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The Impact of Business Environment on Small and Medium Enterprise Sector's Size and Employment: A Cross Country Comparison

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Abstract

According to the World Bank's study Voices of the Poor, poor people expect to escape poverty through "income from their own business or wages earned in employment". A streamlined business environment supporting the development of competitive small and medium enterprises (SMEs) may expand employment opportunities and improve the living conditions of low income households. This study tries to determine if having a larger SME sector is associated with competitive or constraining business environments. Applying an OLS estimation of multiple linear regression models using cross-country data, the study attempts to assess how much of the cross-country variation in the size, and contribution to employment of the SME sector can be explained by cross-country variation in business environment regulations. While a factor analysis over regulatory variables confirm previous findings that regulation comes in packages, the estimation results show that streamlined tax and labor regulations predict larger numbers of SMEs in the economy. Considering micro and SMEs contribution to employment together, it is the regulation of labor and product-market (easy entry, exit, access to credit, well functioning of judiciary system, and trade) that have a determinant role. However, the role of the latter is subject to governance levels. Product-market regulation remains significant after an instrumental variables analysis. The evidence suggesting that a larger SME sector might be associated with constraining business environments is weak. Overall, an adequate business environment with regulatory procedures that are transparent, easy to comply, and accessible to all despite of their connections, may foster a greater contribution of the small enterprise sector to the economy.

Keywords: Business environment; SME; Employment

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1. Introduction

According to Chen (2005) the persistence of poverty worldwide is a major challenge of the 21st century; more than 1 billion people struggle to survive on less than $1 a day, of these, roughly half are actually working[1]. The World Bank study Voices of the Poor asked 60,000 poor people around the world how they thought they might escape poverty. The answers, as stated by the study, were clear: "women and men alike pin their hopes above all on income from their own business or wages earned in employment".

The World Bank (2012a) determined that around 200 million people are currently unemployed, and 600 million jobs need to be created by 2020 mainly in developing countries. A number of those jobs are expected to be generated in the micro, small, and medium enterprise (MSME) sector given its high labor intensity. For instance, Stein, Goland, & Schiff (2010) stated that in developing countries formal small and medium enterprises (SMEs) represent around 45 percent of employment and 33 percent of GDP (the contribution is higher when informal firms are accounted for). In turn, the Organization for Economic Cooperation and Development (2004) stated that in their economies, MSMEs provide 60-70 percent of employment while accounting 55 percent of the GDP. In general, SMEs are often considered as engines for innovation, economic growth, employment and social mobility as stated by Innovations for Poverty Action [IPA] (2013), and Ayyagari, Demirguc-Kunt, & Maksimovic (2011).

While there is no solid evidence about the role of SMEs in the economy, an enabling business environment does seem to pave the way for private sector development more in general. Even though there is a widespread recognition of the role that SMEs play in sustained economic growth, there is no systematic data to rely on or high quality research to confirm the role and contribution of the small enterprise sector to the economy as highlighted by IPA (2013), Ayyagari et al. (2011), Hurst & Pungsley (2011), Miliaras (2012), and Gonzales (2013). The World Bank (2003) caution against directly subsidizing SMEs' development because reverse causation erode the findings of a positive as well as significant relationship between SMEs and economic growth. Furthermore, they assessed that cross-country comparisons do not show that SMEs boost the incomes of the poor. Whereas Stangler & Litan (2009) advocated that most jobs are generated by young small enterprises, Mazzucato (2013), Hurst & Pungsley (2011), Haltiwanger, Jarmin & Miranda (2010b), Acs & Muller (2008) suggested that while entrepreneurship generates an up-or-out dynamic in the economy, it is not the role of small firms which should be emphasized for job generation but the role of high-growth enterprises (generally with already demonstrated ambition and in sectors with potential to grow). In addition, the International Finance Corporation (2000) implied that scale-based enterprise promotion is often driven by social and political considerations rather than by economic reasoning. Nevertheless, Thorsten & Demirgunk-Kunt (2004) based on World Bank (2003) found that cross-country regressions provide qualified evidence that an effective business environment does cause growth (also suggested in Klapper, Lewin, & Quesada, 2009). Consequently, there seems to be an increased shift from SMEs promotion towards the impact of reforms of the business environment on economic growth and poverty alleviation as stated by the Donor Committee for Enterprise Development (2009), Chen (2005), International Labour Organization [ILO] (2002), and ILO (2004).

In light of the broader impact of reforming the business environment, and the necessity of a deeper comprehension of the SME sector, it seems adequate to study each issue not only on its own but also on relationship to each other. The World Bank (2005) defined investment climate as "the set of location specific factors shaping the opportunities and incentives for firms to invest productively, create jobs, and expand", and Weiss (2013) described the business environment as a subset of it. While there is ample of room for discussion as for the influence of government behavior in private sector development, collaborative state-business relations promote economic growth and firm survival as stated by Sen & Te Velde (2009), Mazzucato (2013), Evans (1995), Hansen, Rand, & Tarp (2009), Fajnzylber, Maloney, & Montes-Rojas (2009). ILO (2005) highlighted the increased importance of the business environment in small enterprise development. However, the framework under which small firms operate in most developing countries has plenty of opportunities for enhancement. In the International Finance Corporation's (IFC) Doing Business ranking, almost all low income countries are among the worst performers[2]. Particularly bad is the score of low income countries for the Trading across Borders indicator (average ranking position of 144 out of

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[1] ILO (2011) stated in their study Key Indicators of the Labour Market (KILM) that new estimates suggest 476 million workers live with their families on less than US$1.25. An estimated 942 million workers (one in three worldwide) is living below the US$2 poverty line. According to the World Bank, in 2010, around 1.22 billion people lived on less than US$1.25 a day, and 2.4 billion people lived on less than US$2 a day.

[2] In the 2011 report, the average ranking position for low income countries is 140 out of 183 economies, from 37 low income countries only 6 occupy a position under 100; Kyrgyz Republic (44), Rwanda (58), Ghana (67), Zambia (76), Solomon Islands (96), and Kenya (98). The average ranking position including lower middle income countries is 125 out of 183 ranked economies.

183 economies). Similarly, the World Economic Forum's Global Competitiveness Report ranks low income countries with an average position of 110 out of 139 economies for Business Sophistication and an average position of 99 for Innovation. Furthermore, Altenburg & von Drachenfelds (2006) pointed out that some successful Asian economies rank low on the business environment rankings, and suggested that an effective business environment should not only follow a minimalistic approach but also consider other issues such as innovation and business sophistication. Ultimately, one possibility to improve the opportunities for the poor is to provide an enabling and streamlined business environment where all driven individuals could participate in the market independently of their gender, ethnic origin, political or social connections.

The database presented in this study provides comprehensive statistics on the size and employment contribution of the SME sector, along with additional employment variables and data on selected business environment indicators across a broad spectrum of countries. Applying an OLS estimation of a multiple linear regression model using cross-country data, this paper assesses how much of the cross-country variation in employment and size of the SME sector can be explained by cross-country variation in various business environment frameworks, including; ease of firm entry, access to credit, ease of exit (insolvency), property registration, contract enforcement, obtaining construction permits, getting electricity, labor, tax, and trade regulations along with variables capturing the macroeconomic stability, physical infrastructure, and the countries' ability to innovate trough cooperation. Section 2 presents some issues for the analytical framework of the economic and econometric models. Section 3 describes the data and methodology, and Sections 5 to 6 discuss and conclude the findings.

2. Analytical Framework

2.1 A Theoretical Review on the Size of the Small Firm

The technological choice and the factors affecting that decision seem to be of utmost importance and a common ground across several approaches attempting to address the economic theory of the small firms' size. The microeconomic approach, as described by You (1995), states that technical and allocational efficiency determine firm size; therefore, the efficient size of a firm will be the one in which long run average costs are minimized. Panzar (1989) observed that the size distribution of firms in an industry could be determined both by the efficient firm size as well as by the market size. Consequently, the industrial organization approach proposes that the size distribution of firms is determined by market power and its competitive structure. For instance, firms with lower costs obtain greater market share and increase their chances to grow large as stated by Clarke & Davis (1982), Saving (1970) highlighted the decisions of the most powerful firms about prices (e.g. if stronger firms cut prices in order to maintain output during a recession, small firms operating on the edge have to close down), and You (1995), abandoning the assumption of product homogeneity, pointed out the importance of product differentiation and market segments for market share competition (e.g. small firms based on market niches will heavily depend on the ability to address the special needs of the costumers). Nevertheless, Pyke (1992) proposed that small firms could not only aim for economies of scope, but also reach economies of scale through small-firm cooperation. Collaboration implies formal and informal alliances unleashed in an institutional structure affecting the behavior of actors in the market as pointed out by ILO (2005), Lerner, Allen, & Leamon (2012), EIU (2011), and Sen & Te Velde (2009).

The institutional approach for the size distribution of firms has different perspectives. The first perspective is developed around the idea of transaction costs. Coase (1937) stated that the efficient size of the firm is determined when intra-firm transaction cost equals the market transaction cost. In turn, Chandler (1976) discussed that the efficient size of the firm will increase when bureaucratic costs in the organization are reduced. They expanded the attention over other costs in addition to the ones defined by the production technology. The second perspective attempts to explain different size distribution of firms across countries with similar income and technological levels. Pagano (1990) stated that during decision and negotiation processes, power structures might influence the process of technological change. An excellent example is found in Ranis & Saxonhouse (2010) who stated that the determinants of technology choice by Indian and Japanese cotton industries in retrospect is better explained by organizational and institutional environments rather than by factor-prices distortions (the latter accounts for differences in labor, usage of double shifts, raw materials, tariff policy, etc). The main investor in cotton mills in India, successful merchants and financers, were commonly also designated as managers. Their lack of experience on the industry, and a pervasive incentives structure conduced actors not to behave in the best interests of the industry, and to make the wrong technological choices. Commissions for managers were not based on profits, and did not account for depreciation of assets not to mention that innovation was not an issue since managers were used to sell

their capital holdings in the short-medium term for moving into other investments. In addition, managers received commissions for every machine purchased which created a strong bias towards capital intensity without considering efficiency issues. Between 1883 and 1900, the Japanese halted "mule" textile machinery imports, and moved to import "ring" textile machinery (it meant less but more adequate machines for their production). In the same period, the Indians kept importing two more million new "mules". While in Japan BOREN (All Japan Cotton Spinner's Association) agglomerated 97 percent of all spinners, and had a pivotal role on the diffusion of technology (they controlled the allocation of cotton), in India, the evidence suggests that among several associations, the largest, BMOA (Bombay Mill Owners Association) was more involved in political issues like tariffs which diverted attention from technology. To conclude, in 1885, India exported ten times more yarn than Japan to China and Hong Kong. By 1915, the Japanese were not only exporting more yarn to those markets than the Indians, but also the Japanese clothes exports to India increased from zero in 1900 to around 380 millions of yards by 1930. Ultimately, the second perspective calls for attention to the potential existence of multiple institutional equilibria. The third and last institutional perspective is based on inter-firm cooperation. Lazonik (1990) stated that cooperation among independent firms has benefits over integration because it avoids bureaucratic costs and inflexibility. Caves (1989) stated that if there is strong inter-firm cooperation, *ceteris paribus*, there will be more small firms. Given the threatening situation were trust is lacking, Sengenberger & Pike (1990) stressed the importance of the existence of institutions and ideologies supporting and sustaining cooperative relations. Under this perspective, You (1995) stated as examples Italy and Japan[3]. While in the Japanese case, the cooperation and coordination is more hierarchical, the Italian industrial districts are more horizontally related. The Japanese model makes the case for the influence of larger firms' strategies over the small firms sector while the Italian situation highlights the importance of local institutions and geographic proximity to promote small firms and to spread ideas and innovations.

The last approach to the theory of the small firm size distribution is proposed by dynamic models. The Gibrat's Law described by You (1995) states that given any initial distribution and a random variation for the firms' growth rates, the resulting distribution of the firms will tend to a log-normal distribution which is close to the skewed distributions observed in many industries. Empirically, the law seems to hold for larger firms while a negative growth-size relationship is found by Evans (1987) even after controlling for the exit of smaller firms. Jovanovic (1982) found a negative relationship between firm growth and firm age if firm size is held constant. Davis, Haltiwanger & Schuch (1996) and Arkolakis (2011) challenged the previous results on the ground of misclassification leaving the discussion open to new empirical studies.

Across different approaches, the size distribution of firms in the economy, the competitive position and the very existence of the firm seems to be subject to constant changes in their technology and organization. Innovation defined by Drucker (1998) as "the effort to create purposeful, focused change in an enterprise's economic or social potential" is a determinant factor for the private sector to face constant change. Cohen and Levine (1989) affirmed that the results for empirical research about the relationship of innovation and firm size are inconclusive. Pagano & Schivardi (2003) stated that inequalities among firms will tend to grow over time since large enterprises may have higher productivities given their ability to cover fixed costs associated with R&D. On the other hand, if information generated outside the industry is important for innovation, new entrants will have an advantage as stated by Audretsch (1991). Systems of innovation require all actors to work together, to develop links and to interrelate in order to diffuse knowledge throughout the economy and translate knowledge into economic growth and social well being as argued by Mazzucato (2013), Nelson & Winter (1982), Freeman (1995), and Drucker (1998).

While larger firms might guide their technological choice by a formal process of R&D, small firms increasingly rely on the diffusion of knowledge through cooperative arrangements (among firms, financial institutions, academia, public sector, and intermediary institutions such as business associations at sectoral, regional and national levels) in order to make better technological decisions. Therefore, constructive institutional environments could eventually lead not only to strong inter-firm cooperation, but also to size distribution of firms focused on taking the most advantage of market opportunities.

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[3]The industrial districts in Italy have strong networks and high specialization (given the current rise of the Chinese manufacturing industry, these clusters seem to be following the strategy of targeting specific markets and take advantage of the quality related to their brands). In the case of Japan, it is argued that firms rely more on subcontracting. The layers of Japanese suppliers have a great coordination to the extent that those with long term relations with the main manufacturer are not so different from the in house divisions; however, with regard to personnel and financial matters the small suppliers are relatively independent.

2.2 A Review of Small Firms and their Importance in the Economy

The definitions assigned to SMEs vary across countries and institutions. Most definitions are based on quantitative factors such as number of workers, assets, and sales, sometimes differentiated by industrial sector. Some examples of SME definitions are presented in Appendix A. Kushnir, Mirmulstein, & Ramalho (2010) stated that business culture, size of the country's population, industry, level of international economic integration, and even political reasons also play a role for governments to decide on a certain definition. Bartlett (2012) stated that new definitions should be industry-specific and Gibson & Van der Vaart (2008) pointed out that "single definitions of SMEs for multiple countries in diverse stages of development" contribute to distortions in the allocation of resources for private sector development. Whereas Gibson, & Van der Vaart (2008) proposed an adjusted measure of the volume of turnover in relation to the per-capita gross national income at purchasing parity as a more appropriate measure, IPA (2013b) advocated for the development of definitions based on the enterprises' capacity to innovate, compete and grow (the target is to foster transformational SMEs, not subsistence SMEs). Aware of the heterogeneous definitions, and circumscribed by the data availability, the adoption of number of workers as a common definition is a starting point for cross country studies. Ayyagari, Beck, & Demirgüç-Kunt (2007) as well as Kushnir et al. (2010) agree on a 250 workers cut-off based on previous findings showing that from "132 economies covered, 46 economies define MSMEs as those enterprises having up to 250 employees."

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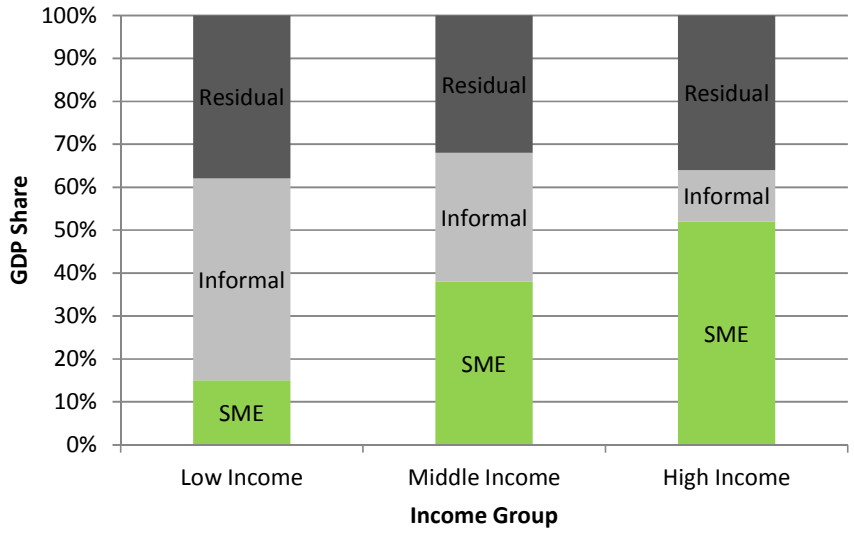
Ayyagari et al. (2007) asserted that the promotion of the SME sector is a core element to foster employment, economic growth, and poverty alleviation. Beck, Demirguc-Kunt, & Levine (2005) found a large SME contribution to employment, and Liedholm and Mead (1999) as well as World Bank (2004) stated that this contribution has been increasing particularly in developing countries. Furthermore, Stein et al. (2010) highlighted that SMEs in developing countries represent approximately 45 percent of employment and approximately 33 percent of GDP. Based on a sample composed of 104 developing countries, Ayyagari et al. (2011) stated that small firms (less than 20 employees) contribute around 20.21 percent to total permanent, full-time employment. When small firms and medium firms (20 to 99 employees) are considered together, the mean employment share of SMEs is 47.94 percent which is comparable to the contribution made by large firms. Nevertheless, the findings of Ayyagari et al. (2011) should be taken with caution since they acknowledged that their sample does not include data on microenterprises (less than 5 workers). In figure 1, Ayyagari, Demirgüç-Kunt, & Beck (2003) pointed out that the share of GDP accounted to SMEs is reduced as countries' income level decreases. Furthermore, Tybout (2000) concluded that the number of small firms not only negatively correlates with per capita income levels across countries but also within countries through time.

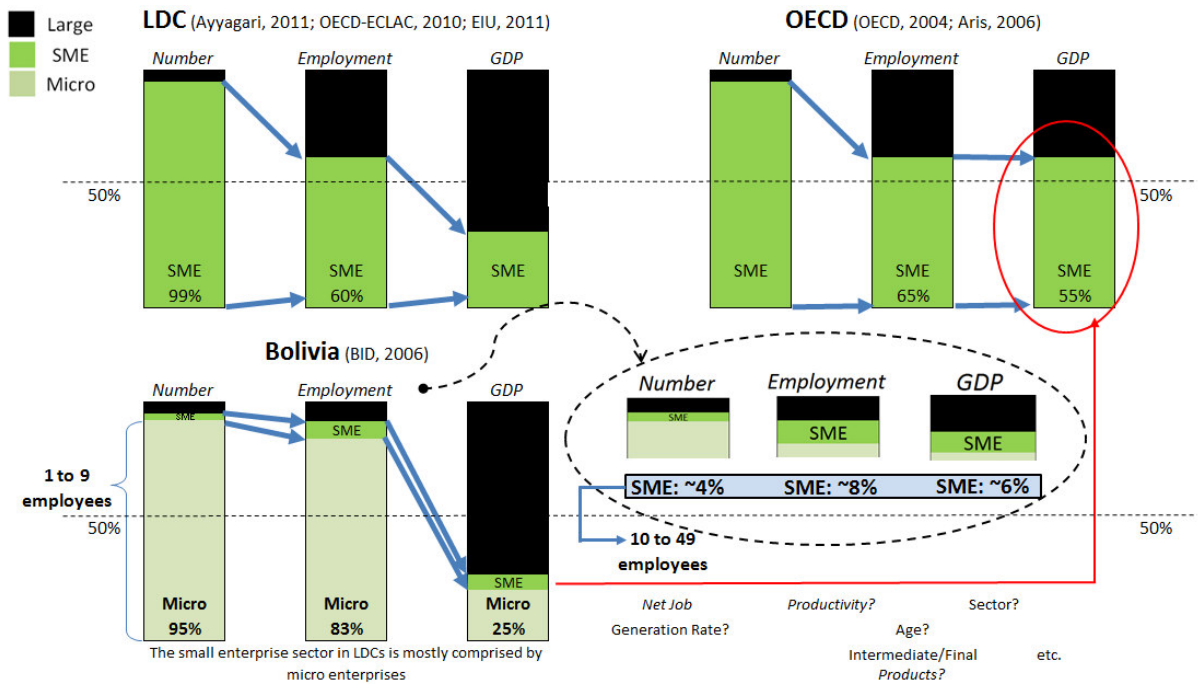
Figure 1: SME Contribution to GDP by Countries' Income Level



Source: Ayyagari et al. (2003)

When analyzed in detail, the small enterprise sector in developing countries is mainly comprised by microenterprises (not to mention a vast informal sector), and the significance as well as contribution of SMEs is very limited. OECD (2004) stated that in their economies, SMEs provide 60-70 percent of employment while accounting 55 percent of the GDP. Aris (2006) described the contribution to GDP by SMEs in Korea at around 50 percent, 55.3 percent in Japan, 57.0 percent in Germany, 60 percent in China, and 47.3 percent in Malaysia. However, most of the contribution of the small enterprise sector in developing countries is accounted to microenterprises. Banco Interamericano de Desarrollo (2006) based on the example of Bolivia highlighted that microenterprises alone (1 to 9 employees) account for 95% of the firms, 83.1% (91.2% plus SMEs) of employment and contribute only 25.5% (31.6% plus SMEs) to the GDP. Figure 2 illustrates these facts. It seems that better assessments about the SME sector could be made if consistent data on employment shares, contribution to GDP, productivity, or other quality-type measurements would be available at different levels and for most of the countries.

