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Does judicial quality matter for firm performance?

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A sound legal environment is said to be good for business to the extent that it protects property rights, enforces contracts, and ensures the consistency of policies. By lowering uncertainty and contracting costs, a better judiciary is expected to encourage business investments. We test if this hypothesis holds in the Philippine setting by examining whether and how judicial quality is significant to firm-level growth. We construct a quantitative measure of judicial quality, a Judicial Quality Index, using principal components analysis on a diagnostic survey dataset of judges across 13 regions, and we use this in a regression analysis of firm-level growth using data from micro, small, and medium enterprises across 34 Philippine cities.

We find that higher judicial quality has no independent effect on firm growth. But it does reduce the effect of "bribes" or informal payments, which are typically offered by firms to overcome inordinate delays in government processes or to gain an advantage in business. It therefore makes a positive but indirect contribution to firm performance. In the presence of a better quality judicial system, there is a less compelling need for firms to engage in informal payments to "grease the wheels of commerce".

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1. Introduction

Since Coase [1937] first observed that differential transaction costs affect firm size, functions, and existence relative to markets, studying the interplay between institutional arrangements and economic behavior has become important in understanding the root causes of growth or the lack thereof. Applying the notion more generally, North [1991; 1994] refers to institutions as the "rules of

the game", the incentive structure of a society, and the "political and economic institutions, in consequence, are the underlying determinants of economic performance". Institutions comprise formal constraints (such as rules, laws, constitutions), informal constraints (such as norms of behavior, conventions, self-imposed codes of conduct), and their enforcement characteristics [North 1994:360]. Informal institutions, such as corruption and clientelism, often arise as alternatives to weak formal institutions [Helmke and Levitsky 2003]. Whether formal or informal, institutions may be viewed as pragmatic social constructs that seek to mitigate transaction costs inherent in any economy. Institutions strive to set rules or standards in order to govern human behavior in an organized manner.

How the judiciary interprets and applies laws is part of North's rules of the game. The judiciary can be viewed as an institution that emerged in order to organize how private parties can fairly and effectively contract with one another:

> The inevitability of human error, especially when human interest (which includes the exercise of power as an end in itself) comes into conflict with the claims of others, requires that a judiciary should interpret the law, and the assumptions, which underlie it…. [Marsh 1959:279]

A good legal environment provides for a good business environment since it protects property rights, enforces contracts, and ensures consistent economic policies [Sereno et al. 2009]. This is demonstrated in Chemin [2007], Chakraborty [2013], Garcia and Mora [2013], and Dove [2014], among others, who find evidence that better judicial quality or judicial independence is associated with increased investment and access to finance for firms, better firm performance (in terms of exports, total trade, total sales), relatively smaller firm size, and increased entrepreneurship in India, Spain, and the United States, respectively.

The quality of the judiciary should be of particular concern in developing countries like the Philippines where business decisions are likely to be more sensitive not only to high monetary costs (e.g., fees paid to courts, lawyers, documentation) and non-monetary costs (e.g., stemming from delays in deciding cases) but also to uncertainty with respect to the credibility and validity of contracts [Sereno et al. 2009]. Economic losses due to the suboptimal functioning of the Philippine judiciary have been estimated at ₱7 billion to ₱13 billion for 1999 or one-fourth to half of a percentage point of annual gross domestic product growth foregone [Sereno et al. 2009]. By lowering contracting costs or by enhancing certainty and consistency in the protection of property rights and the enforcement of contracts, a better quality judiciary is expected to encourage business investments [Sereno et al. 2009].

We examine this hypothesized link between the judiciary and firm performance in the Philippines in greater depth. In particular, we examine whether and how judicial quality, quantified using subjective evaluation data of Philippine courts, affects the growth of a cross-section of micro, small, and medium enterprises

across Philippine cities. Initially we find the seemingly paradoxical result that higher judicial quality seems to have no direct and independent effect on firm growth. This appears to run against the grain of the findings of Sereno et al. [2009] who, based on interviews with business people, report that investments and therefore growth in general are held back by the imperfections of the Philippine judicial system.

