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# Corruption and the Local Business Environment: Insights from SMEs in 29 Philippine Cities

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ABSTRACT

This paper contributes to the international evidence on the possible factors linked to corruption using data on over 1,700 small and medium scale enterprises (SMEs) in 29 Philippine Cities covered by the 2009 Asian Institute of Management (AIM) Enterprise Survey. The results suggest that corruption appears to be linked to conditions that affect Philippine SMEs in a very pernicious way—more corruption is reported by firms located in cities with very poor business environments and weak provision of public goods. For instance, bribery reported among those who obtained their business permits 30 days late is 1.23 times compared to those that receive their permits on the same day.

Key words: corruption, bribery, business permits, small and medium scale enterprises

JEL: D20, H41, O12, O43, P48

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## Introduction

In Dante's *Inferno*, a special place in the deepest part of hell is reserved for government officials, lawyers, and judges who take bribes.[1] Corruption has probably plagued mankind since the dawn of organized human societies and government. In modern public policy, corruption—or put simply, the abuse of public power for private benefit—has become a central plank of reform efforts to promote inclusive growth.

This paper contributes to the policy discussions and literature on corruption and micro, small and medium sized enterprises (SMEs)[2] by analyzing the correlates of corruption using data on over 1,700 firms in 29 Philippine Cities covered by the 2009 AIM Enterprise Survey. There are very few city- and local-level empirical studies on corruption, and this study contributes to the international evidence on this topic by examining the characteristics of firms and cities in the Philippines that may be linked to corruption prevalence. Many of these indicators relate to how business friendly the local economic environment is; and this study analyzes how these features potentially interact with corruption prevalence. Additional innovations in this study include the use of novel city-level proxy variables for the quality of institutions and political accountability (e.g. variables for dynastic local government official and number of AM radio stations). As far as we know, few (if any) studies have been able to consider these types of factors at the local level, in studying corruption.

There are several findings from the analysis herein. First, corruption is correlated with other indicators of an environment that is not business friendly and generally characterized by poor provision of public goods. Cities with entrepreneurs that report more corruption are also the cities, on average, with longer time necessary to obtain business permits, more power and water service interruption, worse road quality, higher crime and lower cleanliness. Furthermore, an analysis of the possible determinants of corruption incidence in a multivariate regression framework suggests that a lengthier business permit process, higher population density and more AM radio stations are some of the factors linked to more reported bribery. The evidence suggests that opportunities for corruption may be high in an environment of underprovided public goods and poor public services. The message for policymakers is that an improved business environment may also lower these types of corruption opportunities. Such an emphasis also could reflect the need to improve human

[1] We acknowledge Tanzi (1998) for making this link to the literature.
[2] We will refer to the firms in our sample as SMEs in order to follow the common nomenclature in the literature and avoid confusion, even as our sample contains micro-level firms.

security through better public goods provision, which in turn could improve local economic dynamism and households' opportunities to boost their income and wellbeing.

In what follows, section 1 briefly reviews the related literature on this topic, and section 2 outlines the data and methodology for this paper. Section 3 analyzes the results and a final section reiterates the main findings.

## I. Related Literature

The majority of empirical research on the correlates of corruption point to its detrimental effects on firms by increasing their transactions costs, lowering the incentives for investment, while also hampering productivity and employment growth. Corruption is also expected to diminish over-all economic growth and worsen inequality by being more detrimental to smaller and women-led firms. However, far fewer empirical studies have examined the potential factors that exacerbate corruption in bureaucracies, notably in the context of decentralization. This type of evidence could be critically important in understanding how corruption thrives and which strategies could be most effective in curbing it.

### Corruption and economic development

The impact of corruption on economic development, human development and human security has become a major area for policy research in recent decades. Earlier literature on corruption tried to reconcile the strong economic performance of countries like China and South Korea with their otherwise widely recognized corruption challenges. Corruption, according to this earlier view, could enable some firms—particularly those with more resources; and presumably those with more potential to compete and succeed—to move forward despite the bureaucratic quagmire in many developing countries with underdeveloped institutions. Corruption greased the wheels of commerce and therefore could be expected to facilitate economic development, or at least not serve as a hindrance to it (e.g. Bardhan, 2002). Based on this view, corruption may be particularly prevalent in jurisdictions with underprovided public goods and poor public services.

More recent scholarship has also exposed the pernicious effects of corruption. First, corruption is typically characterized by opaque policy processes and uncertain policy environments, both of which are anathema to investor confidence. Corruption could weaken the performance of firms, and thus could also prove detrimental to broader economic development

prospects. And because small firms could be adversely affected disproportionately, corruption could exacerbate existing inequalities and it could weaken the prospects for human development and human security.

Fisman and Svennson (2007), for example, examined the correlates of the bribery rate (i.e. bribe payments divided by sales), taxes and firm growth using data on Ugandan firms covering the period 1995-1997. Using the industry-location average of corruption incidence to address the endogeneity issue, these authors found that both taxation and the bribery rate are both negatively linked to firm growth. Their results suggest that a one percentage point increase in the bribery rate leads to an over three percentage point reduction in firm growth. This effect is approximately 2.5 times larger than the estimated impact of taxation on firm growth.[3]

These results are supported by studies using cross-country datasets, including a study of over 11,000 firms in 28 countries in Central and Eastern Europe and Central Asia in 2009 (De Rosa and others, 2007[4]) and a study of almost 70,000 enterprises in 107 countries during the period 2000-2006 (Aterido and others, 2007[5]). In addition, a more recent study by Seker and Yang (2012) examined corruption data on over 6500 firms in Latin America and the Carribean in order to assess the extent to which corruption could affect sales growth. Using macro-level averages of corruption (across locations and sectors) to address the endogeneity of corruption and firm performance, these authors found evidence that firms engaged in bribery actually grew 23.6 percent slower than firms not engaged in bribery (ibid:5).