Figure 2: The contribution of SMEs in terms of number of firms, employment share, and contribution to GDP across different countries' income level



Source: Gonzales (2013). LDC stands for Less Developed Countries and OECD stands for Organization for Economic Cooperation and Development.

The limited contribution of enterprises in the middle of the firm size distribution (SMEs) could be signaling problems in the productive structure. A problem for SMEs is not so much their size, but their isolation which makes them unable to scale up production and specialize according to OECD-ECLAC (2013). For example, in Colombia within the same 5-digit ISIC industrial sectors there are firms with less than ten workers as well as firms with more than two hundred workers according to Tybout (2000). He advocated that the coexistence of microenterprises with a handful of modern large scale factories could be produced because "small, diffuse pockets of demand lead to small-scale, localized production", Gauthier and Gerzovits (1997) suggested that less mid-sized firms exist because they face the highest tax rates and labor cost since smaller firms may choice to remain informal in order to avoid taxes, and larger firms tend to lobby for special treatment, and Rauch (1991) pointed out that when high input prices are a characteristic of the market, the most talented entrepreneurs opt to operate in large scale while less talented remain small and informal. Moreover, Hughes (1999) highlighted that among a sample of EU countries and some non-EU countries, the lower GDP per capita the higher the share of the smallest (1-9 workers) and the larger enterprises (50 and more workers), but the lower the share of enterprises with 10 to 49 workers. Sleuwaegen & Goedhuys (2002) showed that restrained access to inputs, credit in particular, creates a bi-modal firm size distribution, the "missing middle". Finally, Tybout (2000) stated that when cross-firm productivity dispersion is high, small groups exploit monopoly power, and many small firms are unable or unwilling to grow. EIU (2011) and OECD-ECLAC (2013) explained this inequality as a result of "the structural heterogeneity and persistent productivity gaps, between and

within sectors and enterprises" where small firms do not have access to adequate technology given that they are not part of innovation systems.

While SMEs in developing countries often compete within national markets (not only with other SMEs but also with large firms frequently in the same sector), most SMEs in Europe and East Asia are related to one another or to larger firms in terms of production, frequently included into global value chains as suggested by Armington & Odle (1982) and Knorringa & Meyer-Stamer (2008). More than 80 percent of small business sales in LDCs are directed to final consumers as reported by Liedholm and Mead (1987). EIU (2011) supported that evidence for the case of Latin America where "more than 50% of nascent and new businesses in the region are consumer-oriented (small, retail commerce)". Furthermore, from the demand side, BMLA (2012) established that 90 percent of the surveyed countries in that region identify reliability in overseas suppliers as the most pressing issues affecting their businesses over the past five years. Paradoxically, BMLA (2012), as a result of a survey based on more than 800 SME top-level executives in seven countries, defined that 80 percent of the executives identified global trade as particularly beneficial to mid-sized companies and beneficial for economic growth.

Beck et al. (2005) as well as Levine & Renelt (1992) found a robust relationship between the size of the SME sector and economic growth; the latter include among their determinants an aggregate index of the overall business environment. However, World Bank (2003) suggested that regressions for reverse causation erode the significance of the relationship. Subsidies to SMEs are thought to be a poverty alleviation tool because the promotion and development of small businesses may create scenarios for low income people to participate in the economy. However, Beck et al. (2005) did not find a significant relationship between SMEs and poverty alleviation. Overall, the evidence suggests that a strong SME sector might be a characteristic of developed economies, but not necessarily a causal factor for economic growth.

Meyer-Stamer & Haar (2008) affirmed that the evidence at hand mainly calls for deeper and comprehensive analyses because a SME sector embedded in an adequate industrial structure can make a difference since there is no single high income economy without a competitive SME sector. In addition, the ILO (1998) highlighted that if SMEs provide adequate working conditions, and access to social protection, larger numbers of people, including disadvantaged groups of society, may have a better quality of life by having access to full, productive and freely chosen employment. On the other hand, detractors of pro-SME policies argue that larger firms provide more stable and consequently higher quality jobs as stated by Beck et al. (2005). In addition, Ayyagari et al. (2011) in agreement with Banejee & Duflo (2005), Maksimovic & Phillips (2002), Bartelsman, Haltiwanger, & Scarpetta (2009), and Enterprise Surveys (2013) pointed out small firms have lower productivity as compared with large firms, also after controlling for firm age. Finally, Stangler & Litan (2009) advocated that most jobs are generated by young small enterprises; however, Mazzucato (2013), Hurst & Pungsley (2011), Haltiwanger, Jarmin & Miranda (2010b), Acs & Muller (2008) suggested that while entrepreneurship generates an up-or-out dynamic in the economy, it is not the role of small firms which should be emphasized for job generation but the role of high-growth enterprises (generally with already demonstrated ambition and in sectors with potential to grow).

2.3 A Revision of the Business Environment and its Relation with the Small Enterprise Sector

ILO (1998) suggested that assessing the policy, legal, and regulatory environment is important because small firms do not have the managerial and monetary resources to deal with complex procedures, or frequently variable monetary and fiscal policies. Beck et al. (2005) stressed that "the focus of the business environment view is not on SMEs per se; it is on the environment facing all businesses", large and small. Dethier et al. (2010) indicated that the business environment affects the economy through its influence on incentives to invest and by inflicting pressure over firms that were previously enjoying some sorts of protection. They also mentioned that as a consequence of political economy, successful reforms on certain regulation, trade for example, will in turn put pressure for reform in other issues of the business environment such as the protection of capital. Klapper et al. (2009) found countries with high firm entry rates provide entrepreneurs with a "stable political climate, good governance, modernized business registries, reduced red tape, and simplified business legal forms". Thorsten & Demirgunk-Kunt (2004) affirmed that cross country comparisons suggest a sound business environment has an effect on poverty by stimulating economic growth. Lastly, Dethier et al. (2010) summarized that if there is a weak business environment, firms have to, among others; take costly counter steeps to overcome the difficulties, spend on private security if social order and control is weak, invest on extra backup for electricity when power supply is unreliable, keep larger inventories and reduce potential markets if trade procedures are cumbersome.

For the previous reasons, Schiffer (2005) stated that the World Bank's strategy for promoting small firms has its focus on "leveling the playing field" which is to promote the establishment of business environments that give equal opportunities to all entrepreneurs independently of their size. The previous idea is well defined in the following statement by the World Bank (2012b):

> "Enabling growth—and ensuring that poor people can participate in its benefits—requires an environment where new entrants with drive and good ideas, regardless of their gender or ethnic origin, can get started in business and where good firms can invest and grow, generating more jobs."

One of the main points of this study is that in countries where the business environment is complex, particularly when it comes to regulation, the success of firms (and to a vast extent other aspects of life in developing countries) depends more on who you know rather than on what you know or what you can do. The section continues describing the concept of business environment applied in the research starting from a theoretical description of regulation and ending up on the setting of the economic and econometric models to be explored.

The effects of regulation and its impact on aggregate economic performance have attracted increasing attention in recent years. Loayza, Oviedo, & Servén (2010) mentioned that regulation can be thought of as a set of rules that constrain the actions of economic agents in order to meet social goals. These researchers affirmed that issues such as informational asymmetries, economies of scale in production, incomplete markets, and externalities may contribute to the existence of market failures such as the "missing middle" described in the previous section. Meyer-Stamer & Haar (2008) pointed out that; for example, the "structural adjustment approach of the 1980s and 1990s tended to look at macroeconomic factors while neglecting microeconomic issues, such as the functioning of markets." However, given that social cost and benefits are not internalized by the actors, the process of raising social welfare and promote the private sector through regulation is not expedited.

Schleifer (2005) described three theories of economic regulation. The public interest theory associated with the work of Pigou in 1938, claims that markets often fail; consequently, benign governments could correct those market failures through regulation. The contracting theory, based on the work of Coase in 1960, states that impartial courts through the enforcing of contracts could solve discrepancies when competition cannot successfully address market failures. The capture theory, grounded on the research made by Stigler in 1971, points out that the process of regulation design is captured by the industry sector (so that, for example, the regulation enforced by the state ends up supporting monopolies). Additionally, the latter theory stressed that even when regulation is designed to achieve broader societal goals, regulators often fail to enforce it. As expected, the three theories have received different criticisms. For example, the public interest theory was strongly criticized by the Chicago School of Law and Economics. According to Schleifer (2005) these criticizers besides suggesting that courts could solve market failures, also highlight that government regulators are incompetent, corrupt, and captured. On the other hand, Djankov et al. (2003) states that courts around the world are often highly inefficient, politically motivated, slow and even corrupt as well.

It seems that given different scenarios, the quality of the people behind those institutional arrangements is what makes the difference. Alonso & Garcimarti (2010) stated that institutions "respond to problems stemming from social interaction in an uncertain world, where agents take non-coordinated decisions under a framework of imperfect information"; therefore, institutions ought to reduce discretional decisions and to limit opportunism. However, also Alonso & Garcimarti (2010) pointed out that inefficient institutions will prevail if several agents' interests are not limited and put under the institutions' mandates. Not being the scope of this research how to ultimately address the quality of the people behind the institutional arrangements, the theory presented here subscribes to theories of economic regulation. Djankov et al. (2003) defined four strategies on regard to regulation that are often encountered in different economies: market discipline, private litigation, public enforcement of regulation, and state ownership. Those strategies go from greater private control to greater public control.

Optimal institutional designs might be based between a mix of choices and different arrangements according to the context and objectives. For example, Schleifer (2005) suggested that regulation in developing countries is often excessive, and associated with poor outcomes because public officials may abuse their power, so it will pay back to find ways to simplify the procedures. The evidence suggests that the potential areas for deregulation in developing countries are those where competition and market discipline could do a more effective job than courts (e.g. entry and labor regulation). While excessive regulation of the business environment is identified among the key obstacles to growth in many developing countries as World Bank (2008) stated, Blanchard (2006) implied it is also a concern

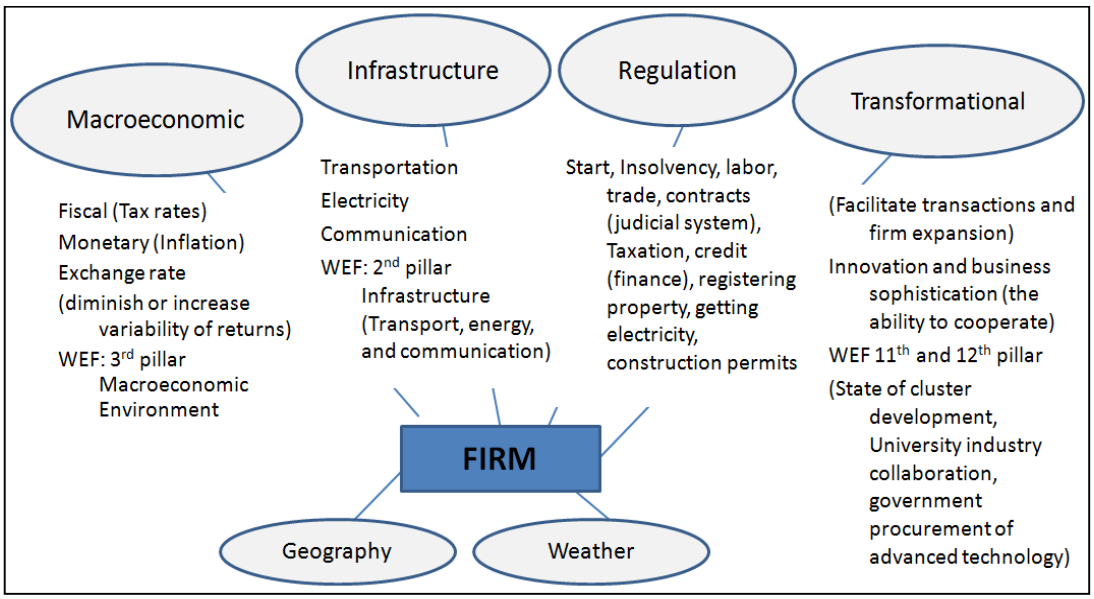
for developed economies by stating that excessive regulation could be the prime cause for European macroeconomic underperformance in the last decade vis-à-vis the United States.

The World Bank (2005) defined investment climate as "the set of location specific factors shaping the opportunities and incentives for firms to invest productively, create jobs, and expand", and Weiss (2013) described the business environment as a subset of it. The ILO (2005) defined the term business environment as those "elements that are external to the enterprise itself." Consequently, they assessed the business environment with a particular focus on small enterprises considering three perspectives; a) the policy, legal, and regulatory framework, b) the organizational framework and c) the markets, social and economic settings. These perspectives open the discussion for considering government and non-government organizations that are created to implement and enforce policies, laws and to perform other functions in the business environment (e.g. business incubators, innovation centers, research agencies, chambers of commerce, business associations, trade unions, and other private associations). Dethier et al. (2010) defined the business environment in terms of physical infrastructure, access to finance, security (absence of corruption and crime), and the regulatory framework. Commander & Svejnar (2007) analyzed that firms will be able to succeed depending on the macroeconomic, legal and institutional environment. Even though their conclusions are derived from studies at the firm level, Renko & Haar (2008), Meyer-Stamer & Haar (2008), and Liedholm & Mead (1999) commented and determined key aspects for competitive MSMEs that could be summarized in four; people, markets, technology, and networks which in a way, support the intention of capturing at the macro level issues such as the ability to cooperate. In addition, Ayyagari et al. (2007) concluded that a larger role of SMEs in manufacturing is more strongly associated with a competitive business environment.

Altenburg & von Drachenfelds (2006) made the case for a more comprehensive measurement of the business environment. They pointed out that some successful Asian economies (in terms of high past and present economic growth rates) usually are not well ranked in business environment rankings such as the Heritage Foundation's Index of Economic Freedom or the IFC's Doing Business (the case of China, India, Indonesia, Vietnam, for example). However, the same countries occupy much better positions on rankings like the World Economic Forum's Global Competitiveness Report. As a result, it seems that there is an over focus on the harmful effect of government intervention in the market when it comes to measure the business environment. The United Nations Secretariat (1997) stressed that public-private interaction has played an important role for the development of countries; for example, Malaysia started to make progress in this area from 1979 with the Industrial Advisory Council (wider understanding of policies was secured, the voice of the private sector was included, and the balance between stability and change was kept). Additionally, Altenburg & von Drachenfelds (2006) commented that the first generation of NIC's (South Korea, Taiwan, Singapore and Hongkong) as well as the second generation of NIC's (e.g. Malaysia, Thailand), and emerging China and India have made extensive use of selective trade and industrial policies. Therefore, the ability to cooperate towards technologically advanced industrial structures should be captured as part of an enabling business environment, particularly for homegrown development. Even Sachs (2005) affirmed poor countries' governments besides proving infrastructure and social investments should also care of the productive inputs for private businesses. In addition, the World Bank has also developed the Competitive Industries Global Practice at the World Bank which increases the focus in industrial policies aiming to achieve growth and competitiveness with emphasis in local context and successful previous experiences.

Appendix B presents a summary of the variables utilized to measure the business environment, compiled from some other studies executed in this area. As it can be verified, there is an opportunity to include variables related to more competitive (innovative and cooperative) business environments on the study of their impact over the development of the private sector. Figure 3 aims to summarize the areas of the business environment that may have an impact on the small firms' sector size and contribution to employment. Four main areas were identified at the macro level; macroeconomic stability, physical infrastructure, regulation, and an area called transformational attempting to capture the ability to innovate and cooperate. The variable transformational is based on the indices "government procurement of technology", "degree of cluster development", and "university-industry collaboration" from the Innovation and Business Sophistication pillars of the World Economic Forum's Global Competitiveness Report. Finally, endowments such as geography or weather may also play a role; however, given their difficulty to be altered, they are not included in the final design of the variables.

Figure 3: Factors Affecting the Firm at the Macro Level



Source: Author's elaboration

In order to describe the economic model, the departure point is the assumption that the impact of business regulation arises from its effects on the creation, growth, and renewal of firms as suggested by Loayza et al. (2010). Then, the question is if regulation improves the conditions for firm's activities, or on the contrary, it imposes unnecessary restrictions that increase costs and reduce productivity. The following main areas of a firm's activity that are subject to regulation as part of the business environment were considered: ease of firm entry, access to credit, ease of exit (insolvency), property registration, contract enforcement, obtaining construction permits, getting electricity, labor, tax, and trade regulations along with variables capturing the macroeconomic stability, physical infrastructure, and the countries' ability to innovate and cooperate.

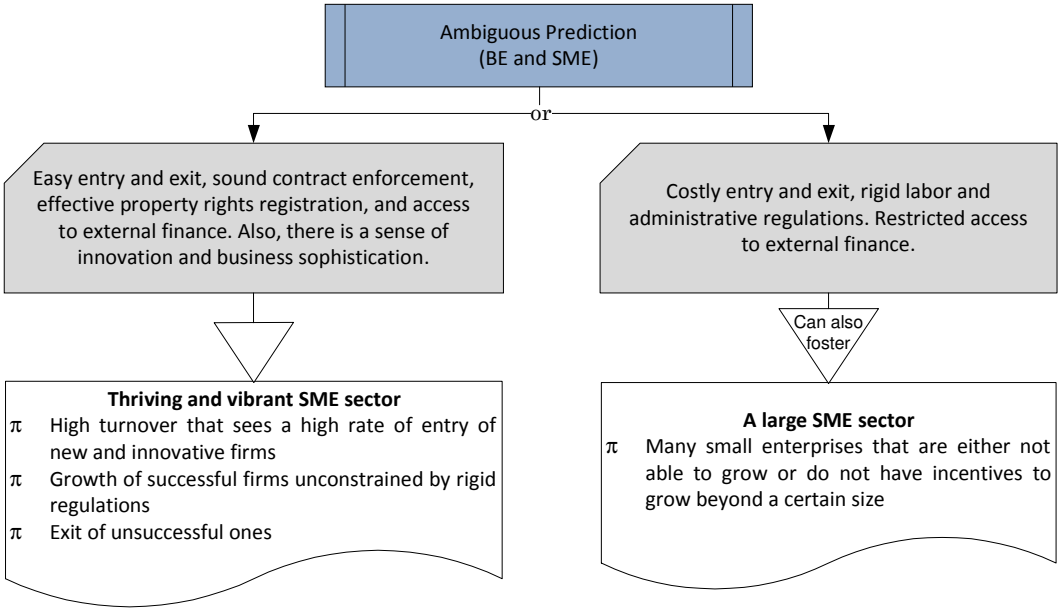
The variables will be described in Section 3. The equation below establishes the basic economic model.

$$\text{Dep. Var.} = f(\text{Regulation, other elements of Business environment, additional controls})$$

Dependent Variables (Dep. Var.): SME density,
MSME share of employment
(Average employment growth rate)
(Average number of permanent full time workers)
(Share of unskilled production workers)

The ILO (2005) determined an ambiguous prediction of the business environment because in some circumstances it promotes the development of small enterprises and employment creation while "in other cases the business environment inadvertently constrains employment growth, reduce the quality of small enterprise employment, and contribute to poverty through low wages and a lack of social protection". Consequently, it seems that there could be two possible general mechanisms in which the business environments may have an impact on generating greater shares of SMEs or higher shares of employment. Ayyagari et al. (2007) also defined that a greater share of SMEs in the economy could be either the result of a regulation framework that facilitates the constant entry, growth and exit of SMEs or the result of a stifling business regulation which imposes a burden to the private sector by, sometimes unnecessary, heavy and costly regulation of contracts, registries and hiring processes among others. In other words, Liedholm & Mead (1999) affirmed that the increasing employment share of the SME sector could be either because markets are working and providing the opportunities for entrepreneurs, or because cuntries' economies are failing to provide jobs and people are forced to find refuge in activities that provide minimal subsistence support. Figure 4, describes these two general mechanisms.

