The governance environment and innovative SMEs

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Version: November 8, 2016

This paper examines the impact of the governance environment on SME performance, concentrating on differences between innovators and non-innovators. A poor environment is related to lower profits and sales for SME innovators than non-innovators. Using a complementary indicator, SME innovators tend to have higher sales and profits when courts are perceived to be strong. On the other hand, the governance environment does not impact large innovative and non-innovative firm performance differently. Latin America and the Caribbean is a region with many entrepreneurs but few innovators. The region also has a larger proportion of smaller firms compared to other regions. In this context, lessons on SME constraints related to governance is important for developing enabling policies.

Keywords: Firm performance, innovation, SMEs, governance, business environment, Latin America and the Caribbean,

JEL codes: D22, D73, O31, L25

1. Introduction

Latin America and the Caribbean (LAC) is a region with many entrepreneurs, characterized by a large number of business owners per capita. Yet there is not a large presence of innovative activity (Lederman et al, 2014). LAC also has a higher proportion of SMEs than other regions in the world (World Bank, 2014), but SMEs innovate less than large firms. Using firm-level panel data collected by the World Bank, small, medium, and large firms in LAC innovated at 27.5, 38.1, and 42.1 percent respectively[2]. Annual sales and profits from SME innovators are lower than non-innovators. Moreover, in 2010, 14 percent of innovative SMEs in LAC were bribed when conducting business transactions compared to 11 percent of SMEs that did not innovate; this difference is significant (Table 3). In contrary, in Europe and Central Asia, there is no significant difference in how often firms are bribed according to their innovation activity. These findings highlight potential challenges to innovation activity and growth for SMEs in the LAC region.

This study shows that there are differential effects from a poor governance environment on SMEs by whether or not they are innovators[3]. Results show that innovative SMEs experience lower sales and profits than non-innovators when they operate in poor governance environments, measured by the percent of firms expected to pay informal payments "to get things done". Complementarily, when perceptions of the court system are better, innovative SMEs have higher sales and profits than non-innovators as is expected in developed countries.

While corruption has been linked to reduced innovation, there is limited literature linking these two aspects to firm sales and profits. A poor climate for doing business obstructs firms from bringing ideas to market and hurts innovation and growth (Pagés, 2010). Paunov (2016) uses firm-level data from 48 countries and finds that corruption lowers the adoption of quality certificates and machinery investments. Anokhin and Schulze (2009) use cross-country data from 64 countries and find support that increasing the control of corruption can rise levels of innovation and entrepreneurship.

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[2] Based on a set of panel firms from 14 LAC countries in 2006 and 2010.
[3] Firms are innovators if they have created new or significantly modified products in the last 3 years. This is an objective measure in the Enterprise Surveys.

In some country studies, corruption was found to negatively affect firm-level outcomes, however results vary by country[4]. These papers also do not investigate why impacts may differ for firms that are innovators. Given the relation of innovation to growth, this is an important question. The literature has also linked the quality of governance to various measures of firm performance such as investment growth, employment growth, total factor productivity, and sales growth. Yet, these results either utilized perception-based measures of corruption or do not find a significant or robust effect from corruption onto firm sales growth, investment, nor employment growth[5].

This paper expands on the literature of firm-level analysis of corruption and innovation by linking these features to firm performance, as well as focusing on SMEs. The subset of SMEs is important to study in isolation as there is a very high proportion of SMEs in LAC, and the size of the SME sector has been linked to growth (Beck, Demirguc-Kunt, and Levine, 2005). In terms of SME constraints, a well-developed literature exists on access to finance as a constraint[6], but lesser literature exists on the impacts of governance. This paper finds that sales and profits among SME innovators are lower when the governance environment is poor. In terms of policy, this is important. Private sector development policies are frequently aimed at SMEs since the imbalance between small and large stakeholders are often viewed to be a reason for inequity. Reforms in strengthening good governance and easing the process for firm operations may increase the propensity to innovate in LAC and also contribute to growth.

Firm-level analysis is important since corruption can affect firms differently depending on their characteristics. Recognizing which type of firms are sensitive to corruption or poor governance is important to develop targeted and evidence based policy[7]. Many well-cited research on corruption often focuses on effects conditional on country and institutional characteristics and not firm-level characteristics[8]. It is important to underscore differences across firms and differential impacts from

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4 See Fisman & Svensson 200); Francisco & Pontara 2007; Hallward-Driemeier et al 2006; Honorati & Mengistae 2005; Bastos & Nasir 2004; Beck et al 2005; Carlin et al 2006; Gaviria 2002.
5 See Aterido et al 2010; Aterido et al 2011; Asiedu 2009, Bastos & Nasir 2004; Beck et al 2005; Dollar et al 2005, 2006; Escribano & Guasch 2005; Hallward-Driemeier et al 2006; Seker & Yang 2014; Bhaumik & Estrin 2007; see Dethier et al 2010 review of Enterprise Surveys literature.
[6] Just to cite a few: Carpenter and Petersen 2002; Beck and Demirguc-Kunt, 2006; Hutchinson and Xavier 2006.
[7] See World Bank 2004; Pande & Udry 2005; Durlauf et al 2008; Dethier et al 2010
[8] See Belitski, Chowdhury, and Desai 2016; Mauro 1995; Kaufmann et al 2004; Mo 2001; Wei 2000; Lambsdorff 2003; Johnson et al 2011; Djankov et al 2002; Shleifer & Vishny 1993; Seligson 2006

corruption by firm characteristics. In LAC, there is no significant difference in bribery incidence between large innovative and non-innovative firms. Moreover, in analysis on the subset of large firms, there is no impact from a poor governance climate onto large firm's performance, there are also no differential impacts by innovation status.