All these recent empirical studies improve on earlier ones that failed to address potential endogeneity issues, by turning to instrumental variables techniques and much larger datasets. (As is now well recognized in the literature on corruption, firm-level performance may be affected by corruption, just as better performance may relax credit constraints and enable some competitive bribe-paying.) With few exceptions, recent empirical studies with more sound methodological approaches point to the adverse impact of corruption on firm performance.

Exceptions should nevertheless be noted. For instance, Aterido and others (2007:20) found that a 10 percentage point increase in the incidence of bribes was associated with a 1.4 percentage point reduction of the employment rate of large firms. However, a 10 percentage point increase in bribe incidence also boosted the growth rate of micro firms by 1.4 percentage points. Similarly,

[3]See Fisman and Svennson (2007:3).
[4]This study used the 2009 EBRD/World Bank Business Environment and Enterprise Survey (BEEPS).
[5]This study used the World Bank Enterprise Survey.

Cai, Fang and Xu (Forthcoming) used the "entertainment and travel costs" (ETC) of Chinese firms as a proxy for bribe payments, and they found evidence that ETC over-all has a negative effect on firm productivity but some contexts of ETC seem to generate positive returns for firms, by protecting firms from excessive expropriation and helping them obtain better public services. These studies seemed to find evidence in support of the "greasing the wheels" argument.

An empirical analysis of the impact of the investment climate on productivity using firm-level data in Guatemala, Honduras and Nicaragua revealed further evidence of the cost of corruption and red tape on firms' productivity. Escribano and others (2005:54) found evidence that if firms dedicate one more day to inspection and regulation control activities, on average, it would decrease productivity by anywhere from 5.8 to 10.7 percent. Similarly, firms that were able to afford to make payments to speed-up bureaucratic processes enjoyed, on average, an increase in productivity of between 1.3 and 3.3 percent.

Additional evidence from these studies also suggested that smaller, younger and women-led firms appear to be disproportionately more adversely affected by corruption. Those firms that tend to face more intense competition and smaller profit margins, coupled with more binding credit constraints were also those that could be expected to have less leeway to mitigate the adverse effects of corruption.

**Factors behind corruption**

Scholars have pointed to a variety of factors that could contribute to corruption prevalence. One strand of literature emphasizes the quality of the over-all institutional environment, which covers, for instance, the strength of property rights and the legal origin.[6] In countries with weaker institutions, corruption is left unchecked or is even seen as a second-best solution to avoid economic gridlock (even at high social and economic cost as the evidence in the previous section suggests).[7]

Other factors may also include the country's income level (as corruption may develop in response to an effort to internalize better economic opportunities compared to second best approaches premised on corruption); the level of human capital (as improved literacy, for example,

[6]For instance, some scholars argue that corruption is more likely in countries with civil law based systems that tend to favor more regulation on economic activities (La Prorta and others, 1998;1999).

[7]An empirical study of the correlates of measures capturing good governance and the strength of countries' institutions, Ngobo and Fouda (2012) also find evidence that good governance indicators are associated with lower variability and higher levels of companies' profitability.

is a possible pre-condition of stronger scrutiny of government practices and therefore improved accountability); market competition (as competition could lower mark-ups and profits of firms and offer less opportunity for wide scale corruption taxes); and linked to the former, the regulatory environment (as any effort to stifle market competition and free entry may open the doors for rent-seeking and corruption).[8]

In addition the literature suggests that government decentralization could also affect corruption, but in less predictable ways. Earlier theoretical work pointed to how increased political competition—possibly brought about by decentralization—could mitigate corruption, as public pressure could be brought to bear more easily on politicians' agendas. Nevertheless, decentralization could also increase of state capture as local decision makers could also be much closer to local interest groups (e.g. Prud'homme, 1995). Greater dispersion of government decision-making powers could also result in less coordination among government bureaucrats, and excessive rent extraction (e.g. Shleifer and Vishny, 1993).

Tiebout (1596) type competition across jurisdictions could also create conditions that mitigate corruption. Voters may compare policy outcomes of their home jurisdictions with neighbouring jurisdictions, and this may facilitate inter-jurisdictional competition to produce better policy outcomes, and in part, by mitigating corruption (e.g. Dincer and others, 2010). Similarly, investors could also compare competitiveness and investment factors across jurisdictions, and thus also trigger some competition for capital and investments across jurisdictions (e.g. Arikan, 2004). In addition, monitoring and therefore accountability of central government officials could also be relatively more intense compared to local government officials, due to the perception that serving in the central government is much more prestigious. This in turn could lead to weaker monitoring and accountability in a more decentralized setting (e.g. Taebllini, 2000). Finally, the replacement of incumbent local government officials could also serve as a shock to corrupt environments, leading to uncertainty in the business environment. The latter, in turn, could be detrimental to investment and firm productivity (Malesky and Samphantarak, 2008).

Bardhan (2002) has since emphasized that the relative effectiveness of monitoring and accountability mechanisms under centralized vs. decentralized settings would need to be weighed, in order get a fuller sense of whether either approach improves or exacerbates corruption.