Laws and their judicial interpretation are part of formal institutions as North defines them. In discharging business, however, firms can also avail themselves of informal institutions that are often characterized by relational contracting. Bribery or corruption by firms can be understood as one form of relational contracting, which substitutes for and undermines the impersonal application of formal institutions. Until recently the relationship between formal and informal institutions has tended to be understood in black-and-white terms, with a wider prevalence of formal institutions always being beneficial to development.[1] Other studies[2], however, suggest a more nuanced view that holds out the possibility that even corruption may be conducive to growth, depending on context. For the Philippines, Mendoza et al. [2015] find that bribery by firms serves as "grease" for the wheels of commerce, particularly for those operating in unfavorable business environments.

In this study, we find that judicial quality appears to be associated with a reduction in the positive contribution of bribes or informal payments. In the context of the sample of firms used here, informal payments are typically offered to overcome inordinate delays in government processes or to gain an advantage in business; informal payments can therefore be interpreted as a means to circumvent higher transaction or contracting costs presented by weak formal institutions. Our results provide initial support for the hypothesis that a better quality judiciary, by reducing formal transaction costs (and the consequent need for informal payments), does matter for economic performance, though not in a straightforward manner. Rather, this is an empirical example of the less-studied relationship between formal and informal institutions when they exist alongside one another, which Dixit [2004] has termed "private ordering in the shadow of the law".

Our use of subjective evaluation survey data in constructing a measure of institutional quality follows the example of Knack and Keefer [1995] and Acemoglu, Johnson, and Robinson [2001] who, in their cross-national analysis, use indices of expropriation risk, rule of law, corruption in government, and quality of bureaucracy that are based on the perceptions of experts.[3] Knack

[1] This is especially true of earlier work, e.g., North [1991], but more recently even North has taken a more nuanced view of the functionality of informal institutions at certain levels of development, e.g., North, Wallis, and Weingast [2009].

[2] Mendoza et al. [2015] provide a useful survey of literature.

[3] Their indices come from the International Country Risk Guide. Apart from this guide, Transparency International constructs a Corruption Perception Index, and the World Bank (Governance) reports a control of corruption index, also based on subjective evaluations of experts or survey respondents.

and Keefer [1995] find that institutions that protect property rights are crucial to economic growth and to investment, with some effects rivaling even those of education; secure property rights affect not only the magnitude of investment but also the efficiency with which inputs are allocated. Acemoglu, Johnson, and Robinson [2001] find that differences in modern-day institutions explain three-quarters of the difference in per capita income across former colony countries. With respect to judicial quality specifically, Sherwood [2004] uses firm perceptions of own-country judicial systems across seven countries and estimates that better-functioning judicial systems are associated with a predicted increase in investment of about 13.7 percent in Brazil, 9.4 percent in Peru, 28 percent in Argentina, 9.9 percent in Portugal, and 6-11 percent in the Philippines.[4] on the Other hand, Wang [2013] uses the perceptions of ordinary Chinese citizens and firm managers to measure judicial corruption and fairness and finds that spending by provincial government on courts has a significantly positive effect on judicial fairness at the prefecture level.

The subjective evaluation data used here is self-diagnostic in nature. The data come from members of the courts themselves rather than from second or third parties (i.e., client-firms, general public, experts). Respondents have been judges for an average of 9 years (with likely more years in the judiciary though not as a judge, although this is not captured) and are privy to the functioning of the courts, including the complex incentive systems that drive it. As such, our quality index is likely to be closer to a measure of *actual* quality rather than a measure of *perceived* quality.

Our results contribute to the policy debate on the importance of well-functioning formal institutions—in this case, the judiciary—to economic outcomes in the Philippines. It is also relevant to the literature on corruption and its impact on the growth trajectory of firms. We build on the model used in Mendoza et al. [2015] which set out to examine whether corruption tends to "throw sand" in the wheels of commerce or "greases them", i.e., whether it hinders the growth of firms by acting like a tax, or whether it enables firms to circumvent bureaucratic red tape that would otherwise weaken competitiveness. Using instruments such as industry location averages of informal payments to deal with endogeneity and drawing on contextual information on the nature of reported "bribery", Mendoza et al. [2015] find that corruption greases the wheels of commerce for Philippine small and medium enterprises—with a positive marginal effect on firm sales' growth—in cities with poor business environments. We use this core model and demonstrate that when a direct measure of judicial quality is included, the marginal effect of bribery on firm growth is reduced by a non-trivial amount (about 2 percentage points) everything else held fixed.

[4] Sherwood [2004] surveyed a cross-section of firms from Brazil (278 firms), Peru (700), Argentina (200), Canada (100), Philippines (320), Spain (500), and Portugal (602). Firms surveyed were primarily involved in services and manufacturing.