SMEs or innovators can be more negatively affected by or targeted for bribery. Bribery can have smaller distortionary effects for large or established firms because they are more likely to be in a position to benefit from regulatory capture since they have larger influence or tenure in an industry. Şeker and Yang (2014) find firms in LAC have lower sales growth when operating in areas with a higher propensity of bribery when conducting business transactions with public officials; and the negative distortion is even larger for young firms or firms with low levels of sales. Dealing with bribes also consumes time. For smaller firms with fewer employees, the distraction of continuous bribery requests can be costlier. Moreover, bribes can be petty rather than proportional to a firm's sales (Clarke, 2011). Firms with higher sales may be abler to shoulder the financial burden of bribery.

Profitable firms are often targets of bribery (Svensson 2003). Evidence from developed countries suggests that innovative firms are more profitable than non-innovative firms.[9] Innovative firms tend to be characterized by more educated managers, better technologies, and have access to finance (Ayyagari et al, 2011). Geroski et al (1993) finds that innovators enjoy higher profit margins than non-innovators; and not only during periods when they introduce specific innovations. In LAC, this paper actually find that innovators have lower profit. Ayyagari et al (2010) find that firms who pay bribes do evade taxes but innovative firms are net victims.

This paper uses firm-level panel data collected by the World Bank. The World Bank's Enterprise Surveys paid special attention to the panel data collection in the LAC region in 2010. This was the surveys' first concerted effort to create a large panel component across an entire region. The survey also allows for objective measures of innovation, corruption, and firm sales.

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9 See Geroski et al 1993; Leiponen 2000; Cefis & Ciccarelli 2005; Love, Roper and Du, 2009

Outcomes of interest are firm-level profits and sales. The principle explanatory variable of interest is the interaction term between the average governance environment and whether or not a firm is an innovator. A firm is considered to be an innovator if it has created new or significantly modified existing products within the last three years. Firms in the LAC region are much less likely to have recently conducted product innovation when compared to firms in the Europe and Central Asia (ECA) region. Within LAC, Central American countries have the lowest levels of product innovation. In El Salvador, Nicaragua, and Honduras, less than 10 percent of SMEs recently created new or modified existing products. To capture the quality of governance related to doing business, this paper focuses on two variables; if firms are expected to pay informal payments to get things done, and if firms believe the court system is fair, impartial, and uncorrupted.

Results show that sales and profits among innovators are lower when governance dimensions of the business environment are poor. The creation of new products requires more interactions with the government through compliance with additional regulations, obtaining licenses, and undergoing more processes and procedures. These firms may experience more frictions when attempting to grow their business or enter new markets, which creates more opportunities for firms to encounter red tape or bribery. This evidence corroborates with other research that has found profitable and innovative firms to be candidate victims of bribery or extortion.[10]

The next sections are organized as follows. Section 2 describes the data. Section 3 discusses the empirical strategy. Section 4 discusses the results and robustness. Section 5 concludes.

2. Data

This section reviews data and key variables. The construction of sales, profit, governance environment, and innovation variables are described in detail.

Sample of Firms

Firm-level data is obtained from the Enterprise Surveys database and yields a set of panel firms from 14 countries in LAC surveyed in 2006 and 2010. Table 1shows the distribution of panel firms

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[10] See Svensson 2003; Ayyagari et al 2010; Anokhin & Schulze 2009; Murphy, Shleifer, Vishny 1993

across countries. The original sample of panel firms included 2,396 unique SMEs in LAC with two periods of data. However, after reducing the sample to those with a complete data profile in profits and other explanatory variables, the set of firms is reduced to about 1,195 unique SMEs in LAC. Compared to other regions with Enterprise Surveys data, the number of unique panel firms in much larger in LAC since it is the first region to undergo field work with a strict focus on the response rates of panel firms. However, the sample of panel firms alone is not representative of any population of firms, and thus this paper precludes the use of weights. The main variable with missing values that is reducing this sample size is recall data on sales from 3 to 4 fiscal years ago. If the lagged sales variable is not used, then the sample size is increases to 1,607 unique firms. Previous sales and performance are important determinants of current profits (McDonald 1999). However, due to the large improvement in sample size, results will be compared with and without lagged sales. Results will be shown to remain robust.

Sales and Profit

The impact of the governance on firm profits and sales is important since firms are likely to base operating decisions on these two financial measures.

Sales refers to annual sales from the last complete fiscal year. The annual profit for a firm is the total annual sales from the last complete fiscal year less all reported costs. All monetary values are converted to U.S. dollars in 2009 values using a GDP deflator. Costs are reported for k categories: labor costs, energy, fuel, inputs etc. Costs categories lack consistency across survey waves. However, since costs are totaled over all categories, this will reduce differences from classification.

Firm-level data on sales and costs is one of the most unique aspects of Enterprise Surveys; however it is also where data error can occur. There are two sources of error: reporting error and data entry error. In some instances, financial data is reported without referring to books. Firms report financing figures directly from books only 47 percent of the time in our sample, another 45 percent report figures that the interviewer judged to be reliable but estimated. Interviewers judged about 7 percent of firms to have unreliable financial information. On the data entry side, care is taken to ensure accuracy of reporting. For instance, if profits are calculated to be negative, then firms are re-contacted to double check if the data is correct. Ratio checks are also used to compare

the ratio of sales to costs to flag any unreasonable ratios. Quality control programs also flag outliers and firms are re-contacted if their reported costs or sales are in the extreme tails of the distribution.[11] Beginning in 2012, monetary values were recorded in words as well as numerically as an extra level of data verification.

SMEs are excluded whose sales, cost, or profit data is an outlier in their country-year survey group. In the final sample of panel firms used in the regressions, all firms have positive sales, though some are very low. In the Latin America and Caribbean region in 2010, SMEs in Mexico had the highest annual profits averaging $10.3 million USD2009. On the lower end, Colombian SMEs had the lowest average profits in 2010 at $1.9 million USD2009.

The Governance Environment

Enterprise Surveys provides data on how firms experience and perceive the business environment. This paper focuses on two variables that characterize the governance and corruption dimension of the business climate. The first variable is if firms are expected to pay informal payments to get things done. The second variable is if firms believe the court system is fair, impartial, and uncorrupted.