[8]For empirical analyses of the main factors that might influence corruption prevalence, see De Rosa and others (2010), Seldayo and de Haan (2006) and Serra (2006).

Empirical studies of corruption under decentralized environments yielded mixed results—it is difficult to conclude one way or the other whether corruption is mitigated with decentralization or corruption becomes worse. Fisman and Gatti (2002), for example, examined the links across corruption in US states and their dependency on central government transfers. Their results pointed to a positive link between large central government transfers and corruption, providing some support to earlier theories of rent-seeking and poor accountability of local officials who depend less on local taxpayer revenues and more on central government transfers.

In addition, Arikan (2004) empirically analyzed fiscal decentralization measures and their links to the Corruption Perceptions Index (CPI) of Transparency International. This study, however, yielded inconclusive results when endogeneity was addressed in the empirical framework. Similar inconclusive results were found by Dincer and others (2010) who initially found indications that corruption is smaller in more decentralized US states. These results disappeared in significance with an effort to address endogeneity. Moreover, Freille, Haque and Kneller (2007) empirically examined the link between fiscal and constitutional decentralization and measures of corruption, using an extensive dataset covering 177 countries and a wide range of decentralization measures. These authors found a negative relationship between decentralization and corruption.

More recent work by Lessmann and Markwardt (2010) tried to build on earlier studies which did not capture institutional differences across decentralized contexts—differences which have been emphasized by some of the earlier literature (e.g. Bardhan, 2002) and these could help determine whether accountability indeed increases with decentralization. Lessmann and Markwardt examined cross section data on 64 countries covering information on decentralization, corruption and an index of press freedom. Their empirical findings suggested that in countries with the lowest press freedom indicators, decentralization in fact exacerbated corruption. Decentralization was associated with lower corruption only in those countries with relatively higher indicators of press freedom. Clearly, the conditions under which decentralization takes place could help determine corruption outcome, and remains a nascent area of research.

## II. Data and Methodology

As a contribution to the policy research on corruption and decentralization, this paper examines the 2009 AIM Enterprise Survey data, which was implemented in the second quarter of 2009 and covers about 1740 firms in 29 cities in the Philippines. The cities included in this survey are: Angeles, Bacolod, Baguio, Batangas. Butuan, Cagayan de Oro, Cebu, Cotabato, Dagupan, Davao, General Santos, Iligan, Iloilo, Lapu-Lapu, Legazpi, Lucena, Mandaue, Naga, Olongapo, Ormoc, Pagadian, Puerto Princesa, San Fernando, Santiago, Surigao, Tacloban, Tagum, and Tuguegarao. This dataset offers a unique opportunity to examine micro- and entrepreneur-level data which allows the empirical approach to account for both firm-level and city-level characteristics.

The objective is to try and analyze the possible factors that may be linked to corruption, and the main empirical framework relies on a logistic regression model wherein reported corruption is the dependent variable, and the independent variables include characteristics of the enterprise and the city context. The use of reported bribery as a dependent variable is an artifact of data availability—there are presently very few if any alternatives to perceptions-based bribery indicators notably at the local government level. Hence, one possible limitation of the approach is that only certain firms will tend to report bribery, even if many more firms actually engage in it. To help mitigate the risk of bias, we include independent variables that might help account for differential bribe-reporting behaviour (e.g. gender, willingness to move to another city, etc).

The analysis begins with a comparison of mean bribery reports segmented across different indicators of interest, such as the provision of different public goods and services at the city level. Our goal here is to help illustrate whether bribery incidence is linked to these features of the local level business environment.

We also develop a more formal empirical model to analyze the possible factors behind bribery. This multivariate framework draws in part from work by Arikan (2004) and Lessmann and Markwardt (2010) which are among recent studies of how aggregate corruption indicators are linked to various country-level measures for decentralization. We try to improve on their approach by using micro- or entrepreneur-level (as opposed to country-level) data which allows us to account for a richer set of correlates at the local government (i.e. city) level. The variables considered here also draw heavily on the recent literature on corruption which finds that poor

public and private services provision could open the opportunities for rent-seeking and bribery, by firms that seek to acquire slightly better (i.e. higher quality and more timely) services.[9]

Additional innovations in this study include the use of novel city-level proxy variables for the quality of institutions and political accountability. As far as we know, no other study has been able to consider these types of factors at the local level, in studying corruption. The first variable, which is a dummy for the presence of a dynastic politician, attempts to proxy for political competition (i.e. having a dynastic city Mayor indicates weak political competition). It is possible that lack of political competition translates into weak political accountability, in turn contributing to lack of anti-corruption and pro-competitiveness reforms. This type of proxy variable has been used in the literature on decentralization and economic performance, as studies attempt to capture the level of institutional development at the local government level (e.g. Balisacan and Fuwa, 2004).

Moreover, the presence and freedom of media has also been identified in the literature as a possible factor behind the mitigation of corrupt practices (e.g. Ferraz and Finan, 2008; Lessmann and Markwardt, 2010; Seldayo and de Haan, 2006). In this study, we utilize a variable indicating the number of AM radio stations operating in each city in our sample. Studies have shown that the presence and strength of media could have a mitigating effect on corruption, to the extent that voters are much better informed about politicians' actions.[10]

The independent variables include both perceptions-based information collected from the enterprise survey, as well as other hard data collected on the cities being examined. In particular, the specific variables and their brief descriptions are listed in Table 1.

