and cost of capital) and corporate governance, thus impacting overall firm-value. There are two main sources of this information - first is the credit information sharing schemes that reduce asymmetric information between lenders and borrowers. These schemes allow lenders to disseminate to other lenders knowledge of borrowers' payment history, total debt exposure, and overall credit worthiness, either through a privately held credit bureau or publicly regulated credit registry, thus bridging the information divide between lenders and borrowers[3].

Mylenko (2003) find that existence of private credit registries is associated with lower financing constraints and

The information sharing that occurs through credit bureaus and registries is particularly relevant for small firms in developing countries. Seminal work by Stiglitz and Weiss (1981) shows that asymmetric information prevents efficient allocation of lending such that demand for credit exceeds supply, driving a wedge between lending and borrowing rates, also resulting in credit rationing. Theoretical studies emphasize the different channels through which information sharing can potentially impact firm financing – reduced adverse selection and increase in the volume and efficiency of lending (Pagano and Jappelli, 1993), reputation effects leading to higher repayment of loans and lower default rates (Klein, 1992), and increased borrower disciplines and reduced moral hazard (Vercammen, 1995; Padilla and Pagano, 1997; Padilla and Pagano, 2000).

There has been a large empirical literature documenting the positive impact of credit sharing schemes. In cross-country work, Jappelli and Pagano (2002) and Djankov, McLiesh, and Shleifer (2007) collect data on the existence and operation of credit bureaus around the world and find that bank lending is higher and credit risk is lower in countries where lenders share information. Galindo and Miller (2001) use firm-level data, albeit in a cross-section setting and find that scope and quality of credit information schemes are

[3] Private credit bureaus operate on the principle of reciprocity collecting and distributing the information supplied by its members whereas public credit registries are managed by country central banks that mandate the reporting of data on borrowers. Some studies point to the differing impact of private versus public credit registries. Love and higher share of bank financing, while the existence of public credit registries is not. Djankov, McLiesh, and Shleifer (2007) find that public registries are associated with more private credit only in poorer countries.

correlated with lower financing constraints. Brown, Jappelli, and Pagano use firm-level panel data that allows them to control for unobserved firm heterogeneity for 24 countries in 2002 from Eastern Europe and the Former Soviet Union and show that greater, information sharing is associated with improved availability and lower cost of credit to firms, especially for more opaque firms and for firms in countries with weak legal environments.

These findings are not causal so while the above studies suggest that banks lend more to firms in countries with information sharing systems than in countries without these systems, they do not suggest that the implementation of an information sharing scheme caused banks to lend more to firms. More recent work has paid closer attention to causality concerns using a difference-in-difference setting and/or matching methods. Love, Martinez Peria, and Singh (2013) find that introducing collateral registries for movable assets increases firms' access to bank finance especially for smaller firms. Ayyagari, Juarros, Martinez-Peria, and Singh (2016) use the introduction of credit bureaus as an exogenous shock to the supply of credit in over 4 million firms in 29 developing countries and find that the resulting access to finance results in higher employment growth, especially among micro, small, and medium enterprises.

Another strand of the literature has used natural or randomized experiments to examine the implementation of credit information systems that showed variation in either the firms covered under the information system or in the use of information by lenders. The findings can be attributed to be causal under the assumption that the counterfactual is valid (i.e., the treatment and comparison groups are indeed comparable in terms of their observable and unobservable.

For instance, Hertzberg, Liberti, and Paravasini (2011) use the expansion of the Public Credit Registry in Argentina in 1998 as a natural experiment to show coordination between lenders to new information. Prior to 1998, the registry only covered borrowers with total debt above $200,000 and this threshold was eliminated in 1998 leading to the disclosure of information about additional borrowers, for which credit assessments were previously only known privately. The reform was announced in April 1998 and implemented in July of that year. Hertzberg, Liberti, and Paravisini study the difference in lenders' behavior between prior to the announcement and the period between announcement and implementation for borrowers below the threshold and on whom the lender has negative information. While the announcement generates no new information for this sample of borrowers, the fact that the information is now public leads the lender to reduce lending because the lender realizes that other lenders would reduce credit once the information is public. They do not find a decrease in debt for firms that were slightly above the threshold (for whom the information was always available) and for those who borrow from only one lender (for whom there is no coordination problem). Their results are demonstrated in Figure 2.

Other studies that study the effects of the introduction of a new credit registry in different countries include Liberti, Seru, and Vig (2016) in Argentina, Luoto, McIntosh, and Wydick (2007) and de Janvry, McIntosh, and Sadoulet (2010) in Guatemala; Behr and Sonnekalb (2012) in Albania; and Cheng and Degryse (2010) in China. While these studies are able to provide clean identification, they have limited generalizability since they are focused on

single countries or identify a very local effect (for instance, the Hertzberg paper tells us about lender behavior for borrowers around the $200,000 threshhold).

A parallel literature has focused on information sharing in capital markets. Merton (1987)'s investor recognition hypothesis describes how firm value is increasing in the degree of investor recognition of the firm. Investors buy and hold only those securities about which they have enough information. Greater transparency and better quality of firm specific information also makes for more efficient contracting between management and investors and makes it easier for firms to identify good investment opportunities. One strand of this literature has used the quality of accounting standards in a country as a measure of information quality, at least on the large public firms. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998, 1999) compile an index of accounting standards across countries and find that the quality of accounting standards varies by legal origins. They show that countries with an English legal tradition have better accounting standards than French or German Civil Law countries. Leuz, Nanda, and Wysocki (2003) also establish a link between a country's legal and institutional environment and the quality of accounting earnings reported to investors. Others have shown that cross- country differences in accounting standards also explain differences in financial development (e.g. Levine, Loayza, and Beck (2000)), and volume of mergers and acquisitions (Rossi and Volpin (2004)).

A second stream of literature has focused on different measures of firm-level information quality. Several papers have used the number of analysts following the firm and the accuracy of analyst forecasts as measure of the information environment of the firm (see Lang and Lundholm, 1996; Healy, Hutton, and Palepu, 1999; Gebhardt, Lee, and Swaminathan, 2001, Lang, Lins, and Miller, 2003). The literature on cross-listings in the US considers the extensive information disclosure associated with meeting disclosure requirements mandated by the SEC and the listing exchange and shows that it leads to improved analyst coverage, more accurate earnings forecasts and higher valuations (e.g. Baker, Nosfinger, and Weaver, 2002; Lang , Lins, and Miller, 2003; Sarkissian and Schill, 2004; Bailey, Karolyi, and Salva, 2006)[4]. Mitton (2002) shows that higher disclosure quality as proxied by a cross-listing and having a Big Six international accounting firm as an auditor was associated with a better stock price performance during the East Asian crisis. Other studies such as Durnev and Kim (2005) find that firm-level governance and disclosure is positively related to a firm's growth opportunities and need for external financing.

2.4. Government Intervention, Corruption and Political Ties

In this section we examine the implications of government ownership in financial markets. In particular, we examine three specific issues: state ownership of banks and directed lending programs, political elitism where the government in power favors certain firms that they are politically associated with, and public rent seeking by government officials.

A large literature has examined the implications of government ownership in financial markets. Several papers have shown that not only is government ownership of banks

[4] Karolyi (2006) provides an excellent review of the cross-listings literature.

pervasive around the world, especially in countries with poor institutions but also is associated with poorer financial development, growth, and productivity (e.g. Barth et al. (2001), La Porta et al. (2002)). Dinc (2005) also uses a cross-country setting to show that government owned banks increase their lending in election years relative to private banks in 22 emerging markets. Other studies use a more detailed single-country approach to analyze the consequences of government lending. Using loan-level data from Pakistan, Khwaja and Mian (2005) find that government banks differentially favor politically connected firms by providing greater access to credit - firms that are politically connected borrow 45% more but also have 50% higher default rates. Sapienza (2004) also finds that Italian public banks charge lower interest rates than private banks and stronger the political party in the area where the firm is borrowing, the lower the interest rates charged. Cole (2009) studies agricultural lending by government banks in India and finds that government owned bank lending tracks the electoral cycle with agricultural credit increasing by 5-10 percentage points in an election year. Carvalho (2014) studies Brazilian manufacturing plants and finds that in exchange for government bank loans, firms expand employment and investment in politically attractive regions.

