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Evaluating the impacts of corruption on firm performance in developing economies: an institutional perspective

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Abstract

Conventionally, corruption is viewed as deleterious to firm performance. Analysing World Bank Enterprise Survey firm-level data across 132 countries and controlling for other firm performance determinants, this paper finds that paying corrupt public officials enhances firm performance. This is argued to be because developing economies are characterized by formal institutional imperfections (e.g., inefficient public administration and the weak rule of law). Making bribe payments compensates for these formal institutional imperfections. Examining the policy implications of this rational economic act for entrepreneurs, but which is deleterious at the aggregate country level for economic development and growth, the argument is that public authorities should shift away from increasing the costs of corruption by improving the risks of detection and penalties, and instead focus upon the formal institutional imperfections that lead to endemic corruption in the developing world.

Keywords: entrepreneurship; corruption; bribery; firm performance; productivity; institutional theory; emerging economies; developing countries.

Introduction

Corruption is now acknowledged to be a pervasive and extensive phenomenon in many countries in the developing world (Aidis and Van Praag, 2007; Aliyev, 2015; Khan and

Quaddus, 2015; Osipian, 2012; Round et al, 2008; Svensson, 2003; Tonoyan et al., 2010). Although it is widely recognised that corruption has a negative impact at the aggregate country level on economic development and growth (Ades and Di Tella, 1999; Méndez and Sepúlveda, 2006; Méon and Sekkat, 2005), fewer studies have examined its firm-level impacts. The few studies to do so, mostly in individual countries, reveal mixed results, with some revealing that engaging in acts of corruption boosts firm performance and others that it harms performance (Athanasouli et al., 2012; De Rosa et al., 2010; Donadelli et al., 2014; Gaviria, 2002; Teal and McArthur, 2002). The aim of this paper, therefore, is to provide the first comprehensive cross-national analysis of the impacts of corruption on firm performance across the developing world.

To do this, the next section reviews the competing theories on the impacts of corruption on firm performance in particular, and economic development and growth more generally. Revealing the lack of a comprehensive cross-national study of the impacts of corruption on firm performance across the developing world, the third section outlines the cross-national data here used, namely the World Bank Enterprise Survey conducted in 132 countries, and analytical method, namely random intercept and random slopes multilevel models. The fourth section reports the finding that corruption has positive impacts on firm performance. The fifth and final section then provides both a theoretical explanation for this finding grounded in institutional theory and addresses the policy implications by revealing the need to address the formal institutional imperfections in the developing world, if participation in corruption is to be reduced.

Throughout this paper, the common and widely accepted definition of corruption is adopted, namely the misuse of public office for private gain (Alatas, 1990; Bardham, 1997; Johnston, 1996; Philp, 1997; Pope, 2000; Rodriguez et al. 2006; Rose-Ackerman, 1975, 1978; Shleifer and Vishny, 1992, 1993; Svensson, 2005; Treisman, 2000; World Bank, 1997). As such, corruption here covers the practice of public sector officials demanding or receiving gifts or payments from enterprises and providing a service in return in order that these enterprises can circumvent unfavourable regulation or survive competitive pressure in the marketplace. This is a common practice in developing economies and involves enterprises paying small sums of money to public officials, such as to speed up receiving their operating license, avoiding a negative outcome from a workplace inspection or to avoid delays in some other regulatory process requiring the approval of public sector officials. It should be noted, however, that although such low-level public sector corruption is the focus of the vast majority of the literature on corruption, there are other forms of corruption that have been less studied, including state capture, whereby firms influence the formulation of laws and other government policies to their own advantage through illicit or non-transparent means (Fries et al., 2003), and what might be termed small-scale 'private corruption', whereby enterprises or individuals use personal private connections to gain preferential access to goods and services and/or to circumvent formal procedures (Williams and Onoschenko, 2004a,b, 2015).

Competing views on the relationship between corruption and firm performance

In recent years, advances in understanding the prevalence of corruption in developing countries have been made by scholars adopting the lens of institutional theory. All societies have codified laws and regulations (i.e. formal institutions) that define the legal rules of the game (Baumol and Blinder, 2008; Denzau and North 1994; Mathias et al., 2014; North, 1990; Williams and Horodnic, 2015a,b,c; Williams et al., 2015a,b). All societies, however, also have informal institutions, which can be defined as the 'socially

shared rules, usually unwritten, that are created, communicated and enforced outside of officially sanctioned channels' (Helmke and Levitsky, 2004: 727). Although corruption is illegal in terms of the formal institutional environment, in many developing economies, due to the formal institutional imperfections, the circumvention of burdensome administrative requirements by paying bribes to public officials is often deemed to be a socially legitimate activity (De Soto, 1989).