LOGIT MODEL

CORRUPTION = F [City competitiveness characteristics (e.g. proxy variables for private and public services, including access to electricity, credit and water, and length of time to acquire business permits, prevalence of crime, city cleanliness, etc); proxy variables for political competition and institutions (e.g. dynastic Mayor); entrepreneur characteristics (e.g. gender, age,

[9] See among others Dethier and others (2010) and De Rosa and others (2010).

[10] Ferraz and Finan (2008), for instance, finds that the public disclosure of the results of a random audit of municipal government expenditures in Brazil led to a lower probability of re-election for incumbents with violations in their audit report. These findings were even more pronounced in areas with a local radio station, suggesting the important role of media in promoting political accountability.

interviewee's position, and a proxy for risk-taking behaviour such as willingness to move out, etc.); and firm characteristics (e.g. number of years on operation, size, etc.)]

**Table 1. Variables for Empirical Analysis**

**Dependent Variable: Reported Bribery**

| Dimension | Description of Independent Variables |
|---|---|
| Public goods provision | 1. Length of applying for a business permit<br>2. Length of power interruption<br>3. Frequency of water service interruption<br>4. Rating of road in terms of wear and tear (1 - Poor; 0 - not poor)<br>5. Rating of road in terms of travel time (1 - Poor; 0 - not poor) |
| City characteristics | 1. City's income class (1 - 1st; 0 - 2nd/3rd)<br>2. Population density (0 - at most median; 1 - above median)<br>3. With dynastic executive (1 - with dynasty; 0 - without dynasty)<br>4. Poverty incidence (small area estimates 2003)<br>5. Number of AM radio stations<br>6. Distance from Manila (km)<br>7. Prevalence of crime(1 –Prevalent; 0 –Not prevalent)<br>8. City cleanliness(1 - Unclean; 0 - Clean) |
| Firm level characteristics | 1. Gender (1 - Male; 0 - Female)<br>2. Size (1 - micro; 0 - small-medium)<br>3. Interviewee's position (1 - owner or owner manager; 0 - manager)<br>4. Number of years in business<br>5. Accessed formal institution for credit<br>6. Accessed informal institution for credit<br>7. Accessed savings for credit<br>8. Will move out of the city |

Note: Some of these variables may have been dropped based on goodness-of-fit tests.

## III. Main Findings

### Simple comparison of means

As mentioned earlier, poor delivery of services can create avenues for bribery. Underprovision of public goods and services—in term of both inadequate amount and insufficient quality—implies a latent demand for these goods and services. The literature indicates that entrepreneurs may be willing to pay bribes and grease money in order to address this underprovision. In our dataset, starting with power disruption, it can be seen in Table 2 that there is higher incidence of reported bribery among those who experienced power interruption compared to those who did not. More than one out of 10 establishments that experienced disruption in power services reported bribery compared to only seven out of 10 among those who did not experience power interruption. This result is statistically significant given the value of test statistic with p-value 0.006.

Similarly, Table 2 also shows higher bribery reports among those who experienced water interruption compared to those who said that they did not experience disruption in water services. More than 12 percent of those who experienced water interruption reported bribery while only 8.7 percent of those who did not experience water disruption reported bribery. These findings indicate that given the data, water and power interruption are associated with bribery reports.

In addition, mean duration of disruption among those who reported bribery is higher compared to those who did not report bribery. This is true for both power and water disruption (see in Table 3). Note, however, that only the difference between mean duration of power interruption among those who reported bribery and those who did not is significant at $\alpha=0.05$[11]. Hence, aside from having higher bribery incidence among those who experienced disruption, the duration of disruption is also higher among those who reported bribery.

Securing business permits also seems associated with bribery reports (see Table 3). The average waiting time until a business permit is secured is higher among those who reported bribery compared to those who did not report bribery. In addition, the figures in the table show that waiting time among those who reported bribery is more than 1.5 times longer compared to the waiting time of those who did not report bribery. The difference between the two means also turned out to be significant. This finding, in turn, implies that increased number of steps may be associated with bribery.

[11]The difference is significant at 0.10 using non-parametric test.

In terms of infrastructure, Tables 4 conveys that more than 17 percent of the respondents who said their roads are poor in reducing wear and tear reported bribery, while only 8.6 percent of those who said their roads are not poor in these aspects reported bribery. These results are fairly similar to those when using the indicator for reduced travel time on the road. These results are statistically significant based on the tests. Hence, it can be said that given the data, there can be higher reports of bribery among cities with poorer quality roads.

**Table 2. Number and percent of establishments who reported incidence of bribery, by incidence of service interruption**

| **Service** | **Interrupted** | **Total** | **Incidence of bribery** | | **$H_0: \pi_1 = \pi_2$** | |
|---|---|---|---|---|---|---|
| | | | *Magnitude* | *Proportion* | *Z* | *P(Z>z)* |
| **Total** | | 1,740 | 159 | 9.1 | | |
| **Power** | Yes | 884 | 96 | 10.9 | 2.533 | 0.006 |
| | No | 856 | 63 | 7.4 | | |
| **Water** | Yes | 240 | 29 | 12.1 | 1.706 | 0.044 |
| | No | 1,500 | 130 | 8.7 | | |

$H_0$: Proportion of bribery among those in category 1is the same with those in category 2.