Because firms are asked for their general perception about these conditions, they are more likely to respond honestly than if an interviewer asked about the firm's own experience with officials. But naturally, the firms are more likely to report based on own experiences which they are familiar with. Moreover, since the set of panel firms are not necessarily representative of incidences of bribery in the population, the use of these perception variables on aspects of governance are useful. There is also a lack of availability of objective measures of bribery. In the questionnaire, firms are asked if bribery occurred only in regards to specific activities such as during obtainment of a construction permit. Therefore, the use of these objective measures would be biased since not all firms conduct these activities.

There are consistencies between Enterprise Surveys reporting and other international measures of corruption. In 2010, the two least corrupt countries in LAC according to the Corruption

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[11] A data point is considered to be an outlier if it lies three standard deviations away from the mean. Outliers are examined over the distribution of panel firms.

Perception Index was Chile and Uruguay. In the Enterprise Surveys data, these two countries also have the highest proportions of SMEs who believe "…the court system is fair, impartial and uncorrupted" (Table 2). In terms of the percent of SMEs who are expected to pay informal payments to get things done, Chile also has the lowest proportion at only 1.3 percent of SMEs believing this to be true in 2010. Enterprise Survey's perception data has also been shown to align well with objective measures and that perceptions are often honest. Hallward-Driemeier and Aterido (2009) do find a high correlation between firm perceptions and objective measures of the business environment in the ES data. Gelb et al (2007) also find that firms do not discriminately complain about the business climate.

As an added level of precaution, since perception-based indicators may introduce bias (Bertrand & Mullainathan, 2001), a firm's own perception of the business environment is not used. Firm f's own response to a governance climate question is denoted by the variable G_f . For a firm $f=F$, the average perception of a governance indicator by other firms in their common cluster (g) is denoted as $\overline{G}_F$ (Equation 1). Excluding firm F's own response will also reduce reverse causality or simultaneity; although a firm's individual contribution to the average is small. A minimum cluster size of $n=25$ is also imposed to ensure the average is computed from an adequately sized sample.

$$\overline{G}_F \ = \frac{1}{n-1} w_f \left(\sum_{f \in g}^{n} \{ G_{f \in g} \} - G_F \right) \times 100 \tag{1}$$

Aggregate responses are computed from the complete set of firms (including large firms), and not just panel firms, further reducing reverse causality. The total number of firms of all sizes surveyed before restricting to panel firms was 37,519 observations, compared to 3,056 unique panel firms or 6,112 observations. Virtually all firms respond to the two governance questions described above since it is a required question. A larger group of firms allows for a stronger representative measure of the average external governance climate that is experienced by a group of firms.

Enterprise Surveys stratifies by sector, size, and sub-national locations. Aggregate statistics at these levels of stratifications with survey weights (w_f) will yield statistics that are representative

of the population of firms at that level of stratification. Weighted averages of governance climate perceptions at these levels of stratification will closely reflect the perceptions of the population.[12]

The strategy of utilizing group averages to disassociate individual unobservable factors from measures of the business climate is a common empirical strategy used by researchers.[13] It is unclear if the selection of firms to bribe is random. Profitable firms may be more likely targets of bribery (Svensson, 2003). Aggregate perceptions reflect the external governance climate and helps disassociate biases observed by a firm from within. For example, exporters are more likely to complain about customs regulations or firms without generators may complain about electricity regardless of the local supply of power.

Innovators

Firms are classified as innovators if they had "introduce any new or significantly improved (goods or services)" over the last three years, also known as product innovation. While there are different definitions of innovation, Ayyagari et al (2011) examined the relationship between firm-level innovation and financing and find similar relationships across different definitions of innovation. Notice that by asking about innovation in only the previous three years and not any earlier, we avoid the firm remarking on innovation activity in the same time period in the two survey waves. Compared to R&D, product innovation is more descriptive of active innovation activity that is affecting products sold rather than experimentation or development that has yet to affect sales.

Firms in LAC have a low rate of innovation which may be related to lagging productivity and growth (Lederman et al, 2014). Low innovation rates are evident when compared to rates in ECA. Among all firms, 55 percent of firms in LAC did *not* recently create new or modify existing products in either survey wave, compared to only 33 percent in ECA. In the most recent survey waves for each region, 53 percent of firms recently innovated in ECA compared to only 33 percent in LAC. Firms are also more dynamic in their innovation in ECA than in LAC. Half of firms who

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[12] I use the term "closely" since I exclude the firm's own perception response from the average. For firms who did not respond to these questions, I impute the average from their cluster. These instances are rare since obstacle questions are required and there are few instances when a firm chose "don't know".

[13] See Dethier et al 2010; Escribano & Guasch 2005; Şeker & Yang 2014; Dollar et al 2005, 2006; Hallward-Driemier et al 2006

were not innovators in 2005/6 in ECA became innovators 2008/09. In LAC, this rate was only 16 percent.

There is large variation in innovation across countries as well (Table 1). In the Latin America and Caribbean region, SME panel firms surveyed in El Salvador had no product innovation activity. Nicaragua also has extremely low shares of SMEs who innovate. SMEs in large LAC economies are more innovative. In 2010, 42 to 53 percent of SMEs innovated in Argentina, Peru, and Colombia.

3. Empirical Estimation

The panel structure of the data to is exploited to evaluate the relationship between governance and innovation onto firm outcomes. A first-difference regression is estimated (Equation 2). In a two-period model, a first-difference specification is identical to a fixed-effects specification.

$$\Delta \log \pi_{fct} = b + \delta \Delta \bar{G} + \eta \Delta N_{fct} + \phi \Delta (\bar{G} \times N_{fct}) + \Delta X_{fct} \beta + \Delta Z_{ct} \gamma + \Delta \varepsilon_{fct}$$

(2)

The dependent variable is the difference in the log of profits (π_{fct}) for firm f between the two survey periods. In alternate specifications, the log of sales is also used as a dependent variable. The variable $\Delta \bar{G}$ is the differenced of the average governance environment quality experienced by a firm's peers at a given cluster level[14]. The indicator for whether a firm is an innovator is denoted as N_{fct}.