A second stream of literature on political connections shows that firms actively establish political connections and that political connections increase firm value (e.g. Fisman (2001); Johnson and Mitton (2003); Faccio (2006); Goldman, Rocholl and So (2009); Cooper et al. (2010)). The typical channels through which political contributions are found to be beneficial are preferential access to credit (Dinc (2005); Khwaja and Mian (2005)) and receipt of government bailout funds during periods of financial distress (e.g. Duchin and Sosyura (2012), Faccio, Masulis, and McConnell (2006), Johnson and Mitton (2003)).

Others studies argue that political connections are detrimental to firm value. Fan, Wong, and Zhang (2007) analyze the post-IPO performance of newly privatized SOEs in China and find that Chinese firms with politically connected CEOs underperform those without politically connected CEOs in terms of stock returns, earnings growth, sales growth, and return on sales. A parallel literature on privatization provides direct evidence on how the politicization of firm investment may prove detrimental to firm's public shareholders. Dinc and Gupta (2011) find that political patronage plays a significant role in the privatization decisions of Indian firms. They find that privatization is delayed if the main operations of a firm are located in more competitive electoral districts and no government-owned firm located in the home state of the politician in charge is ever privatized. Other studies have examined the role of politics on investment. In a cross-country setting, Julio and Yook (2012) and Durnev (2012) find that political uncertainty surrounding elections leads to a drop in investments and investment-sensitivity to stock prices during election years. Alok and Ayyagari (2015) document a political investment cycle in the corporate investment decisions of state owned firms in India. They show that state owned firms announce more capital investment projects in election years and these hat projects have negative announcement returns suggesting that political influence results in projects that are likely value destroying.

Finally one of the most commonly studied aspects of government intervention in economies, especially in developing countries, is public rent seeking by government officials. Corruption is commonly defined as the “misuse of public office for private gain” (Svensson (2005) or more specifically as the “sale by government officials of government

property for personal gain" (Shleifer and Vishny (1993)). In their seminal paper on corruption, Shleifer and Vishny (1993) show that corruption is costly to investment and economic development because of two main reasons: First, with a weak central government that cannot prevent individual government agencies from soliciting complementary bribes, the cumulative burden of bribes increases, thus hindering investment and growth. Second, the secrecy of corruption leads to investment distortions from high value projects to those that offer greater opportunities for hidden corruption. The solution they argue is to have better accounting systems (e.g. in the

collection of taxes and custom duties) that prevent agents from stealing from the government and economic and political competition that can reduce the level of corruption and its adverse effects. Murphy, Shleifer, and Vishny (1994) argue that public rent seeking by government officials is particularly harmful for innovation since innovators are more vulnerable than established firms because they have a high (and inelastic) demand for government-supplied goods such as permits and licenses. Other theoretical frameworks of corruption and government intervention include Rose-Ackerman (1978), Banerjee (1997), Bliss and Di Tella (1997), Ades and Di Tella (1999), and Acemoglu and Verdier (2000).

The adverse consequences of corruption have been well established by a number of empirical studies. Several cross-country and country-specific studies have established that corruption hinders trade and investment and impedes financial development and growth (e.g. Mauro, 1995; 1997; Wei, 2000; Fisman and Svensson, 2006). Ayyagari, Demirguc-Kunt, and Maksimovic (2010) use data on bribe payments across 25,000 firms in 57 countries and show that corruption is indeed a tax on innovation as suggested by Murphy, Shleifer, and Vishny (1994). They find that innovating firms pay more bribes to government officials than non- innovating firms and that innovating firms that pay bribes do not receive better services than firms that do not bribe. Bardhan (1997) and Tanzi (1998) provide excellent reviews of the empirical work on corruption. More recently, Banerjee, Mullainathan, and Hanna (2012) highlight gaps in the theoretical and empirical literature on corruption and recommend moving away from a crime and punishment approach to understanding the nature of the particular economic decision or the task that the bureaucrat is participating in.

3 Empirical challenges in development finance research

In recent years much work has identified challenges to the study of the effect of institutions in empirical finance that, turn out to be more severe than the earlier literature had recognized. Some of these challenges arise from the emphasis, required for policy prescriptions, on rigorously characterizing causal relations, rather than on assuming causality in statistical relations, and others from data issues. This section briefly highlights the principal concerns and discusses some alternative approaches that have been adopted.

A great deal of research on the effect of institutions on firm growth is inherently comparative in nature: often asking if the existence of some institution or law causes specific market imperfections, thereby affecting firm growth. Such studies employ econometric techniques, often in a cross-country setting and sometimes relying on natural experiments to identify the parameters of interest. Because some work is closely tied with the study of discrete policy interventions by government agencies, such as programs related to the financing of small and micro-enterprises, research in this area lends itself to randomized controlled trials (RCTs).

An early example of a study that uses traditional techniques in a natural experimental setting is Johnson and Mitton (2003). Johnson and Mitton trace out the effect of 1997 Asian financial crisis on the valuation of politically-connected firms in Malaysia. The 1997 financial crisis reduced the market value of Malaysian firms in general. However, it also led to changes in the regulatory regime, with implications for the expected value of government subsidies to politically connected firms. The study shows that one of the principal regulatory responses, the imposition of capital controls in September 1998, increased the relative valuations of firms affiliated to then Prime Minister Mahathir, and decreased the valuations firms connected to his principal political rival. Because the introduction of controls coincided with a major government realignment, it is possible to use the study to provide estimates of the value of connections to the political winners. The paper finds that “Malaysian capital controls provided a screen behind which favored firms could be supported.”

While RCTs are widely used in development economics (see, for example, Duflo, Glennerster, and Kremer, 2008), in the study of financial institutions they have most often been used to study small scale enterprises and issues such as financial literacy. Take, for example Cole, Sampson, and Zia (2010), which tests whether the low utilization of bank accounts in Indonesian villages can be attributed to a lack of financial literacy of villagers or to the various transactions costs associated with bank accounts. To test this, they randomly assign a program of lessons on bank accounts to half of a sample of 564 households. Independently, they randomly offer payments, ranging from U.S. $3 to $14, for opening a bank account to a different group. They find that direct payments for opening bank accounts had a greater effect on the use of bank accounts than the program of financial literacy they provided to the villagers. RCTs and natural experiments have high internal validity provided that the required randomization and exogeneity conditions,

respectively, are satisfied. Both techniques are also relatively easy to understand and compelling[5].

Unfortunately, for a large range of issues involving first order policy questions, RCTs are not feasible (Rodrik, 2008). Moreover, an issue arises in that RCTs involving institutions are by their nature not double blind. Bulte, Pan, Hella, Beekman and Di Falco (2014) argue, the experiments that are not double-blind can give rise to a pseudo-placebo effect which causes the subjects to alter their behavior. They show in the context of an agricultural experiment in which the participating farmers altered their behavior when they received randomly assigned familiar and unfamiliar seeds, that these pseudo-placebo effects may be large and can explain the entire treatment effect on the treated, as conventionally measured.

In many other cases, the RCT and quasi-experimental approaches requires policymakers to extrapolate conclusions about policies from a very specific instance and specific institutional arrangements. This is difficult to do well. In practice, attempts to do this often amount to informal matching on observables between the sample and the countries of interest. However, attempts to generalize like this, obviate the principal advantage of RCTs, that in-sample they are not dependent on matching on observables but also randomize over unobserved characteristics (Cartwright, 2007). As a result of these difficulties in implementation of RCTs and natural experiments, the practical choices are often between a more limited study using quasi-experimental techniques and a cross-country study using more descriptive techniques, augmented with instrumental variable approach as feasible.

A widely adopted, approach along these lines to studying the effect of institutions is based on Rajan and Zingales (1998)'s analysis of how financial development affects the growth rate of industries across the world. They test the hypothesis that industries that some industries depend more on external financing than others and that the more dependent industries grow faster in countries with well-developed financial systems, which are better able to provide the required financing. Clearly there is an obvious concern that any results obtained might be contaminated by reverse causality.

To circumvent this problem, Rajan and Zingales (1998) use U.S. data to classify industries into financially and financially independent industries. This classification does not depend on conditions in developing countries or growth rates of industries in developing countries, thus avoiding any potential reverse causality.

Given a classification using U.S. data, Rajan and Zingales use a difference-in-differences approach where they use variation across industries in their dependence on external finance and variation across countries in their level of financial development to assess the impact of finance on industry growth. The identifying assumption using this approach is that industries that are financially dependent in the U.S. are financially dependent in developing countries.