Figure 4: Possible Mechanisms for a Higher Share of SMEs in the Economy in relation to the Business Environment



Source: Author's elaboration, content based on Ayyagari et al. (2007)

Therefore, this study relates the variation in the SMEs' number and employment across countries to differences in the business environment in which firms operate, particularly in the manufacturing sector.

Dethier et al. (2010) suggested that regressions on single business environment indicators could present bias and inconsistent parameters estimates due to omitted variables; therefore, they indicated that a "broad array of indicators and controls should be used in regression equations". Loayza et al. (2010) stated that "governance turns out to be an important determinant of the effects of regulation", suggesting that the governance-regulation interaction ought to be explored. Dethier et al. (2010) also found that regulation may have a positive effect when correctly enforced. Another example is given by Aterido, Hallward-Driemeier, & Page (2007) where the findings showed a positive relationship of good enforcement of regulation with employment growth in small firms for most developing countries. Moreover, Honorati & Mengistae (2007) showed that industrial growth in India is affected by regulation, infrastructure, financial constraints, as well as corruption, and found that all those effects depend on the incidence of corruption. Additionally, they suggested that more studies should consider these types of interactions in order to deliver more precise policy recommendations. Alonso & Garcimarti (2010) indicated that the World Bank's Governance Indicators might be the best proxy to gauge institutional quality. In addition, GDPpc (Gross Domestic Product per capita) will also be utilized as a proxy for the economic setting of every country.

Equations (1) to (5) below describe the generic econometric models.

$$\ln_smeden = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{govern} + \beta_3 \text{macro} + \beta_4 \text{infra} + \beta_5 \text{trans} + \beta_i \text{regulation}_i + \beta_j \text{reg_gov}_i + (\dots) + u \quad (1)$$

$$\text{msmeemploy} = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{govern} + \beta_3 \text{macro} + \beta_4 \text{infra} + \beta_5 \text{trans} + \beta_i \text{regulation}_i + \beta_j \text{reg_gov}_i + (\dots) + u \quad (2)$$

$$\text{empgrowth} = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{govern} + \beta_3 \text{macro} + \beta_4 \text{infra} + \beta_5 \text{trans} + \beta_i \text{regulation}_i + \beta_j \text{reg_gov}_i + (\dots) + u \quad (3)$$

$$\ln_\text{pfulltw} = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{govern} + \beta_3 \text{macro} + \beta_4 \text{infra} + \beta_5 \text{trans} + \beta_i \text{regulation}_i + \beta_j \text{reg_gov}_i + (\dots) + u \quad (4)$$

$$\text{shareuskprodw} = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{govern} + \beta_3 \text{macro} + \beta_4 \text{infra} + \beta_5 \text{trans} + \beta_i \text{regulation}_i + \beta_j \text{reg_gov}_i + (\dots) + u \quad (5)$$

According to Wooldridge (2009) large integer values often appear in logarithmic form in order to narrow the range of the variables. This is the case for *smeden*, *pfulltw*, and *GDPpc*. The variables measuring the business environment will be in level form to facilitate interpretation and also because they will be measured as indexes, all of them varying from zero to one. Section 3 includes a RESET test for functional form misspecification. Then, tests for joint significance of some business environment variables as well as a Breusch-Pagan test for heteroskedasticity are studied. In addition, an instrumental variables procedure for the first two models is briefly explored in Section 4.

3. Data and Methodology

In order to measure regulation around the world, ten areas were considered: entry, credit, insolvency, property registration, contract enforcement, obtaining construction permits, getting electricity, labor, tax, and trade. Ayyagari, et al. (2007) utilized one indicator for each regulation area[4]; for example, the regulation of entry is exclusively measured based on the cost of starting a business (as a ratio of income per capita). In turn, Loayza et al. (2010) constructed an index of the regulation's severity for each area based on different indicators and several sources. Taking the example of regulation of entry, in addition to the cost, the IFC's Doing Business provides information for the number of procedures as well as for the time (in days) to open a business for most of the decade of 2000. Considering the three variables could help to capture in a better way not only the economic, but also the practical restrictions.

Hence, in this study's database, the variables for regulation of entry (*start*), registering property (*regprop*), enforcing contracts (*enfcontract*), closing a business (*insolv*), dealing with construction permits (*construct*), and getting electricity (*getelec*) are built considering the time in days, number of procedures as well as the cost imposed by regulation. For the case of obtaining credit (*credit*), the variable captures the strength of legal rights of borrowers and lenders, the depth of credit information, share of private credit in the economy, and the behavior of interest rates. Turning to trade (*trade*), this variable captures the time and costs to import and export, complemented with considerations over mean tariff rates, the existence of hidden import barriers, and their severity both for exports and imports. In the case of labor (*labor*), the variable considers issues related to minimum wage, and difficulty of hiring and firing. Lastly, taxation (*tax*) captures the number of payments and time taken to comply with this regulation as well as the value of the tax burden imposed over personal and corporate income. Each regulation index was normalized to vary between zero and one. For all of them, higher values represent heavier regulation burden[5]. Appendix C presents a summary of the indicators utilized, the weights assigned as well as the sources for the construction of each regulation index.

Because they cover many countries, their publication is regularly on a yearly basis, and their methodologies are clear, the following sources for measuring regulation were utilized: Doing Business (International Finance Corporation - The World Bank), Index of Economic Freedom (The Heritage Foundation), Economic Freedom of the World (The Fraser Institute), and Worldwide Governance Indicators (The World Bank). Some of the previous sources are linked to certain ideologies and political values, but the combination of them could help addressing the measurement of regulation in a more balanced way. Additionally, it was also taken into account that some sources might be more precise at measuring certain indicators because of their focus on that area[6]. Lastly, Dethier et al. (2010) suggested that objective indicators have an advantage over subjective ones in that the former are less vulnerable to measurement error and reverse causality. While almost all of the utilized indicators for regulations are objective, some other variables in the study come from subjective sources. The subjective indicators transmit the information about the perception of entrepreneurs which ultimately could shape their decisions.

Table 1 presents correlations between the regulation variables. First, the most visible outcome is that *tax* seems to behave in a different way in relation with the other variables, and the correlation is negative in most of the cases. On

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[4] OLS multiple linear regressions were also explored over the defined models using single indicators for each area of regulation. Overall, the results showed the same group of variables as statistically significant as in the results presented in Section 4, although not always in the same models.

[5] Following the methodology of Loayza et al. (2010), the equations below were utilized according to the values of every indicator. If higher values indicated heavier regulation: $\frac{X_i - X_{min}}{X_{max} - X_{min}}$. And, $\frac{X_{max} - X_i}{X_{max} - X_{min}}$ if lower values indicated heavier regulation.

[6] That was the case for tax regulation, for example. The Heritage Foundation's indicator for total tax rate was utilized and assigned more weight instead of the one measured by the World Bank because of the focus of the former organization on tax issues.

Table 1: Correlations between Regulation Variables – Before Factor Analysis

	start	trade	insolv	Credit	regprop	enfcontract	Construct	getelec	labor	tax	Gov2000
start	1.0000										
trade	0.619***	1.0000									
insolv	0.539***	0.631***	1.0000								
credit	0.623***	0.672***	0.551***	1.0000							
regprop	0.344***	0.447***	0.349***	0.515***	1.0000						
enfcontract	0.465***	0.446***	0.480***	0.544***	0.427***	1.0000					
construct	0.356***	0.415***	0.286***	0.334***	0.165**	0.0950	1.0000				
getelec	0.247***	0.457***	0.287***	0.368***	0.293***	0.135*	0.411***	1.0000			
labor	0.341***	0.268***	0.314***	0.416***	0.195**	0.233***	0.212***	0.200***	1.0000		
tax	-0.0188	-0.136	-0.154*	0.0534	0.123	-0.0777	-0.0521	-0.0232	0.135*	1.0000	
gov2000	0.568***	0.791***	0.648***	0.616***	0.367***	0.483***	0.363***	0.438***	0.305***	-0.205***	1.0000

****, **, * stand for significance levels at 1, 5, and 10 percent respectively.*

Table 2: Correlations between Regulation Variables – After Factor Analysis

	promar	function	Labor	tax	regulation	Gov2000	Principal component 1	Principal component 2	Principal component 3
promar	1.0000								
function	0.474***	1.0000							
labor	0.394***	0.244***	1.0000						
tax	-0.142	-0.0429	0.135*	1.0000					
regulation	0.620***	0.449***	0.857***	0.366***	1.0000				
gov2000	0.774***	0.481***	0.305***	-0.205***	0.387***	1.0000			
Principal component 1	**0.924*** **	0.204**	0.583***	-0.104	0.676***	0.658***	1.0000		
Principal component 2	0.333***	**0.943*** **	-0.0421	-0.0453	0.271***	0.419***	0	1.0000	
Principal component 3	-0.0580	-0.0343	0.288***	**0.920*** **	0.516***	-0.338***	0	1.05e-08	1.0000

****, **, * stand for significance levels at 1, 5, and 10 percent respectively.*

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the other hand, it is found a strong and positive correlation among all the other variables, except for *construct*, *getelect*, and *labor*. It is also important to highlight that *regprop* and *enfcontract* are strongly and positively correlated with *credit* which might be suggesting the relationship of these variables through the important issues of collateral and well function of courts as suggested by De Soto (2000). The correlations in this study also suggest that *start*, *trade*, *insolv*, *credit*, *regprop*, and *enfcontract* could be grouped under one category; product-market regulations. These results are in line with Loayza et al. (2010) where it was suggested that regulation comes in packages[7]. In addition, supporting the relationship of these variables, Straub (2005) stated that protection of property rights and contract enforcement "are important not only because they improve firms' productivity directly, but because they secure access to important markets, where they make interactions more efficient." Furthermore, Dethier et al. (2010) commented a potential collinearity problem between financial and legal regulation, so it will contribute to the study to group both aspects along with other related variables under the label of product-market regulations. As for the case of *construct* and *getelect*, it could be verified that while the correlation between them is strong and quite high, their correlation with other variables has rather low values. Finally, *labor* presents a similar situation given its low correlation values with almost all the other variables.

In order to complement the previous interpretation and provide statistical support, a factor analysis was executed. The detailed results are presented in Appendix D. As it can be verified by the eigenvalues, the factor analysis found three components. According to the rotated factor loadings, the first component is better explained by the following variables: *start*, *trade*, *insolv*, *credit*, *regprop*, *enfcontract*. This first component comprises the product-market ("*promar*") regulations. The factor analysis includes *labor* in this first component; however, the self-determination value of *labor* is high (as it can be verified in the uniqueness column presented in the detailed results). Therefore, labor will be analyzed without grouping it into other components. The second component is better explained by *construct* and *getelect*, and in this study, they will constitute the "*function*" component (the World Bank (2012b) classify this two variables along with others under a category called operations). Lastly, the third component is exclusively determined by the *tax* variable. As a result, the factor analysis helped to comprise the measurement of regulation into four categories; *promar*, *function*, *labor* and *tax*. At the same time, using these categories may help to reduce the existence of potential multicollinearity problems during the regression analyses.

Following the previous results a *promar* index was constructed as an average of its constituents, the same procedure was applied for *function*. Furthermore, the values of the components were predicted according to the factor analysis, and it can be verified in Table 2 that there is a close correlation of the constructed indexes with the predicted values of the components. In a complementary way, an overall regulation index was obtained as an average of all the constructed variables. Appendix E presents a graphical representation of regulation around the world. As expected, high income countries have in general less constraining regulation frameworks. On the other side, Sub-Saharan Africa suffers from the most constraining regulatory environment. The regulation of tax shows a different behavior because on average, high income countries inflict a rather strict tax regulation. Then, East Europe and Central Asia present the higher values (more constraining) for the regulation of *function* while Latin America and Caribbean and Middle East and North Africa are among the most constraining in terms of *labor* regulation.

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[7] The study of Loayza et al. (2010) groups the following variables into the product-market regulations: entry, trade, financial markets, bankruptcy, and judicial administration.

In line with the revised theory in section two, the independent variables are complemented with indices capturing the macroeconomic stability (*macro*), the physical infrastructure (*infra*) which measures not only the extent and efficiency of infrastructure, but also a solid and extended communications network, and, lastly, the ability to innovate and cooperate (*trans*) which is based on university-industry collaboration, government procurement of advanced technology, and the state of cluster development. The previous variables come from the WEF's Global Competitiveness Report, and are constructed in a similar way as the regulation indices. Consequently, between values of zero and one, lower scores represent a less constraining assessment in that area.

The previous variables were constructed using all the available data for the decade of 2000s. Hence, they represent an average for that decade. For example, in the case of Doing Business, comparability was allowed between 2004 and 2011 (which in practice represent the measurement from 2003 to 2010). Similar procedures and considerations were executed with all the other variables and sources. Furthermore, it was highlighted by Loayza et al. (2010) that regulation tends to stay constant over long periods of time. To deal with potential endogeneity of governance with the business environment variables in the econometric analysis, the measures corresponding to the year of 2000 were taken, so that the index reflects the initial governance level of each country for the decade of 2000.

While subjective measurements of the business environment are recently available at the firm level thanks to an effort from the IFC's Enterprise Surveys, the objective data from Doing Business is only available at the aggregate level (for just a few countries, the data is recently disaggregated into three or four main cities, but they only cover some indicators). In addition, data for the SME sector at the national level is not available on a yearly basis, and the compiled data for this sector is mainly limited to the number of firms, sector distribution, and contribution to employment. The combination of the previous factors represents a considerable challenge for studies trying to make a contribution to the better understanding of the small enterprise sector at the aggregate level.

The dependent variables are SME's density –number of SMEs per 1000 people– (*smeden*), the share of employment of the MSME sector in the total labor force (*msmeemplo*), along with the average employment growth (*empgrowth*), average number of permanent full time workers (*pfulltw*), and the share of unskilled production workers (*uskprodw*) in each country. Appendix F provides a complete description of all the variables utilized in this study. The small and medium enterprises' density and share of employment come from a single database which is a massive effort made by the International Finance Corporation. The Micro, Small and Medium Enterprise Country Indicators (MSME-CI), updated in August, 2010, provides the latest global snapshot for each variable in each country. Consequently, the year in which the information was captured for the case of the first two dependent variables varies from country to country. Nevertheless, the data points are dispersed within the decade of 2000. Given the serious restrictions of data availability for the small enterprise sector at the aggregate level, and to the extent of the revisions made, MSME-CI database constitute the only one providing a picture of the MSMEs sector for each country.

Even though the previous database constitutes the only on its own, the variables it contains provide an understanding of the MSME sector mostly in terms of quantity. ILO (2002) suggested the analysis of employment by enterprise size not only to be in terms on quantity, but also of quality of employment. Therefore, and additional, and related source was consulted; the World Bank's Enterprise Surveys. Variables like employment growth rates, and permanent full time workers were added to the study with the objective to complement the analysis in an attempt to gauge some quality aspects of employment for the small enterprise sector. Within this second array of variables, the share

of unskilled production workers pretends to have only an indicative purpose as an initial approach to evaluate the potential employment opportunities for the poor as a result of a streamlined business environment. The data coming from Enterprise Surveys is also captured at different years depending on the country, but the data points are concentrated mainly within the second half of the decade of 2000.

The dependent variables coming from MSME-CI represent the non agricultural sector of the economy[8]. For the case of Enterprise Surveys, only the data for the manufacturing sector was considered. Both sources present data for the formal sector in each economy. Even though only the formal sector is discussed (for the sake of brevity and focus), it is important to mention that there is evidence for a negative correlation between larger informal sectors and MSME density as noted by Kushnir et al. (2010). Also, Straub (2005) affirmed that cross-country evidence suggests a negative relationship of informality and different aspects of the quality of institutions such as corruption, rule of law, and regulatory burden.

Several steps were taken to construct an adequate database. For instance, only the countries and variables that provided information for the non agricultural sector (MSME-CI), the manufacturing sector (Enterprise Surveys), and with a defined breakdown for micro and small and medium enterprises were included. Additionally, Sachs & Warner (1997) stated that natural resource abundance generally shrinks the manufacturing sector; nevertheless, some countries' manufacturing sector tends to respond by promoting industrialization despite the Dutch Disease situation. However, it is also stated that in the case of oil-rich states "the natural resource base is so vast that there is no strong pressure to develop an extensive industrial sector". Kushnir et al. (2010) also excluded countries that are heavily dependent on mineral resources. Consequently, economies denominated as oil producing or oil exporting countries were removed from the data base[9]. Finally, in consideration of Ayyagari et al. (2007), two panels were constructed; Panel A is assembled maintaining the countries' official definition of SME and Panel B contains those countries whose definition matches an SME cut-off of 250 workers. Table 3 and Table 4 present the summary statistics for Panel A and Panel B respectively.

Table 3: Descriptive Statistics – Panel A

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
smeden	87	4.087201	6.957562	.0556654	59.33802
msmeemplo	102	41.60412	21.43036	1.76125	92.82653
empgrowth	92	4.816432	5.532006	-11.3667	26.0556
pfulltw	122	65.07049	55.35954	9.4	341.1
shareuskprodw	91	32.42088	13.09702	10	83.5
promar	109	.2535229	.0918619	.056617	.5106055
function	160	.1473813	.0665807	.0236293	.3864555
labor	148	.5063718	.2110312	0	1
tax	149	.2857315	.1128775	.036364	.6345206
macro	122	.4432825	.1633356	0	1
infra	122	.5956357	.2554757	.0568218	.9898122
trans	122	.5478582	.189619	.0633403	.8910916
GDPpc	160	6632.563	9943.72	111.8476	51161.05
governance	156	.5065515	.2250551	.0087978	.9773704

[8] MSME-CI does not provide a further breakdown between manufacturing and services sector for the variables utilized.

[9] The following countries were removed from the sample; Algeria, Angola, Azerbaijan, Bahrain, Ecuador, Equatorial Guinea, Gabon, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Saudi Arabia, Turkmenistan, UAE, Venezuela, Syria, Congo, Iran, Russia, and Yemen.

Table 4: Descriptive Statistics – Panel B

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
smeden	47	3.023668	3.377139	.0556654	17.39806
msmeemplo	52	40.9682	20.73425	1.76125	78
empgrowth	36	5.355023	4.902021	-1.47143	26.0556
pfulltw	42	78.95714	53.40797	17.6	270.7
shareuskprodw	42	29.58571	14.06248	10	83.5
promar	52	.2324203	.079811	.056617	.3978431
function	57	.1445077	.0677503	.0297417	.3855187
labor	56	.5182845	.2077903	0	.9460347
tax	56	.3052747	.1158987	.0836956	.6345206
macro	56	.4015437	.1460928	.1259975	.7551542
infra	56	.5484791	.2519613	.07338	.8961928
trans	56	.5090541	.1941707	.0633403	.8435464
GDPpc	57	9377.051	12088.05	211.4699	51161.05
governance	56	.4551776	.2344763	.0087978	.834048

The number of analyzed countries in every model varies mainly depending on the dependent variable. In general and considering *smeden*, for example, Panel A includes 87 countries. From those 87 countries there are; 30 "High income: OECD", 5 "High income: nonOECD", 25 "Upper middle income", 19 "Lower middle income", and 8 "Low income"[10]. From the regional perspective; 6 “East Asia and Pacific”, 4 “South Asia”, 13 “Europe and Central Asia”, 6 “Middle East and north Africa”, 15 “Latin America and Caribbean”, and 8 “Sub-Saharan Africa”. Taking as an example also *smeden*, Panel B includes 47 countries. From those 47 countries there are; 17 "High income: OECD", 2 "High income: nonOECD", 17 "Upper middle income", 8 "Lower middle income", and 3 "Low income". From the regional perspective; 2 “East Asia and Pacific”, 1 “South Asia”, 9 “Europe and Central Asia”, 3 “Middle East and north Africa”, 8 “Latin America and Caribbean”, and 5 “Sub-Saharan Africa”. Appendix G presents a list of the countries included in each panel. Table 5 presents correlations of MSMEs’ share and densities with GDPpc. It is observed that the density variables are positively correlated with GDPpc. Kushnir et al. (2010) and Klapper et al. (2009) also found that business density is positively correlated with income per capita.