The data and methods are discussed in the second section. This is followed by empirical results in the third section. Concluding remarks end the paper.

2. Data and methods

We employ two data sets. The first is from a diagnostic survey of 1,072 judges from across 14 regions commissioned by The Asia Foundation and conducted by Social Weather Station from July 2005 to February 2006.[5] In the survey, respondents were asked to answer a comprehensive questionnaire evaluating the judiciary. Various aspects of the courts and the legal system as a whole were covered, including the rules of court, pre-judicature training, court relations with media, caseloads, compensation and benefits, and corruption and corrupt personnel in each court, to name a few. The survey was used to identify weaknesses in the judicial system which impinge on efficiency and quality.[6]

We employ principal components analysis (see, e.g., Jolliffe [1986]) to construct a regional-level Judicial Quality Index (*JQI*), the summary statistics of which are found in Table 1. By construction, a higher *JQI* score is associated with better judicial quality. That is, a higher *JQI* score would be associated with greater certainty in contract enforcement, lower contracting costs, and better firm performance. Other details on the survey and construction of the *JQI* are found in the Appendix.

TABLE 1. Judicial Quality Index (*JQI*) across regions

Region*	*JQI*	Region*	*JQI*	Region*	*JQI*
I	0.596921	VI	0.614832	X	0.586089
II	0.548302	VII	0.59721	XI	0.639024
III	0.529875	VIII	0.626673	XII	0.622754
IV-A and IV-B	0.507127	IX	0.624054	NCR	0.531325
V	0.620587				

Source: Authors' calculations

* No observations for the Cordillera Administrative Region, the Autonomous Region in Muslim Mindanao, and Caraga. See footnote 5.

The second data set we use is firm-level data from the Asian Institute of Management Enterprise Survey. The survey was conducted for the first time during the second and third quarters of 2009 with a second round in the same

[5] "Region" here refers to place of work. There were no observations for the Cordillera Administrative Region, the Autonomous Region in Muslim Mindanao, and Caraga.

[6] The collection of data may *prima facie* be subject to bias and conflict of interest since the ones critiquing the judiciary are themselves members of the institution. However, The Asia Foundation noted that the judge-respondents welcomed this survey as it provided them with an opportunity to vent regarding the legal system. They voiced their concerns as individuals operating within a larger system. Compared to public perception surveys, which focus on the confidence of the users in the judiciary, The Asia Foundation survey relied on the expertise of the respondents as persons who are able to characterize the institution from within.

quarters of 2012, which is the data used in this study. The 2012 round covered 2,040 micro, small, and medium enterprises across 34 cities, 16 regions, and 13 different industries. Among other economic variables, the data set we obtained contained information on total sales in 2012 and 2009, taxes paid to the Bureau of Internal Revenue and the local government in 2009, college graduate concentration among employees, firm size, and power outages per month, industry, and region.[7] Also included are questions on gifts or informal payments paid to public officials, measured as a percentage of total annual sales in both 2011 and 2009. In obtaining responses about the sensitive topic of informal payments, an indirect approach was used, allowing the respondent to provide information without being implicated.[8] This step, along with other steps taken to strengthen the data collection process, is discussed fully in Mendoza et al. [2015].

Of the more than 2,000 firms in the survey, 70.2 percent, or 1,433 firms, reported informal payment figures in 2009 (of which 178 firms indicated a bribery percentage greater than 0); 19 percent did not know how much was paid; 3.4 percent "refused" to provide an answer; and around 7 percent did not furnish a reason for not providing a bribery figure [Mendoza et al. 2015:420].[9] Mendoza et al. test for potential selection bias (i.e., whether the same percentage of those that declared informal payments and those that did not have similar sales growth) and find none, but they note that those that provided bribery figures have significantly higher sales growth than those that did not (ibid). The sample is in fact driven by firms (around 89 percent) that were motivated to engage in bribery activities to avoid delays in transactions with the government or to get ahead of the competition, rather than those who were approached directly for payments by a government official (around 11 percent).[10] That the former dominates is consistent with the country's showing in global comparisons of "ease of doing business" (of the World Bank), for instance, where the country slid in its ranking from 8 in 2013 to 95 in 2014 (out of 189 countries) and is ranked 161 out of 189 countries (and the worst-ranked among ASEAN economies) with respect to starting a business, as well as with results from local surveys of firms on corruption. (See discussion in

[7] The data set we obtained in January 2014 was a partial one and did not include information on city of origin. Nor did we obtain data on political dynasties which we understand to be from a separate data set.