$H_a$: Proportion of bribery among those in category 1 is higher than those in category 2

Source: Authors' calculations based on 2009 AIM Enterprise Dataset.

**Table 3.[12]Mean and standard deviation of duration of disruption of services and waiting time for business permit renewal by incidence of bribery**

| Variables | Statistic | Bribery | | $H_0: \mu_{Yes} = \mu_{No}$ | |
|---|---|---|---|---|---|
| | | *Yes* | *No* | *Z* | *P(Z>z)* |
| **Length of power interruption(hours)** | Mean | 2.77 | 2.06 | 1.75 | 0.04 |
| | Std. Dev. | 4.92 | 4.43 | | |
| **Frequency of water interruption (hours)** | Mean | 2.36 | 1.34 | 1.19 | 0.117 |
| | Std. Dev. | 10.56 | 6.45 | | |
| **Length of business permit renewal (days)** | Mean | 23.84 | 15.52 | 2.24 | 0.014 |
| | Std. Dev. | 41.74 | 26.17 | | |

$H_0$: Mean among those who reported bribery is the same with those who did not.

$H_a$: Mean among those who reported bribery is higher than those who did not.

Source: Authors' calculations based on 2009 AIM Enterprise Dataset.

**Table 4. Number and percent of establishments who reported incidence of bribery, By rating of roads**

| Factor | Poor | Total | Incidence of bribery | | $H_0: \pi_1 = \pi_2$ | |
|---|---|---|---|---|---|---|
| | | | *Magnitude* | *Proportion* | *Z* | *P(Z>z)* |
| **Total** | | 1,740 | 159 | 9.1 | | |
| **Wear and tear** | Yes | 103 | 18 | 17.5 | 2.11 | 0.012 |
| | No | 1,637 | 141 | 8.6 | | |
| **Reducing travel time** | Yes | 118 | 20 | 16.9 | 2.65 | 0.004 |
| | No | 1,622 | 139 | 8.6 | | |

$H_0$: Proportion of bribery among those in category 1is the same with those in category 2.

$H_a$: Proportion of bribery among those in category 1 is higher than those in category 2

Source: Authors' calculations based on 2009 AIM Enterprise Dataset.

[12]Although the framework is comparing the incidence of bribery in different levels of the given variables, for simplicity, the comparison is by incidence of bribery. This will be done for the succeeding continuous covariates. However, it can be verified in the following results that the significant differences in incidence holds true given the predictors.

Moreover, Table 5 shows significantly higher incidence of bribery reported in cities in our sample with population density above the median, compared to those in cities with densities below the median. Furthermore, bribery reported among establishments in first class cities is more than twice those in second or third class cities. Reports of bribery in more urbanized cities tend to be higher compared to less urbanized ones.

Furthermore, establishments in cities with dynastic mayors[13] are more likely to report bribery compared to those in cities with non-dynastic mayors. However, given the overall sample, the difference is not significant at 0.05.

In the same table, it can be seen that cleanliness and crime are distinguishing factors of bribery as well—more than one out of 10 establishments who said that their city is unclean reported bribery compared to 8 percent among those who said their city is clean. Moreover, businesses in crime prevalent cities are more likely to report bribery compared to cities where crime is not prevalent.

Table 6 also shows that there are more businesses that report bribery in cities where there is lower poverty incidence. Furthermore, firms that reported bribery tend to be in cities with higher number of AM radio stations. The differences in the bribery incidence across poorer jurisdictions and across jurisdictions with more/less AM radio stations are statistically significant.

Moreover, Table 7 shows that male owners or managers tend to report bribery significantly more than female respondents. Almost 11 percent of the male respondents reported bribery while only 8.2 percent of female respondents reported bribery. Furthermore, owners (including owner-managers) are likely to report bribery more than managers, although this result is only significant at 0.15. Almost one out of 10 owners reports bribery while only eight percent among managers.

[13]Definition based on Mendoza and others (Forthcoming).

**Table 5. Number and percent of establishments who reported incidence of bribery, by city population density, income class, dynasty, cleanliness and order**

| Attribute | Level | Total | Incidence of bribery | | $H_0: \pi_1 = \pi_2$ | |
|---|---|---|---|---|---|---|
| | | | *Magnitude* | *Proportion* | *Z* | *P(Z>z)* |
| **Total** | | 1,740 | 159 | 9.1 | | |
| **Population density** | Above median | 840 | 88 | 10.5 | 1.872 | 0.031 |
| | At most median | 900 | 71 | 7.9 | | |
| **City income class** | 1st | 1,500 | 148 | 9.9 | 2.637 | 0.004 |
| | 2nd-3rd | 240 | 11 | 4.6 | | |
| **Dynastic mayor** | Dynastic | 780 | 78 | 10.0 | 1.125 | 0.130 |
| | Non-dynastic | 960 | 81 | 8.4 | | |
| **City is clean** | No | 802 | 84 | 10.5 | 1.772 | 0.038 |
| | Yes | 938 | 75 | 8.0 | | |
| **Crime is prevalent** | Yes | 399 | 59 | 14.8 | 3.240 | 0.000 |
| | No | 1,182 | 100 | 8.5 | | |

$H_0$: Proportion of bribery among those in category 1 is the same with those in category 2.

$H_a$: Proportion of bribery among those in category 1 is higher than those in category 2

Source: Authors' calculations based on 2009 AIM Enterprise Dataset.