From this institutional perspective, therefore, corruption results from either the formal institutional imperfections and/or the asymmetry between formal and informal institutions in the developing world. Two main types of formal institutional imperfection result in the use of corruption in developing countries. On the one hand, there are formal institutional inefficiencies, or resource misallocations by formal institutions (Qian and Strahan, 2007), such as when formal institutions seek to protect or maximize economic rents for elites (Acemoglu and Robinson, 2012), manifested for example in overly burdensome taxes, and registration and licensing regulations and costs, which act as an entry barrier for new entrepreneurs (De Soto, 1989). On the other hand, there is formal institutional weakness and instability, manifested in a lack of capacity to enforce policies (Webb et al., 2009), poor public sector pay and continuous changes in laws and regulations (Levitsky and Murillo, 2009; Williams and Vorley, 2015). To explain corruption, however, it is not only the role and quality of formal institutions which needs to be considered.

Beyond imperfections in formal institutions, corruption also arises where there is incongruence between what is defined as legitimate by formal and informal institutions. Given that developing economies are so defined precisely because they are undergoing the development of their formal institutions, entrepreneurs draw upon existing norms, values and beliefs to govern and structure their behaviour instead of relying on formal codified laws and regulations. These then become the basis for collective shared rules, whether implicitly held or formally codified (London et al., 2014; Mair et al., 2012). The result is that engaging in corrupt payments becomes viewed as socially legitimate even if formally illegal (Williams and Shahid, 2015). The greater prevalence of corruption in developing economies than developed economies is therefore due to not only the greater formal institutional imperfections, but also the greater incongruence between formal and informal institutions (Mair et al., 2012).

What, therefore, are the impacts on firms of engaging in such corrupt practices? Until now, two contrasting perspectives have been adopted. Here, each is reviewed in turn.

Corruption harms firm performance perspective

Numerous country-level studies reveal firstly, that corruption is harmful to economic development and growth (e.g., Ades and Di Tella, 1999; Méndez and Sepúlveda, 2006; Méon and Sekkat, 2005) and secondly, that countries with high levels of corruption have relatively lower levels of firm performance (Donadelli et al., 2014; Doh et al., 2003; Faruq and Webb 2013; Frye and Schleifer, 1997; Gray et al., 2004; Knack and Keefer, 1995; Mauro, 1995; Rodrik et al. 2002; Wieneke and Gries, 2011). As Myrdal (1968) explains, corrupt civil servants cause delays that would not otherwise occur simply in order to provide themselves with the opportunity to receive a corrupt payment to speed up the process. The result is that corruption is not seen to hinder efficiency.

A similar negative depiction exists at the firm level, namely that enterprises who engage in corruption have lower levels of firm performance (Athanasouli et al., 2012; De Rosa et al., 2010; Donadelli et al., 2014; Faruq and Webb, 2013; Gaviria, 2002;

Lavallée and Roubaud, 2011; Teal and McArthur, 2002). Until now, however, the evidence for this has been limited to a small number of studies of single countries or regions. Teal and McArthur (2002) find in Africa that enterprises engaging in payments to corrupt public officials have 20 per cent lower output per worker, as do Fisman and Svensson (2007). Again in the African context, Faruq and Webb (2013) find that less productive firms are more likely to engage in payments to corrupt public officials and that corruption reduces firm productivity. Athanasouli et al. (2012) in Greece, meanwhile, using firm level data, reveal that corruption is negatively associated with sales growth, whilst in Latin America, Gaviria (2002) finds that engaging in payments to corrupt public officials substantially reduces sales growth. To evaluate this view that corruption harms firm performance across the developing world, therefore, the following proposition can be tested:

> Corruption harms firm performance hypothesis H1: corruption is negatively associated with firm performance, after controlling for other key determinants of firm performance.

Corruption improves firm performance perspective

Alternatively, corruption has been viewed at the country-level to boost economic development (Huntington, 1968; Jian and Nie, 2014; Leff, 1964). In this 'efficient grease' thesis (Kaufmann and Wei, 1999; Mawuli and Stinchfield, 2013), corruption is argued to reduce the heavy bureaucratic burden and resultant long delays in environments with formal institutional imperfections. Such 'grease' money thus circumvents in a second best world the distortions caused by an inefficient bureaucracy (Wei, 1998) and helps overcome liabilities of 'newness' or 'smallness' (Stinchcombe, 1965) by enabling entrepreneurs to develop favourable relationships with public officials which increases their legitimacy and decreases the risk of failure. From this perspective, therefore, corruption positively contributes to firm performance because it compensates for a defective institutional framework, such as an inefficient administration or the weak rule of law.

Supporting this thesis, Ayaydin and Hayaloglu (2014) analyse the relationship between firm growth and corruption in 41 manufacturing firms in Turkey, and find that making corrupt payments to public officials has a positive effect on firm growth, mainly because such 'speed money' enables enterprises to circumvent bureaucratic delays. Using panel data of Indonesian manufacturing firms, Vial and Hanoteau (2010) also find a positive relation between corruption and firm output and labour productivity. Yet this is not always the case. Lavallée and Roubaud (2011) find no association between corruption and firm output, and Fisman and Svensson (2007) only a weak association with sales growth.