[8] As reported in Mendoza et al. [2015:420], the question reads: "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?"

[9] Missing data for the bribery measure is not deemed to be related to observed variables, and a refusal to answer represents a small fraction of the sample in any case. Missing data in other key variables is likewise argued as not a significant problem. See footnote 12 in Mendoza et al. [2015].

[10] Respondents were asked "What is the usual motivation in paying 'informal payments' to facilitate a business transaction with the government?" They were given the following choices: (a) a government official outright asked for it; (b) inordinate delay in business related process with the government; and (c) voluntary from the firm to obtain favors and get ahead of other businesses". See Mendoza et al. [2015:421].

Mendoza et al. [2015:421, 422]. This profile of respondents provides the context for the understanding of regression results.[11]

Descriptive statistics for key variables are presented in Table 2.

TABLE 2. Descriptive statistics of key variables

Variable	Observations	Mean	Standard deviation
2012 total sales	944	6,611,440	4.28e+07
2009 total sales	808	7,403,248	9.18e+07
Percent of revenue reported as Bureau of Internal Revenue tax, 2009	808	10.16319	8.20306
Percent of revenue reported as local tax, 2009	808	6.176423	6.141575
Number of power interruptions per month	944	9.534958	22.49937
Informal payments as percent of revenues, 2009*	808	1.072463	4.864227
Percent of college graduates among employees	944	22.4665	33.38512
Micro enterprises	944	.5158898	.5000124
Small enterprises	944	.2478814	.4320115
Medium enterprises	944	.2362288	.4249895

Source of base data: 2012 Asian Institute of Management Enterprise Survey, partial data set

*Of the 808, 89.6 percent reported that they voluntarily offered payments to avoid delays or get ahead, and 10.1 percent reported that they were approached by a government official. The rest did not know.

3. Hypothesis and empirical framework

We test the hypothesis that a judiciary of better quality has a positive effect on firm performance. The effect may be direct (e.g., greater confidence in the certainty and consistency of impartial contract enforcement is associated with greater investment), or indirect (e.g., reducing formal contracting costs reduces the usefulness of bribes needed to "grease the wheels" since the absence of a queue eliminates the need to pay to speed up services). We build on the model of corruption and firm performance used by Mendoza et al. [2015], which is itself based on Fisman and Svensson [2007], by incorporating a direct measure of judicial quality.

Our initial empirical model is:

$$SalesGr_i = \alpha_0 + \alpha_1 Bribery_i + \alpha_2 JQI_i + \alpha_3 X_i + \varepsilon_i \qquad (1)$$

where firm performance is proxied by sales growth defined as $SalesGr_i = \log(2012$

[11] In Mendoza et al. [2015], the significance of bribery to firm performance holds for the full sample of firms as well as for just the sample of "proactive bribe-offering" firms but not for the sample of firms who are approached by "proactive bribe-seeking" government officials. Hence the nuanced finding that while bribery may have an ambiguous link to firm performance on average, "the link tends to be clearer when the bribery context is specified" [Mendoza et al. 2015:430].

Sales_i) - log(2009 Sales_i)]/2; $Bribery_i$ is the indicator for corruption, defined as the percentage of total revenues allotted to informal payments in 2009; JQI_i is the newly constructed Judicial Quality Index, as earlier described; and X_i is a vector of explanatory variables for firm performance from Mendoza et al., although not all have been retained.[12] In equation (1), α_3, is a vector of coefficients conformable with X_i . Vector X_i includes

- Taxes (*TotalTax*) paid to the national and local government in 2009 as a percentage of firm revenues, expected to have a negative effect on firm sales growth;
- Educational attainment of firm employees (*CollegeGrad*) as a proxy for human capital, measured as the percentage of employees with four or more years of college education, which is expected to have a positive effect;
- Power outages (*Power*) as a proxy for the quality of infrastructure and utilities in the region, expected to have a negative effect;
- Sales in the base year of 2009 (*lnSales2009*). The higher the amount of sales of the firm during this base year, the flatter the growth trajectory of the firm; and
- Firm size, classified as micro (with 1 to 9 employees), small (from 10 to 99 employees), and medium (from 100 to 199 employees). The effect of size is not clear. Larger firms may have economies of scale, contributing to growth, but they may also be nearing an optimal size, and thus be demonstrating slower growth rates.