**Table 6. Mean and standard deviation of poverty incidence, number of AM radio stations and distance from by incidence of bribery**

| Variable | Statistic | Bribery | | $H_0: \mu_{Yes} = \mu_{No}$ | |
|---|---|---|---|---|---|
| | | *Yes* | *No* | *Z* | *P(Z>z)* |
| **2003 Poverty incidence*** | Mean | 14.53 | 16.90 | (2.66) | 0.004 |
| | Std. Dev. | 10.07 | 10.75 | | |
| **Number of AM radio stations** | Mean | 7.95 | 6.27 | 2.77 | 0.003 |
| | Std. Dev. | 3.38 | 3.24 | | |
| **Distance from Manila** | Mean | 516.93 | 523.75 | (0.27) | 0.605 |
| | Std. Dev. | 309.10 | 294.19 | | |

$H_0$: Mean among those who reported bribery is the same with those who did not.

$H_a$: Mean among those who reported bribery is higher than those who did not.

*$H_a$: Mean among those who reported bribery is lower than those who did not.

Source: Authors' calculations based on 2009 AIM Enterprise Dataset.

**Table 7. Number and percent of establishments who reported incidence of bribery, by respondent's gender, position firm size, city population density, income class, dynasty, cleanliness and order**

| Attribute | Level | Total | Incidence of bribery | | $H_0: \pi_1 = \pi_2$ | |
|---|---|---|---|---|---|---|
| | | | *Magnitude* | *Proportion* | *Z* | *P(Z>z)* |
| **Total** | | 1,740 | 159 | 9.1 | | |
| **Gender** | Male | 642 | 69 | 10.8 | 1.782 | 0.037 |
| | Female | 1,098 | 90 | 8.2 | | |
| **Position** | Owner/ owner-manager | 1,035 | 101 | 9.8 | 1.088 | 0.138 |
| | Manager | 705 | 58 | 8.2 | | |
| **Firm size** | Small-medium | 866 | 88 | 10.2 | 1.475 | 0.070 |
| | Micro | 874 | 71 | 8.1 | | |
| **Accessed formal financing source** | Yes | 323 | 46 | 14.2 | 3.527 | 0.000 |
| | No | 1,417 | 113 | 8.0 | | |
| **Accessed informal financing source** | Yes | 203 | 29 | 14.3 | 2.708 | 0.003 |
| | No | 1,537 | 130 | 8.5 | | |
| **Accessed savings for credit** | Yes | 707 | 68 | 9.6 | 0.575 | 0.283 |
| | No | 1,033 | 91 | 8.8 | | |

$H_0$: Proportion of bribery among those in category 1 is the same with those in category 2.

$H_a$: Proportion of bribery among those in category 1 is higher than those in category 2

Source: Authors' calculations based on 2009 AIM Enterprise Dataset.

**Table 8. Mean and standard deviation of years in business by incidence of bribery**

| Variable | Statistic | Bribery | | $H_0: \mu_{Yes} = \mu_{No}$ | |
|---|---|---|---|---|---|
| | | *Yes* | *No* | *Z* | *P(Z>z)* |
| **Years in business** | Mean | 15.78 | 13.13 | 2.28 | 0.012 |
| | Std. Dev. | 13.13 | 12.33 | | |

$H_0$: Mean among those who reported bribery is the same with those who did not.

$H_a$: Mean among those who reported bribery is the higher than those who did not.

Source: Authors' calculations based on 2009 AIM Enterprise Dataset.

Finance also appears to be strongly associated with bribery. Firms that accessed any financing source, whether formal or informal, tend to report bribery more than those who did not. In Table 7, more than 14 percent of firms who accessed formal financing source reported bribery compared to only eight percent among those who did not access formal financing source. Same can be said for those who accessed informal financing sources. The differences are significant which means that firms that there is a high chance for firms that borrowing money to report bribery.

When it comes to firm size, small or medium firms are more likely to report bribery compared to micro establishments. More than 10 percent of small-medium establishments reported bribery while only eight percent in micro. The result is only significant at 0.10. In relation to this, those who reported bribery belong to significantly older firms compared to those who did not report bribery (see Table 8).

**Multivariate regression results**

As discussed in the previous section, the aim is to identify possible factors that are linked to corruption. The analysis here is not necessarily causal in nature. Rather the objective here is to try and determine the conditions that typically accompany more bribery reported by firms in the 29

Philippine cities.[14] In the AIM Enterprise Survey, the corruption variable is a binary variable (1 for reporting bribery, and 0 for not reporting any bribery). Hence, a logistic regression model could be a useful empirical framework in analyzing the different correlates of corruption and their combined links on bribery incidence.

In order to build the model, univariable logistic regressions on bribery were first performed wherein each of the independent variables is regressed on the response variable containing only that variable. This procedure helped identify the most useful covariates in the model. It was also determined that only X2, the length of power interruption needs fractional polynomial to fit its relationship with Y. Hence, $X2.2 = \sqrt{X2}$ was added to the model to form the preliminary model, whose results are noted in Table 10. From this, plausible interactions were identified and iterative logistic regressions were undertaken, in order to assess the changes in the fit and coefficients. Aside from Wald's *Z*, two other measures were essential in the process of variable and model selection: Deviance and Akaike Information Criterion (AIC).[15]Deviance serves as the tool in assessing goodness-of-fit for each of the model while the AIC balances the goodness-of-fit and complexity of the model. These further tests were implemented and guided a series of adjustments in removing/adding variables. The results of the final regression model are reported in Table 9.[16]

[14] A caveat worth noting here is that the dataset for the regression analysis includes self-reported (and perceptions based) data as well as hard data (based on city-level characteristics from other datasources). The challenges in using self-reported data are well known so the caveat attached to the empirical literature using those types of data also apply here.