To be valid, instruments have to be both sufficiently inflexible as to be unaffected by the usual ups and downs of the economy and important enough to affect government and

[5] Cox (1958) is a standard reference source.

corporate policies, yet have no direct effects on the dependent variables of interest. Several ingenious solutions have been proposed. Acemoglu, Johnson, and Robinson (2001), for example, use mortality rates of early European settlers in colonies as an instrument for the quality of the legal systems in those countries today[6]. How plausible one finds such instruments in cross-country studies is a matter of judgment.

As Deaton (2010) points out, both RCTs and econometric techniques depending on IVs work best when the entities studied are relatively homogeneous. When the subpopulations are sufficiently different that they react differently to a specific instrument, the use of an arbitrary IV estimator may not provide a good estimate of the mean effect in the population of a change in the explanatory variables. To clarify matters, consider an example in which the researcher is attempting to estimate the effect of the number of banking relationships a firm has on its growth, where the firms whether or not to attempt apply for a loan to a new bank. Since banking relationships are endogenous, one might want to instrument for the decision to apply. However, if firms are heterogeneous and different types of firms decide to apply to a new bank in response to different instruments, each instrumental estimate of the effect of banking relationships on growth will differ. Under conditions derived in Angrist and Imbens (1994), the estimates will each yield a local average treatment estimator (LATE)[7]. These will in general be different and depend on the specific instrument used. Deaton (2010) argues that, as a result, to be useful in addressing policy questions or testing theory, a formal model is often needed to clarify the interpretation of the instrumental variable estimates.

[6] The argument being that when the mortality rate was high, the legal system was set up to extract resources from the indigenous population rather than to protect property rights. See Murray for an econometric critique of this approach.
[7] See Angrist and Imbens (1994), Heckman (1996) and Heckman and Vytlacil (1999, 2007).

4 Institutions and Firm Financing

We focus on how differences in institutions between developing and developed countries affect two aspects of financing of firms: the provision of long term finance and on financial constraints, two areas important for firm growth. Long-term financing facilitates investment in long-term assets – property, plant, and equipment – and permits firms to engage in long term projects. To the extent that firms are financially constrained they will be unable to invest optimally, and will thereby realize lower growth rates.

Demirguc-Kunt and Maksimovic (1999) show that there exist economically significant differences in realized long term financing of firms in developed versus developing countries. They focus on the amount of long-term and short-term debt used to finance the firm's assets. Using a sample of publicly traded firms in 30 countries between 1980-1991, they show that firms in developed countries had more long term debt, after controlling for firm size. This difference, however, is mediated by the institutions in each country. Thus, they show that in countries with effective legal systems, large firms in countries use more long-term debt compared to short-term debt, while small firms do not respond in the same way to the effectiveness of the legal system. Their findings do not support the position that legal systems founded on the common-law tradition facilitate financing of firms using long-term debt. If anything, they find suggestive evidence that firms, both large and small, in countries with a common-law tradition use less long-term debt, relative to their assets, than firms in countries with a civil-law tradition.

Demirguc-Kunt and Maksimoviv (1999) obtain more definitive results when correlating the effect of the banking system and an index of how active the stock market is on the financing of firms. The size of the banking sector is associated with more long-term debt and less short-

long term debt for small firm. Large firms are unaffected. By contrast, stock market activity is positively associated with debt levels of large firms but not small firms. Thus, overall, institutions affect large and small public firms differentially - an effective legal system and an active stock market are associated with the provision of long-term debt to large firms, whereas a large banking system is associated with more long-term financing of smaller firms.

These results are consistent with the notion that the financing of smaller firms requires the existence of financial intermediaries that can closely monitor firms and provide funds as appropriate. Larger firms can obtain financing and monitoring in public markets. The types of institutions required for each purpose are somewhat different.

There have been a number of studies trying to determine which factors affect the use of debt and equity financing in developing countries, and how well these factors correspond to those found to affect financing in developed countries . For listed firms, Booth, Aivazian, Demirguc-Kunt, and Maksimovic (2001) find that while similar factors such as profitability and asset tangibility affect debt ratios in both developed and developing countries, there are also systematic differences in the way these ratios are affected by institutional factors

such as capital market development, GDP growth, and inflation. For unlisted firms, Giannetti (2003) uses data on from 26 European countries and finds that good creditor rights protection is important in obtaining financing for firms investing in intangible assets that cannot be easily used as collateral (e.g. R&D) and also those in sectors with high volatile returns. Fan, Titman, and Twite (2010) find that a country's taxation and inflation policies as well as its legal and financial institutions have an important effect on capital structure and debt maturity choices. Consistent with Modigliani and Miller (1958), firms use more debt relative to equity when dividends are more highly taxed. They also use less debt and debt of shorter maturity when inflation is lower, and use more short-term debt in countries that which score more highly on an index of corruption. Controlling for corruption, the legal tradition, i.e. common law versus civil law traditions, only influences the ratio of long-term to short-term debt and not the total amount of debt relative to assets[8].

A separate strand of the literature analyzes the financing of foreign-owned firms in developing countries. Desai, Foley, and Hines (2005) look at foreign affiliates of U.S. corporations find that multinational affiliates use less external debt in countries with underdeveloped capital markets and weak creditor rights and make greater use of internal capital markets (borrowings from parent companies) to overcome capital market imperfections. They also find the overall level and composition of debt to be very sensitive to tax incentives.

Overall the body of evidence suggests that institutional factors such as legal institutions, the level of banking and stock market development are important determinants of firms' leverage choices and choices short-term versus long-term debt.

Most of the above studies have focused on listed public firms, which tend to be large and perhaps unrepresentative of smaller firms, especially in developing countries. This is largely because data availability for private firms for many firms in developing countries is limited. However, a series of cross-country firm surveys conducted by the World Bank that have greatly expanded the information available about financing patterns of especially small and medium firms across countries. These sources include the Regional Program on Enterprise Development (RPED) studies for Sub-Saharan Africa in the 1990s; Business Environment and Enterprise Performance Surveys (BEEPS) for the transition economies; the World Business Environment

Survey (WBES), conducted across 80 countries in 1999–2000; and the Enterprise Surveys (ES), conducted since 2002 and available for almost 100 countries.

The Enterprise Surveys use standardized survey instruments and a uniform sampling methodology to benchmark the investment climate of countries across the world and to analyze firm performance. The sampling frame in each country is derived from the universe of registered businesses and follows a stratified random sampling methodology. These surveys include micro-, small, and medium enterprises that are not captured in

[8] There is a large literature in international economics on how globalization (both financial liberalization and financial crises events) might affect debt maturity structures (e.g. Rodrik and Velasco (1999), Schmukler and Vesperoni (2006), Caballero and Krishnamurthy (1998), Calvo (1998), Calvo and Mendoza (1996), Calvo and Reinhart (2000), Chang and Velasco (1999, 2001a), Furman and Stiglitz (1998), and Sachs, Tornell, and Velasco (1999)

data sets based on published financial statements more commonly base on listed firms. In addition to specific firm information, these surveys contain a large set of questions on the business environment in which the firm operates, the proportion of investment and working capital that is financed externally, and also the source of external financing comes (i.e., debt, equity, suppliers' credit, leasing, and other sources such as development banks, moneylenders, public sector or other informal sources). The more recent surveys also contain sampling weights that allow us to draw inferences about the population of firms in each country.

While several studies have used these surveys, their rich potential has not been sufficiently exposed. As an example, the data from the Enterprise Surveys, conducted from 2006-2010, shows that a large proportion of firms, especially small and medium firms, do not have any bank loans. The firm survey results suggest that this reflects both firms being refused bank loans as well as a lack of demand for bank loans either because of other financing sources or lack of good projects to finance. Some of the common reasons why firms claim that they are excluded from bank finance include high interest rates, collateral requirements, a perception on the part of firms that bank lending officers are often corrupt, and difficulties firms have in completing paperwork

Beck, Demirguc-Kunt, and Maksimovic (2008) is an example of a study that has used the World Business Environment Survey (WBES) to look at the financing of small firms. Beck, Demirguc-Kunt, and Maksimovic find that while the relation between the external financing of firm investment and institutions is weak, there is a strong relation between institutions and the form of external financing. Firms in countries with more developed institutions tend to use bank and equity financing, whereas in institutionally underdeveloped countries tend to use more trade credit finance. Asset-based lending such as factoring, fixed-asset lending, and leasing are do not substitute for bank finance in developing countries.

Financial constraints arise when firms are unable to invest in positive net present value projects because they are unable to obtain funds from external investors. In developed countries financial constraints are hypothesized to arise because of adverse selection in the market for external capital, and moral hazard, which arises from the agency conflicts between investors and the firms' insiders. Such constraints are likely to be even more severe in contexts where legal institutions are underdeveloped.