Bribery is likely to be endogenous, however, whether from possible measurement errors in the self-reported estimates of informal payments or because firms with greater growth or with a perceived higher propensity to pay may be targeted by bureaucrats or levied a larger amount by bureaucrats if approached (Mendoza et al. [2015]). Thus *Bribery* is instrumented using industry-location averages, following the original paper, but with the addition of *JQI* as an instrument to *Bribery*. As earlier hypothesized, and assuming *JQI* is exogenous to sales growth, a more efficient judicial system could influence the business performance indirectly by reducing the need to give bribes.[13] Our second

[12] Other variables employed by Mendoza et al. [2015], such as firm age, export/import orientation, and political dynasties, were not retained in this study because they yielded insignificant results; data on political dynasty were also not in the data set we obtained. Instead, we add power supply and also specify firm size as a set of categorical variables, departing from Mendoza et al. who specify it as a continuous variable.

[13] Instrument exogeneity, i.e., *JQI*, is exogenous to firms sales' growth in Equation (1) and is one of two assumptions *JQI* must satisfy to be an IV candidate for *Bribery*. The other is instrument relevance, that is, in Equation (3), $E(v) = 0$, v is uncorrelated with b_1, b_2, and b_3, and $b_1 \neq 0$. We maintain that the second condition holds because while the active solicitation of bribes (e.g., by bureaucrats to "extort" payments) could have a "'knock-on"' effect on firm-client or public perceptions of judicial quality (i.e., by creating the conditions for many contests in the judicial system), knock-on effects on insider opinion of structural

empirical model is therefore the structural equation:

$$Salesgr_i = a_0 + a_1 Bribery_i^{\text{ins}} + a_3 X_i + \varepsilon_i \quad (2)$$

where *Bribery* is instrumented with the following reduced form:

$$Bribery_i = \beta_0 + \beta_1 JQI_i + \beta_2 IndLocAve_i + \beta_3 X_i + v_i \quad (3)$$

In Equation (3), $IndLocAve_i$ are industry location averages, computed by classifying firms according to region and industry as per the 1994 Philippine Standard Industrial Classification.[14] All other variables in (2) and (3) are defined as they were in (1). Vector β_3 is like α_3 also understood to be conformable for multiplication with vector X_i.

Model (1) will be implemented using ordinary least squares (OLS). Model (2) will be implemented using two-stage least squares (2SLS).

4. Results

The results confirm that judicial quality has no independent effect on firm performance, but, rather, it has a positive and significant indirect effect operating through *Bribery*.

Table 3 presents the results of the OLS without and with the *JQI*. *JQI* has no statistically significant influence on firm sales growth (demonstrating instrument exogeneity) and the signs and coefficients of the other explanatory variables are as expected (i.e., consistent with original results of Mendoza et al. [2015]). Specifically,

- Without correcting for endogeneity and measurement errors, *Bribery* has a positive but practically insignificant effect on firm growth. A one-percentage point increase in bribery increases firm growth by less than 1 percentage point;

weaknesses of the judiciary (which have been impinging on efficiency and quality at regional levels over the longer term) are not likely. Likewise, while a poor-quality judiciary could encourage bribery in the business environment, firm-level bribery practices, even if they do spill over to the judiciary, are also not likely to alter systemic weaknesses in the larger legal system averaged at regional levels (or views thereof). We gratefully acknowledge the comments of an anonymous referee who sought clarification on this matter.

[14] This procedure is borrowed from Mendoza et al. [2015] who argue that industry-specific factors behind bribery are influenced by technology and the rent-extraction propensities of bureaucrats in that industry and both are plausibly assumed to be exogenous to the firm, and, therefore, are not directly linked to firm performance. Mendoza et al. cite Fisman and Svensson [2007] who make the same argument. Mendoza et al. also use industry-location averages at the city level, which turn out to be a stronger instrument; however, while magnitudes of coefficients change, the statistical significant patterns associating bribery with firm performance do not. We were unable to obtain city-identifiers, however, and we were unable to replicate this.

- Taxes paid have a statistically insignificant effect on sales growth;
- Increasing the number of employees with at least four years of college education by one-percentage point increases firm growth by 0.08 percentage points;
- Power interruptions per month have a negative but statistically insignificant effect on firm growth;
- Sales in 2009 have a negative and significant effect. As expected, firms that had bigger initial sales in 2009 experience have a flatter growth trajectory; and
- Firm size matters, with larger firms demonstrating greater growth. The approximate difference in sales growth between small and micro firms is 5 percentage points; between medium and micro firms, it is 11 percentage points.