For inquisitive purposes, the auxiliary variables of share of micro and SMEs in the total number of firms were utilized. The sign of the correlation indicates a negative relationship between the share of microenterprises and GDPpc. Table 6 presents correlations between the dependent variables and GDPpc. It could be verified that except for the share of unskilled production workers, all the other variables are positively correlated with GDPpc. Lastly, Table 7 provides the correlations between all the variables utilized in the study. Bearing in mind that for the business environment variables higher values represent heavier or more constraining regulation, it is observed that except *tax*, all the other variables are negatively correlated with GDPpc. There is a strong correlation between *smeden* and *promar* as well as with *macro*. In the case of *msmeemplo* the correlation is stronger with *promar* and *macro* while *empgrowth* is strongly correlated only with *macro*. Then, *pfullw* shows a stronger correlation with *trans* and *infra*.

Another issue worth of comment is that the overall density of MSMEs is higher for high income countries, and it decreases as the income level decreases. Kushnir et al. (2010) also found that “the regional distribution of MSME density is in line with the income level distribution”.

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[10] The World Bank’s criterion for classifying economies based on gross national income (GNI) per capita was utilized. Available at: http://data.worldbank.org/about/country-classifications/country-and-lending-groups.

Table 5: Correlations between MSMEs' Densities and Shares with GDPpc

	smeden	persme	permicro	GDPpc
GDPpc	0.258**	0.0418	-0.0417	1.0000

****, **, * stand for significance levels at 1, 5, and 10 percent respectively.*

Table 6: Correlations between Dependent Variables and GDPpc

	Smeden	msmeemplo	empgrowth	Pfulltw	shareuskprodw	GDPpc
smeden	1.0000					
msmeemplo	0.334***	1.0000				
empgrowth	-0.0387	0.0189	1.0000			
pfulltw	-0.0285	-0.208*	0.0254	1.0000		
shareuskprodw	0.171	-0.0324	-0.0327	0.134	1.0000	
GDPpc	0.258**	0.274***	0.0351	0.144	-0.149	1.0000

****, **, * stand for significance levels at 1, 5, and 10 percent respectively.*

Table 7: Correlations between All Variables

	Smeden	msme emplo	emp growth	pfulltw	shareusk prodw	promar	function	labor	tax	macro	infra	trans	GDPpc	Gov
Smeden	1.0000													
Msmeemplo	0.334***	1.0000												
Empgrowth	-0.0387	0.0189	1.0000											
Pfulltw	-0.0285	-0.208*	0.0254	1.0000										
shareuskprodw	0.171	-0.0324	-0.0327	0.134	1.0000									
Promar	-0.355***	-0.335***	-0.0115	-0.163	0.124	1.0000								
Function	-0.0857	-0.189*	-0.162	-0.00282	-0.0033	0.546***	1.0000							
Labor	-0.187*	0.00268	0.0919	0.0779	-0.0902	0.431***	0.283***	1.0000						
Tax	0.0110	0.132	-0.00307	0.0324	-0.131	-0.125	-0.0585	0.0887	1.0000					
Macro	-0.352***	-0.295***	-0.239**	-0.0383	0.165	0.631***	0.457***	0.207**	-0.175*	1.0000				
Infra	-0.191*	-0.258**	0.138	-0.29***	0.142	0.835***	0.506***	0.342***	-0.353***	0.597***	1.0000			
Trans	-0.103	-0.186*	-0.0542	-0.36***	0.0528	0.677***	0.483***	0.283***	-0.315***	0.543***	0.855***	1.0000		
GDPpc	0.258**	0.274***	0.0351	0.144	-0.149	-0.716***	-0.396***	-0.27***	0.308***	-0.495***	-0.864***	-0.77***	1.0000	
Governance	-0.133	-0.264***	-0.0530	-0.105	0.0979	0.763***	0.511***	0.324***	-0.280***	0.538***	0.866***	0.725***	-0.803***	1.00

****, **, * stand for significance levels at 1, 5, and 10 percent respectively.*

`

At the regional level, East Asia and the Pacific along with Latin America and Caribbean show the highest densities of MSMEs (besides high income countries). At the other end, the lowest densities are found in South Asia and Sub-Saharan Africa (the density in South Asia is significantly lower than the one in Sub-Saharan Africa)[11]. In high income countries, not only there is a higher density of MSMEs, but also MSMEs employ a greater share of the workforce. Furthermore, the MSMEs' contribution to employment in high income countries fluctuates between 24 to 77 percent. The fluctuation varies greatly for other income levels and regions of the world. This, observation might be suggesting that there could be an optimal range in terms of MSMEs' contribution to employment. Therefore, cases in which the share of employment is too low, like in Sub-Saharan Africa, or cases in which is too high, like in Latin America and Caribbean, might be signaling potential problems with the industrial structure of those countries. Perhaps because of larger populations, South Asia presents a particular case because even though they have the lowest MSME density, this sector contains a significant share of employment (as high as in high income countries). There is not much that could be said about the quality of those jobs from the database. From the point of view of the average permanent full time workers in each economy (which provides figures not only for the small enterprise sector but for all manufacturing enterprises), it can be verified that this variable is in line with the income level. Countries with higher incomes have the higher numbers of permanent full time workers employed. Tables 8 and 9 summarize the before mentioned comments.

Table 8: MSMEs' Density and Share of Employment by Income Level[12] (Panel A)

Income Level	**msmeden (mean)**	**msmeemp (mean)**	msmeemp (min)	msmeemp (max)	**pfulltw (mean)**
HINC	43.596	49.48137	24.69496	76.98749	89.26
UMINC	26.11015	38.03194	12.27025	80	68.08611
LMINC	25.96468	40.94885	2.17416	92.82653	59.17857
LINC	15.25228	26.01477	1.76125	76.103	57.34828

Table 9: MSMEs' Density and Share of Employment by Region[13] (Panel A)

Region	**msmeden (mean)**	**Msmeemp (mean)**	msmeemp (min)	msmeemp (max)	**pfulltw (mean)**
HINC	43.596	49.48137	24.69496	76.98749	89.26
ECA	22.566	35.44944	4.476295	65	62.73889
EAP	24.187	30.6955	2.243632	80	92.51429
LAC	36.919	37.44049	13.74581	92.82653	58.05
SA	8.5175	49.47713	2.17416	78.28878	58.95714
MNA	18.83	35.6113	12.27025	82	119.96
SSAFRICA	17.354	39.07136	1.76125	75	44.68649

The empirical methodology of this study is based on multiple linear regressions by OLS. For each dependent variable, the explanatory variables are measurements of the business environment. It is proposed to control for GDPpc on the basis of the study of Ayyagari et al. (2007). In addition, governance and its interactions with the business environment variables are included according to the

[11] Panel A include within the regional category of South Asia; Sri Lanka, India, Nepal, Pakistan, Bangladesh. The first three present the lower MSMEs densities.
[12] HINC: High income countries (OECD and nonOECD), UMINC: Upper middle income, LMINC: Lower middle income, and LINC: Low income countries.
[13] ECA: East Europe and Central Asia, EAP: East Asia and Pacific, LAC: Latin America and Caribbean, SA: South Asia, MNA: Middle East and North Africa, and SSAFRICA: Sub Saharan Africa.
`

explanations given in Section 2. As a result, the equation below represents the generic econometric model to be utilized in each regression.

$$Dep.Var. = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{gov} + \beta_3 \text{promar} + \beta_4 \text{function} + \beta_5 \text{labor} + \beta_6 \text{tax} + \beta_7 \text{macro} + \beta_8 \text{infra} + \beta_9 \text{trans} + \beta_j (\text{be} * \text{gov})_i + (\dots) + u \qquad (1-5)$$

For every model, several regressions were progressively explored starting from the inclusion of each interaction term individually, going through each possible combination, to the inclusion of all combinations at once. Those variables that remained significant along all the possible tested combinations were the ones included in the final models. Before proceeding to the results and discussion, a RESET test for functional form misspecification was carried out for each resulting model that is presented in Section 4. The results suggest that there is no functional form problem. A detailed procedure of RESET test, and summary results for each model is presented in Appendix H[14]. A Breusch-Pagan Test for Heteroskedasticiy was also explored for every model. Except for model 1A, all the resulting p-values are greater than 0.05, this means that the reported standard errors are reliable because the null hypothesis of homoskedasticity in the model was not rejected. Therefore, there is strong evidence against heteroskedasticity in almost all the models. In order to address potential heteroskedasticity problems, particularly for model 1A, robust multiple linear regression was utilized in every calculation for all the models. The results of the tests are presented in Appendix I.

Given potential multicollinearity problems among the explanatory variables, joint significance tests were executed for each model. For the case of models 1A and 1B, the variables that individually appear as not significant, are, according to the test results, jointly significant. In the case of models 2A and 2B, their individually not significant variables are not jointly significant. The former situation is also replied for models 3A, 3B, 4A, and 4B. For all the cases in which the analyzed variables appeared as not jointly significant, a new OLS regression was executed excluding those variables from the model (the models run after the joint significance tests have an apostrophe after the model's name). Except for model 3A' in which *trans* is no longer significant, in all the new models (2A', 2B', 3B', 4A', and 4B') the variables that appeared as individually significant in the original models, remain significant in the new models. The previous results might be a good indicative for the robustness of the analysis with regard to those variables. A summary of the joint significance tests is presented in Appendix J.

4. Results and Discussion

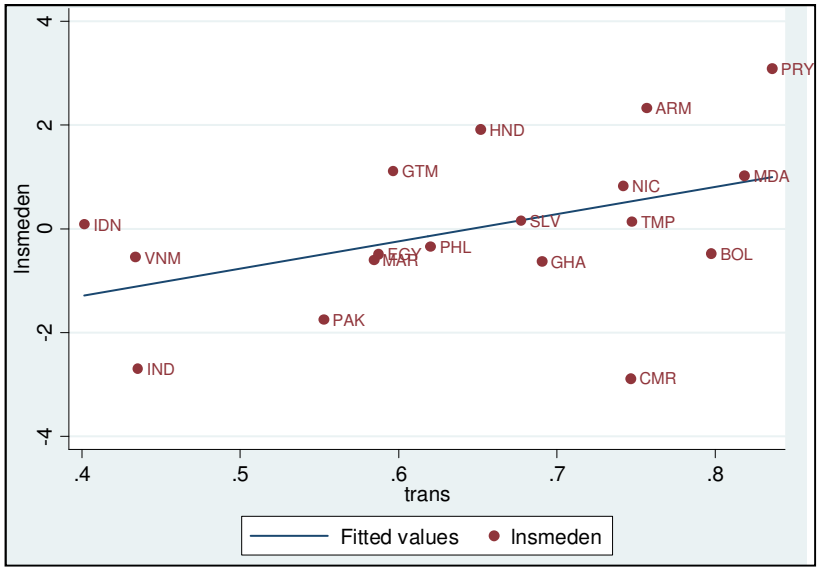
Using OLS multiple linear regression, Tables 10 and 11 show a significant association of several dimensions of the business environment with the size of the SME sector (measured by the number of SMEs per 1000 people in each economy), and the MSME sector's contribution to employment (measured as the share of total employment) as well as with other employment variables across countries. For each table, the utilized models are numbered according to the dependent variable. A letter is added after each model's number; the letter A determines that the model comes from Panel A, and the letter B establishes that the model was applied in Panel B.

[14] Only models 1A and 3B required a significance level at the one percent to successfully pass the test.

4.1 The impact on SMEs density

Table 10 presents the results for the dependent variables coming from the IFC's database (MSME-CI). With regard to the SME density (models 1A with special emphasis on 1B) it is noticed that tax regulation and the ability to cooperate play a significant role; however, their impact is inflicted in conflicting ways. *Tax* carries a negative and significant coefficient which suggests that the less constraining the tax regulation might be, the more number of SMEs that will be found in that economy. In the case of *trans*, the variable presents a positive and significant coefficient. At first, this result seems to discourage the effect of cooperation in order to foster a large SME sector because the higher the value (more constraining to business) for the index of *trans*, the higher the number of SMEs. With this regard, Molina (2006), based on the case of Bolivia, described that a characteristic of SMEs in developing countries is that this sector spreads and tends to diversification without being able to specialize[15]. The previous statement could be visualized in Figures 5 and 6 which show a positive relation of *smeden* and *trans* for the case of lower middle income countries while in the whole sample the relationship is negative with countries like Japan, USA, Finland, or Korea presenting higher densities of SMEs and lower (less constraining) values of *trans*.

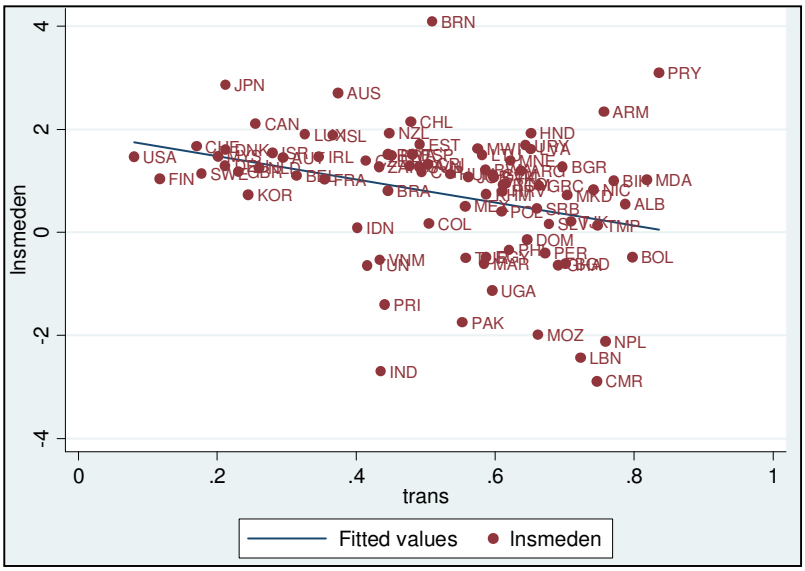
Figure 5: Scatter Plot of smeden and trans; Lower Middle Income Countries (Panel A)



Source: Author's elaboration

[15] It is also stated that in many cases workers seem to have as a hidden project to reproduce its employment source by becoming an independent entrepreneur.

Figure 6: Scatter Plot of smeden and trans; Whole Sample (Panel A)



Source: Author's elaboration

If there is neither the ability to cooperate nor the incentive for coordination towards the creation of a competitive industrial structure, the result will be the atomization of hundreds of actors that have scarce possibilities to actively compete in bigger markets. Lastly, labor regulation appears with a negative and significant coefficient while GDPpc has a positive and significant coefficient, both for the case of model 1B. Generally speaking, besides tax and labor regulation, it is usually stated the importance of entry regulation as having an impact for greater shares of small firms in the economy. That aspect is recognizably important as it is verified in the next section; however, it is needed to be highlighted that the dependent variable being analyzed does not include micro enterprises and considers only SMEs. However cumbersome the entry regulation might be, SMEs may regard those procedures as possible to address. Nevertheless, with potentially higher levels of initial capital, and number of workers, among others, the results suggest that SMEs will turn their attention towards issues such as tax and labor regulatory frameworks which might ultimately be more constraining for that sector.

Summarizing, for the size of the SME sector in terms of the number of enterprises per 1000 people in each country, the evidence is mixed. From the regulatory point of view, variables such as *tax* and *labor* suggest that less constraining regulatory frameworks, especially in those areas, foster the number of enterprises in an economy (in other words, an SME entrepreneur will be more likely to start or expand a formal small or medium sized business if tax and labor regulations are less constraining). In addition, Gelb et al. (2007) found that "tax administration is primarily a problem in middle income countries and the perception of labor regulations as a severe constraint increases with the GDP level". The findings of models 1A and 1B confirm the previous statement. The coefficient of labor regulation is significant only in Panel B which is composed up to 80 percent by high and upper middle income countries. Furthermore, Straub (2005) proposed labor market rigidities (e.g. a

minimum wage above the market clearing level) “push firms to remain informal at higher level of initial capital”.

On the other hand, the significant and positive coefficients of *trans* suggest that constraining business environments generate larger numbers of small enterprises that are either not able to grow or do not have the incentives to grow beyond a certain size, particularly in the cases where the ability to cooperate and coordinate is missing. However not significant, *macro* in model 1A, and *function* in model 1B might be in line with the previous hypothesis given their positive sign. Nevertheless, the existence of more firms per 1000 people in each economy does not provide a comprehensive analysis because we cannot make inferences about the quality, competitiveness, or the contribution to employment of those existent enterprises.

4.2 The impact over MSMEs Contribution to Employment

Turning the attention to the MSMEs share of employment in the total labor force, it is noticed that the interactions with governance of product-market and labor regulation have negative and significant coefficients (models 2A and 2A’). In model 2A, the labor coefficient alone is also significant. For models 2B and 2B’, the interactions of product-market with governance present negative and significant coefficients.

With regard to rigidities of the business environment, the coefficients of infrastructure (2A), macroeconomic stability and function (2B) present a positive sign although not significant. Thus, the evidence for larger MSMEs sector as a result of a constraining business environment is rather weak.

In summary, the results suggest that larger contributions to employment by the MSME sector are characterized by streamlined labor and product-market regulation. However, this role is subject to the level of governance. For example, in model 2A, the impact of labor regulation on the MSMEs contribution to employment is represented by the following equation:

$$\frac{\partial msmeemplo}{\partial labor} = -0.282 + 1.136(governace) \qquad (for\ model\ 2A)$$

Therefore, according to the level of governance the effect of labor regulation could be exacerbated or mitigated. In principle, labor regulation has a negative coefficient; however, if governance takes the value of one (indicating an inadequate level of governance), the resulting sign of the labor regulation’s overall effect will be positive. In turn, the former not only contributes to the theory that constraining regulations artificially increase the contribution to employment of the MSMEs sector (because stifling regulations prevent SMEs from growing, or exit), but also suggests that the constraining business environment theory is more likely to occur in developing countries which are more prone to suffer from constrained levels of governance.

The before mentioned is an interesting proposition that combines and harmonizes the implications of Ayyagari et al. (2007) and Loayza et al. (2010). Ayyagari et al. (2007) advocated that business environments could foster the MSMEs sector either because they support a constant entry and development of enterprises or because they constrain MSMEs development by not letting them grow or rapidly exit the market. Loayza et al. (2010) advocated for the interaction of governance with the regulation variables. Particularly for the case of labor regulation, the findings proposed in this study

could contribute to the previous discussion by stating that for inadequate levels of governance, the theory of constraining business environments is more likely to hold.

In a complementary way, if governance takes the value of zero, (meaning a good level of governance) the sign over the effect of labor regulation will remain negative. In this case, the easier the labor regulation the greater the share of employment accounted to MSMEs. For explicative purposes only, if governance takes a threshold value of 0.25 (in model 2A, for example), the effects of labor regulation are mitigated. The previous statement implies that independently to the complexity of labor regulations the effects could actually be reduced through good levels of governance. The quality of governance explains the regulatory context; for example, how regulation is enforced, or given that a procedure may include several steps or requirements, whether or not it could be completed without serious delays, or whether the regulation is applied to all actors in the same way.