A dominant strand of this literature has developed methodologies to detect constraints indirectly using investment-cash flow sensitivities developed Fazzari, Hubbard, and Petersen (1988; 2000)[9] or the propensity of firms to save cash out of incremental cash flow (e.g. Almeida, Campello, and Weisbach, 2004). Most of these studies are based on listed firms in developed economies. Thus, the implications from these studies for financing constraints of firms in developing countries are unclear.

Beck, Demirguc- Kunt, and Maksimovic (2005) use survey data to provide the first direct evidence of whether firms in developing countries perceive themselves to be financially constrained and whether reported financing constraints are related to firm growth. They use a size-stratified survey of over 4000 firms in 54 countries, where firms reported on a

[9] Several papers have challenged the usefulness of investment-cash flow sensitivities to measure financing constraints on both theoretical and empirical grounds. See Kaplan and Zingales (1997, 2000), , Erickson and Whited (2000),

scale of 1 (no obstacle) to 4 (major obstacle) the extent to which financing, legal, and corruption problems presented obstacles to the operation and growth of their businesses. The Table 1 below, adapted from their paper, shows that all three obstacles have a negative and significant impact on firm growth when entered individually. When entered together, the effect of the corruption obstacle is subsumed by the other two. They also show that the smallest firms are consistently the most adversely affected by all obstacles. Financial and institutional development attenuates the relation between firm growth and reported financial, legal and corruption obstacles. Small firms benefit the most from developments in financial and legal institutions[10].

Firms in developing countries report a large list of institutional obstacles that affects their day-to-day operations and growth. Given this large list, it is unclear whether finance is a bindng constraint to growth compared to other reported obstacles, Ayyagari, Demirguc-Kunt, and Maksimovic (2008) attempt to address this question using survey data on the different obstacles to growth that firms report - access to finance, inadequate security and enforcement of property rights, poor provision of infrastructure, inefficient regulation and taxation, corruption and macroeconomic instability. They find that, in fact financing obstacles are of primary importance in limiting firm growth. Their methodology allows for each of the obstacles reported by firms in the survey to either affect firm growth directly, only indirectly through their influence on other factors, or to have no effect. Using regressions as well as Directed Acyclic Graph (DAG) methodology, they find that access to finance, emerges consistently as the most robust obstacle constraining firm growth. And of the many specific financing obstacles firms identify, only the cost of borrowing is directly associated with firm growth. But the cost of borrowing is itself affected by imperfections in financial markets such as difficulties with posting collateral, limited access to long-term financing, and firms that face high interest rates also perceive that the banks to which they have access are corrupt, underfunded, and require excessive paperwork.

Together, the studies reviewed in this section suggest that access to financing is one of the most constraining obstacles to growth for firms in developing countries and that it is, in turn, closely related to the firms' institutional environment.

[10] Beck, Demirguc-Kunt, Laeven, and Maksimovic (2006) use the same data and find that the financing obstacles are a function of firm characteristics such as size, age, and ownership (domestic versus foreign).

5. Financial Structure and Economic Development

5.1. Banks versus Markets

A large body of literature has emphasized the importance of financial structure – the mixture of financial institutions and securities markets in an economy – for economic development. Economic theory argues that banks and markets provide different financial services and have unique advantages in solving different types of financial frictions. The advantages of banks include more efficient information acquisition due to their long-run lending relationships with firms (Gerschenkron, 1962; Boot, Greenbaum and Thakor, 1993; Rajan and Zingales, 1999), better inter-temporal risk sharing services (Allen and Gale, 1997), superior corporate governance due to their ability to exert corporate control (e.g. Shleifer and Vishny (1997)), and savings mobilization (e.g. Lamoreaux, 1995). Well-developed stock markets on the other hand stimulate information production (e.g. Grossman and Stiglitz, 1980; Kyle, 1984), foster corporate governance by aligning interests of managers and owners via takeover threats and linking managerial compensation to stock prices (e.g. Diamond and Verrecchia, 1982; Jensen and Murphy, 1990, Scharfstein, 1988; Stein, 1988), encourage innovation and intrepreneurship, and are better at cross-sectional risk sharing (e.g. Allen and Gale, 1997).

While much of the theoretical literature has framed this debate as banks versus markets i.e. that banks and markets compete and develop at the expense of the other ((Allen and Gale, 1997, 1999; Boot and Thakor, 1997a; Dewatripont and Maskin, 1995), other studies emphasize the complementarity between banks and markets (e.g. Allen and Gale (2000), Holmstrom and Tirole (1997) and Song and Thakor (2010)).

The empirical literature however has found no evidence that one type of financial structure is better than another for access to finance or growth. Financial structure has not been shown to explain cross-country differences in financial development (e.g. Levine (2002) or differential growth rates of financially dependent industries across countries (e.g. Beck and Levine (2002)). Demirguc-Kunt and Maksimovic (2002) also reject the idea that firms' access to external financing is a function of the relative development of stock markets to banks.

Schmukler and Vesperoni (2001) argue that the difference between bank-based versus market- based systems is less important than the difference between emerging and developed economies for firms' financing choices –sources of financing, leverage ratios, and maturity structure.

This is not to say that financial structure does not matter. As discussed in section 4, there is some literature to show that maturity of firm financing is related to financial structure.

Demirguc-Kunt and Maksimovic (2002) suggest that a larger securities market is associated with better access of firms to long-term financing while banking development is more associated with availability of short-term financing. Allen et al. (2011) compare and contrast the predominantly bank based systems in Germany and Japan with the market based structures in the US and UK and suggest that a variety of financial structures can lead to higher growth. Other studies have suggested that different structures are optimal

at different stages of development. For instance, while Demirguc-Kunt and Levine (2001) do not find a link between financial structure and economic growth, they do provide some evidence that financial systems become more market based as countries become richer. More recently, Demirguc-Kunt, Feyen, and Levine (2011) show that different financial structures may be better at promoting economic activity at different stages of a country's economic development. In particular, they show that during the process of economic development, the relative demand for services provided by securities markets increases. They also show that deviations of actual financial structure from an economy's optimal financial structure negatively impacts overall economic development.

5.2. Formal vs. Informal Finance

A common feature of developing economies is the wide prevalence of informal financial systems in facilitating access to credit. Informal financing arrangements are very diverse ranging from simple to complex and include loans made by moneylenders, traders, landlords, family and friends, as well as loans from institutions such as rotating savings and credit associations (ROSCAs), savings and credit cooperatives (SACCOs), and other community based financial organizations (see Besley (1995) for a survey of the different forms on informal financing mechanisms). Unlike formal financial intermediation, informal arrangements are typically based on business or personal relationships characterized by the use of self-enforcing contracts and social sanctions (e.g. Kandori, 1992; Udry, 1994; Straub, 2005) and do not rely on the state to enforce contractual obligations (e.g. Ayyagari, Demirguc-Kunt, and Maksimovic (2010).

A recent set of papers in the finance-growth literature have examined the role of informal finance in stimulating firm growth. On the one hand, Allen, Qian, and Qian (2005) argue that informal finance supports the growth of the private sector in developing economies like China. They present China as an important counter-example to the focus on formal institutions, since the private sector firms in China, despite facing weaker legal protections and poorer access to finance than firms in the state and listed sectors, are the fastest growing due to their reliance on alternative financing and governance mechanisms. On the other hand, Ayyagari, Demirguc-Kunt, and Maksimovic (2010), Cheng and Degryse (2010), and Cull, Xu, and Zhou (2009) show that informal financing plays a very limited role in firm growth in China. ADM (2010) show that while non-bank sources of financing are very prevalent, it is the formal financing channel, specifically bank finance that is positively associated with higher growth and reinvestment.

This debate on formal versus informal finance has spawned a large literature trying to reconcile the mixed findings. Allen, Qian, and Xie (2013) argue that the type of informal financing is important. So mechanisms such as trade credit or loans from family and friends, that rely on information advantages and monitoring mechanisms through social or business networks, support firm growth whereas underground financing, such as moneylenders is not associated with firm growth. Degryse, Lu, and Ongena (2016) find a complementary effect between formal finance and informal finance for small firm growth but find a negative effect of informal finance on growth of large firms. They argue that the optimal choice for small firms may be co-funding due to the scalability of formal finance and informational advantages of informal finance.

Madestam (2014) formalizes the co-existence of informal and formal finance in a theoretical model where he shows that when there are credit market distortions , informal lenders' monitoring ability helps banks reduce agency costs by letting them channel formal credit through the informal sector.