A panel structure allows time-invariant firm and country specific unobservable factors to be differenced out. The interaction of firm and country unobservables will also be removed through first differencing. Examples of factors that are differenced out are if a firm has a highly talented manager in both periods, and time-invariant productivities. Equation (3) is estimated with and without previous year's annual sales since the sample size increases substantially when this

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[14] The cluster level used in the estimation is country-stratification region-sector. Other clusters at country-region-size are also used for robustness checking.

variable is excluded. While the literature has examined the characteristics of innovative firms[15], there are fewer conclusions regarding the performance of innovative firms in the developing world. Since firms in the same country may have correlated unobservables, errors (ε_{fct}) are clustered by country.

Table 4 describes the firm-level and macroeconomic control variables used in this paper. Table 5 lists summary statistics by whether a firm is an innovator or not. The vector X_{fct} includes firm-level variables capturing age, size, sole proprietorship, foreign ownership, and export activity. A number of firm attributes are controlled for that may characterize profits. Recall that lagged values of annual sales from 3 fiscal years ago are included. Previous firm performance is an important determinant of current profits (McDonald, 1999). Annual sales are also converted to U.S. dollars and reported in 2009 value. Dummy variables are included if a firm is a sole proprietorship, if it has foreign-ownership of at least 5 percent, and if at least 10 percent of all sales are from direct exports. Ownership is an important determinant of profits (Cull & Xu, 2005). Yurtoglu (2004) finds that export activity is correlated to profits for firms in Turkey. Continuous variables are included such as age, years of top manager experience, and firm size as measured by the number of employees. The total number of employees is a composite of full-time and part-time workers. Part-time workers are weighted by the average number of months they work in a year.

Since a country dummy would be collinear with a firm fixed-effect, time-varying country characteristics are introduced such as GDP per capita, GDP per capita growth, current account balance, interest rates, and inflation (Z_{ct}). It is important to control for the macroeconomic characteristics of a country. Some characteristics of the governance climate will be related to a country's income level or level of development. For example, permit and regulation related constraints are more reported to be more serious in high income countries simply because these elements are not even relevant in poorer economies. These variables are obtained from the World Development reports. Lagged macroeconomic variables at the country level are used. There is

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[15] Ayyagari et al (2011) find that having external financing, borrowing in a foreign currency, having highly educated managers, internal ownership and exposure to foreign competition is positively related with higher levels of firm innovation. The quality of the financial sector is important for innovation determination. However, I do not find the interaction between access to finance and innovation to significantly predict profits.[15] In Australia, Bhattacharya and Bloch (2004) find firm size, R&D intensity, market structure, and trade shares to predict innovation levels

some incompleteness in this data across countries. To deal with missing data, if a macroeconomic variable is missing for surveys in 2006, an average from 2004 to 2006 is used instead. If a variable is missing for 2006, the 2007-2010 average fills the gap. Regressions are mostly robust with or without macroeconomic variables.

The use of panel data can also control for firm-specific unobservables to correct for sources of bias under certain structural assumptions.

Assume the error term is characterized by an additive structure: $\varepsilon_{fct} = \left(w_t + v_c + u_f + v_c \times u_f\right) + \xi_{fct}$. The component w_t is a time-varying unobservable. The component v_c is a time-invariant country-level unobservable that is external and unassociated with the firm. Country-level components affecting profit may include tax rates or whether or not the economy is closed or open. The variable u_f represents a firm-specific and time-invariant unobservables that are associated with profit margins such as firm productivities. The last component ξ_{fct} is a mean zero error term. In cases where firm fixed effects are included, differencing across two periods removes country and firm-specific unobservables, as well as interactions between firm and country unobservables (Equation 3).

$$\Delta\varepsilon_{fct} = \left(\left[w_t + v_c + u_f + v_c \times u_f\right] - \left[w_{t-1} + v_c + u_f + v_c \times u_f\right]\right)$$

$$= \left[(w_t - w_{t-1}) - \left(\xi_{fct} - \xi_{fct-1}\right)\right]$$

(3)

Measures of the business climate are at aggregate levels. Construction of aggregate measures do not reflect the individual perception of firm f. This is an important step to disentangle profits with innovation and the business climate.

To estimate the coefficient η under the additive error structure, it is necessary that $E\left(\Delta N_{fct}\Delta\varepsilon_{fct}\right) = 0$, or after reduction, changes in innovation activity is independent to changes in time-varying unobservables.

A relevant concern is that there are time-varying unobservables characterizing the change in a firm's decision to innovate over time, and they are correlated with some unobserved measure affecting profit. For example, assume the structure of the error term included a time component

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that was also interacted with a firm-specific component. For example, a time-varying unobservable is present if a firm switched managers between the two survey rounds who had different levels of experience or hired a talented research team to create new products. In LAC, the number of years of a manager's experience is observable and changes in management can be accounted for. Changes in export activity and foreigner ownership are also observed. Unobserved changes in firm productivities are an example of unobservable that may induce bias. While it is reasonable that this unobservable is related to the changes in innovation activity, it is not straightforward when it is related to the interaction between innovation and business climate.

To retrieve the coefficient ϕ under the additive error structure that was presented, changes in unobservables associated with firm profit are assumed to be uncorrelated to unobservables in the interaction between business climate and firm innovation (Equation 4). This assumption is valid even if unobservables are correlated with the business climate or innovation alone. Identification of the parameter η also follows from this assumption.

$$\left(G_{ct} \times N_{ft} - G_{ct-1} \times N_{ft-1}\right) \perp \left[(w_t - w_{t-1}) - \left(\xi_{fct} - \xi_{fct-1}\right)\right]$$

$$(4)$$

The last consideration is if there are significant unobserved interaction effects between time and country. The subscript *m* to denote country and year effects. This is primarily a concern when the firm business perceptions created using ES data are averaged at the country-level. The concern is that reforms are correlated to the market and the economy. It is unlikely that one reform occurs in isolation; reforms can reflect a wide spread attitude regarding change and development. A wide range of macroeconomic variables are used to control for changes in the economic landscape, including GDP, GDP growth, inflation, current account balance, and interest rates. In robust results, the inclusion of these country variables does not impact the significance or magnitude of the impact of business climate and innovation.