The product-market regulation and its interaction with governance could be explained in a similar manner; however, their behavior is different. For instance, if in order to analyze the partial effect, the mean values of governance both for Panel A (0.51) and for Panel B (0.46)[16] are inputted into the product-market regulation and its interaction with governance, the resulting sign for all models (2A, 2A', 2B, 2B'), is negative. For all models, it is the interaction terms that carry significant and negative coefficients. In this case, and for explicative purposes, the thresholds for a change of sign in the product-market regulation take lower values (0.17 for model 2A, 0.15 for 2A', 0.25 for 2B, and 0.20 for 2B'); therefore, they cover a broader range of levels of governance. The potential implication is that for the case of product-market regulation, the resulting sign will remain negative as long as the levels of governance take values between the before mentioned thresholds and the maximum value of one. In that range, a streamlined product-market regulation might pave the way for a greater contribution to employment by MSMEs. This could in part explain why many development institutions have a strong focus on issues like credit and other aspects of the product-market regulations when it comes to private sector promotion in developing countries. In conclusion, the results suggest that for those countries with levels of governance from around 0.20 to 1 (which include all developing countries), it could be more recommendable to start tackling the improvement of the business environment by simplifying the product-market regulation.

For instance, Dethier et al. (2010) mentioned that the case for better entry regulation "has now become common wisdom worldwide". In addition, Straub (2005) suggested that a better judicial system and access to credit (both also included in product-market regulation) will make the participation of MSMEs in formal credit markets more attractive; therefore, the reliance of entrepreneurs in informal credit markets (generally lacking project screening which might lead to modest or unsuccessful outcomes of the financed projects) will be reduced. Moreover, Stein et al. (2010) stated "approximately 70 percent of all emerging-market MSMEs (roughly 255 million to 310 million enterprises)" do not utilize any formal credit at all even though they want to use it. Dethier et al. (2010) stated that access to finance declines with the level of GDP while You (1995) and Kushnir et al. (2010) also highlighted the importance of letting MSMEs have access to credit.

The question is; what happens at low values of governance (those countries with good governance)? At good levels of governance, from a minimum of zero to the threshold values, the sign over the overall effect of product-market regulation will turn to positive. One possible explanation

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[16] Panel B has a better level of governance because most of the countries composing this panel are high and upper middle income countries.

could also be analyzed through access to credit. Straub (2005) stressed the importance of project screening in formal credit markets. The idea is that for those countries with good levels of governance (where even though some regulation might take several procedures, the correct functioning of the whole system allows the accomplishment of the procedures generally on time and with concluding results) it could pay-off to strengthen some aspects of the product-market regulation. For example, in the credit market, the design of more detailed and perhaps stricter procedures could help to allocate resources more efficiently to better projects that could boost the economy and increase employment. These kind of measures hold only for a restricted number of countries; for example, there are only fourteen countries with governance levels inferior to the value of 0.15[17].

Therefore, a simplified product-market regulation may allow the participation of more enterprises in the formal markets (this is especially true for developing countries which typically present not good levels of governance). In the case of countries with outperforming levels of governance, the design of stricter product-market regulation may allow the correct MSMEs projects to be financed, enter the market, and increase the contribution to employment by this sector.

4.3 The Impact over other Employment Variables

ILO (2002) stated that while the employment share by enterprise size provides one parameter to judge their importance in total employment, that measure does not convey information about how employment is created. For example, an increase of the small enterprise share in total employment could be originated because of the downsizing of larger enterprises, rather than from new or growing small enterprises.

Turning to the results presented in Table 11, the first four columns analyze the employment growth in the manufacturing sector for each economy and its relationship with the business environment[18]. First, models 3A, 3A', 3B, and 3B' present significant coefficients for macroeconomic stability and its interaction with governance. The behavior of the sign is similar to the case explained for product-market regulation and the MSMEs share of employment. In general, it could be said that for those countries with not good levels of governance (the threshold value is 0.45 for model 3A, 0.43 for 3A', 0.64 for 3B, and 0.62 for 3B' -the thresholds for Panel B are higher because that panel contains countries with higher income levels-), macroeconomic stability will definitively contribute to higher growth rates in employment[19]. When governance takes low values (meaning better governance), the overall coefficient of macroeconomic stability takes a positive sign. This result might suggest that the lower the level of *macro* (more stable macro economy), the lower the employment growth rates. Most developed countries present lower employment growth rates as well as reasonable levels of macroeconomic stability. Table 12 below presents descriptive information to complement the previous explanation.

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[17] The countries are Australia, Austria, Canada, Denmark, Finland, Germany, Iceland, Luxembourg, Netherlands, New Zealand, Sweden, Switzerland, United Kingdom, and United States.

[18] Because the IFC's MSME-CI database provides data exclusively on the size, breakdown, and employment contribution of the small enterprise sector, the study had to look for additional variables in the World Bank's Enterprise Surveys in an attempt to further comprehend the impact of business environments, particularly on employment.

[19] Meyer-Stamer and Haar (2008) pointed out that in developing countries, SMEs are not correlated with economic growth because there is a time lag between enterprise development and macroeconomic stability since it takes time for entrepreneurs to recover confidence in the economy. The macroeconomic stability variable in this study is a measure over the decade of 2000 (2004 to 2010); therefore, it is able to capture this potential time-lag as it appears significant in the model.

Table 12: Descriptive Statistics for empgrowth by Income Level (Panel A)

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
High Income: OECD					
empgrowth	6	**3.55**	1.11669	1.9	4.7
infra	6	.4846494	.1037205	.3802374	.6534814
governance	6	.3357158	.0528853	.2753448	.4087012
High Income: nonOECD					
empgrowth	3	**5.866667**	1.059874	4.9	7
Infra	2	.5607366	.0652582	.5145921	.6068811
governance	3	.3713675	.1504942	.2007989	.4854318
Upper Middle Income					
empgrowth	33	**6.193939**	4.411628	1	23.8
Infra	26	.6409272	.0979753	.443212	.8152534
governance	29	.4947168	.1429368	.2174751	.7794067
Lower Middle Income					
empgrowth	37	**6.145946**	4.274316	-3.3	17.2
Infra	27	.7797847	.0889699	.5887812	.9518008
governance	31	.6260692	.1042727	.3849111	.817634
Low Income					
empgrowth	24	**7.383333**	5.151924	-7.4	13.4
Infra	14	.8668131	.046581	.7987509	.9840839
governance	20	.7029515	.107943	.5343227	.8893903

As it can be verified, on average, there is less employment growth in the manufacturing sector for higher income levels. Additionally, lower income levels have more constraints with regard to physical infrastructure which might be explaining the positive sign on the coefficients of *infra* in models 3A, and 3B although they are not significant. Ultimately, the importance of macroeconomic stability for employment growth is highlighted, particularly for countries with more constrained governance levels.

Besides macroeconomic stability, it is observed from models 3B and 3B' that tax and product-market regulation have significant roles on employment growth. Lastly, the coefficients of *trans* and its interaction with governance are significant. The coefficient of *trans* is in principle negative; however, for more constrained levels of governance (a range from around 0.65[20] to 1) the effects of *trans* have a different channel. Therefore, governance as a measure of the quality and the context that determines how the business environment functions has also an impact on the potential ability to cooperate when it comes to talk about employment growth rates. The World Economic Forum (2011) stated that as countries move towards higher stages of development, the need to boost innovation becomes more important. Those countries with better governance are also the more developed. Nevertheless, it is important to highlight that almost 70 percent of the countries in Panel A are included in the range of governance (from 0 to 0.67) that will produce a negative sign in the overall effect of *trans* on employment growth. The way *trans* behaves in models 3A to 3B' is the same as *labor* behaves in models 2A and 2A'. The difference is that *trans* includes a wider range of countries that could pay attention to the issue of collaboration, and innovation to foster employment growth rates in the manufacturing sector.

The ILO (2005) pointed out the improvement of employment quality in small enterprises could be achieved not only by creating new jobs, but also by decreasing underemployment. That stated, the analysis is turned to models 4A to 4B' to analyze the potential areas of the business environment that

[20] The threshold values are 0.67 for model 3A, 0.64 for 3B, and 0.64 for 3B'.

could be addressed in order to support the employment of permanent full time workers in the manufacturing sector. First of all, the variable *trans* has a significant and negative coefficient in models 3A and 3A'. The variable is significant without the interaction with governance which means that it has a direct and straightforward influence. Those countries with more ability to cooperate and innovate have on average more permanent full time employees working in the manufacturing sector. Since the *trans* variable appears as significant in the models of Panel A, it could also be stated that the previous proposition could hold not only for developed, but also for developing countries.

The case of taxation and average number of permanent full time workers presents an interesting behavior. From model 4A to model 4B' the coefficient of the variable tax is significant along its interaction coefficient[21]. The tax coefficients are positive, and the interactions terms are negative. The threshold values are rather high 0.61 for model 4A, 0.56 for 4A', 0.70 for 4B, and 0.72 for 4B'. For explicative purposes, when governance is between the before mentioned values and the value of 1, the overall impact of tax regulation over the dependent variable will be negative. Therefore, and given the previous condition, as lower the value of the tax regulation index may have (meaning less constraining) as higher the value of the average permanent full time workers. The range of governance for the previous implication to hold, suggests that it might be valid particularly for developing countries (typically with higher values in the index of governance which means that this aspect is more constrained). When the levels of governance are closer to zero, the overall effect of tax regulation will take a positive value. This finding reflects the fact presented in Section 3 (Appendix D –Fig. 4) that high income countries show a more strict tax regulatory framework (Loayza et al. (2010) also found heavier tax regulation in high income countries). Table 13 helps to visualize the previous comments.

Table 13: Descriptive Statistics for pfulltw by Income Level (Panel A)

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
High Income: OECD – nonOECD					
pfulltw	15	**89.26**	48.61995	30.9	186.4
tax	15	***.3118065***	.1056667	.0400234	.4427238
governance	15	.2954564	.1095341	.1028866	.4854318
Upper Middle Income					
pfulltw	36	**68.08611**	53.41676	14.5	270.7
tax	31	***.2389634***	.0653938	.0836956	.3544551
governance	35	.4792719	.129724	.2174751	.7794067
Lower Middle Income					
pfulltw	42	**59.17857**	48.12515	11.7	223.9
tax	40	***.2651371***	.1004768	.036364	.4648126
governance	40	.6218732	.1196792	.3849111	.9497885
Low Income					
pfulltw	29	**57.34828**	68.29957	9.4	341.1
tax	28	***.2837545***	.0955038	.0997977	.536701
governance	29	.7152755	.1081798	.5343227	.9773704

Completing the analysis of this dependent variable, it is noticed that product-market regulation and its interaction with governance have significant coefficients in models 4B and 4B'. These variables appear as significant once again in Panel B (suggesting an increased importance at higher income levels). Their behavior is the same as when they appear significant in previous models. The variable

[21] In model 4B' the interaction with governance is not significant; however, if the interaction term is eliminated (as it was tested for all such similar cases), the tax term is no longer significant.

function takes a negative and significant coefficient while its interaction with governance takes a positive and significant coefficient. The potential channel for function to affect the number of permanent full time workers is through the expansion or creation of new formal establishments which require straightforward procedures for construction permits, for example. As in other similar cases, the variable *function* is in principle negative but its overall coefficient will take positive or negative values when interacted with governance. To the extent of the revision and analysis made, there are no further comments in this study for this variable.

Proceeding to the analysis of the share of unskilled production workers, models 5A and 5B do not provide relevant information except for the negative and significant coefficient of the *tax* regulation.

4.4 Brief Discussion of an IV Procedure for SME density and MSME Contribution to Employment

For models 1A and 2A, an instrumental variables procedure was explored in an attempt to isolate the exogenous variation in regulation. In Beck et al. (2005), Ayyagari et al. (2007), Ayyagari et al. (2008), and Loayza et al (2010), the use of several exogenous variables as instruments for the regulatory framework in studies related to the small enterprise sector are well argued. Consequently, variables for the legal origin, ethnic fractionalization, latitude, and the share of Catholic, Muslim and Protestant in every country are utilized in consideration of their impact on the quality of; government provision of public goods, business transactions, the contracting environment, and the level of financial and institutional development. Table 14 presents the results.

The Angrist-Pischke (A-P) first stage F-statistics are reported. Angrist & Pischke (2009) developed first stage F-statistics when there is more than one endogenous regressor. While Cragg-Donald and Kleibergen-Paap statistics test the equation as a whole, the A-P first stage F-statistics, explores whether one of the endogenous regressors is under or weekly specified. The Angrist-Pischke X^2 for under-identification was also calculated; nevertheless, since the results are in line with the A-P F-statistics, they are not presented. Given the low values of the F-statistics, tests for robust inference were considered. Therefore, the Kleibergen-Paap LM statistic replaces the Anderson-Canon for under-identification, and the Kleibergen-Paap Wald F-statistic replaces the Cragg-Donald for weak identification. For over-identification, the Hansen J statistic is analyzed. The Anderson-Rubin Wald statistic was also calculated to verify the joint significance of the endogenous regressors.

In general, while the Hansen J-statistic is never rejected (suggesting that the instruments are valid), the Anderson-Rubin Wald test fails to be rejected in some models (except for Model 2A, for example). The individual evaluation of the endogenous regressors provides new insights. For instance, in model 1A, it can be verified by the A-P first stage F-statistics that the utilized instruments might be suitable for the regulation of product-market, function and labor (for *smeden*) while tax is weekly specified. Because of the weak specification of one of the variables, the results for the whole model might be hampered.

One potential result to highlight might be found in model 2A were *promar* and *promargov* are instrumented. The 2SLS coefficient for *promargov* is negative and significant. What is more, the coefficient of *promar* alone is also negative suggesting that streamlined product-market regulation may definitively contribute to greater shares of employment. The role of governance in the previous situation will only be to reduce or augment the impact without changing the sign of it. The A-P first stage F-statistics provide satisfactory results, and the other tests results suggest that the instruments

seem to be valid for the whole equation. In addition, the Anderson-Rubin statistic shows that the endogenous regressors are jointly significant. The former findings stress the importance of product-market regulation.

Overall, new instruments as well as techniques need to be explored. For instance, while geographical proximity may play a role for taxation, religion variables have greater impact shaping attitudes towards credit (captured in product-market). At the moment, IV-procedures for multiple endogenous variables, instrument all of them in the same way. Beck et al. (2005) affirmed that "the lack of theory and empirical cross-country work on the determinants of the size of the SME sector in manufacturing is a significant hurdle in selecting appropriate IV".

4.5 General Discussion over Concurrent Findings

Table 15 summarizes all the findings previously discussed. The case of the SMEs' sector size is straightforward. It seems that as economies reach higher stages of development, or as the size of the firms grows, it will not only be tax, but also labor regulation the most important factors potentially constraining the entry of new small and medium firms.

In the case of the contribution to employment by MSMEs, it was found that for lower stages of development or smaller firm size both product-market as well as labor regulation were important; however, as income level increases, or firms grow, it is mainly product-market regulation that might play a determinant role. The simplification of the regulation of entry and exit along with the regulation of credit, registering property, enforcing contracts, and trade, may allow firms that are new, or have potential for growing, to secure and expand market transactions which, in turn, might let them hire more workers.

The relation of regulation with the level of governance gives way to more focalized and practical findings. Simplified procedures for the regulation of labor (share in employment), tax (employment growth), and a stronger ability to cooperate (employment growth) are more likely to contribute to the development of the small enterprise sector when the levels of governance are reasonably good. On the contrary, and for the previous aspects, a complex regulatory framework combined with constrained levels of governance, may result in artificially large small enterprise sectors whose growth or renewal is constrained. Then, for these regulation areas, those countries with good levels of governance might find it convenient to simplify the regulatory procedures while those countries with less developed governance structures may support the small enterprise sector development by improving the quality of governance (e.g. democratizing regulation by making it accessible and applicable to all actors in the same way, enhancing enforcement, improving flows of information within and among institutions related to a certain regulation), streamlining the regulations' procedures, or addressing both at the same time.

The product-market regulation (share in employment, employment growth, and number of permanent fulltime workers), macroeconomic stability (employment growth), and tax (permanent full time workers) interact with governance in a different way. In these cases, an improvement towards more business friendly regulation will have a positive impact regardless of the constrained governance levels. Particularly broad is the range of governance (from around 0.20 to 1) for which an improvement of product-market regulation will have a positive impact on the development of MSMEs. This suggest an explanation as for the strong focus of development institutions such as the World Bank on issues like access to credit, simplification of entry procedures, etc. to promote the

small enterprise sector. Given outstanding levels of governance, it could actually pay off to design stricter regulation frameworks to improve efficiency.

In general, the results provide evidence that the development of the small enterprise sector is due to a business enabling and competitive environment. For almost all the cases, in which a variable supported the theory of constraining business environment, their coefficients are not significant, and their t-statistics very low.

In addition, it is important to emphasize that (except for models 1A and 1B which analyze quantity-type variables) the ability to cooperate, as measured by *trans*, has negative, and in most models, significant coefficients (3A, 3B, 3B', 4A, and 4A' which analyze more quality-type variables). Therefore, the existence of aspects such as collaboration between universities and enterprises, cluster development as well as introduction of new technologies by the government enhances the competitiveness and effective contribution that the private sector may have.

Table 10: OLS Results - SMEs' Densities and MSMEs' Contribution to Employment (IFC's MSME-CI)

Dependent variable:	Ln_smeden	Ln_smeden	msmeemplo	msmeemplo	msmeemplo	msmeemplo
Independent Variables	**(1A)**	**(1B)**	**(2A)**	**(2A')**	**(2B)**	**(2B')**
Ln GDPpc	0.377 (0.229)	0.442*** (0.158)	-0.0190 (0.0448)	-0.0227 (0.0311)	0.00445 (0.0542)	0.00966 (0.0463)
Governance	0.129 (1.432)	-1.056 (0.976)	-0.232 (0.421)	-0.265 (0.321)	0.794 (0.524)	0.686** (0.309)
Promar	-1.901 (2.423)	-1.548 (2.588)	0.485 (0.741)	0.394 (0.673)	1.233 (1.199)	0.804 (0.844)
Promar_gov			-2.845* (1.445)	-2.603* (1.324)	-5.025** (2.135)	-4.024** (1.625)
Function	-0.851 (3.207)	2.445 (2.237)	-0.200 (0.378)		0.376 (0.428)	
Function_gov						
Labor	-0.743 (0.563)	-1.495*** (0.369)	-0.282* (0.166)	-0.311 (0.191)	-0.0168 (0.110)	
Labor_gov			1.136** (0.445)	1.160*** (0.406)		
Tax	-2.003** (0.850)	-2.158** (1.023)	-0.0912 (0.212)		-0.310 (0.202)	
Tax_gov						
Macro	0.380 (0.977)	-0.410 (1.032)	-0.00422 (0.221)		0.317 (0.294)	
Macro-gov						
Infra	-1.467 (1.094)	-1.940 (1.402)	0.145 (0.250)		-0.0248 (0.382)	
Trans	1.967* (0.995)	3.521*** (1.140)	-0.157 (0.265)		-0.294 (0.359)	
Trans_gov						
C	-1.200 (2.405)	-1.659 (1.681)	0.824* (0.468)	0.813** (0.350)	0.389 (0.518)	0.294 (0.490)
Observations	78	42	90	90	46	46
R^2	0.433	0.774	0.246	0.236	0.425	0.368

Standard errors in parenthesis

****, **, * stand for significance levels at 1, 5, and 10 percent respectively.*

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Table 11: OLS Results – Other Employment Variables (Enterprise Surveys)