Overall, the evidence suggests that while informal financing is very prevalent in China, it still offers a second-best solution since there is no evidence that informal financing is scalable and may even be detrimental to higher growth and productivity of firms.

6. Firm size and firm size distributions.

The role played by small firms in an economy has not only been a key question for policy makers but also a topic of active academic debate. In this section we survey the empirical evidence on the role of small versus large firms as regards their contribution to growth, productivity, and job creation while analyzing the unique types of challenges faced by small versus large firms.

The cross-country evidence on small firms' contribution to growth and jobs in an economy has been mixed. On the one hand, Ayyagari, Demirguc-Kunt, and Maksimovic (2015) construct a cross-country database on the contribution of small and medium enterprises to total employment, job creation, and growth across 104 developing economies and show that the small and medium enterprises (<99 employees) not only employ nearly half the workforce in the average country but also generate the most new jobs as seen in Figure 3 and have the highest growth rates. A large literature in the US has also pointed to an inverse relationship between firm size and net growth rates (e.g. Neumark, Wall, and Zhang, 2008)[11]. On the other hand, Beck, Demirguc-Kunt, and Levine (2005) show that while a large small and medium enterprise (SME) sector is a characteristic of successful economies, the relationship between the SME sector's share of formal manufacturing employment and growth is not causal. Haltiwanger, Jarmin and Miranda (2013) challenge the inverse relation between size and age in the U.S. and argue that the inverse relationship is almost entirely attributable to most new firms being classified in small size classes and that once we control for age, there is no systematic relationship between firm size and net growth rates.

While the above literature explores the role of institutions on the firm size-productivity relationship, there is also a large literature that shows that small firms tend to be the most financially constrained (e.g. Demirguc-Kunt and Maksimovic, 1998; Rajan and Zingales, 1998; Beck, Demirguc-Kunt, and Maksimovic, 2005; Love and Mylenko (2003), Galindo and Micco (2005), and IADB (2007)). Ayyagari, Demirguc-Kunt, and Maksimovic (2008) use firm level survey data from the World Business Environment Survey and find that not only do small firms report higher financing obstacles than large firms, they are also more severely affected. Beck, Demirguc-Kunt, and Maksimovic (2005) find that the growth of smaller firms is hindered most by financing constraints, especially collateral requirements, bureaucracy, the need for special connections, and interest rate payments. Beck, Demirguc-Kunt, and Maksimovic (2008) compare the financing patterns of small and large firms and find that small firms in developing countries use less external finance, especially bank finance. They also find that other sources of finance such as leasing, supplier finance, finance from development banks and other government sources does not fill the financing gap of small firms. If small firms are constrained in their ability to obtain capital they should also have high marginal returns to the capital they do have, as shown in de Mel, McKenzie, and Woodruff (2008); Udry and Anagol (2006); Kremer, Lee, Robinson,

[11] See Sutton, 1997 for a review. Early studies such as Birch (1979, 1981, and 1987) found an inverse relation between growth and size and found small firms to be particularly important in job creation. Evans (1987), Dunne, Roberts, and Samuelson (1989), and Dunnes and Hughes (1994) focus on unraveling the roles played by firm age and size as determinants and find that larger firms have lower growth rates but are more likely to survive.

and Rostapshova (2013). Beck et. al. (2005, 2008) also suggest that small firms benefit disproportionately as the financial systems develop. Laeven (2003) finds that small firms' financing constraints decrease following financial liberalization episodes such as interest rate liberalization, elimination of credit controls, privatization and bank entry where as those of large firms actually increases, reflecting the loss of political patronage and erosion of entrenched interests.

Banerjee and Duflo (2014) however argue that small firms are a relatively small part of the overall capital stock in a country and it must be the case that even large firms are credit constrained to explain the aggregate differences between developed and developing countries. They study a directed lending program in India and show that large firms were severely constrained during 1998-2002 and unable to take advantage of growth opportunities.

6.1. Is there a missing middle in firm size distributions in developing countries?

A large literature on firm size distributions has pointed to the contrast between the size distributions of firms in developed versus developing economies. A widely accepted idea is that firm size distributions are bimodal with a "missing middle" where a few large firms and many small and micro firms contribute to the bulk of employment and value added in the economy (e.g. Biggs and Oppenheim, 1986; Tybout, 2000; Krueger, 2013). The literature has offered several explanations for the missing middle. One strand of this literature suggests that onerous regulation and bureaucracy associated with being formal that particularly disadvantages small firms (e.g. Rauch, 1991), coupled with weak demand and poor institutional infrastructure, to support large scale production (e.g. Tybout, 2000). The literature surveyed above on credit constraints faced by small firms also suggests that small firms face difficulties in becoming middle-sized firms especially in low income countries giving rise to the missing middle. A second strand of the literature favors a dual-economy model of large high-productivity firms and small low-productivity firms (e.g. Harris and Todaro, 1970) and argues that large firms are subject to constraints and regulations which small firms avoid. Along these lines, Dharmapala, Slemrod, and Wilson (2010) have argued that the missing middle may be the result of optimal tax policy where the government economizes on administrative costs by exempting small firms but in turn intermediate sized firms reduce their output to tax-exempt levels.

Empirical research on the size distribution of firms in developing countries has been limited by the absence of available census data and most studies have had to rely on small survey samples. Thus, while there are several case studies analyzing the missing middle in a single country context such as Cote d'Ivoire (e.g. Sleuwaegen and Goedhuys, 2002) there has been no systematic research/data on the prevalence of the missing middle across countries. Recently however, Hseih and Olken (2014) obtain census microdata from India, Indonesia, and Mexico and argue that is no "missing middle" in the sense of a bimodal distribution in any of these three countries - mid-sized firms are missing, but large firms are missing too and most firms are small in these developing countries.

6.2. Size-Productivity Covariance

While the focus in the above work is on firm size and growth, a recent literature has argued that the large differences in productivity between rich and poor countries can be explained by heterogeneity in firm-level productivity which can in turn be attributed to the resource mis-allocation in developing countries (Bartelsman, Haltiwanger, Scarpetta, (2004), Banerjee and Duflo (2005), Jeong and Townsend (2007), Restuccia and Rogerson (2008), Hsieh and Klenow (2009), Alfaro, Charlton, and Kanczuk 2008; and Midrigan and Yi Xu 2014). Bartelsman, Haltiwanger, and Scarpetta (2013) show, that the within-industry covariance between size and productivity is a robust measure of this mis-allocation and that this size/productivity relationship is stronger in the more advanced economies.

The underlying logic behind this measure is as follows - In the absence of any distortions, the traditional models of firm size distribution (e.g. Lucas, 1978 and Melitz, 2003) predict a positive correlation between size and productivity so that larger firms are more productive. However distortions in developing countries affect both resource mis-allocation (too many resources are devoted to small unproductive firms) and selection processes (highly productive firms may exit and low productivity firms may be allowed to operate) which lead to a great deal of variation in the size-productivity relation across countries. This variation is then captured by the cross country variation in the covariance between size and productivity. Ayyagari, Demirguc- Kunt, and Maksimovic (2015b) in their cross country study using Enterprise Survey data show that the covariance term is largely negative in developing countries. They also find that the resource mis-allocation seems to decrease with age since the average and median size- productivity appears to increase with age suggesting that on average the unproductive firms exit so older firms are more productive.

Overall, the declining size-productivity covariance in developing countries and the work by Hsieh and Klenow (2014) on the absence of a missing middles in firm size distributions suggests that large firms are equally constrained in the developing countries and more research is needed to understand the welfare implications of relieving the constraints faced by large firms versus small firms and the priorities for reform efforts.

7. Firm Life-cycle

A body of research in finance has established the importance of life-cycle explanations for many fundamental corporate finance policies, including dividends (Fama and French (2001), Grullon et al. (2002), DeAngelo and DeAngelo(2006), and DeAngelo, DeAngelo, and Stulz (2006), Denis and Osobov (2008)), financing (Berger and Udell, 1990), stock valuations (Pastor and Veronesi (2003)) and acquisitions (Maksimovic and Philips (2008), Arikan and Stulz (2013)). We also know that size and age are closely related and are the best predictor of financing constraints (Hadlock and Pierce, 2010). However much less is known about if there is a lifecycle of firm size and what factors explain the evolution of firm size and productivity with age.