The only known cross-national study at the firm-level of the impacts of corruption on firm performance examines data from the Business Environment and Enterprise Performance Survey (BEEPS) for 27 transition countries for the period 2002-2009 (Blagojevic and Damijan, 2012). The finding is that private firms (domestic and foreign owned) are more involved in making payments to corrupt public officials and that those firms making such payments have higher productivity growth, especially foreign-owned firms. To evaluate whether this positive association is more widely valid across the developing world, therefore, the following hypothesis can be tested:

Corruption improves firm performance hypothesis H2: corruption is positively associated with firm performance, after controlling for other key determinants of firm performance.

Methods

Data and Variables

Data**.** To evaluate whether corruption is positively or negatively associated with firm performance, WBES data is analysed collected since 2006 in 132 developing countries using a common methodology and harmonized questionnaire. In every country, data is collected from a stratified random sample of formal private sector businesses with five or more employees, stratified by business sector, firm size and geographic region, covering 1200-1800 business owners and top managers in larger countries, 360 in medium-sized countries and 150 in smaller countries. The result is a sample of 106,805 surveyed enterprises.

Dependent Variables. To evaluate the association between corruption and firm performance, the dependent variables are three indicators of firm performance on which data is collected by the WBES, namely: (1) Real annual sales growth (using GDP deflators) (%): this is a derived variable in the WBES measuring the change in sales 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 annualised measure is used. All values for sales are converted to USD using the exchange rate in the corresponding fiscal year of the survey. Sales are deflated to 2009 using the USD deflator; (2) Annual employment growth (%): this is a derived variable in the WBES measuring the 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 annualised measure is used. And (3) Annual productivity growth (%): this is a derived variable that measures annualized growth in labour productivity where labour productivity is real sales (using GDP deflators) divided by full-time permanent workers. Annual productivity growth is the change in labour productivity reported in the current fiscal year from a previous period. For most countries the difference between the fiscal year periods is two years. However, for some countries the interval is three years. Hence, an annualised measure is used. All values for sales are converted to USD using exchange rate in corresponding fiscal year of the survey. Sales are then deflated to 2009 using the USD deflator.

Key Independent Variables. To evaluate the association between corruption and firm performance we analyse two indicators of corruption: (1) Graft incidence, which measures whether firms experienced at least one request for a bribe payment across six types of application, namely for an electrical connection, water connection, construction-related permit, an import license, operating license or in a meeting with tax officials, and, more indirectly, (2) Perceived need to make bribe payments, based on their answer to the following question: 'It is said that establishments are sometimes required to make gifts or informal payments to public officials to "get things done" with regard to customs, taxes, licenses, regulations, services, etc. On average, what percentage of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?'. In both cases, value 0 signifies either no payments or gifts are paid, whilst value 1 is when they

state a payment. Given the sensitive nature of the topic under investigation (i.e., corruption), the advantage of the latter question over the former is that it asks entrepreneurs about their payment to corrupt public officials indirectly, enabling them to state payments are made without incriminating themselves.

Control Variables. To measure the impacts of corruption on firm performance, it is necessary to control for other key determinants of firm performance. Here, nine characteristics are examined that previous studies reveal influence firm performance:

- starting-up unregistered (La Porta and Schleifer, 2008; Perry et al., 2007). This is a dummy variable with value 1 indicating that the firm started operations in the country without formal registration and 0 when the firm was formally registered.
- firm age (Wiklund et al. 2010). This is a continuous variable measuring firm age in years with a minimum value of 0 for start-ups and a maximum of 195 years for the oldest firms (the average firm age across countries and years is 19 years).
- firm size (Hsieh and Olken, 2014; La Porta and Schleifer, 2014). This is a categorical variable with value 1 for small firms with less than 20 employees, value 2 for medium size firms between 20 and 99 employees, and value 3 for large firms with more than 100 employees.
- ownership structure and legal status (Barbera and Moores, 2013; Baghdasaryan and la Cour, 2013). Legal status is a categorical variable indicating whether the enterprise is an open shareholding, a closed shareholding, a sole proprietorship, a partnership, a limited partnership, or any other form. In addition, whether the organization is foreign- or domestic-owned is examined using a dummy variable with value 1 indicating if the share of the firm's ownership held by foreign individuals or enterprises is larger than 49% and 0 otherwise. Given that export-oriented firms display higher levels of firm performance (La Porta and Schleifer, 2008), export-orientation is also included as a control using a dummy variable with value 1 indicating firms exporting directly at least 1% of sales and 0 for those who sell only domestically.
- economic sectors (Nabar and Yan, 2013). This is a categorical variable indicating the sector of the firm (i.e., textiles, leather, garments, food, metals and machinery, electronics, chemicals and pharmaceuticals, wood and furniture, non-metallic and plastic materials, auto and auto components, other manufacturing, retail and wholesale trade, hotels and restaurants, and others).
- access to finance (Cull et al., 2007). This is a dummy variable with value 1 indicating whether the firm has access to bank loans or to a line of credit to finance its activities and 0 otherwise.
- level of technological innovation (Mansury and Love, 2008). Here, three basic control variables available in the WBES are used: quality certification, a dummy variable with value 1 indicating that the firm has an internationally-recognized certification and 0 otherwise; presence of a website, a dummy variable with value 1 when the firm uses a website for business related activities and 0 otherwise, and the use of e-mail, a dummy variable with value 1 when the firm uses e-mail to interact with clients and suppliers and 0 otherwise.
- human capital factors, including educational level, the skills and experience of the owners, managers and the workforce, the level of professionalism, and whether there is numerical flexibility in the workforce (Black and Lynch, 1996; Gennaiolo et al., 2013; Van der Sluis et al., 2005). Here, six control variables available in the WBES are used: top manager's experience, a continuous variable of the years of experience the top manager has working in the sector; temporary workers, a variable measuring the average number of temporary workers in the firm; permanent full-time workers, a continuous variable of the average number of permanent full-time workers in the firm;