Dep. variable:	Empgrowth	Empgrowth	Empgrowth	Empgrowth	Ln_pfulltw	Ln_pfulltw	Ln_pfulltw	Ln_pfulltw	Shareuskprodw	Shareuskprodw
Ind. Variables	**(3A)**	**(3A')**	**(3B)**	**(3B')**	**(4A)**	**(4A')**	**(4B)**	**(4B')**	**(5A)**	**(5B)**
Ln GDPpc	0.661	-0.117	1.293	0.457	0.0864	0.143*	0.166	0.218	-0.0178	1.090
	(1.165)	(0.706)	(1.300)	(1.079)	(0.0959)	(0.0782)	(0.138)	(0.129)	(2.136)	(3.950)
Governance	-20.20	29.14**	-83.96**	-60.26**	2.641**	3.688***	8.691**	5.759*	-6.468	-17.42
	(17.27)	(11.45)	(33.97)	(27.55)	(1.129)	(1.315)	(3.312)	(3.088)	(12.45)	(19.81)
Promar	0.589		174.8*	162.4*	-0.342		19.29**	12.85	40.99	25.87
	(20.06)		(90.84)	(93.30)	(1.630)		(8.180)	(8.283)	(25.10)	(44.70)
Promar_gov			-277.6*	-247.8			-36.04**	-26.19*		
			(150.7)	(156.6)			(13.04)	(14.16)		
Function	-6.313		0.417		1.059		-15.43**	-15.01*	-26.21	-74.96
	(8.361)		(11.43)		(1.211)		(6.350)	(7.391)	(28.39)	(44.19)
Function_gov							24.62**	22.68*		
							(9.981)	(11.36)		
Labor	-0.0298		-5.795		-0.174		-1.005		-8.595	-16.40
	(3.052)		(5.571)		(0.399)		(0.616)		(8.320)	(17.75)
Labor_gov										
Tax	1.865		-185.3**	-150.3**	4.150**	5.042**	6.098**	5.159*	-38.03*	-29.03
	(7.992)		(78.06)	(69.48)	(1.881)	(2.351)	(2.495)	(2.653)	(21.66)	(30.88)
Tax_gov			297.2**	236.6**	-6.811*	-9.047**	-8.609*	-7.145		
			(117.3)	(106.3)	(3.827)	(3.934)	(4.194)	(4.576)		
Macro	40.34**	23.49*	102.4**	91.23**	0.719		-0.0954		6.879	16.01
	(18.41)	(13.41)	(38.43)	(33.39)	(0.626)		(1.197)		(14.09)	(24.64)
Macro-gov	-89.36***	-54.73**	-160.4**	-146.3**						
	(31.60)	(21.81)	(67.01)	(58.27)						
Infra	14.12		11.02		-0.826		-0.665		3.442	16.62
	(8.832)		(10.67)		(0.775)		(1.005)		(18.61)	(30.23)
Trans	-74.02***		-153.7**	-133.8**	-1.297*	-1.773***	-1.117		-14.04	-11.12
	(27.18)		(55.68)	(53.46)	(0.758)	(0.567)	(1.137)		(17.79)	(24.15)
Trans_gov	109.9***		239.3**	208.7**						
	(41.12)		(87.95)	(86.73)						
C	14.28	-6.754	45.32*	40.91*	2.945**	2.074*	0.00791	-0.117	46.13	42.45
	(12.60)	(9.790)	(22.53)	(20.62)	(1.380)	(1.175)	(1.436)	(2.024)	(34.55)	(59.27)
Observations	66	73	32	32	82	92	37	37	77	37
R^2	0.266	0.128	0.535	0.488	0.254	0.230	0.547	0.419	0.122	0.199

Standard errors in parenthesis

****, **, * stand for significance levels at 1, 5, and 10 percent respectively.*

Table 14: SMEs' Density and MSMEs' Share of Employment – Instrumental Variables

Dependent variable:	Ln_smeden	Ln_smeden	Ln_smeden	msmeemplo	Msmeemplo
Independent Variables	**(1A)**	**(1A)**	(1A: only *tax*)	**(2A)**	**(2A)**
Ln GDPpc	0.448 (0.293)	0.467* (0.252)	0.200 (0.327)	-0.0765 (0.0576)	-0.0317 (0.0513)
Governance	0.273 (1.722)	-0.436 (1.684)	-1.500 (1.574)	0.457 (0.621)	0.223 (0.542)
Promar	-2.809 (5.898)	-0.298 (2.732)		-0.228 (1.387)	0.111 (1.211)
Promar_gov				-4.920** (2.360)	-2.517 (1.933)
Function	-10.48* (5.727)	-3.245 (3.906)		-0.215 (0.641)	-0.321 (0.655)
Labor	-1.640 (1.308)	-0.660 (0.599)		-0.209 (0.190)	-0.261 (0.420)
Labor_gov				0.885 (0.554)	0.379 (0.946)
Tax	-1.322 (3.804)	-3.860 (2.655)	-7.158** (3.282)	-0.0106 (0.251)	-0.0490 (0.266)
Macro	1.266 (1.702)	0.685 (1.057)	-0.0766 (1.309)	0.167 (0.262)	0.00154 (0.250)
Infra	0.404 (1.410)	-0.833 (1.157)	-2.676 (1.787)	0.0865 (0.351)	-0.0676 (0.310)
Trans	1.661 (1.622)	0.894 (1.211)	0.238 (1.314)	-0.0418 (0.319)	0.203 (0.316)
C	-1.340 (3.826)	-1.252 (2.987)	3.116 (4.606)	1.330** (0.593)	0.896* (0.528)
Observations	66	66	69	75	75
Angrist-Pischke F (promar) p-value	4.94 0.0009			2.21 0.0400	
Angrist-Pischke F (function) p-value	3.74 0.0058				
Angrist-Pischke F (labor) p-value	3.55 0.0077				0.87 0.5462
Angrist-Pischke F (tax) p-value	1.15 0.3446	1.14 0.3561	1.13 0.3607		
Angrist-Pischke F (promargov) p-value				4.27 0.0005	
Angrist-Pischke F (laborgov) p-value					0.89 0.5308
Kleibergen-Paap rk Wald F Stock-Yogo critical values (5%)	0.68	1.14 20.25	1.13 20.25	3.30 18.30	2.04 18.30
Kleibergen-Paap rk LM p-value	4.94 0.4232	7.92 0.4414	8.56 0.3807	15.37 0.0524	13.76 0.0883
Hansen J statistic p-value	6.075 0.1936	6.742 0.4562	9.086 0.2465	8.108 0.3231	9.703 0.2060
Anderson-Rubin Wald test p-value	2.11 0.0514	1.55 0.1637	3.02 0.0069	2.06 0.0495	0.97 0.4714
Instrumented:	*promar, function, labor, tax*	*tax*	*tax*	*promar, promargov*	*labor, laborgov*

Standard errors in parenthesis.
****, **, * stand for significance levels at 1, 5, and 10 percent respectively.*
Note: Two Stage Least Squares regressions were used. In the first stage, the regression equation estimated is: $Regulation(promar, function, labor, tax) = \alpha + \beta_1 Common\ Law + \beta_2 French\ Civil\ Law + \beta_3 German\ Civil\ Law + \beta_4 Catholic + \beta_5 Muslim + \beta_6 Protestant + \beta_7 Ethnic\ Fractionalization + \beta_8 Latitute$. When the interaction terms $promargov$ and $laborgov$ were included as endogenous, their respective instruments were also included at the right hand of the previous equation. Following a suggestion by Chakravarty (2011) the instruments for the before mentioned variables are the predicted values of the first stage interacted with governance ($\widehat{promar} * governace$, $\widehat{labor} * governance$). Detailed variables' definitions and sources are given in Appendix E.

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Table 15: Summary – Significant Variables for each Model[22]

Panel	Models	Dep. Var.	Explanatory Variables that appear as Significant				Area	Aspect	Concurrent to most models
			micro	small	medium	Large			
PANEL A All (Including developing) 50%	(5A)	*shareuskprodw*	Tax				Employment		Tax
	(4A), (4A')	*pfulltw*	tax(gov) trans					Quality	
	(3A), (3A')	*empgrowth*	macro(gov) trans(gov)						
	(2A)	*msmeemplo*	PROMAR(GOV) LABOR(GOV)						
	(1A)	*densities*		tax trans (-)			Size	Quantity	
			micro	small	medium	Large			
PANEL B Developed (80%)	(4B), (4B')	*pfulltw*	tax(gov) promar(gov) function(gov)				Employment	Quality	Promar(gov) ------ Tax (gov) ------
	(3B), (3B')	*empgrowth*	macro(gov) trans(gov) promar(gov) tax(gov)						
	(2B)	*msmeemplo*	PROMAR(GOV)						
	(1B)	*densities*		tax trans (-) labor			Size	Quantity	
			micro	Small	medium	Large			

[22] A negative symbol after the variable "(-)" indicates the finding supports the theory that constraining business environments generate large numbers of small enterprises that are either not able to grow or do not have the incentives to grow beyond a certain size. The symbol "(gov)" after a variable's name means that the variable is significant including its interaction with governance.

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5. Conclusions

This study compiled a dataset of cross-country information about the size and employment contribution of SMEs, the employment share in the industry and services sector as well as the business environment indicators in order to determine if larger SMEs sectors are due to competitive business environments.

Some dimensions of the business environment can explain cross-country variation in the importance of SME sector's size and contribution to employment. Specifically, tax and labor regulation support the theory of competitive business environments having a positive impact on the number of SMEs in each economy. Labor and product-market regulation may have an impact over the MSMEs share of employment depending on the level of governance. The evidence suggesting that a larger SME sector may be associated with constraining business environments is rather weak, and at any case, more likely to hold at constrained levels of governance.

Product-market regulation appears as a clear priority for developing countries to address (given the constructive effect that may have even at inadequate levels of governance). Therefore, for the case of the formal small enterprise sector, it will be important to constantly improve the credit channels along with the property registration and contract enforcement procedures, and simplify the regulations for trade, entry, and insolvency.

It is important to keep in mind that tax regulation is more likely to be a constraint for the smaller enterprises whilst labor regulation is gradually to become more a constraint for medium sized enterprises. The ability to cooperate seems to have a positive impact particularly on the quality type variables which ultimately determine the effective contribution that the private sector may have to the economy. Therefore, policies in favor of SMEs should also pay attention to topics such as fostering collaboration among enterprises, universities, and other institutions both public and private. The previous findings seem to be reasonable especially when contrasted with the experience of some East Asian economies (e.g. Hong Kong, Korea, Singapour, Malaysia, etc).

An increasing body of literature is indicating that a strong SME sector might be a result of economic development rather than one of the causes. Nevertheless, there is no single advanced economy without a strong SME sector. Most likely, the right inquiry should be first posed over which are the SMEs that have an effective contribution to the economy, and what aspects of the business environment might foster them. To the extent of the available data, the intention of the study was to analyze not only those quantity-type variables such as the number of enterprises, but also other quality-type variables related to employment.

One of the main limitations of the study is that the definition of SME varies from country to country. Nonetheless, the study tried to create a panel including only those countries with a similar definition for SME; however, in some cases the sample size is small. Another limitation is given by the limited availability of data at the aggregate level. Furthermore, the data is not available on a yearly basis. For example, it will also be interesting to count with consistent data as for how much is the contribution of SMEs to Gross Domestic Product (GDP). While issues such as the improvement of governance may broadly be accepted, changes in other aspects of regulation may have political and social implications beyond the scope of the study (in particular, the existence of determined groups which are not able to pursue the greater good). Even though the instrumental variables for product-market regulation may have acceptable results, the study does not have a strong emphasis on the

determination of causality, but pretends to raise awareness about the role that several aspects of the business environment may play for the development of the small enterprise sector.

To further advance in this area of study, the discussion on regard to the definition of SME needs to be enhanced in order to improve the comparison among countries as well as to include in future analyses measures of the importance of SMEs in terms of value added while maintaining the focus on the actor's ability to cooperate and the production relationships among enterprises within the industrial structure. On regard to the measurement of the business environment, a possible combination between objective indicators (available only at the country level) and subjective indicators (coming from the firm level) could help not only to improve the measurement, but also to explore the inclusion of these improved variables into firm level datasets in order to enable more sophisticated analyses.

The findings of this research may contribute to guide the support to the SME sector when it comes to streamline the business environment in which firms operate. An adequate business environment with regulatory procedures that are transparent, easy to comply, and accessible to all regardless of their connections, will bring benefits and opportunities to every potential entrepreneur with a good idea. Furthermore, improving the business environment sets the conditions for any economic unit to thrive whether they are small, large, foreign or homegrown initiatives.

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References

Acs, Z. & Mueller, P. 2008. Employment effects of business dynamics: Mice, Gazelles and Elephants. *Small Business Economics,* 30(1), 85-100.

Armington, C. & Odle, M. 1982. Small Business: How Many Jobs? *Brookings Review*, 14-17.

Altenburg, T. & von Drachenfelds, C. 2006. Proceedings from the Asia Regional Consultative Conference: *Creating Better Business Environments for Enterprise Development – Asian and Global Lessons for more Effective Donor Practices*. Bangkok, Thailand.

Arkolakis, C. 2011. A Unified Theory of Firm Selection and Growth. *National Bureau of Economic Research Working Paper Series*, 17553.

Aterido, R., Hallward-Driemeier, M., & Pagés, C. 2007. Investment Climate and Employment Growth: The Impact of Access to Finance, Corruption and Regulations Across Firms, *Discussion Paper Series*, IZA DP No. 3138.

Angrist, J. & Pischke J. 2010, May 11. Mostly harmless econometrics. Retrieved from: http://www.mostlyharmlesseconometrics.com/2010/02/ivreg2-update/

Alonso, J., & Garcimarti, C. 2010. The determinants of institutional quality. More on the debate, *Journal of International Development*, DOI: 10.1002/jid.1710.

Aris, N. 2006. Proceedings from the National Statistics Conference: *SMEs: Building Blocks for Economic Growth*. Malaysia.

Audretsch, D. 1991. New-firm survival and technological regime, *Review of Economic Studies*, 58, 441-450.

Ayyagari, M., Demirguc-Kunt, A., & Maksimovic, V. 2011. Small vs. Young Firms across the World: contribution to employment, job creation, and growth. *Policy Research Working Paper Series*, 5631

Ayyagari, M., Demirguc-Kunt, A., & Maksimovic, V. 2008. How Important Are Financing Constraints? The Role of Finance in the Business Environment, *The World Bank Economic Review*, 22(3), 483–516.

Ayyagari, M., Beck, T., & Demirgüç-Kunt, A. 2007. Small and medium enterprises across the globe, *Small Business Economics,* 29(4), 415-434.

Ayyagari, M., Demirgüç-Kunt, A., & Beck, T. 2003. Small and Medium Enterprises across the Globe: A New Database. *World Bank Policy Research Working Paper*, 3127

Banco Interamericano de Desarrollo. 2006. *Bolivia: situación y perspectivas de las MYPYMES y su contribución a la economía*. Washington, DC: Borda, D. and J. Ramirez.

Banerjee, A. & Duflo, E. 2005. Growth Theory through the Lens of Development Economics. In Aghion, P. & Dourlauf, S. (Eds.), *Handbook of Economic Growth* (pp. 473-552), Vol. 1a. Amsterdam: Elsevier.

Bartelsman, E., Haltiwanger, J. & Scarpetta, E. 2009. Cross-Country Differences in Productivity: The Role of Allocation and Selection. *National Bureau of Economic Research Working Papers*, 15490.

Bartlett, B. 2012. Do Small Businesses Create Jobs? *New York Times*. Retrieved from http://economix.blogs.nytimes.com/2012/04/17/do-small-businesses-create-jobs/

Beck, T., Demirguc-Kunt, A., & Levine, R. 2005. SMEs, growth, and poverty: Cross-country evidence, *Journal of Economic Growth*, 10(3), 199-229.

Business Monitoring Latin America. 2012. Global Trade is a Key Growth Factor for SMEs in Latin America. Retrieved from http://pressroom.ups.com/Press+Releases/Archive/2012/Q2/Global+Trade+is+a+Key+Growth+Factor+for+SMEs+in+Latin+America

Blanchard, O. 2006. *Macroeconomics* (4th ed.). United States of America: Pearson Education.

Caves, R. 1989, International differences in industrial organization. In Schmalensee, R. and Willig, R. (Eds.), *Handbook of Industrial Organization*, vol. 2, Amsterdam, North-Holland.

Chakravarty, T. 2011, June 1. Statalist Archive. Retrieved from: http://www.stata.com/statalist/archive/2011-08/msg01496.html

Chandler, A. 1976. Institutional Integration: An Approach to Comparative Studies of the History of Large-Scale Business Enterprise, *Revue Economique,* 27(2), 177-199.

Chen, M. 2005. "The Business Environment and the Informal Economy." Proceedings from the Committee of Donor Agencies for Small Enterprises Development Conference: *Reforming the Business Environment*. Cairo, Egypt

Clarke, R. and Davies, S. 1982, Market structure and price-cost margins, *Economica*, 49, 277-287

Coase, R. 1937. The Nature of the Firm. *Economica, 4(16), 386-405.*

Cohen, W. & Levine, R. 1989. Empirical studies of innovation and market structure. In Schmalensee, R. and Willig, R. (Eds.), *Handbook of Industrial Organization*, vol. 2, Amsterdam, North-Holland.

Commander, S. & Svejnar, J. 2007. Do Institutions, Ownership, Exporting and Competition Explain Firm Performance? Evidence from 26 Transition Countries, *Discussion Paper Series*, IZA DP No. 2637.

Davis, S., Haltiwanger, J., & Schuh, S. 1996. Small business and job creation: Dissecting the myth and reassessing the facts, *Small Business Economics*, 8(4), 297-315.

De Soto, H. 2000. *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*, New York: Basic Books and London: Bantam Press/Random House.

Dethier, J., Hirn, M., & Straub, S. 2010. Explaining enterprise performance in developing countries with business climate survey data, *The World Bank Research Observer*, 26, 258–309.

Djankov, S., La Porta, R., Lopez-de-Silanes, & Shleifer, A. 2002. The regulation of entry. *Quarterly Journal of Economics,* 117(1), 1-37.

Djankov, S., La Porta, R., Lopez-de-Silanes & Shleifer, A. 2003. Courts, *Quarterly Journal of Economics,* 118(2), 453-517.

Djankov, S., McLiesh, C. & Shleifer, A. 2007. Private credit in 129 countries. *Journal of Financial Economics,* 84(2), 299-329.

Donor Committee for Enterprise Development. 2009. *Business environment reforms and the informal economy.* University of Maryland: Zinnes, C.

Drucker, P. 1998, November. The Discipline of Innovation. *Harvard Business Review*. 98604, 3.

Economist Intelligence Unit. 2011. Latin America Business: Innovation and entrepreneurship still lag. Available at http://viewswire.eiu.com/index.asp?layout=VWArticleVW3&article_id=1958682380

Enterprise Surveys. 2013. Measuring Firm Performance in Latin America and the Caribbean. Retrieved from http://www.enterprisesurveys.org/~/media/FPDKM/EnterpriseSurveys/Documents/Topic-Analysis/Measuring-Firm-Performance-LAC-Note-3.pdf

European Comission. 2005. *Flash Eurobarometer: SME acces to finance*. Bruxelles, Belgic.

Evans, P. 1995. *Embedded Autonomy: States and Industrial Transformation* (1st ed.). United States of America: Princeton University Press.

Evans, P. 1987. Class, State and Dependence in East Asia: Lessons for Latin Americanists. In Frederik, D. (Ed.), *The Political Economy of New Asian Industrialism*.

Fajnzylber, P., Maloney, W., & Montes-Rojas, G. 2009. Releasing Constraints to Growth or Pushing on a String? Policies and Performance of Mexican Micro-Firms. *Journal of Development Studies*, 45(7), 1027-1047.

Freeman, C. 1995. The 'National System of Innovation' in Historical Perspective. *Cambridge Journal of Economics,* 19, 5-24.

Gauthier, B. & Gersovitz, M. 1997. Revenue erosion through tax exemption and evasion in poor countries. *Journal of Public Economics*, 64(3), 407-424.

Gelb, A., Ramachandran, V., Kedia-Shah, M., & Turner, G. 2007. What matters to African Firms? The relevance of perceptions data, *Policy Research Working Paper,* 4446, World Bank, Washington D.C.

Gibson, T. & Van der Vaart, H.J. 2008. Defining SMEs: A Less Imperfect Way of Defining Small and Medium Enterprises in Developing Countries. Brookings Global Economy and Development. Retrieved from http://www.brookings.edu/~/media/research/files/papers/2008/9/development%20gibson/09_development_gibson.pdf

Gonzales, E. 2013. SMEs in Relation to Poverty, Employment, and Productivity: Setting the Way Forward. *Literature Review Paper, Internal Report*. Washington, DC: Inter-American Development Bank.

Hansen, H., Rand, J., & Tarp, F. 2009. Enterprise Growth and Survival in Vietnam: Does Government Support Matter? *Journal of Development Studies,* 45(7), 1048-1069.

Haltiwanger, J., Jarmin, R., & Miranda, J. 2010b. Who Creates Jobs? Small vs. Large vs. Young. *National Bureau of Economic Research -NBER Working Papers*, 16300.

Honorati, M., & Mengistae, T. 2009. Corruption, the Business Environment, and Small Business Growth in India, *Policy Research Working Paper*, 4338, The World Bank.

Hughes, A. 1999. On Enlarging Employment by Promoting Small Enterprises: A Report for the United Nations Symposium on States, Markets and Social Progress: Roles and Co-operation of Public and Private Sector. Beijing, People's Republic of China.