Hsieh and Klenow (2014) contrast growth trajectories in India and Mexico with those in the USA and show that the lifecycle of firms in developing countries is different from firm lifecycle in developed countries. Ayyagari, Demirguc-Kunt, and Maksimovic (2015a) however argue that there is a great deal of heterogeneity in the mix of developing countries. Using Enterprise Survey data from the World Bank on formally registered firms, they show that on average older firms are substantially larger than younger firms in developing countries. As shown in Figure 4, the average firm that is 40 years and older employs 5 times as many workers as the average firm under the age of 5 years.

More importantly, Ayyagari, Demirguc-Kunt, and Maksimovic (2015b) examine the role of institutions and firm characteristics at the time of creation of the firm in explaining the size, growth and productivity of firms over their lifecycle using survey data from 120 developing countries. As shown in Table 2, they argue that while the institutional factors that the current literature has been examining (e.g. legal origin, endowments, ethnic fractionalization) are first order in explaining firm life-cycles, firm-level characteristics are comparable and sometimes even larger than institutional factors in predicting size and growth but not productivity. In particular, size at birth plays a key role in predicting variation in firm size and growth since birth over the lifecycle whereas country factors dominate in predicting variation in labor productivity across the life-cycle.

Using better data from the Indian census of manufacturing firms, and in more careful analysis afforded by a single country setting (India), Ayyagari, Demirguc-Kunt, and Maksimovic (2016) show that the founding conditions of a firm, specifically size of the start-up, are a strong predictor of persistence in firm size over the first eight years of firm life cycle. Start-up size is in turn determined by local institutions. Thus institutions matter for the selection of firms. The average entrant is smaller with greater financial development but greater financial development is also associated with higher entry rates. Subsequent to entry however, during early life cycle, large and small entrants do not grow at different rates across states with different institutions or industries with differing reliance on external finance. As seen in Figure 5, panel A drawn from their paper, the difference between large entrants (or between small entrants) in good and bad institutions is not economically significant. Panel B shows that large and small entrants do not grow at different growth rates in states with good versus weak financial development.

8. Gaps in existing research and policy implications for low income countries

The review of evidence above points to two somewhat conflicting interpretations about the role of institutions in firm growth. First, there is ample evidence that specific institutional deficiencies and obstacles directly affect the growth of firms. This evidence is both from the association between direct reports of constraints faced by firms and their performance (e.g., Beck, Demirguc-Kunt and Maksimovic (2004)) and from natural experiments relating specific institutional changes to subsequent firm growth (e.g., Kerr and Nanda (2009)). Second, there is also evidence that the firm's initial conditions are highly predictive of firm outcomes, and that surviving firms register similar growth trajectories over multi-year periods across a wide variation of institutional frameworks, once the initial characteristics of the firms at the time of entry is taken into account (e.g., Ayyagari, Demirguc-Kunt and Maksimovic (2015, 2016)).

While the first strand of literature would seem to place more emphasis on the role of institutions than the second strand, this is in fact not the case. The second approach would place greater stress on the effect of institutions on the conditions of entry and entrepreneurship than on the growth trajectories of mature firms. Thus, it is quite clear that institutions have a major effect on both the quantity and quality of entry (e.g., Klapper, Laeven and Rajan (2006), Ayyagari, Demirguc-Kunt and Maksimovic (2016), and Kerr and Nanda (2009)).

A second issue that arises is that as the firm traverses its life-cycle its growth trajectory is potentially impacted by several different institutional regimes and those regimes can affect the firm differently at different stages of its development. The effect of institutional regime switches may impact firm growth at the micro level in a manner analogous to the effect of growth spurts on the whole economy at the macro-level. Thus, periods of during which corruption , say, is relatively unchecked may be interspersed by periods during which it is more carefully regulated. These episodes will affect firms directly, and the effect may be very different on young and old firms. However, to the extent that that the episodes are temporary and irregular, their effect may substantially cancel our over time, thus partially masking the role of institutional variations, for example, government changes may affect large and small firms differentially.

In principle, the interaction of firm characteristics and institutions of firm growth can be addressed using panel-data methods. Thus, regressing firm outcomes on interactions of institutional changes with firm life-cycle stages will give estimates of the differential effect of the change on the outcomes for firms of different ages.

A problem arises due to the difficulties of finding rich firm-level data for a suitable cross-section of countries. Such data is available from the Census Offices of most developed countries and some developing countries. However, generating micro-data for a sufficient cross-section of countries with different institutions, especially if given the further requirement that there is sufficient fluidity of institutions within countries to obtain some degree of time-series identification, is very challenging. The task is made more difficult by

attempts to find a suitable instrument or natural experiment that is plausibly likely to hold across a set of countries with different institutions undergoing changes in regime.

Consistent cross-country cross-sectional data for non-listed firms is difficult to obtain. Panel data covering a large number of developing countries is even more difficult to locate. A researcher might confront this challenge in several ways.

First, on a descriptive level one might extend the Hsieh and Klenow (2014) methodology to attempt to measure the effect of institutions at different stages of the firm life-cycle. Hsieh and Klenow take a cross-section of the Indian Manufacturing Census, which contains information of firm size (number of employees) and firm age. From that cross-section one can derive a size-age profile. Any attempt to compare such profiles directly across countries rests on the assumption that the institutions in each country remain constant over time. A natural extension would be to allow breaks in institutions within countries – allowing for different regimes due to the Indian industrial deregulation being one such example.

An obvious further step would be to allow for differential effects of institutions at different points of the firm's life-cycle. Thus, for example, take the case of the sample of 10 year-old firms across a set of countries. Their life-cycle can be decomposed into two five year stages. The growth rate of the firm over its first five years will in principle be affected of the interaction of the firm's quality, as measured by its initial characteristics and the institutions in

existence at this time, b_{ct} and c_{ct} respectively, where the subscript c indexes the country and the subscript t references the time period. Denote the effect of the interaction of the institutions and the country level effects by $f(b_{ct}, c_{ct})$. We can obtain a similar expression for the second stage (b_{ct}, c_{ct}). Putting the two together, one can then model the firm's growth over its first ten years as follows:

$$Log\ (Size)_{i10} - Log\ (Size)_{i0} = f(b_{ct}, c_{ct})_{Stage\ 1} + g(b_{ct}, c_{ct})_{Stage\ 2} + Firm,\ \ County,\ Cohort\ and\ Industry\ Controls + \vartheta_{it}$$

The variation in institutions across countries and changes in institutions over time within a country can identify the role of institutions on firm growth over its life cycle. The functions $f(b_{ct}, c_{ct})$ and $g(b_{ct}, c_{ct})$ can be modeled either as fixed effects in a variance decomposition exercise or using more formal nonparametric methods.

The indicator variable for each of the intervals could take value 0 if, say, capital investment in the firm's industry was regulated during the interval and 1 if the firm was not regulated. Furthermore, firms of different ages can be stacked together for added estimation efficiency.

Once specific institution-life-cycle strategies are identified, the second stage of the research can then proceed with a more detailed analysis stressing the existence of casual relations. The central question here is whether or not the change in a specific institution

might affect casually firms at a specific stage in their life-cycle. For example, changes in WTO trading rules might affect firms of different size and firms in countries with different financial systems differently. The key for this analysis is the choice of instruments or of a natural experiment. Thus, one might not be able to forecast a specific test until the relevant instruments are found and the plausibility of the exclusion condition determined. As such, the specifics of this analysis are by nature more difficult to predict.

Taken together, the two stages can clarify whether the previous lack of evidence of long term effects of institutions on firms is because such effects are small or because favorable regimes alternate over time with unfavorable regimes, creating a levelling effect. More broadly, the research can clarify the extent to which different institutions are complements or substitutes. Thus, it can provide policy guidance on which interventions are likely to positively affect firms at different stages in their life cycle.

Viewed in this way, such research would provide a cross-country parallel for the intensive quantitative and qualitative research program proposed by Professor Francois Bourguignon.