female full-time workers, examining the share of permanent full-time workers that are female; female involvement in ownership, a dummy variable with value 1 indicating whether women are involved in the ownership of the firm and 0 otherwise; and as a signal of professionalism, whether they use an external auditor, a dummy variable with value 1 indicating that the firm has its annual financial statement reviewed by an external auditor and 0 otherwise.
- the wider business environment. To control for this, two control variables are used, namely: transport, a dummy variable with value 1 indicating that transportation is a major constraint for the firm's activity and 0 otherwise, and electricity, a dummy variable with value 1 indicating that electricity supply is a major constraint for the firm's activity and 0 otherwise.

Analytical Methods

Multiple Imputation of Missing Values**.** To address the issue of missing information on particular responses, multiple imputation methods (through a system of chained equations) have been applied to the dataset. Across all variables, the average number of missing values on each variable is 11,056 (with a maximum of 45,551 and a minimum of 297). Based on the classical methodological literature on imputation (Schafer and Graham 2002; Collins et al 2001; Rubin 1987), 10 imputations have been employed. This increases the reliability of the imputed dataset compared with the original one.

Multilevel Modelling**.** To evaluate the association between corruption and firm performance, we apply multilevel techniques to the WBES dataset. Given that the surveyed enterprises in the WBES are clustered across country-year subsamples, multilevel modelling is the optimal technique to elicit unbiased standard errors as well as reliable statistical comparisons. In the standard regression model, a single random residual adjusts the prediction to the observed value for each individual observation.

$$y_i = \beta_0 + \beta_1 x_1 + \cdots + \beta_n x_n + \varepsilon_i$$

In contrast, the random intercept model decomposes the residual into two random terms, one for the individual and the other for the aggregate level (Snijders and Bosker, 2012):

$$y_{ij} = \gamma_{00} + u_{0j} + \varepsilon_{ij}$$

where ε_{ij} remains the individual-level (in our case firm-level) error term and γ_{00} the average intercept of all countries considered. Here, the constant term (β_{0j}) is the result of two separate components; u_{0j} is the random noise correcting the average intercept to each country observation. This second random term is a type of latent variable capturing the specificity of each cluster that can eventually be explained by modelling the variation existing within and across clusters under a full model specification. The decomposition of the regression error into u_{0j} and ε_{ij} allows for a proper quantification of the effect of the clustering of individual observations and a reliable estimation of the effect of the individual variables (that can be placed at either Level 1, Level 2 or both). Random effects can be added to the slope of individual-level independent variables. This relaxes the assumption that the effect of a given predictor is equal across aggregate level units of analysis. In this case, the slope of a given predictor β_{1j} is decomposed into an average impact (γ_{10}) and a group-specific one (u_{ij}). The complete model specification is thus the following:

$$y_{ij} = \gamma_{00} + u_{0j} + y_{10}x_{1j} + u_{1j} + \cdots + \beta_n x_n + \varepsilon_{ij}$$

Here, we use random slope and random constant models to estimate the average impact of bribery on firm performance across countries, accounting for how the size of bribery varies between countries. The number of countries in the analysis is not drawn from a random sample to infer regularities in the broader population, but represents the universe. This means that we do not need to treat combinations of country-years as the Level 2 units but that the average effect of time can be estimated. That is, our Level 2 only considers the clustering of firms at the country-level while, as mentioned above, the multilevel regressions include year dummies to control for time fixed effects at the firm-level. Finally, as is customary in multilevel modelling, to interpret the results we centre all control variables around each country at the aggregate level (group mean centring). While centring independent variables is advisable in random intercept models to interpret the average constant in the model, it is of key importance in random slopes models used here to give a substantive interpretation to the intercept and the random components of the constant (Cebolla, 2013). The only key explanatory variable not centred around the group mean are the corruption indicators as the value 0 has a substantive interpretation for the purpose of this paper (corruption has occurred).