[15]See Hosmer and Lemeshow (2000) and Sheather (2009).

[16] The rest of the results are also available from the authors, for those interested to review the process. These are no longer reported here in order to keep to word limits.

**Table 9. Final Adjusted Logit Model**

| Variable | Coeff. | Std. Error | Z-value | Pr(>\|z\|) | |
|---|---|---|---|---|---|
| **Intercept** | -3.443 | 0.615 | -5.600 | 0.000 | *** |
| **Length of applying for a business permit** | 0.007 | 0.003 | 2.675 | 0.007 | *** |
| **Length of power interruption (Square root)** | 0.133 | 0.078 | 1.711 | 0.087 | * |
| **Road rating in travel time** | 0.584 | 0.298 | 1.958 | 0.050 | * |
| **Population density (X1)** | 1.063 | 0.505 | 2.103 | 0.035 | ** |
| **Dynastic Mayor (X2)** | -0.591 | 0.282 | -2.094 | 0.036 | ** |
| **Poverty incidence (X3)** | -0.023 | 0.012 | -1.915 | 0.056 | * |
| **AM radio stations (X4)** | 0.162 | 0.043 | 3.718 | 0.000 | *** |
| **Crime prevalence (X5)** | -0.248 | 0.351 | -0.706 | 0.480 | |
| **City cleanliness** | 0.297 | 0.202 | 1.471 | 0.141 | |
| **Gender (X6)** | -0.238 | 0.265 | -0.896 | 0.370 | |
| **Size of firm** | -0.284 | 0.199 | -1.432 | 0.152 | |
| **Years in business** | 0.012 | 0.007 | 1.739 | 0.082 | * |
| **Accessed credit from formal source** | 0.403 | 0.220 | 1.831 | 0.067 | * |
| **Accessed credit from informal source (X7)** | -0.120 | 0.493 | -0.244 | 0.807 | |
| **Willingness to move out of city (X8)** | 0.362 | 0.445 | 0.812 | 0.417 | |
| **X5×X6** | 1.076 | 0.411 | 2.617 | 0.009 | *** |
| **X1×X4** | -0.137 | 0.060 | -2.274 | 0.023 | ** |
| **X2×X8** | 1.093 | 0.570 | 1.917 | 0.055 | * |
| **X2×X5** | 0.828 | 0.411 | 2.012 | 0.044 | ** |
| **X3×X7** | 0.044 | 0.027 | 1.633 | 0.103 | |

**Note: ***1%, **5%, *10% significance levels**

Note that the logit model is the natural logarithm of the odds of success (ratio of probability of success to the probability of failure). Given this, odds ratios will be useful in interpreting the meaning of the model. Let $\underline{X}_a$ and $\underline{X}_a$ be two sets of realizations of the vector of explanatory variables $\underline{X}$. Denote $\hat{\theta}(\underline{X}_a, \underline{X}_b)$ as the estimated odds ratio given two events represented by the

outcomes of the vectors $\underline{X}_a$ and $\underline{X}_b$ respectively. In terms of the model, the odds ratio can be expressed as:

$$\hat{\theta}(\underline{X}_a, \underline{X}_b) = \frac{P(Y=1|\underline{X}_a)}{1-P(Y=1|\underline{X}_a)} \Big/ \frac{P(Y=1|\underline{X}_b)}{1-P(Y=1|\underline{X}_b)}$$
$$= \exp\{\text{logit}[P(Y=1|\underline{X}_a)] - \text{logit}[P(Y=1|\underline{X}_b)]\}$$

The main results are summarized here, and the analysis leverages important interactions across different conditions linked to bribery reporting.

**Public goods**. The model confirms that poor public goods provision is associated with high reported bribery. Lengthier business permit processing is linked to more reported bribery. For instance, bribery reported among those who got their business permits 30 days late is 1.23 times those who got theirs approximately the same day. On average, firms experiencing power interruption for at least an hour will likely report bribery at least 1.14 times that of firms which did not experience power interruption. Reported bribery is also higher among those who said that their roads are poorly maintained, i.e. 1.8 times those who did not rate their roads poor. These findings seem to confirm the argument in the literature that corruption thrives particularly in poor business environments. One possible explanation is that these environments offer ample opportunities for corruption and bribe seeking. This result stands, even with the inclusion of variables that help to account for the quality of local institutions (e.g. the dynastic Mayor and radio stations variables).

**City characteristics**

Population density is positively linked to corruption. On the other hand, having a dynastic Mayor is associated with lower bribery reported, ceteris paribus. However, the interaction term of a dynastic Mayor and prevalent crime in the city, points to a positive and significant link to reported bribery. These results suggest a possible complex relationship between dynastic politics and corruption at the local level. Perhaps dynastic regimes may help temper corruption by minimizing uncertainty and mitigating bribe taking on the margin (including by centralizing and organizing it), as noted in the literature (e.g. Gupta and Abed, 2002; Malesky and Samphantarak,

2008). On the other hand, dynastic regimes that reflect a general failure in political accountability may also undermine the rule of law and fail to mitigate both crime and corruption.