As a further robustness check, country-year interactions are introduced into the regression instead of controlling for macroeconomic changes over time using variables such as GDP. In this case, in the presence of firm and country-time fixed effects, the identifying assumption is shown in (Equation 5).

$$\left[(G_t \times N_f - G_{t-1} \times N_f) - (G_t \times N_{f'} - G_{t-1} \times N_{f'})\right] \perp \left[(\varepsilon_{ft} - \varepsilon_{ft-1}) - (\varepsilon_{f't} - \varepsilon_{f't-1})\right]$$

$$(5)$$

Firms f and f' are located in the same country. If a shock occurred to a policy in country c and the shock was permanent, first-differencing of the error terms will remove this effect. Notice when firms f and f' are in the same country, and under assumptions of an additive error structure, the right hand side reduces to the difference of two mean zero error terms.

As described above, using the constructed averages of governance perceptions to reflect the external environment as well as exploiting a panel structure allows for the control of unobservable factors that may bias estimates. Conditions presented in (Equation 4) are reasonable but for added sensitivity, analysis is also performed with additional country-time dummy variables.

In the next section, results are presented that are robust to variations in regression specifications which include: no country controls, with country controls, or with country-year controls.

4. Results and Discussion

This section discusses results from estimating equation (Equation 2). First, the determinants of profit and sales are analyzed, including variables in the vectors X and Z (firm and country level characteristics). Second, the discussion focuses on the interaction of governance and whether or not a firm is an innovator.

Full regression results are shown in Table 6 to illustrate the impacts of being an innovator, firm characteristics (*X),* and macroeconomic variables (*Z).*

Being an innovator is predictive of lower profits. This may not be surprising as innovating requires resources such as R&D, new investments into materials, and new products are not guaranteed to be profitable immediately. Firm size as measured in the number of employees, and annual sales three years ago predict higher profits. These variables are also found to be significant determinants of the profit in other studies as well (McDonald, 1999). While lagged sales do significantly predict current profits. The R-squared of the regressions also increases substantially when the lagged sales variable is included as a regressor. However, in robust results the coefficient

estimate on our interaction term of interest is unaffected. Sole proprietorship predicts lower profits. Foreign ownership, export activity, and the age of the firm do not significantly predict profits. Macroeconomic variables are important controls however they have little influence in on our variables of interest.

Enterprise Surveys firm-level data offers the advantage of observing variations of the governance climate at local levels. Recall the governance climate variable is an average measure of the external governance climate that a firm's peers experience and excludes the firm's own response. Moreover, these grouped averages are computed using all SMEs in the data, not just the panel firms, which creates a more representative indicator of the local governance environment[16]. For example, the value of 'Informal Payments' assigned to any particular firm reflects how similar peers view the prevalence of informal payments to government officials.

Table 7 and Table 8 illustrates results of the interaction between informal payments and whether or not the firm is an innovator. The coefficient on the interaction term is negative and significant across most specifications and also in regressions where the dependent is either profit or sales. However, results are weaker when the dependent variable is sales. This implies that firms who are conducting product innovation and in environments where informal payments are more common have lower profits. The results are robust, with the interaction term being significant in specifications with and without macroeconomic controls, lagged sales, or country-year interaction dummies.

This result is consistent with several findings in the literature. Using the Enterprise Surveys data set with multiple countries, Ayyagari et al (2010) find that innovative firms are victims of corruption and pay larger bribes as a proportion of their annual sales. Anokhin and Schulze (2009) find evidence that corruption reduces trust and the absence of trust increases transaction costs that can hamper productivity, innovation, and entrepreneurship. Firms often cite red tape and regulatory barriers as principle problems facing entrepreneurship (IDB, 2002). Moreover, Şeker

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[16] Furthermore, the regression includes only firms who are in groups where the average business climate was averaged across at least 25 firms. Recall this was done to ensure that average business climate measures were computed with enough firms. This is not a strict restriction since governance questions are not allowed to be skipped in the survey and averages are calculated from the full sample of firms. However, there are some cases where a location has very small number of firms and these cases are excluded.

and Yang (2014) find that firms in LAC have lower sales growth when faced with bribery. The negative distortions from bribery are larger for young firms and firms with lower levels of annual sales, which are precisely the types of firms with less power or voice.

From the a complementary but opposite perspective, when the courts are strong, a consistent and complementary result is that SME sales and profits are higher. The court system can be closely linked to the decision or incidence of conducting innovative activities since the patent system and protection of ideas rely on strong institutions and courts.

Table 9 and Table 10 illustrate results when examining the relationship of firms perception of the court system and innovation activity. In these regressions, when controlling for lagged sales, a higher quality courts system predicts higher sales and profits for innovating SMEs.

Notice that the two governance questions are completely unrelated to each other in the questionnaire, so it is validating to see both a positive and negative governance indicator leading to respectively consistent results. A negative governance indicator yielded lower sales and profits, and a positive indicator yielded higher sales and profits for innovators.

To investigate if the issue of innovation and poor governance is limited to SMEs, additional regressions of the same specification were also estimated on the subsample of large firms. In the data there are 519 large panel firms that were surveyed in both 2006 and 2010. In these regressions, interaction terms between governance and innovation were insignificant. It is important to note this particular finding since it emphasizes the constraint is on primarily smaller sized firms. It is often noted that in markets, size is a factor of inequity due to differences in voice and power. In this paper, it seems that when it comes to innovation activity, poor governance hinders SME performance.

5. Conclusion

Innovative firms are often seen as drivers of economic growth and this concept has been established as early as Schumpeter (1911) and continues to motivate economists and policy makers to encourage businesses to innovate. Innovation promotion is an especially relevant policy agenda for upper-middle countries. In these countries, efficiencies from sectoral shifts and resource and

labor reallocation have been achieved. Further growth must come from productivity growth driven by innovation or competition (Aghion and Howitt, 2005).