Results

Examining the 106,805 formal private sector businesses with five or more employees surveyed in the WBES across these 132 developing countries between 2006 and 2014, 25.3% believe that enterprises like theirs need to bribe public officials to get things done and 21.7% had received at least one request for a bribe payment. However, there are marked cross-national variations. Those believing that enterprises like theirs need to bribe public officials ranged from 84.5% of enterprises in Guinea, 83.8% in the Syrian Arab Republic and 79.8% in the Republic of Congo through to 2.7% in St Lucia, 1.3% in Israel and no enterprises in Dominica, Eritrea and Micronesia. Meanwhile those who had experienced at least one request for a bribe payment ranged from 66% of enterprises in Liberia, 64.6% in Yemen and 61.3% in Guinea through to 2.9% in Kenya, 2.4% in Uruguay and 1% in Israel.

To evaluate the association between corruption and firm performance, we here report post-estimation estimates from multiple imputation bivariate linear regressions, with clustered standard errors at the country-level and including year fixed effects. Not taking control variables into account, this reveals that enterprises believing that firms like theirs need to bribe public officials have average annual sales growth rates 4.6% lower than who do not (8.4% compared with 8.8%), annual productivity growth rates that are 22.3% lower (2.8% compared with 3.6%), but annual employment growth rates 12.5% higher (6.3% compared with 5.6%). Similarly, those who had received requests for payments from public officials had average annual sales growth rates 6.9% lower (8.1% compared with 8.7%), lower annual productivity growth rates 25.7% lower (2.6% and 3.5%), but annual employment growth 5.2% higher (6.1% compared with 5.8%). These results, nevertheless, are a descriptive snapshot based on a bivariate relationship and do not take into account and control for other determinants of firm performance.

To do so, we therefore carry out a series of multilevel analyses in which we control for other key firm-level determinants of firm performance. Tables 1, 2 and 3 reveal the results of the random intercept and random slopes multilevel models for the dummy indicators of the two corruption variables on annual sales, employment and productivity growth respectively. In this analysis, a random intercept specification

allows country-level specific differences on firm performance to be taken into account, whilst the introduction of random slopes for the key independent variables allows for the varying impact of corruption on annual sales, employment and productivity growth that are due to country-specific differences.

INSERT TABLES 1, 2 AND 3 ABOUT HERE

Starting with the impacts of corruption on annual sales growth, the coefficient in model 1 of Table 1 displays that annual sales growth is 1.1 percentage points (i.e., 9.0% compared with 7.9%) and thus 13.9% higher in enterprises viewing bribe payments to public officials as necessary to get things done compared with those who do not, and this difference is statistically significant. This confirms hypothesis 2 that corruption enhances the firm performance measure of annual sales growth rates. Model 2 in Table 1, meanwhile, reveals that although annual sales growth is higher in firms that had received requests for payments from public officials than in those who had not, this difference is not significant. Overall, therefore, no evidence is found to support hypothesis 1 that corruption has a negative impact on annual sales growth, but there is evidence to support hypothesis 2 that there is a significant positive association between corruption and annual sales growth.

Turning to the impacts of corruption on annual employment growth, the coefficient in model 1 of Table 2 displays that annual employment growth is higher in enterprises viewing corruption as necessary to get things done. However, this neither confirms hypothesis 1 or 2 since this difference is not significant. Model 2 in Table 2 similarly reveals that annual employment growth is higher in firms that had received requests for payments from public officials than in those who had not, but this positive association is again not significant.

Finally, and examining the impacts of corruption on annual productivity growth, the coefficient in model 1 of Table 3 shows that annual productivity growth is 1.2 percentage points (3.7% compared with 2.5%) and thus 48% higher in enterprises viewing corrupt payments to public officials as necessary to get things done, and this difference is significant. This, therefore, confirms hypothesis 2 that corruption enhances the firm performance measure of annual productivity growth. Model 2 in Table 3, meanwhile, displays that although annual productivity growth is slightly lower in firms that had received requests for payments from public officials than in those who had not, this difference is not significant. Overall, therefore, no evidence exists to support hypothesis 1 that corruption has a negative impact on annual productivity growth, but evidence is found to support hypothesis 2 that there is a significant positive association between corruption and annual productivity growth.

The outcome is that this multivariate analysis overall reveals a positive association between corruption and firm performance when significant associations are identified. Enterprises believing firms like theirs need to pay public officials to get things done have both significantly higher annual sales and productivity growth rates than enterprises who do not view this as necessary. No significant associations are identified between corruption and lower firm performance. Overall, therefore, some evidence is found to confirm hypothesis 2 that corruption improves firm performance, and no evidence found at the firm-level to support hypothesis 1 that corruption harms firm performance.

Discussion and Conclusions

The findings that 25.3% of enterprises believe that enterprises like theirs need to give gifts or payments to public officials to get things done and that 21.7% had experienced at least one request for a bribe payment, indicate the prevalence of corruption in the developing world. Analysing whether this improves or harms firm performance, the firm-level analysis shows that once other determinants of firm performance are taken into account and held constant, enterprises believing that it is necessary for enterprises like theirs to give gifts or payments to public officials in order to get things done have 13.9% higher average annual sales growth rates (i.e., 9.0% compared with 7.9%) and 48% higher annual productivity growth rates (i.e., 3.7% compared with 2.5%), confirming H2 that corruption enhances firm performance. No significant associations are identified between corruption and lower firm performance.