Hurst, E. & Pugsley, B.W. 2011. What Do Small Businesses Do? *National Bureau of Economic Research Working Paper Series*, 17041

Innovations for Poverty Actions. 2013, April 08. Why SMEs? Retrieved from http://www.poverty-action.org/sme/why

Innovations for Poverty Actions. 2013b, April 08. Which SMEs? Retrieved from: http://www.povertyaction.org/sme/which

International Labour Organization. 1998. Job Creation in Small and Medium-Sized Enterprises. Recommendation 189 in the subject of Employment Policy and Promotion. *General Conference of the International Labor Organization*. Geneva, Switzerland.

International Labour Organization. 2002. *Small enterprises, big challenges a literature review on the impact of the policy environment on the creation and improvement of jobs within small enterprises*. Geneva, Switzerland: Reinecke, G.

International Labour Organization. 2004. *Impact of national policy and legal environments on employment growth and investment in micro and small enterprises*. Geneva, Switzerland: Dyring, J. and Goedhuys, M.

International Labour Organization. 2005. *Assessing the influence of the business environment on small enterprise employment*. Geneva, Switzerland: White, S.

International Labour Organization. 2011. Working Poverty in the World. *Key Indicators of the Labour Market (KILM)*. Geneva, Switzerland: Kapsos, S. and Horne, R.

International Finance Corporation. 2000. *A market-oriented strategy for small and medium-scale enterprises*. Washington, DC: Hallberg, K.

International Finance Corporation. 2006. *Enterprise Surveys- Bolivia: Country Profile 2006*. Washington, DC

Jovanovic, B. 1982. Selection and evolution of industry, *Econometrica*, 50, 649-670.

Klapper, L., Lewin, A., & Quesada, J. 2009. The impact of the business environment on the business creation process, *Policy Research Working Paper*, 4937, The World Bank.

Knorringa, P. & Meyer-Stamer, J. 2008. Local development, global value chains and latercomer development. In J. Haar & Meyer-Stamer J. (Eds.), *Small Firms, Global Markets* (pp. 18-37). New York, NY: Palgrave Macmillan.

Kushnir, K., Mirmulstein, M., & Ramalho, R. 2010. Micro, Small, and Medium Enterprises Around the World: How Many Are There, and What Affects the Count? *IFC MSME Country Indicators*. Washington, DC: The World Bank.

La Porta, R., López-de-Silanes, F., Shleifer, A. & Vishny , R. 1999. The Quality of Government, *Journal of Law, Economics and Organization*, 15(1), 222-279.

La Porta, R., López-de-Silanes, F. & Shleifer, A. 2008. The Economic Consequences of Legal Origins, *Journal of Economic Literature*, 46(2), 285–332.

Lazonick, W. 1990. *Competitive advantage on the shop floor*. Cambridge, MA: Harvard University Press.

Lerner, J., Allen, C. & Leamon, A. (2012). The role of venture capital in financing innovation. A review with special attention to Latin America. *Office of Evaluation and Oversight – Background paper*.

Levine, R., & Renelt, D. 1992. A sensitivity analysis of cross-country growth regressions, *American Economic Review*, 82(4), 942-63.

Liedholm, C., & Mead, D.C. 1999. *Small enterprises and economic development*. New York, NY: Routledge.

Loayza, N., Oviedo, A., & Servén, L. 2010. Regulation and Macroeconomic Performance. In N. Loayza & Servén, L. (Eds.), *Business Regulation and Economic Performance*, (pp. 65-117). Washington, DC: The World Bank e-library.

Maksimovic, V. & Phillips, G. 2002. Do Conglomerate Firms Allocate Resources Inefficiently? Evidence from Plant-Level Data. *Journal of Finance,* 721-767.

Mazzucato, M. 2013. *The Entrepreneurial State: Debunking Public vs. Private Sector Myths* (1st ed.). United States of America: Anthem Press.

Meyer-Stamer, J. & Haar, J. 2008. Introduction: The environment of small-enterprise competitiveness. In J. Haar & Meyer-Stamer J. (Eds.), *Small Firms, Global Markets* (pp. 3-17). New York, NY: Palgrave Macmillan.

Miliaras, C. 2012. Creatig jobs that reduce poverty: A research agenda on developing-country *gazelles*. *RTI Press publication*, OP-0011-1211. Research Traingle Park, NC: RTI Press. Retrieved from http:// www.rti.org/rtipress

Molina, G. 2006. The Bolivian economy beyond the gas, *América Latina Hoy*, 43, 63-85.

Nelson, R., & Winter, S. 1982. An Evolutionary Theory of Economic Change. Cambridge, MA: Harvard University Press.

OECD. 2004. OECD Conference of Ministers Responsible for Small and Medium-sized Enterprises (SMEs). *Promoting Entrepreneurship and Innovative SMEs in a Global Economy: Towards a More Responsible and Inclusive Globalisation*. Istanbul, Turkey.

OECD-ECLAC. 2013. *"Latin American Economic Outlook 2013: SME policies for structural change"*. Retrieved from http://www.oecd-ilibrary.org/development/latin-american-economic-outlook-
2013_leo-2013-en

Pagano, U. 1990. Property Rights Equilibria and Institutional Stability. *Mimeo*, University of Sienna.

Pagano, P. & Schivardi, F. 2003. Firm Size Distribution and Growth, *Scandinavian Journal of Economics*, 105(2), 255-274.

Panzar, J. 1989. Determinants of firm and industry structure. In Schmalensee, R. and Willig, R. (Eds.), Handbook of Industrial Organization, vol. 1, Amsterdam, North-Holland.

Pyke, F. 1992. Industrial Development Through Small Firm Cooperation, Geneva: ILO.

Ranis, G. & Saxonhouse, G. 2010. Determinants of technology choice: the Indian and Japanese cotton industries. In Stern, R., Wright, G. & Patrick, H. (Eds.), *The Japanese Economy in Retrospect* (pp. 289-308). Singapore: World Scientific Publishin Co. Pte. Ltd.

Renko, M. & Haar, J. 2008. Innovation and entrepreneurship among born global enterprises. In J. Haar & Meyer-Stamer J. (Eds.), *Small Firms, Global Markets* (pp. 86-101). New York, NY: Palgrave Macmillan.

Rauch, J. 1991. Modelling the informal sector formally. *Journal of Development Economics,* 35(1), 33-47.

Sachs, J. 2005. The End of Poverty. The Penguin Press.

Sachs, J., & Warner, A. 1997. Natural resource abundance and economic growth, *Center for International Development and Harvard Institute for International Development*, Cambridge, MA: Harvard University.

Saving, T. 1970. Concentration ratios and the degree of monopoly. *International Economic Review*, 11, 139-146.

Schneider, F. 2002. *Size and Measurement of the Informal Economy in 110 Countries around the World*. Canberra: Australian National University, Australian National Tax Centre.

Sen, K. & Te Velde, D. 2009. State Business Relations and Economic Growth in Sub-Saharan Africa. *Journal of Development Studies*, 45, 8, 1267-1283.

Sengenberger, W. & Pyke, F. 1990. Small Firm Industrial and Local Economic Regeneration: Research and Policy Issues, Geneva: International Institute for Labour Studies.

Shleifer, A. 2005. Understanding regulation, *European Financial Management*, 11(4), 439–451.

Sleuwaegen, L., & Goedhuys, M. 2002. Growth of firms in developing countries, evidence from Cote d'Ivoire, *Journal of Development Economics*, 68, 117-135.

Stangler, D. & Litan, R. 2009. Where will the jobs come from? *Kauffman Foundation Research Series: Firms Formation and Economic Growth Paper*, 01.

Stein, P., Goland, T. & Schiff, R. 2010. Two trillion and counting. *Access to Finance*. Washington, DC: The World Bank.

Straub, S. 2005. Informal sector: The credit market channel, *Journal of Development Economics*, 78, 299– 321.

Thorsten, B. & Demirgüç-Kunt, A. 2004. Do pro-SMEs policies work? View point note 29898, Public policy for the private sector. : The World Bank, Washington, DC.

Tybout, J. 2000. Manufacturing Firms in Developing Countries: How Well Do They Do, and Why? *Journal of Economic Literature*, American Economic Association, 38(1), 11-44.

UN Secretariat. 1997. Public-Private Partnerships: The Enabling Environment for Development. United Nations. New York, USA.

Weiss, J. 2013. Strategic Industrial Policy and Business Environment Reform: Are they compatible? *Working Paper*. Donor Committee for Enterprise Development.

Wooldridge, J. 2009. *Introductory Econometrics* (4th ed.). United States of America: Cengage Learning.

World Bank. 2003. *Small and medium enterprises, growth and poverty: cross-country evidence*. Washington, DC: Thorsten, B., Demirgüç-Kunt, A. & Levine, R.

World Bank. 2005. *World Development Report: A Better Investment Climate for Everyone*. Washington, DC: Loayza, N. Oviedo, A. & Serven, L.

World Bank. 2004. *Review of Small Business Activities*. Washington, DC: World Bank

World Bank. 2003. *Small and medium enterprises, growth and poverty: cross-country evidence*. Washington, DC: Thorsten, B., Demirgüç-Kunt, A. & Levine, R.

World Bank. 2012a. *World Development Report 2013: Jobs*. Washington, DC: The World Bank.

World Bank. 2012b. *Doing Business 2011-2012*. Washington, DC: The World Bank.

World Bank. 2008. *Republic of Bolivia – policies for increasing firms' formality and productivity*. Washington, DC: The World Bank.

World Economic Forum. 2011. *Global Competitiveness Report 2011-2012*. Geneva, Switzerland: Klaus Schwab.

You, J. 1995. Small Firms in Economic Theory. Cambridge Journal of Economics, 19, 441-462.

Appendix A. Some Definitions of SMEs

MSMEs' Definition							
	World Bank SME Department			**White, S. (2005) International Labour Organization**	**Thorsten et al. (2003)**	**EUROSTAT**	**OECD**
	Employees	Assets USD	Sales USD	Employees	Employees	Employees	Employees
MICRO	Up to 10	Up to 10,000	Up to 100,000	Up to 5	Up to 4	1-9	Up to 4
SMALL	Up to 50	Up to 3 million	Up to 3 million	Up to 20	Up to 99	10-49	Up to 99
MEDIUM	Up to 300	Up to 15 million	Up to 15 million	Up to 50	Up to 500	50-249	Up to 500
BIG	>	>	>	More than 50	>500	>250	>500

	Japan[23]							
	Sector							
	Manufacturing		Wholesale Trade		Retail Trade		Services	
	Employees	Assets	Employees	Assets	Employees	Assets	Employees	Assets
MICRO	Up to 20		Up to 5		Up to 5		Up to 5	
SMALL								
MEDIUM	20> - 300		5> - 100		5> - 50		5> - 50	
BIG	300>	300 M JPY >	100>	100 M JPY >	50>	50 M JPY >	50>	50 M JPY>

	Bolivia (1)[24]	**Bolivia (2)**[25]		
	Employees	Employees	Sales	Assets
MICRO	Up to 10	Up to 10	Up to 1.35*(MinWage)	Up to 350*(MinWage)
SMALL	Up to 20	11 to 20	Up to 4.50*(MinWage)	Up to 180*(MinWage)
MEDIUM	Up to 50			
BIG	50>			

[23] Japan's Small and Medium Enterprise Basic Law & A Brief Introduction of SME Policies of Japan (2009). Trade, Investment, and Tourism Division. Industrial Development Department. JICA.
[24] Bolivian Vice Ministry of Micro and Small Enterprises
[25] Ministry of Labor (2001). MinWag stands for current Minimum Wage. This classification is neither well known nor widely accepted.

Appendix B. Variables Utilized to Measure the Business Environment in some Selected Studies

Measurement of Business Environment Cross-Research Comparison					
Thorsten and Demirgüç-Kunt, 2004	**Loayza et al., 2005**	**Dyring, J. and Goedhuys, M., 2004**	**Ayyagari, Thorsten and Demirgüç-Kunt, 2007**	**IFC's Doing Business**	**Relevant Identified Aspects**
Cost of Business Registration	Firm entry		Cost of Entry	Starting a business (1)	Firm entry
	Labor markets		Labor Market Regulation	Employing workers (na)	Labor markets
	Fiscal burden	Fiscal burden of government		Paying taxes (7)	Fiscal burden
	Trade barriers	Trade policy		Trading across borders (8)	Trade policy
	Financial markets	Banking and finance	Credit Registry	Getting credit (5)	Financial markets
Cost of Contract Enforcement	Contract enforcement		Cost of Contract Enforcement	Enforcing contracts (9)	Enforcing contracts
Cost and Efficiency of the Insolvency Process	Bankruptcy regulation		Bankruptcy	Resolving Insolvency (10)	Insolvency Regulation
Protection of Property Rights		Property Rights	Property Rights	Registering property (4)	Property rights
		Regulation	Regulatory Environment		
	(Governance)	Global Corruption Report	Institutional Development		Governance
		Government intervention in the economy			
		Monetary policy			
		Black market activity			
		Capital flows and foreign investment		Protecting investors (6)	
				Dealing with construction permits (2)	Dealing with construction permits
				Getting electricity (3)	Getting electricity
					Business sophistication and Innovation
Additional variables and controls					

Appendix C. Selected Indicators for Calculation of Regulation Indexes by each Area[26]

Indicators	Source	Weight	Variable	Factor Analysis
Starting a Business - Procedures (number)	WB_DB[27]	0.25	entry	promar
Starting a Business - Time (days)	WB_DB	0.25		
Starting a Business - Cost (% of income per capita)	WB_DB	0.25		
Starting a Business - Paid-in Min. Capital (% of income per capita)	WB_DB	0.25		
Registering Property - Procedures (number)	WB_DB	1/3	regprop	
Registering Property - Time (days)	WB_DB	1/3		
Registering Property - Cost (% of property value)	WB_DB	1/3		
Getting Credit - Strength of legal rights index (0-10)	WB_DB	0.25	credit	
Getting Credit - Depth of credit information index (0-6)	WB_DB	0.25		
5Aiii Private sector credit	FI_EFW[28]	0.25		
5Aiv Interest rate controls/Negative real interest rates)	FI_EFW	0.25		
Trading Across Borders - Documents to export (number)	WB_DB	1/18	trade	
Trading Across Borders - Time to export (days)	WB_DB	1/18		
Trading Across Borders - Cost to export (US$ per container)	WB_DB	1/18		
Trading Across Borders - Documents to import (number)	WB_DB	1/18		
Trading Across Borders - Time to import (days)	WB_DB	1/18		
Trading Across Borders - Cost to import (US$ per container)	WB_DB	1/18		
FI_EFW_4Aii Mean tariff rate	FI_EFW	1/6		
FI_EFW_4Bi Hidden import barriers	FI_EFW	1/6		
HF_IEF_trade freedom	HF_IEF[29]	1/3		
Enforcing Contracts - Time (days)	WB_DB	1/3	enfcontract	
Enforcing Contracts - Cost (% of claim)	WB_DB	1/3		
Enforcing Contracts - Procedures (number)	WB_DB	1/3		
Resolving Insolvency - Time (years)	WB_DB	1/3	insolv	
Resolving Insolvency - Cost (% of estate)	WB_DB	1/3		
Resolving Insolvency - Recovery rate (cents on the dollar)	WB_DB	1/3		
Dealing with Construction Permits - Procedures (number)	WB_DB	1/3	construct	function
Dealing with Construction Permits - Time (days)	WB_DB	1/3		
Dealing with Construction Permits - Cost (% of income per capita)	WB_DB	1/3		
Getting Electricity - Procedures (number)	WB_DB	1/3	getelec	
Getting Electricity - Time (days)	WB_DB	1/3		
Getting Electricity - Cost (% of income per capita)	WB_DB	1/3		
HF_IEF_labor freedom	HF_IEF	1	labor	labor
Paying Taxes - Payments (number per year)	WB_DB	0.075	tax	tax
Paying Taxes - Time (hours per year)	WB_DB	0.075		
HF_IEF_Fiscal_Freedom	HF_IEF	0.85		
WGI_cc (control of corruption)	WGI_WB[30]	1/3	Governance	Governance
WGI_rl (rule of law)	WGI_WB	1/3		
WGI_va (voice and accountability)	WGI_WB	1/3		
GCI 2nd pillar: Infrastructure	GCR_WEF[31]	0.80	Infrastructure	Infrastructure
Broadband Internet subscriptions/100 pop.	GCR_WEF	0.10		
Internet users/100 pop.	GCR_WEF	0.10		
GCI 3rd pillar: Macroeconomic environment	GCR_WEF	1	Macro. Stab.	Macro. Stab.
University-industry collaboration in R&D	GCR_WEF	1/3	Trans.	Transformational
Government procurement of advanced tech products	GCR_WEF	1/3		
State of cluster development	GCR_WEF	1/3		

[26] A detailed description for each variable and indicator may be found in Appendix F.
[27] Stands for World Bank's Doing Business.
[28] Stands for Fraser Institute's Economic Freedom of the World.
[29] Stands for Heritage Foundation's Index of Economic Freedom.
[30] Stands for the World Bank's Worldwide Governance Indicators.
[31] Stands for World Economic Forum's Global Competitiveness Report.

Appendix D. Factor Analysis – Regulation Variables

Method: principal-component factors | **Number of observations = 124**

Rotation: (unrotated) | **Retained factors = 3**

Number of parameters = 27

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	4.21814	3.03296	0.4218	0.4218
Factor2	1.18518	0.10354	0.1185	0.5403
Factor3	1.08164	0.22251	0.1082	0.6485
Factor4	0.85912	0.16611	0.0859	0.7344
Factor5	0.69302	0.16820	0.0693	0.8037
Factor6	0.52482	0.07247	0.0525	0.8562
Factor7	0.45235	0.02694	0.0452	0.9014
Factor8	0.42540	0.12597	0.0425	0.9440
Factor9	0.29944	0.03854	0.0299	0.9739
Factor10	0.26090	.	0.0261	1.0000

LR test: independent vs. saturated: chi2(45) = 440.15 Prob>chi2 = 0.0000

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Uniqueness
start	0.8066	-0.0177	-0.1732	0.3190
trade	0.8281	-0.0619	0.0875	0.3027
insolv	0.7839	-0.1809	-0.1396	0.3333
credit	0.8043	0.1674	-0.0608	0.3214
regprop	0.6245	0.3816	0.0510	0.4617
enfcontract	0.6495	-0.0588	-0.4415	0.3798
construct	0.5510	-0.1793	0.5585	0.3523
getelec	0.4984	-0.1221	0.6386	0.3289
labor	0.4761	0.3867	-0.2213	0.5747
tax	-0.1725	0.8801	0.2335	0.1412

Method: principal-component factors	**Number of observations = 124**
Rotation: orthogonal varimax (Kaiser off)[32]	**Retained factors = 3**
	Number of parameters = 27

Factor	Variance	Difference	Proportion	Cumulative
Factor1	3.52438	1.75541	0.3524	0.3524
Factor2	1.76897	0.57737	0.1769	0.5293
Factor3	1.19160	.	0.1192	0.6485

LR test: independent vs. saturated: chi2(45) = 440.15 Prob>chi2 = 0.0000

Rotated factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Uniqueness
start	0.7844	0.2303	-0.1121	0.3190
trade	0.6813	0.4739	-0.0919	0.3027
insolv	0.7217	0.2796	-0.2602	0.3333
credit	0.7647	0.2914	0.0947	0.3214
regprop	0.5937	0.2635	0.3411	0.4617
enfcontract	0.7566	-0.0670	-0.2079	0.3798
construct	0.2100	0.7737	-0.0712	0.3523
getelec	0.1382	0.8075	0.0073	0.3289
labor	0.5833	-0.0421	0.2885	0.5747
tax	-0.1040	-0.0453	0.9198	0.1412

Factor rotation matrix

	Factor1	Factor2	Factor3
Factor1	0.8820	0.4669	-0.0648
Factor2	0.1712	-0.1892	0.9669
Factor3	-0.4392	0.8639	0.2468

[32] Orthogonal rotation rather than oblique is generally used for the construction of indices.