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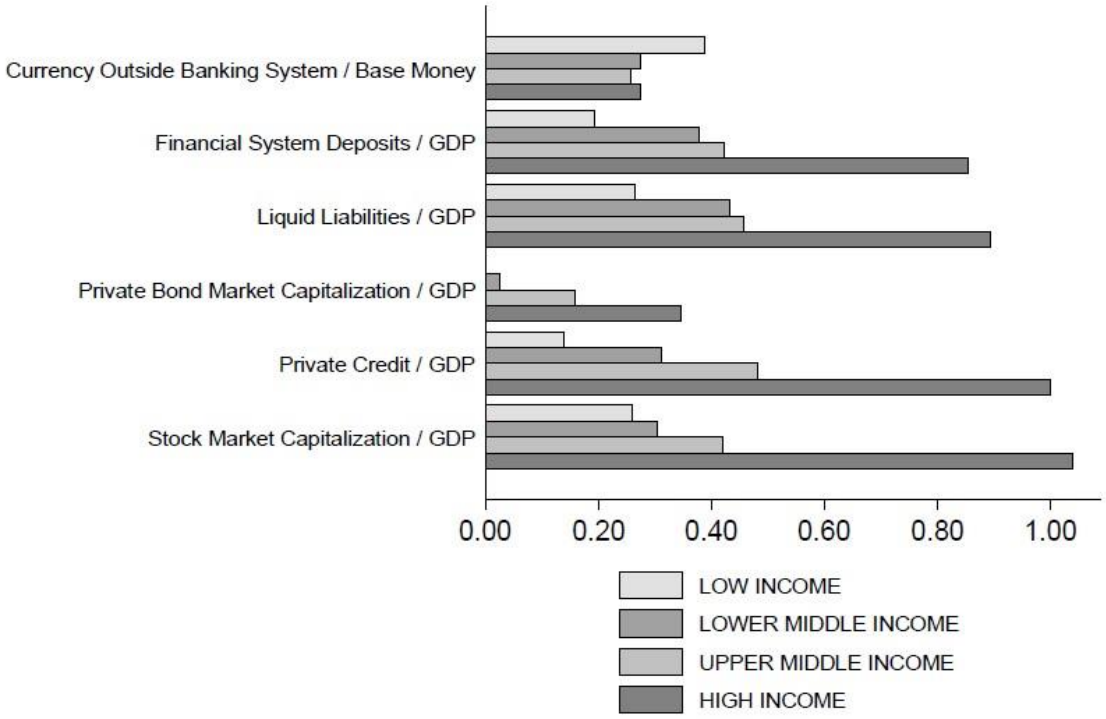
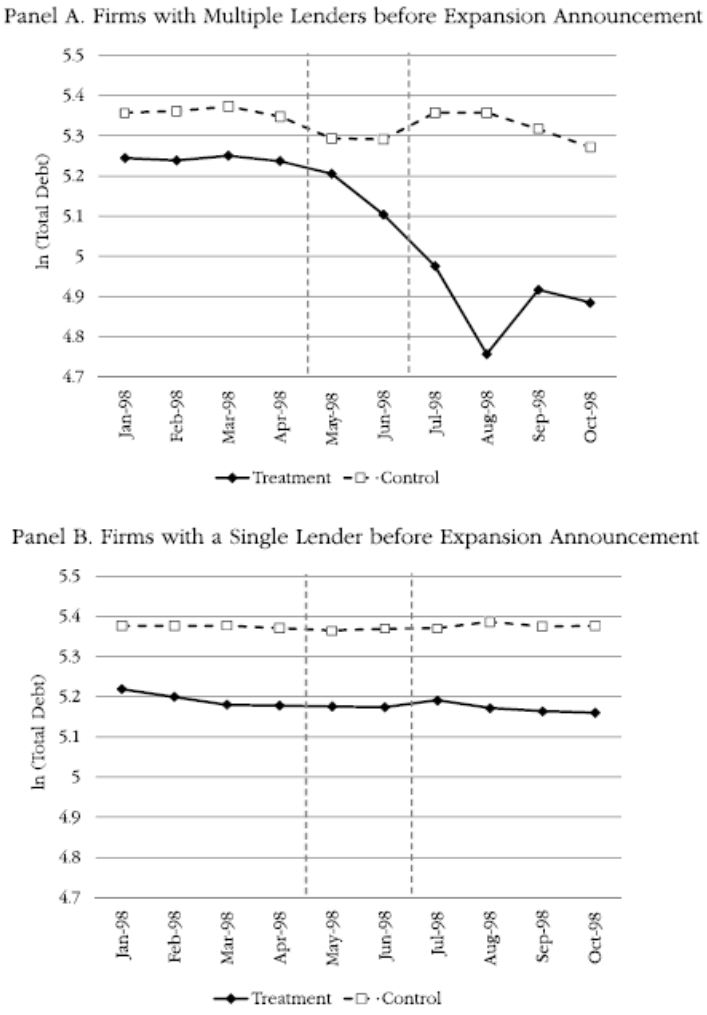
Figure 1: Financial System Size and Income



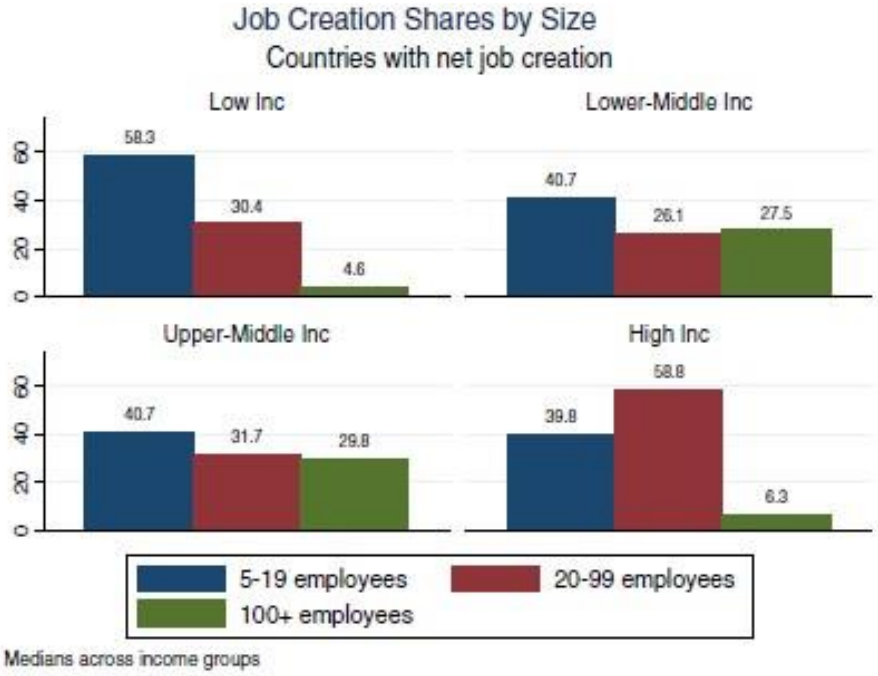
Source: Beck, Demirguc-Kunt, and Levine (2009)

Figure 2:



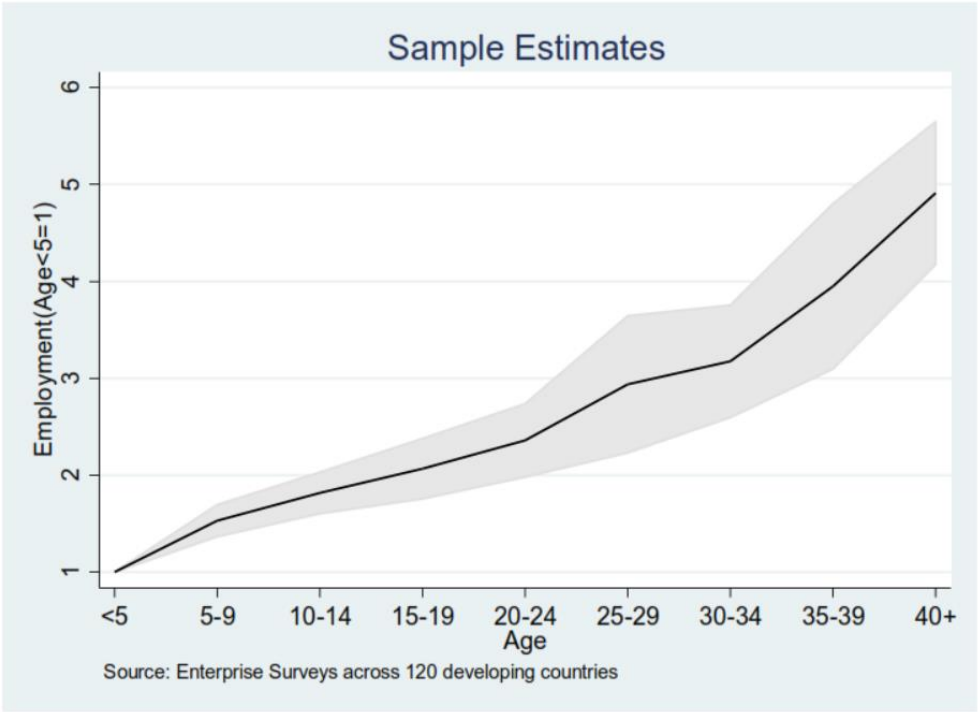
Source: Hertzberg, Liberti, and Paravisini (2011)