The theoretical implication is that at the firm level, corruption is positively associated with firm performance. This finding thus displays that participation in corrupt practices with public officials is a rational economic choice which benefits individual enterprises. From an institutional perspective, this is because in developing economies characterized by formal institutional imperfections and the incongruence of formal and informal institutions, engaging in corruption compensates for the formal institutional imperfections (e.g., inefficient public administration), but without compromising the legitimacy of entrepreneurs since this activity, although illegal in terms of the formal institutions, is deemed socially legitimate in terms of the norms, values and beliefs that comprise the informal institutions. Nevertheless, this may not be an optimal strategy at the aggregate country level. A voluminous literature reveals that corruption harms economic growth and development (e.g., Méndez and Sepúlveda, 2006; Méon and Sekkat, 2005) and that countries with a high level of corruption have relatively lower levels of firm performance (e.g., Donadelli et al., 2014; Faruq and Webb 2013; Wieneke and Gries, 2011). Consequently, although participation in corrupt practices with public officials is a rational economic action that benefits individual entrepreneurs in terms of firm performance, this is not the case at a country level.

Examining the policy implications, there is thus a need to persist with efforts to eliminate corruption, but this paper displays that for this to be achieved, it must be recognised that accepting to pay bribes to corrupt public officials is a rational economic decision for individual entrepreneurs. One option, in consequence, drawing upon the classic utilitarian theory of crime, is to treat entrepreneurs as rational actors who evaluate the opportunities and risks confronting them and decide to do so if the expected penalty and probability of being caught is less than the benefits to be gained (Allingham and Sandmo, 1972; Becker, 1968). To change this cost/benefit ratio in order that not making payments to corrupt public officials is the rational choice, the risks and sanctions can be increased. The problem in developing countries, however, is that formal institutional imperfections hinder the effectiveness of such an approach. Nevertheless, altering the costs and benefits confronting entrepreneurs is not the only way of reducing corruption.

In recent years, grounded in institutional theory, recognition has emerged that corruption directly results from formal institutional imperfections and that entrepreneurs' norms, values and beliefs often differ to the codified laws and regulations (De Castro et al., 2014; Williams and Shahid, 2015). Public authorities should therefore perhaps shift away from a punitive approach that seeks to improve the detection and increase the penalties for engaging in corruption, and instead focus upon the formal institutional imperfections and institutional asymmetry that result in the prevalence of corruption in the developing world. On the one hand, this requires measures to alter informal institutions (i.e., norms, values and beliefs) regarding the

acceptability of corruption so that the asymmetry between informal and formal institutions (and thus corruption) is reduced, such as by raising awareness through advertising campaigns about the costs of corruption. On the other hand, this re-alignment also requires alterations in formal institutions. Corruption has been shown to be a product of formal institutional deficiencies, including the salaries paid to public officials, and to decrease as the efficiency and quality of quality of governance improves (Méon and Weill, 2010).

These two policy approaches towards tackling corruption, however, are not mutually exclusive. Indeed, there are at least two ways of combining them. Firstly, a 'responsive regulation' approach starts out by helping entrepreneurs to self-regulate themselves in a manner consistent with the law by reducing formal institutional imperfections and pursuing campaigns to reduce institutional asymmetry. This facilitating of voluntary compliance is then followed by persuasion through incentives (e.g., enhancing the benefits of not engaging in corruption) and only as a last resort for the small minority refusing to be compliant does it use punitive measures based on increasing the costs of corruption (Braithwaite, 2009; Job et al., 2007). A second approach is the 'slippery slope framework' (Kirchler et al., 2008) which pursues both voluntary and enforced compliance concurrently by developing both greater trust in authorities (e.g., by decreasing formal institutional deficiencies) and the greater power of authorities by increasing the costs associated with engaging in corruption. Until now however, there has been little comparative evaluation of which sequencing and/or combination is the most appropriate and/or effective way of reducing corruption in the developing world.

In sum, if this paper encourages recognition that making bribe payments to corrupt public officials is a rational economic choice for enterprises that results in higher firm performance, despite corruption having an overall detrimental negative impact at the country-level, then one intention of this paper will have been fulfilled. If this then leads governments to recognise the individual firm-level benefits and encourages them not only to seek to alter the cost-benefit ratio confronting individual enterprises but also the formal market imperfections that lead to a lack of alignment of entrepreneurs norms, values and beliefs with the codified laws and regulations regarding corruption, then this paper will have achieved its fuller intention. What is certain, nevertheless, is that unless what is beneficial for the country and what is beneficial for the individual entrepreneur is aligned, little progress will be made towards eliminating the widespread prevalence of corruption in the developing world.