Appendix E. Regulation Around the World (lower values represent less constraining regulation)[33]

Fig. 1: Product-market Regulation

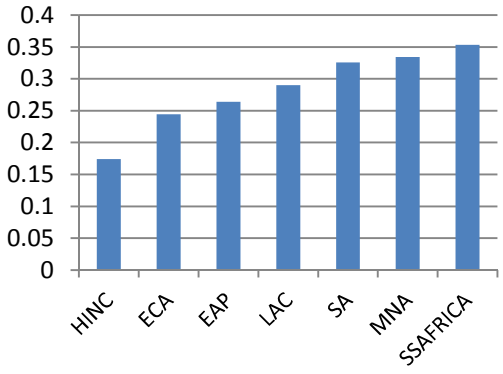


Fig. 2: Function Regulation

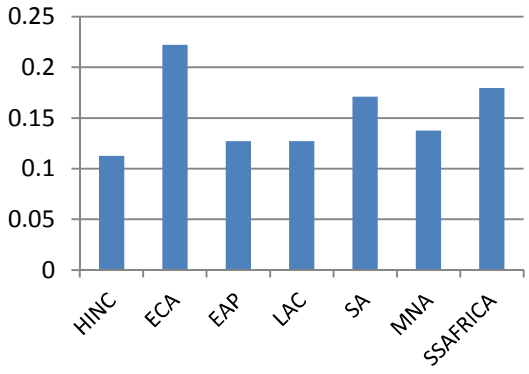


Fig. 3: Labor Regulation



Fig. 4: Tax Regulation

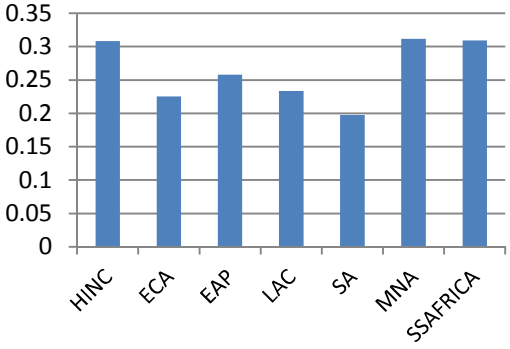
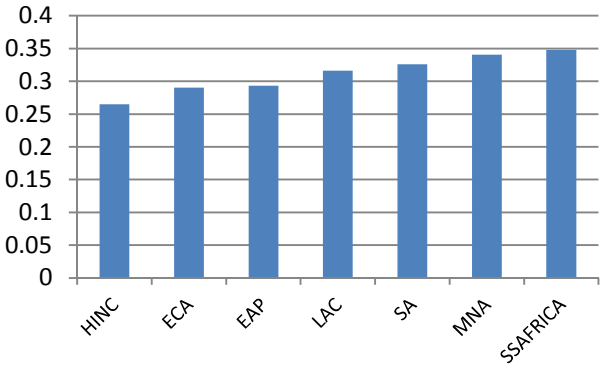


Fig. 5: Regulation - Overall Index



[33] HINC: High Income Countries, ECA: East Europe and Central Asia, EAP: East Asia and Pacific, LAC: Latin America and Caribbean, SA: South Asia, MNA: Middle East and North Africa, and SSAFRICA: Sub Saharan Africa.

Appendix F. Detailed Description of the Variables

Indicator	Description	Source / Observations
smeden	Number of SMEs per 1000 people (includes only small and medium enterprises)	Micro, Small and Medium Enterprise Country Indicators (MSME-CI) provides both the latest global snapshot and historic data back 20 years on the number of MSMEs in 132 world economies. In this study, the latest snapshot (mainly presenting information for the first decade of the century) was utilized. Available at: http://www.ifc.org/msmecountryindicators
msmeemplo	Measures the participation of micro, small and medium enterprises in the economy. It is the share of the MSME sector in the total labor force.	
empgrowth	Annualized growth of permanent full-time workers expressed as a percentage. Annual employment growth is the change in full-time employment reported in the current fiscal year from a previous period. For most countries the difference between the two fiscal year periods is two years. However, for some countries the interval is three years. Hence, an annualized measure is used. T	IFC's Enterprise Surveys (World Bank). Enterprise Surveys provide the world's most comprehensive company-level data in emerging markets and developing economies. Business data are available on 130,000 firms in 135 countries. The survey is applied in all countries under a unique criterion regarding the size of the enterprises. Small sized firm are defined to have 5-19 workers, and a medium sized firms are defined as the ones with 20-99 workers. Available at: http://www.enterprisesurveys.org/
pfulltw	Average number of permanent full time workers. Permanent, full-time employees are defined as all paid employees that are contracted for a term of one or more fiscal years and/or have a guaranteed renewal of their employment contract and work 8 or more hours per day.	
uskprodw	Proportion of unskilled workers out of all production workers. Unskilled production workers are workers (up through the line supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations. Also, these workers are unskilled in that it is not required that they have special training, education, or skill to perform their job.	
start	Measures the burden of the regulation of entry. It includes: the number of procedures, time in days, cost (% of income per capita), and paid-in minimum capital (% of income per capita) that a start-up must bear before it becomes legally operational.	Doing Business Data. International Finance Corporation. The World Bank Group. Methodology based on Djankov, La Porta, Lopez-de-Silanes, & Shleifer (2002)
regprop	Measures the burden of the registering property regulation. It includes: The procedures (number), time (days), and cost (% of property value) to register a property. The costs are related to official transfer of a property from a seller to a buyer, including all fees, taxes, duties and other payments to notaries and registries as required by the law. The costs are computed relative to the value of the property.	Doing Business Data. International Finance Corporation. The World Bank Group.
credit	Measures the burden of the regulation of credit. It includes: the strength of legal rights, depth of credit information, share of private sector credit in the economy, interest rate controls/negative real interest rates. The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The depth of credit information index measures rules and practices affecting the coverage, cope and accessibility of credit information available through either a public credit registry or a private credit bureau. The private sector credit measures the extent to which government borrowing crowds out private borrowing. Is	Doing Business Data. International Finance Corporation. The World Bank Group. Methodology based on Djankov, McLiesh & Shleifer (2007). Economic Freedom of the World. Fraser Institute.

	calculated as the government fiscal deficit as a share of gross saving. If the deficit data are not available, the calculation is based on the share of private credit to total credit extended in the banking sector. The interest rate controls / negative real interest rates assesses if interest rates are determined by the market, stable monetary policy, and positive real deposit and lending rates.	
trade	Measures the burden of the regulation of trade. It includes: Documents (number), time (days), and cost (US$ per container) to export and import. Mean tariff rate which represents the unweighted mean of tariff rates. Countries not imposing tariffs are better ranked. As the mean tariff rate increases, countries are assigned lower ratings. The rating will decline toward zero as the mean tariff rate approaches 50%. The non-tariff trade barrier is a subjective measure that assesses if non-tariff barriers significantly reduce the ability of imported goods to compete in the domestic market. Trade freedom is an objective measure capturing the severity of tariff and non tariff barriers affecting both imports as well as exports.	Doing Business Data. International Finance Corporation. The World Bank Group. Economic Freedom of the World. Fraser Institute. Index of Economic Freedom. Heritage Foundation.
enfcontract	Measures the burden of the enforcing contracts regulation. It includes: The procedures (number), time (days), and cost (% of property value) to enforce a contract. Legal costs incurred in dispute resolution. Cost is recorded as a percentage of the claim. Three types of costs are recorded: court costs, enforcement costs and average attorney fees.	Doing Business Data. International Finance Corporation. The World Bank Group. Methodology based on Djankov, La Porta, Lopez-de-Silanes & Shleifer (2003)
insolv	Measures the burden of the regulation for closing a business. It includes: The time (years), cost (% of estate), and recovery rate (cents on the dollar) that it takes to close a business. The costs are a percentage of the estate (i.e. all the money and property that a firm owns). Specifically, it includes all legal court costs and other fees that are incurred when closing a limited liability company.	Doing Business Data. International Finance Corporation. The World Bank Group.
construct	Measures the burden of the regulation for obtaining construction permits. It includes: The procedures (number), the time (days), and the cost (% of income per capita) to obtain a construction permit.	Doing Business Data. International Finance Corporation. The World Bank Group.
getelec	Measures the burden of the regulation forgetting electricity. It includes: The procedures (number), the time (days), and the cost (% of income per capita) to obtain a electricity.	Doing Business Data. International Finance Corporation. The World Bank Group.
labor	Measures the burden of the regulation of labor. Considers aspects of the legal and regulatory framework of a country's labor market. It accounts, and assigns an equal weight to the: ratio of minimum wage to the average value added per worker, hindrance to hiring additional workers, rigidity of hours, difficulty of firing redundant employees, legally mandated notice period, and mandatory severance pay.	Index of Economic Freedom. Heritage Foundation.
tax	Measures the burden of the tax regulation. It includes: The payments (number per year), and time (hours per year) to comply with the regulation. In addition the fiscal freedom is a measure of the tax burden imposed by government. It includes both the direct tax burden in terms of the top tax rates on individual and corporate incomes and the overall amount	Doing Business Data. International Finance Corporation. The World Bank Group. Index of Economic Freedom. Heritage Foundation.

	of tax revenue as a percentage of GDP.	
governance	Governance consists of the traditions and institutions by which authority in a country is exercised. It includes: Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.	World Governance Indicators. The World Bank Group. Available at: http://info.worldbank.org/governance/wgi/index.asp
infra	Coming from the second pillar of the Global Competitiveness Report, evaluates a well-developed transport and communications and infrastructure network. It includes: Besides the second pillar evaluation, the broadband Internet subscriptions/100 pop., and the internet users/100 population.	Global Competitiveness Report. World Economic Forum.
macro	Coming from the third pillar Macroeconomic Environment of the Global Competitiveness Report, it evaluates the stability of the macroeconomic environment.	Global Competitiveness Report. World Economic Forum.
trans	Coming from the Innovation and Business Sophistication pillars of the Global Competitiveness Report, it aims to capture the ability of actors to cooperate. It includes subjective measures for: The university-industry collaboration in R&D, the government procurement of advanced technology products, and the state of cluster development.	Global Competitiveness Report. World Economic Forum.
GDPpc	GDP per capita is gross domestic product divided by midyear population. Data are in constant US$. In this sample the variable is an average for the decade of 2000s. The intention is to control for the economic settings of each economy.	World Bank based on World Development Indicators data.
Legal Origin	Indicates the type of legal system in the country. It considers English Common law, French Civil Law, and German Civil Law.	La Porta et al. (2008)
Religion	Indicates the dominant religious group in the country. It considers Muslims, Protestants, and Catholics.	La Porta et al. (1999)
Ethnic fractionalization	It is the probability that two randomly selected individuals in a country will not speak the same language.	
Latitude	Absolute value of the latitude of a country, scaled between zero and one.	

Appendix G. List of Countries for Panel A and Panel B

List of countries Panel A:					
Afghanistan	Chile	Guatemala	Luxembourg	Peru	Taiwan, China
Albania	China	Guinea	Macedonia, FYR	Philippines	Tajikistan
Antigua and Barbuda	Colombia	Guinea-Bissau	Madagascar	Poland	Tanzania
Argentina	Comoros	Guyana	Malawi	Portugal	Thailand
Armenia	Congo, Rep.	Haiti	Malaysia	Puerto Rico (U.S.)	Timor-Leste
Australia	Costa Rica	Honduras	Maldives	Romania	Togo
Austria	Côte d'Ivoire	Hong Kong SAR, China	Mali	Rwanda	Tonga
Bahamas, The	Croatia	Hungary	Marshall Islands	Samoa	Trinidad and Tobago
Bangladesh	Cyprus	Iceland	Mauritania	São Tomé and Príncipe	Tunisia
Belarus	Czech Republic	India	Mauritius	Senegal	Turkey
Belgium	Denmark	Indonesia	Mexico	Serbia	Uganda
Belize	Djibouti	Ireland	Micronesia, Fed. Sts.	Seychelles	Ukraine
Benin	Dominica	Israel	Moldova	Sierra Leone	United Kingdom
Bhutan	Dominican Republic	Italy	Mongolia	Singapore	United States
Bolivia	Egypt, Arab Rep.	Jamaica	Montenegro	Slovak Republic	Uruguay
Bosnia and Herzegovina	El Salvador	Japan	Morocco	Slovenia	Uzbekistan
Botswana	Eritrea	Jordan	Mozambique	Solomon Islands	Vanuatu
Brazil	Estonia	Kenya	Namibia	South Africa	Vietnam
Brunei Darussalam	Ethiopia	Kiribati	Nepal	Spain	West Bank and Gaza
Bulgaria	Fiji	Korea, Rep.	Netherlands	Sri Lanka	Zambia
Burkina Faso	Finland	Kosovo	New Zealand	St. Kitts and Nevis	Zimbabwe
Burundi	France	Kyrgyz Republic	Nicaragua	St. Lucia	
Cambodia	Gambia, The	Lao PDR	Niger	St. Vincent and the Grenadines	
Cameroon	Georgia	Latvia	Pakistan	Sudan	
Canada	Germany	Lebanon	Palau	Suriname	
Cape Verde	Ghana	Lesotho	Panama	Swaziland	
Central African Republic	Greece	Liberia	Papua New Guinea	Sweden	
Chad	Grenada	Lithuania	Paraguay	Switzerland	

List of countries Panel B:	
Argentina	Moldova
Australia	Mongolia
Austria	Montenegro
Belarus	Morocco
Belgium	Mozambique
Bosnia and Herzegovina	Pakistan
Brazil	Panama
Bulgaria	Peru
Cameroon	Philippines
Chile	Poland
Colombia	Puerto Rico (U.S.)
Côte d'Ivoire	Romania
Croatia	Senegal
Czech Republic	Serbia
Denmark	Singapore
Dominican Republic	South Africa
Estonia	Spain
Finland	Sweden
Ghana	Taiwan, China
Guatemala	Tajikistan
Hungary	Thailand
Italy	Tunisia
Japan	Turkey
Korea, Rep.	Uganda
Kyrgyz Republic	Ukraine
Lebanon	United Kingdom
Luxembourg	Vietnam
Macedonia, FYR	Switzerland
Mexico	

Appendix H. Reset Test for Functional Form Misspecification

(1A) lnsmeden

The restricted model will be:

$$\text{lnsmeden} = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{gov} + \beta_3 \text{promar} + \beta_4 \text{function} + \beta_5 \text{labor} + \beta_6 \text{tax} + \beta_7 \text{macro} + \beta_8 \text{infra} + \beta_9 \text{trans} + u$$

The estimation results are:

$$n = 78,\ Rr^2 = 0.4325$$

The unrestricted estimated model will be:

$$\text{lnsmeden} = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{gov} + \beta_3 \text{promar} + \beta_4 \text{function} + \beta_5 \text{labor} + \beta_6 \text{tax} + \beta_7 \text{macro} + \beta_8 \text{infra} + \beta_9 \text{trans} + \delta_1 \widehat{\text{lnsmeden}}^2 + \delta_2 \widehat{\text{lnsmeden}}^3 + u$$

The estimation results are:

Linear regression — Number of obs = 78; F(11, 66) = 6.85; Prob > F = 0.0000; R-squared = 0.4974; Root MSE = .84908

lnsmeden	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
lngdppc	.4407723	.1991541	2.21	0.030	.0431482	.8383964
gov2000	.7147703	1.266081	0.56	0.574	-1.813041	3.242582
promar	-3.062198	2.331051	-1.31	0.194	-7.716292	1.591896
function	-2.03327	2.983395	-0.68	0.498	-7.98981	3.923269
labor	-.5961105	.6583037	-0.91	0.368	-1.910456	.7182352
tax	-2.175065	1.203126	-1.81	0.075	-4.577184	.2270549
macro	.842236	.9270908	0.91	0.367	-1.008761	2.693233
infra	-.7088248	1.34059	-0.53	0.599	-3.3854	1.96775
trans	1.593063	1.073573	1.48	0.143	-.5503949	3.736521
lnsmedenh~w2	1.16971	.5730234	2.04	0.045	.0256314	2.313788
lnsmedenh~w3	-.5304634	.2290199	-2.32	0.024	-.9877163	-.0732104
_cons	-2.486707	2.149567	-1.16	0.252	-6.778457	1.805042

$$n = 78,\ Rur^2 = 0.4974$$

We have the same dependent variable for both models. Therefore, we can apply a joint hypothesis test.

$$H_0 : \delta_1 = 0, \delta_2 = 0$$

$$H_1 : H_0 \text{ is not true}$$

With a 1% significance level, $q = 2$, and $n - k - 3 = 78 - 11 - 3 = 64$, the critical value is:

$c \cong 4.98$

In order to calculate the F statistic we use the following equation:

$$F = \frac{\frac{(R_{ur}^2 - R_r^2)}{q}}{\frac{(1 - R_{ur}^2)}{(n - k - 3)}} \qquad F = \frac{\frac{(0.4974 - 0.4325)}{2}}{\frac{(1 - 0.4974)}{(78 - 11 - 3)}} = 4.13 \qquad F = 4.13$$

Since $F < c$, H_0 fails to be rejected. Therefore, this result suggest that there is no a sort of

functional form problem.

Similar procedures were taken for models 1B, 2A, 2B, 3A, 3B, 4A, 4B, 5A, and 5B. For the sake of brevity the detailed calculations are not presented. The Table below summarizes the results.

Table: Summary RESET Test

Model	Significance level	Critical value (c)	F statistic
1A	1%	4.98	4.13
1B	5%	3.34	0.521
2A	5%	3.15	0.0589
2B	5%	3.32	0.5676
3A	5%	3.23	0.689
3B	1%	6.36	5.31
4A	5%	3.15	0.669
4B	5%	3.49	1.33
5A	5%	3.15	0.058
5B	5%	3.42	2.83

Appendix I. Breusch-Pagan Test for Heteroskedasticiy

The Stata's Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was executed for every model under the following null hypothesis:

Ho: Constant variance

The results are summarized in the following table:

Model	F-statistic (F)	p-value (p)
1A	30.03	0.0000
1B	3.00	0.0912
2A	0.05	0.8195
2B	1.27	0.2651
3A	2.40	0.1265
3B	3.45	0.0731
4A	1.16	0.2843
4B	0.01	0.9283
5A	0.51	0.4759
5B	2.28	0.1397

Except for model 1A, all the p-values are greater than 0.05, this means that the reported standard errors are reliable because the null hypothesis of homoskedasticity in the model was not rejected. Therefore, there is strong evidence against heteroskedasticity in almost all the models. In order to address potential heteroskedasticity problems, and in order to obtain test statistics that are robust to heteroskedasticity, particularly for model 1A, robust multiple linear regression was utilized in every calculation for all the models.

Appendix J. Joint Significance Tests

(1A) lnsmeden

First we the restricted and unrestricted models are defined:

Restricted model (Excluding all the not significant variables): $\text{lnsmeden} = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{gov} + \beta_3 \text{labor} + \beta_4 \text{tax} + \beta_5 \text{trans} + u$
The estimation results are the following: $R^2 r = 0.3475$
Unrestricted model: $\text{lnsmeden} = \beta_0 + \beta_1 \ln \text{GDPpc} + \beta_2 \text{gov} + \beta_3 \text{promar} + \beta_4 \text{function} + \beta_5 \text{labor} + \beta_6 \text{tax} + \beta_7 \text{macro} + \beta_8 \text{infra} + \beta_9 \text{trans} + u$
$R^2 ur = 0.4325$

We have the same dependent variable for both models. Therefore, we can apply a joint hypothesis test.

$$H_0 : \beta_3 = 0 , \beta_4 = 0, \beta_7 = 0 , \beta_8 = 0$$

$$H_1 : H_0 \text{ is not true}$$

With a 5% significance level, $q = 4$, and $n - k - 1 = 68$, the critical value is $c \cong 2.53$

In order to calculate the F statistic we use the following equation:

$$F = \frac{\frac{(R_{ur}^2 - R_r^2)}{q}}{\frac{(1 - R_{ur}^2)}{(n - k - 1)}} = 2.55$$

Since $F > c$ H_0 is rejected. Consequently, there is strong evidence for stating that the analyzed variables are jointly statistically significant in the model.

Similar procedures were taken for models 1B, 2A, 2B, 3A, 3B, 4A, and 4B. For the sake of brevity the detailed calculations are not presented. The Table below summarizes the results.

Table: Joint Significance Test

Model	Significance level	Critical value (c)	F-statistic
1A	5%	2.53	2.55
1B	5%	2.53	8.75
2A	5%	2.37	0.211
2B	5%	2.42	0.581
3A	5%	(2.45) 2.25	(1.52) 1.45
3B	5%	3.13	0.63
4A	5%	2.37	0.508
4B	5%	2.78	1.69