LAC suffers from too little competition and not enough innovators. The fact that innovative SMEs are found to be hindered by poor governance is a caution of the potential harmful implications of a poor governance climate onto growth. Lederman et al (2014) suggest policy to shape an enabling environment for entrepreneurs such as building human capital, improving infrastructure, enhancing competition, and improving the contractual environment. Their suggestions are complementary with the findings of this report that governance and institutions are important, in particular for SMEs innovators. An enabling environment is important for promoting entrepreneurship, innovation to occur, increasing productivity, and also boosting growth. Regulatory impediments are major disincentives to entrepreneurship. Other comparative studies have also noted the more challenging business climate in LAC compared to other regions. In a study comparing new firms in East Asia to those in LAC, it was found that new entrepreneurs in LAC take longer to identify opportunities and also rely on informal social networks (Kantis et al 2002). The study also found that regulatory impediments are cited to be major disincentives to entrepreneurship in Mexico, Brazil, and Peru.

This paper uses two variables to characterize how the governance climate is perceived by SMEs. First, if firms are expected to pay informal payments, and secondly perceptions on the quality of the court system. Evidence in this paper suggests that the profits of innovative SMEs decline more than non-innovation firms when regulatory or governance aspects are poor. When conducting identical estimations for large firms, there are no impacts from the interaction of governance and whether or not a firm innovates. Not only is boosting innovation important for growth, LAC is home to a large proportion of SMEs. An understanding of challenges facing SMEs, and especially their innovation activity is important. Creating an enabling environment involves many pillars, but one that cannot be ignored is the role of governance and institutions.

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Tables

Table 1. Distribution of Firms

	N(unique firms)	% of SMEs who created a new product or modified an existing product	
		2006	2010
Argentina	498	45.2	53.4
Bolivia	180	23.8	20.3
Chile	430	44.2	40.1
Colombia	306	45.7	42.9
Ecuador	177	19.4	19.4
El Salvador	116	0.0	0.0
Guatemala	140	22.9	16.2
Honduras	99	0.0	7.6
Mexico	210	27.8	31.1
Nicaragua	79	5.3	7.0
Panama	124	23.2	5.4
Paraguay	153	21.9	24.2
Peru	314	48.2	42.4
Uruguay	287	41.5	35.3
Latin America & Caribbean	2,396	26.4	24.7

Notes: Note that the number of observations is double the number of firms since there are two survey waves. LAC panel firms were surveyed in 2006 & 2010.
Source: Enterprise Surveys.

Table 2. Firm Perceptions on Governance while operating

	% of Firms expected to pay informal payment (to get things done)		% of Firms believing the court system is fair, impartial and uncorrupted	
	2006	2010	2006	2010
Argentina	19.0	16.4	18.5	17.9
Bolivia	39.7	20.5	12.4	14.6
Chile	8.0	1.3	45.3	53.7
Colombia	16.4	7.7	34.2	20.6
Ecuador	15.8	9.3	10.6	11.5
El Salvador	25.5	13.6	24.4	13.1
Guatemala	16.5	13.5	34.0	4.9
Honduras	10.0	9.8	7.8	18.8
Mexico	12.5	15.8	27.7	17.9
Nicaragua	12.0	5.5	24.1	12.8
Panama	24.2	30.9	33.3	12.1
Paraguay	84.7	25.5	13.2	8.7
Peru	14.6	19.7	9.1	11.0
Uruguay	3.0	8.3	54.2	47.7

Notes: Based on the set of SME panel firms.
Source: Enterprise Surveys.

Table 3. Summary Statistics by innovative activity

	Non-Innovators		Innovators			
2006	N	Mean	N	Mean	Difference	t-statistic
Was bribed	1095	0.10	602	0.13	-0.03	-2.091
Expected to Pay Informal Payments	1201	19.65	618	19.90	-0.25	-0.128
Strong Courts	1491	26.02	779	28.37	-2.35	-1.198
Sales (2009USD)	1422	$2,464,911	748	$1,786,718	$678,193	1.382
Profits (2009 USD)	1416	$1,816,999	743	$ 692,096	$1,124,904	3.055
2010	N	Mean	N	Mean	Difference	t-statistic
Was bribed	1109	0.11	605	0.14	-0.03	-2.149
Expected to Pay Informal Payments	1496	13.17	723	12.86	0.31	0.200
Strong Courts	1566	21.90	772	25.13	-3.23	-1.745
Sales (2009USD)	1345	$3,891,711	698	$2,280,073	$1,611,638	1.071
Profits (2009 USD)	1344	$2,619,976	696	$850,338	$1,769,638	1.198

Notes: Based on sample of SME panel firms, unweighted.
Source: Enterprise Surveys.

Table 4. Variable Definitions

	Description	Data Source
Governance environment		
Informal Payments	% of Firms expected to make informal payments (to get things done)	
Courts	% of Firms believing the court system is fair, impartial and uncorrupted	
Firm characteristics		
Innovator	A dummy variable if a firm participated in product innovation	Enterprise Surveys
Sole Proprietorship	A dummy variable if the legal form of the firm is sole proprietorship	Enterprise Surveys
Foreign Ownership	A dummy variable if a firm has at least 10 percent foreign ownership	Enterprise Surveys
Exporter	A dummy variable if a firm derives at least 10 percent of sales from direct exports	Enterprise Surveys
Manager Experience	Years of experience of top Manager	Enterprise Surveys
log(age)	The log of firm age	Enterprise Surveys
log(size)	The log of size, where size is the number of employees, and temporary workers are weighted by the average number of months they work in a year	Enterprise Surveys
log(sales t-3)	Annual sales from three or four fiscal years ago	Enterprise Surveys
Macroeconomic characteristics		
Inflation		World Development Indicators
GDP per capita		World Development Indicators
GDP per capita growth		World Development Indicators
Current Account		World Development Indicators
Lending Rate		World Development Indicators