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Table 1. Linear multilevel regression for impact of corruption on sales growth

	Model 1	Model 2
Need to pay corrupt officials	1.139** (0.449)	
Graft Incidence		0.047 (0.389)
Started unregistered	1.254** (0.507)	1.281**(0.508)
Firm age	-0.195*** (0.012)	-0.196***(0.012)
Exporter	0.211 (0.168)	0.192(0.169)
Foreign ownership	-0.363** (0.147)	-0.366**(0.149)
Workforce		
Top manager´s experience	-0.031*** (0.011)	-0.031***(0.011)
Temporary workers	0.010*** (0.004)	0.010***(0.004)
Permanent full-time workers	0.005*** (0.001)	0.005***(0.001)
Female full-time workers	-0.006 (0.004)	-0.006(0.004)
Female participation ownership	0.198*** (0.076)	0.197***(0.076)
Bank loan/credit	-0.196** (0.092)	-0.200**(0.092)
Major constraints		
Transport	0.034 (0.133)	0.043(0.135)
Electricity	-0.034 (0.071)	-0.036(0.071)
Innovation & technology		
Quality certification	0.155 (0.126)	0.155(0.127)
External auditor	-0.046 (0.062)	-0.049(0.063)
Website	0.005 (0.116)	0.013(0.117)
E-mail	-0.043 (0.114)	-0.044(0.115)
Firm size (R.C.: Small)		
Medium	0.301 (0.193)	0.284(0.194)
Large	0.118 (0.203)	0.136(0.205)
Legal status (R.C.: Open shareholding)		
Close shareholding	-0.253* (0.149)	-0.263*(0.151)
Sole proprietorship	-0.209 (0.145)	-0.214(0.146)
Partnership	-0.444** (0.201)	-0.447**(0.202)
Limited partnership	-0.405*** (0.157)	-0.420***(0.158)
Other form	-0.560** (0.226)	-0.579**(0.226)
Industry Sector (R.C.: Textile)		
Leather	0.475** (0.239)	0.466*(0.241)
Garments	0.786*** (0.278)	0.776***(0.280)
Food	0.070 (0.247)	0.083(0.249)
Metals and Machinery	0.417 (0.300)	0.424(0.302)
Electronics	0.160 (0.916)	0.131(0.922)
Chemicals, pharmaceuticals	0.122 (0.478)	0.095(0.482)
Wood, furniture	-0.140 (0.374)	-0.148(0.376)
Non-metallic, plastic materials	-0.935** (0.365)	-0.953***(0.367)
Auto, auto components	1.047 (1.196)	1.075(1.206)
Other manufacturing	0.254 (0.218)	0.248(0.220)
Retail and wholesale trade	0.348** (0.173)	0.340*(0.175)
Hotels and restaurants	0.018 (0.327)	0.011(0.330)
Other services	0.736*** (0.245)	0.728***(0.247)
Other unclassified	0.281 (0.190)	0.279(0.192)
Year dummies	YES	YES
Constant (fixed)	5.592*** (1.168)	5.804***(1.178)
Random disturbance		
Constant	9.144	9.236
Slope: Corruption indicator	3.304	2.296
ICC (%)	24	24
Observations	106,805	106,805
Countries	132	132
Model F test	16.37	16.24
Prob > F	0.00	0.00

Significant at $p < 0.1$*; ** $p < 0.05$ & *** $p < 0.01$. Standard errors in parentheses.
Source: WBES 2006-2014 data set. Own calculations.

Table 2. Linear multilevel regression for impact of corruption on employment growth

	Model 1	Model 2
Need to pay corrupt officials	0.005 (0.235)	
Graft Incidence		0.167 (0.262)
Started unregistered	1.597*** (0.247)	1.604*** (0.248)
Firm age	-0.211*** (0.007)	-0.211*** (0.007)
Exporter	0.018 (0.044)	0.021 (0.043)
Foreign ownership	0.037 (0.038)	0.036 (0.038)
Workforce		
Top manager´s experience	-0.058*** (0.006)	-0.059*** (0.006)
Temporary workers	0.004** (0.002)	0.004** (0.002)
Permanent full-time workers	0.005*** (0.000)	0.005*** (0.000)
Female full-time workers	-0.039*** (0.002)	-0.039*** (0.002)
Female participation ownership	-0.005 (0.020)	-0.008 (0.020)
Bank loan/credit	0.026 (0.024)	0.028 (0.023)
Major constraints		
Transport	0.057 (0.035)	0.049 (0.035)
Electricity	-0.033* (0.019)	-0.031* (0.019)
Innovation & technology		
Quality certification	0.087*** (0.032)	0.091***(0.032)
External auditor	-0.017 (0.016)	-0.018(0.016)
Website	-0.041 (0.030)	-0.042(0.029)
E-mail	0.024 (0.029)	0.023(0.029)
Firm size (R.C.: Small)		
Medium	0.032 (0.051)	0.028(0.050)
Large	-0.028 (0.053)	-0.033(0.052)
Legal status (R.C.: Open shareholding)		
Close shareholding	0.064 (0.041)	0.062(0.041)
Sole proprietorship	0.087** (0.039)	0.085**(0.039)
Partnership	0.103* (0.053)	0.103**(0.052)
Limited partnership	-0.026 (0.043)	-0.025(0.043)
Other form	0.079 (0.062)	0.084(0.062)
Industry Sector (R.C.: Textile)		
Leather	0.066 (0.064)	0.060(0.063)
Garments	-0.034 (0.074)	-0.024(0.073)
Food	-0.062 (0.065)	-0.065(0.064)
Metals and Machinery	0.098 (0.078)	0.089(0.077)
Electronics	-0.151 (0.235)	-0.117(0.232)
Chemicals, pharmaceuticals	0.210* (0.123)	0.183(0.120)
Wood, furniture	0.319*** (0.099)	0.324***(0.098)
Non-metallic, plastic materials	-0.091 (0.095)	-0.094(0.095)
Auto, auto components	0.080 (0.303)	0.066(0.301)
Other manufacturing	0.015 (0.059)	0.012(0.059)
Retail and wholesale trade	-0.004 (0.047)	-0.005(0.046)
Hotels and restaurants	0.125 (0.087)	0.122(0.085)
Other services	0.179*** (0.067)	0.171***(0.066)
Other unclassified	0.172*** (0.051)	0.165***(0.050)
Year dummies	YES	YES
Constant (fixed)	4.672*** (0.290)	4.670***(0.290)
Random disturbance		
Constant	2.226	2.204
Slope: Corruption indicator	1.660	1.448
ICC (%)	11	11
Observations	106,805	106,805
Countries	132	132
Model F test	57.80	57.42
Prob > F	0.00	0.00