Figure 3: Job Creation by Size Class across country income groups



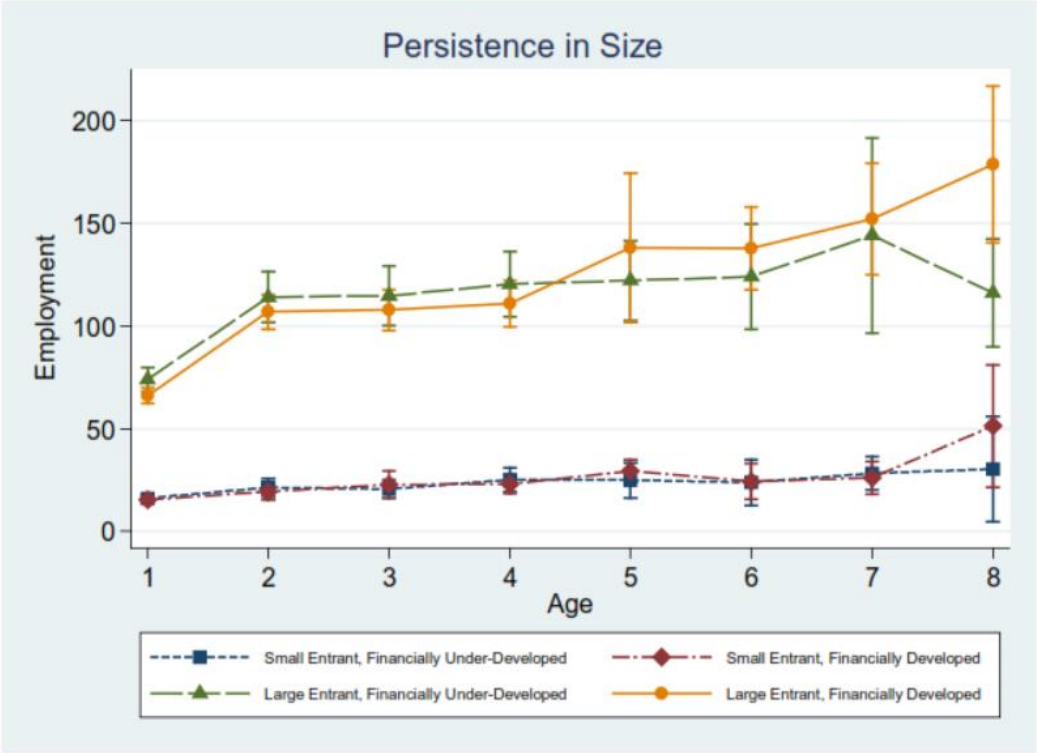
Source: Ayyagari, Demirguc-Kunt, and Maksimovic (2014)

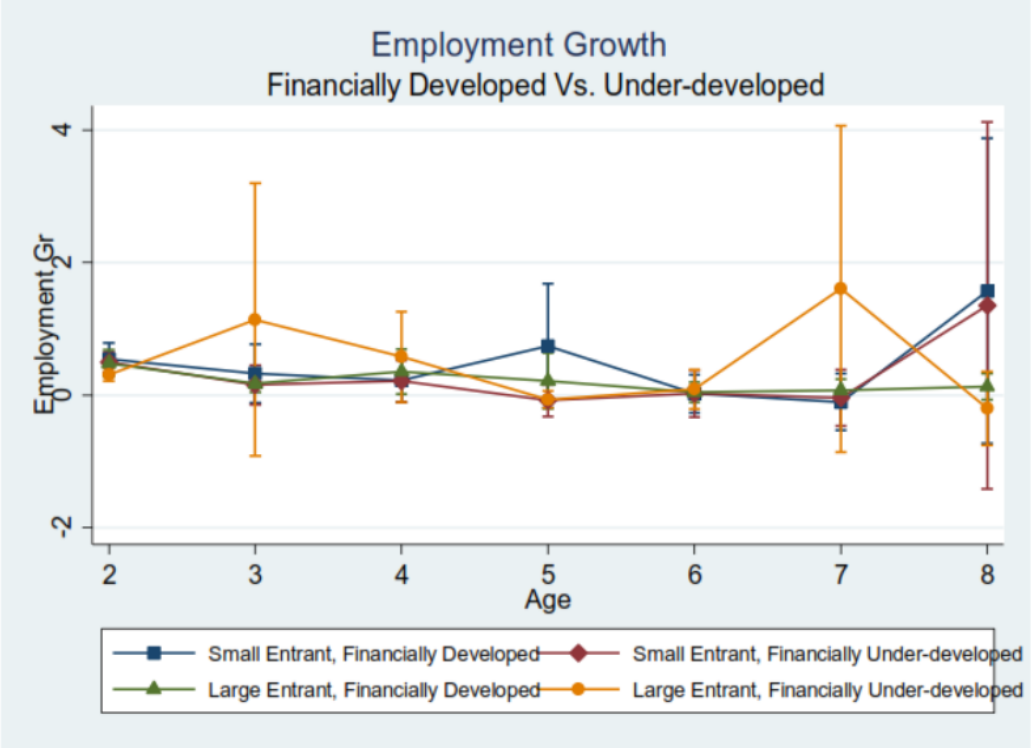
Figure 4: Firm Employment by Age – Estimates in 120 Developing Countries



Source: Ayyagari, Demirguc-Kunt, and Maksimovic (2015a)

Figure 5: Persistence in Initial Size across different levels of financial development in India





Source: Ayyagari, Demirguc-Kunt, and Maksimovic (2016)

Table 1: Impact of Obstacles on Firm Growth

	Dependent Variable: Firm growth over the past three years			
	1	2	3	4
Financing Obstacle	-0.031***			-0.023***
	(0.009)			(0.009)
Legal Obstacle		-0.029***		-0.023***
		(0.009)		(0.011)
Corruption			-0.021***	-0.007
			(0.009)	(0.011)
Number of firms	4204	3968	3991	3800
Number of countries	54	54	54	54
R-square within	0.01	0.01	0.01	0.02
R-square between	0.28	0.27	0.25	0.26
R-square overall	0.02	0.03	0.02	0.02

Source: Beck, Demirguc-Kunt, and Maksimovic (2005, Table IV)
*, **, and *** represent significance at 10%, 5%, and 1% levels respectively.
Other regressors: Dummy for government ownership, Dummy for foreign ownership, Exporter dummy, Dummy that indicates if the firm receives subsidies from national or local authorities, Number of competitors, Industry dummies, Log GDP, Growth rate of GDP/capita, GDP/Capita, Inflation

Table 2: Firm Size and Lifecycle – Analysis of Variance

		1	2	3	4	5	6
Age Groups	All	Young (<5)	Mid-Age (5-19)	Old (20-39)	Young (<5)	Mid-Age (5-19)	Old (20-39)
Country characteristics							
Country Dummies	0.092	0.125	0.089	0.092	0.187	0.105	0.059
Legal Origin	0.008	0.018	0.017	0.014	0.056	0.04	0.015
Ethnic Fractionalization	0.023	0.037	0.021	0.009	0.097	0.041	0.009
Latitude	0.004	0.018	0.009	0.01	0.035	0.01	0.001
Settler Mortality					0.044	0.024	0.016
Legal Origin, Latitude, Ethnic Fractionalization	0.029	0.045	0.033	0.022			
	31.52%	36.00%	37.08%	23.91%			
Legal Origin, Latitude, Ethnic Fractionalization, Settler Mortality					0.127	0.075	0.037
					67.91%	71.43%	62.71%
Firm-level characteristics							
Age	0.068						
Sector Dummies	0.046	0.051	0.041	0.026	0.069	0.033	0.017
Location (City Size) Dummies	0.005	0.002	0.002	0.01	0.014	0.009	0.008
Ownership Dummies	0.039	0.05	0.044	0.026	0.084	0.052	0.038
Legal Organization Dummies	0.101	0.05	0.086	0.154	0.097	0.104	0.148
Log(Size at birth)	0.357	0.522	0.373	0.272	0.577	0.429	0.273
All together	0.423	0.511	0.389	0.346	0.62	0.487	0.37
N	33982	6119	20144	5724	2234	8352	3896

Source: Ayyagari, Demirguc-Kunt, and Maksimovic (2015b)