Table 5. Summary Statistics

Size in 2006	All Panel Firms (SME in base year 2006)		Innovative Firms	
	N	(%)	2006	2010
Small (<20 employees)	1,193	49.8%	362	319
Medium (20-99 employees)	1,203	50.2%	456	411
Large (100+) (*in 2010*)				52

	All Panel Firms		Innovative Firms		Non-Innovative Firms	
	2006	2010	2006	2010	2006	2010
Average Sales (USD2009)	2,231,138	3,341,008	1,786,718	2,280,073	2,464,911	3,891,711
Average Profit (USD2009)	1,429,874	2,016,217	692,095	850,337	1,816,999	2,619,976
Innovators (%)	34.1	32.6	100%	100%	0%	0%
Log(Age)	22.3	26.2	24.4	28.0	21.3	25.3
Sole Proprietorships (%)	16.6%	16.6%	15.4%	13.6%	17.3%	17.8%
Number of Employees	26.8	49.5	29.6	38.7	25.4	54.8
Exporters (%)	11.7%	10.6%	18.6%	17.3%	8.2%	7.3%
Has Foreign Ownership (%)	7.6%	7.2%	5.4%	5.1%	8.8%	8.2%
Top Manager's Experience (years)	22	24.3	23.4	25.9	21.3	23.4

Notes: Firms are identified as SME or not in 2006. By 2010, 52 SMEs grew to large size.
Source: Enterprise Surveys

Table 6. Dep Var: log(Profit)

	(1)	(2)	(3)	(4)	(5)	(6)
ΔInnovator	-0.3127*	-0.3304*	-0.2946^	-0.4181*	-0.3792*	-0.3614^
	(0.0974)	(0.0965)	(0.1029)	(0.1186)	(0.1181)	(0.1204)
Δlog(sales t-3)				0.4464**	0.4518*	0.4511**
				(0.0983)	(0.1033)	(0.0976)
ΔSole Proprietorship	-0.2117	-0.2543	-0.2621	-0.0101	-0.0495	-0.0656
	(0.1307)	(0.1477)	(0.1307)	(0.0990)	(0.1157)	(0.1097)
ΔForeign Ownership	0.0013	0.0007	0.0012	0.0011	0.0006	0.0008
	(0.0018)	(0.0020)	(0.0019)	(0.0015)	(0.0015)	(0.0016)
ΔTop Manager's Experience	0.0021	0.0028	0.0005	0.0021	0.0018	0.0017
	(0.0036)	(0.0044)	(0.0042)	(0.0042)	(0.0047)	(0.0045)
ΔExporter	0.0001	0.0005	-0.0000	0.0002	0.0008	0.0000
	(0.0015)	(0.0016)	(0.0015)	(0.0017)	(0.0016)	(0.0016)
Δlog(age)	0.0947	0.0863	0.0973	-0.0802	-0.0922	-0.0832
	(0.0838)	(0.0884)	(0.0841)	(0.1049)	(0.1078)	(0.1013)
Δlog(size)	0.7322**	0.7059**	0.7635**	0.4706**	0.4599**	0.4863**
	(0.1084)	(0.1158)	(0.1041)	(0.0542)	(0.0549)	(0.0574)
ΔInflation		-0.0011			-0.0179	
		(0.0264)			(0.0219)	
ΔGDP per capita		0.0001			0.0002	
		(0.0002)			(0.0001)	
ΔGDP per capita growth		-0.0455^			-0.0506^	
		(0.0204)			(0.0187)	
ΔCurrent Account		0.0215			0.0846*	
		(0.0172)			(0.0215)	
ΔLending Rate		-0.0333			-0.0635*	
		(0.0176)			(0.0150)	
Constant	-0.3739**	-0.6412*	-0.4109**	-0.4796**	-0.9001**	-0.6947**
	(0.0824)	(0.1775)	(0.0207)	(0.0906)	(0.1696)	(0.0652)
Lagged Sales				X	X	X
Macroeconomic Variables		X			X	
Country*Year Dummies			X			X
Firm Fixed Effects	X	X	X	X	X	X
Observations	1,607	1,443	1,607	1,195	1,083	1,195
R-squared	0.093	0.093	0.115	0.207	0.216	0.231
N-country	14	12	14	14	12	14
N-clusters	82	72	82	80	70	80

Notes: A full regression is shown here to illustrate the impact of the explanatory variables in LAC. Cluster is at the country, sub-national and sector grouping. Standard errors in parentheses, ** p<0.001, * p<0.01, ^ p<0.05. Errors are clustered by country.

Table 7. Dep Var: Δlog(Profit), Governance Climate: % of Firms Expected to Pay Informal Payments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔInformal Payments	-0.3075*	-0.3285*	-0.0777	-0.1158	-0.0931	-0.1180	-0.1089	-0.1127
	(0.0983)	(0.0993)	(0.0958)	(0.0963)	(0.0972)	(0.1134)	(0.1173)	(0.1224)
ΔInnovator	0.0069**	0.0086**	0.0098**	0.0113**	0.0050	0.0083*	0.0086*	0.0034
	(0.0016)	(0.0017)	(0.0022)	(0.0014)	(0.0035)	(0.0021)	(0.0022)	(0.0043)
ΔInformal Payments * Innovator			-0.0175^	-0.0163^	-0.0156*	-0.0227**	-0.0209**	-0.0193**
			(0.0059)	(0.0056)	(0.0048)	(0.0041)	(0.0037)	(0.0033)
Constant	-0.3002*	-0.5551**	-0.3188*	-0.5721**	-0.3853**	-0.4496**	-0.8187**	-0.6873**
	(0.0786)	(0.1093)	(0.0757)	(0.1073)	(0.0351)	(0.0820)	(0.1625)	(0.0849)
Lagged Sales						X	X	X
Macroeconomic Variables		X		X			X	
Country*Year Dummies					X			X
Firm Fixed Effects	X	X	X	X	X	X	X	X
Observations	1,574	1,410	1,574	1,410	1,574	1,172	1,060	1,172
R-squared	0.096	0.096	0.103	0.102	0.119	0.221	0.227	0.240
N-country	14	12	14	12	14	14	12	14
N-clusters	76	66	76	66	76	76	66	76

Notes: Firm characteristics are included in the regression. Group averages for informal payments are at the country, sub-national and sector grouping. Standard errors in parentheses, ** $p<0.001$, * $p<0.01$, ^ $p<0.05$. Errors are clustered by country.