Significant at $p < 0.1$*; ** $p < 0.05$ & *** $p < 0.01$. Standard errors in parentheses.
Source: WBES 2006-2014 data set. Own calculations.

Table 3. Linear multilevel regression for impact of corruption on productivity growth

	Model 1	Model 2
Need to pay corrupt officials	1.187*** (0.433)	
Graft Incidence		-0.110 (0.438)
Started unregistered	-0.005 (0.500)	0.013 (0.500)
Firm age	-0.008 (0.013)	-0.009 (0.013)
Exporter	0.205 (0.169)	0.186 (0.171)
Foreign ownership	-0.380** (0.149)	-0.384** (0.151)
Workforce		
Top manager´s experience	0.021* (0.011)	0.022* (0.011)
Temporary workers	0.007* (0.004)	0.007* (0.004)
Permanent full-time workers	0.001 (0.001)	0.001 (0.001)
Female full-time workers	0.029*** (0.005)	0.029*** (0.005)
Female participation ownership	0.215*** (0.076)	0.218*** (0.077)
Bank loan/credit	-0.232** (0.092)	-0.239** (0.093)
Major constraints		
Transport	-0.011 (0.134)	0.005 (0.135)
Electricity	-0.008 (0.071)	-0.012 (0.072)
Innovation & technology		
Quality certification	0.078 (0.127)	0.076(0.128)
External auditor	-0.043 (0.063)	-0.046(0.063)
Website	0.059 (0.117)	0.065(0.118)
E-mail	-0.079 (0.116)	-0.079(0.117)
Firm size (R.C.: Small)		
Medium	0.288 (0.194)	0.274(0.196)
Large	0.122 (0.204)	0.142(0.206)
Legal status (R.C.: Open shareholding)		
Close shareholding	-0.333** (0.151)	-0.341**(0.153)
Sole proprietorship	-0.309** (0.146)	-0.311**(0.147)
Partnership	-0.550*** (0.202)	-0.552***(0.204)
Limited partnership	-0.409*** (0.158)	-0.421***(0.160)
Other form	-0.650*** (0.229)	-0.671***(0.230)
Industry Sector (R.C.: Textile)		
Leather	0.392 (0.241)	0.392(0.243)
Garments	0.805*** (0.280)	0.790***(0.283)
Food	0.139 (0.249)	0.152(0.251)
Metals and Machinery	0.349 (0.301)	0.362(0.303)
Electronics	0.331 (0.923)	0.285(0.930)
Chemicals, pharmaceuticals	-0.070 (0.483)	-0.069(0.487)
Wood, furniture	-0.424 (0.378)	-0.439(0.380)
Non-metallic, plastic materials	-0.886** (0.368)	-0.903**(0.370)
Auto, auto components	0.927 (1.206)	0.957(1.218)
Other manufacturing	0.228 (0.220)	0.225(0.222)
Retail and wholesale trade	0.362** (0.175)	0.357**(0.177)
Hotels and restaurants	-0.111 (0.331)	-0.111(0.333)
Other services	0.579** (0.248)	0.577**(0.249)
Other unclassified	0.115 (0.191)	0.119(0.194)
Year dummies	YES	YES
Constant (fixed)	1.479 (1.180)	1.706(1.191)
Random disturbance		
Constant	9.183	9.283
Slope: Corruption indicator	3.040	1.788
ICC (%)	23	23
Observations	106,805	106,805
Countries	132	132
Model F test	4.23	3.99
Prob > F	0.00	0.00

Significant at $p < 0.1$*; ** $p < 0.05$ & *** $p < 0.01$. Standard errors in parentheses.
Source: WBES 2006-2014 data set. Own calculations.