Similarly, the results suggest that having more AM radio stations is associated with more reported bribery, ceteris paribus. This runs contrary to the findings in the literature that media would mitigate corruption, yet it might be possible that in this case, media exposes more corruption (in turn leading to more reported bribery). To further clarify this, we turn to the interaction of radio stations with population density; and the coefficient of the interaction term is negative and statistically significant. This result suggests that the mitigating effect of radio stations on bribery reported is much stronger where the city population is denser. This might be true in cases where groups are better able to facilitate information exchange and organize to exert pressure on politicians, due to proximity among communities and population density in cities.

In terms of poverty, among firms that accessed informal sources for credit, those who live in poorer cities will likely report bribery more than those in less poor cities. For instance, firms in a city with 15 percent poverty incidence will report bribery 1.2 times those in cities with 7 percent poverty incidence. Furthermore, firms that are not happy with the cleanliness of their city will likely report bribery 1.35 times those who are happy with their city's cleanliness.

**Firm level attributes**

Female owned/managed firms appear to report more bribery compared to male-led. However, this is only among those who did not rate their cities as crime prevalent wherein the odds of reporting bribery among female-led firms is 1.27 times that of male-led firms. The odds ratio changes when focusing on those who rated their cities as crime prevalent, i.e. male-led firms report bribery 2.3 times that of female-led firms.

Looking at firm size, smaller or younger firms are less associated with bribery reports. Small and medium scale firms report bribery 1.33 times that of micro firms while those firms 10 years older report bribery 1.13 times that of the reference firm.

Finance and risk taking distinguish those who are reporting bribery as well. Those who accessed formal financing sources will likely report bribery 1.5 times compared to those who did not access formal financing sources. On the other hand, bribery reported among those entrepreneurs/managers who want to move out of the city is 1.44 times that of those who do not want to move out.

## IV. Conclusion

This paper contributes to the international policy discussions and literature on corruption and micro, small and medium sized enterprises (SMEs) by analyzing the correlates of corruption using data on over 1,700 firms in 29 Philippine Cities covered by the 2009 AIM Enterprise Survey. While the analysis is focused on Philippine data, the insights gleaned from this study are likely to be informative for policymakers seeking to better understand (and thus more effectively combat) corruption in decentralized settings. The results suggest that corruption affects Philippine SMEs in a very pernicious way—more corruption is reported by firms if they are located in cities with very poor business environments. For instance, these are among the key findings:

- Bribery reported among those who got their business permits 30 days late is 1.23 times compared to those that receive their permits approximately the same day.
- Firms experiencing an hour of power interruption report bribery 1.14 times more than the firms that don't experience any power interruption.
- Reported bribery is also higher among those who said that their roads are poorly maintained, i.e. almost twice those who did not rate their roads poor.
- Among those entrepreneur/managers who want to move out of the city their firm is in, the odds of reporting bribery among those in dynastic cities is 1.65 times that in non-dynastic cities.
- Among firms that accessed informal sources for credit, those who live in poorer cities will likely report bribery more than those in less poor cities.
- Firms in cities with 15 percent poverty incidence will report bribery 1.2 times those in cities with 7 percent poverty incidence.

Furthermore, an analysis of the possible determinants of corruption incidence in a multivariate regression framework reinforces the abovementioned observations that corruption is linked to certain indicators of public goods provision, city characteristics and firm level attributes. First, cities with dynastic Mayors were associated with less bribery reported by firms, while more AM radio stations was linked to more bribery reported. These results are intriguing as they suggest that variables proxying for local institutional quality (e.g. those contributing to or reflecting political competition and accountability) seem to display complex links with reported bribery. As noted in the literature, long-lived or dynastic political regimes may help reduce the uncertainty

linked to corruption as well as minimize it on the margin, yet these same conditions may also weaken the prospects for stamping out corruption altogether. Media may have a similar ambiguous empirical link with reported bribery, as the presence of media may help curb corruption, while it might also facilitate more information on the practice and more likelihood to report bribery.

Furthermore, the regression results suggest that a lengthier business permit process, and higher population density are among the factors linked to more reported bribery. Over-all, the empirical analysis in this paper provides evidence that Philippine SMEs that tend to be in poorer business environments also appear to be more affected by corruption. This provides additional evidence behind the claim that corruption thrives in less economically competitive environs—and these also tend to be characterized by much poorer and generally inadequate provision of public goods. Drawing on the literature, there are several possible explanations here and these include the observation that there are possibly higher opportunities for corruption bribe-seeking when public goods and services are inadequate and inefficient. Firms will simply pay bribes to be spared the much higher cost of exposure to these poor services. For example, firms pay for fixers to help speed up processing of permits, or they pay for extra security in places with weak security and rule of law.

Addressing the latter challenges by boosting public goods and services provision and by making the business environment more friendly to SMEs could alter the dynamics of the business environment in ways that also reduce opportunities for some forms of corruption. For instance, lowering the number of steps to set up a business could also lower the opportunity for "gatekeepers" to extort bribes. Similarly, reducing poverty such as by improving education, health and other human capital investments could dramatically boost competitiveness. And in addition, it could also have knock-on effects in building a stronger "demand" by a well-educated voting cohort for less corruption and a more professional public sector at the local level. Policymakers need to address these challenges if they are to unleash the full potential of SMEs and their contribution to inclusive growth and stronger human security in highly decentralized and rapidly urbanizing settings like that of the Philippines. Otherwise, corruption is going to continue to serve as a drag to inclusive growth, and that, in turn, could contribute to the continued insecurity faced by many households.

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