Table 8. Dep Var: Δlog(Sales), Governance Climate: % of Firms Expected to Pay Informal Payments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔInformal Payments	-0.0075	-0.0134	0.0731	0.0640	0.0718	0.0417	0.0607	0.0583
	(0.0456)	(0.0442)	(0.0432)	(0.0416)	(0.0395)	(0.0523)	(0.0503)	(0.0524)
ΔInnovator	0.0016	0.0007	0.0026	0.0017	0.0043^	0.0022	0.0015	0.0023
	(0.0021)	(0.0014)	(0.0021)	(0.0014)	(0.0015)	(0.0017)	(0.0012)	(0.0017)
ΔInformal Payments * Innovator			-0.0062**	-0.0060**	-0.0056**	-0.0063^	-0.0051	-0.0045
			(0.0014)	(0.0013)	(0.0012)	(0.0027)	(0.0030)	(0.0034)
Constant	-0.0248	-0.1957	-0.0317	-0.2031	-0.0832**	-0.0798	-0.4643**	-0.3267**
	(0.0511)	(0.1609)	(0.0512)	(0.1663)	(0.0180)	(0.0522)	(0.0725)	(0.0429)
Lagged Sales						X	X	X
Macroeconomic Variables		X		X			X	
Country*Year Dummies					X			X
Firm Fixed Effects	X	X	X	X	X	X	X	X
Observations	1,821	1,642	1,821	1,642	1,821	1,353	1,232	1,353
R-squared	0.179	0.184	0.181	0.186	0.203	0.412	0.429	0.434
N-country	14	12	14	12	14	14	12	14
N-clusters	76	66	76	66	76	76	66	76

Notes: Firm characteristics are included in the regression. Group averages for informal payments are at the country, sub-national and sector grouping. Standard errors in parentheses, ** $p<0.001$, * $p<0.01$, ^ $p<0.05$. Errors are clustered by country.

Table 9. ΔDep Var: log(Profit), Governance Climate: Courts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔCourts	-0.3024^	-0.3133^	-0.4230^	-0.4923*	-0.3543	-0.7413**	-0.6663*	-0.6386*
	(0.1053)	(0.1153)	(0.1774)	(0.1584)	(0.1728)	(0.1575)	(0.1615)	(0.1515)
ΔInnovator	0.0060	0.0068	0.0051	0.0055	0.0132	0.0019	0.0047	0.0096
	(0.0062)	(0.0102)	(0.0058)	(0.0100)	(0.0075)	(0.0068)	(0.0088)	(0.0076)
ΔCourts * Innovator			0.0040	0.0058	0.0027	0.0109^	0.0098^	0.0098^
			(0.0048)	(0.0040)	(0.0044)	(0.0040)	(0.0038)	(0.0036)
Constant	-0.3534**	-0.3671	-0.3534**	-0.3347	-0.3975**	-0.4559**	-0.5338	-0.6821**
	(0.0823)	(0.3870)	(0.0811)	(0.3759)	(0.0231)	(0.0898)	(0.3595)	(0.0653)
Lagged Sales						X	X	X
Macroeconomic Variables		X		X			X	
Country*Year Dummies					X			X
Firm Fixed Effects	X	X	X	X	X	X	X	X
Observations	1,574	1,410	1,574	1,410	1,574	1,172	1,060	1,172
R-squared	0.093	0.092	0.093	0.093	0.117	0.213	0.220	0.237
N-country	14	12	14	12	14	14	12	14
N-clusters	76	66	76	66	76	76	66	76

Notes: Firm characteristics are included in the regression. Group averages for Courts are at the country, sub-national and sector grouping. Standard errors in parentheses, ** $p<0.001$, * $p<0.01$, ^ $p<0.05$. Errors are clustered by country.

Table 10. Dep Var: Δlog(Sales), Governance Climate: Courts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔCourts	-0.0058	-0.0171	-0.0564	-0.0955	-0.0333	-0.1935^	-0.1187	-0.1207
	(0.0473)	(0.0487)	(0.0853)	(0.0735)	(0.0799)	(0.0736)	(0.0743)	(0.0711)
ΔInnovator	0.0021	-0.0017	0.0017	-0.0022	-0.0019	0.0004	-0.0012	-0.0033
	(0.0030)	(0.0052)	(0.0032)	(0.0053)	(0.0047)	(0.0030)	(0.0036)	(0.0036)
ΔCourts * Innovator			0.0017	0.0026	0.0011	0.0053*	0.0038^	0.0040*
			(0.0019)	(0.0014)	(0.0016)	(0.0014)	(0.0014)	(0.0013)
Constant	-0.0351	-0.2448	-0.0351	-0.2287	-0.0999**	-0.0800	-0.4481**	-0.3322**
	(0.0434)	(0.2515)	(0.0429)	(0.2436)	(0.0158)	(0.0513)	(0.1000)	(0.0425)
Lagged Sales						X	X	X
Macroeconomic Variables		X		X			X	
Country*Year Dummies					X			X
Firm Fixed Effects	X	X	X	X	X	X	X	X
Observations	1,821	1,642	1,821	1,642	1,821	1,353	1,232	1,353
R-squared	0.179	0.184	0.179	0.184	0.201	0.413	0.429	0.435
N-country	14	12	14	12	14	14	12	14
N-clusters	76	66	76	66	76	76	66	76

Notes: Firm characteristics are included in the regression. Group averages for Courts are at the country, sub-national and sector grouping. Standard errors in parentheses, ** $p<0.001$, * $p<0.01$, ^ $p<0.05$. Errors are clustered by country.