TABLE 3. Coefficient estimates of the Model (1) using Ordinary Least Squares, without and with *JQI*

Dependent variable: *SalesGrowth*		
Explanatory variables	**Without *JQI***	**With *JQI***
JQI		-0.3502494
Bribery	0.0084371***	0.0081644***
TotalTax	0.0010981	0.0010978
CollegeGrad	0.0008414**	0.0008433**
SmallDUMMY	0.0565553**	0.0561808**
MediumDUMMY	0.1167907***	0.1151726***
Power	-0.0000517	0.0001397
lnSales2009	-0.0520199***	-0.0516783***
Constant	0.6938278***	0.8906899***
Observations	808	808
Adjusted R-Squared	0.0768	0.0797

Source: Authors' computations

*Significant at 10 percent level
**Significant at 5 percent level
***Significant at 1 percent level

Table 4 presents the estimation results of 2SLS with and without *JQI* as an instrument for *Bribery*. First, the magnitude of the effect of bribery on firm growth increases markedly when endogeneity is addressed. Second, the relevance of *JQI* as an instrument is confirmed by the first-stage results, which show that *JQI* has a negative and statistically significant effect on *Bribery.* Third, the impact of *JQI* is demonstrated in the second stage, where the effect of bribery on firm growth is reduced by a non-trivial amount—about 2 percentage points—when *JQI* is included as an instrument relative to when *JQI* is omitted as an instrument. This suggests that a better judiciary could dampen the contribution of and,

consequently, the need for, bribery on firm growth. A post-estimation endogeneity test supports the treatment of *Bribery* as an endogenous variable.[15]

Other results are as follows: total taxes and power interruptions still fail to show significant correlations with firm growth. Raising the number of employees with at least four years of college education by one percentage point increases firm growth by 0.1 percentage points. There is no statistical difference between being a small firm and a micro firm, but medium firms have a statistically higher growth relative to micro firms by 12 to 13 percentage points. The variable for sales in 2009 continues to have a negative and significant effect on firm growth.

TABLE 4. Estimates of Model (2) using Two Stage Least Squares, without and with *JQI* as an instrument for Bribery

First stage	**Dependent variable: *Bribery***	
Explanatory variables	**Without *JQI***	**With *JQI***
IndLocAve	0.2091314**	0.173924*
JQI		-7.341819**
TotalTax	0.0491218***	0.490309***
CollegeGrad	-0.0043291	-0.0042531
SmallDUMMY	-0.0069578	-0.0269708
MediumDUMMY	-0.1799700	-0.2191780
Power	-0.0052351	-0.0016245
lnSales09	0.4225062***	0.4329607***
Constant	-5.680794***	-1.56
Observations	808	808
F-statistic	6.36***	6.03***
Second stage	**Dependent variable: *SalesGrowth***	
Explanatory variables	**Without *JQI***	**With *JQI***
Bribery	0.0904298*	0.0698191*
TotalTax	-0.0030282	-0.0019910
CollegeGrad	0.0011908**	0.001103**
SmallDUMMY	0.0632772	0.0615875
MediumDUMMY	0.1347324*	0.1302224**
Power	0.0005955	0.0004328
lnSales09	-0.0895402***	-0.0801086***
Constant	1.178363***	1.056564***
Observations	808	808
Wald-chi^2	21.40 ***	29.95***

Source: Authors' computations

*$p < 0.1$
**$p < 0.05$
***$p < 0.01$

[15] Durbin and Wu-Hausman test statistics are highly significant: Durbin (score) chi^2(1) = 11.2662 (p = 0.0008); and Wu-Hausman F(1,799) = 11.2982 (p = 0.0008).

5. Concluding comments

We present evidence that a better-quality judiciary diminishes the contribution of, and therefore the need for, informal payments to firm growth. In this specific context, informal payments primarily arise as a way for firms to avoid high transaction or contracting costs presented by weak formal institutions and have a positive effect on firm growth. By reducing expected contracting costs, an efficient judiciary eliminates the need for firms to undertake informal payments in order to produce and grow. Dixit [2004:29-32] suggests that one way this interaction between informal and formal institutions occurs is for the law to serve as a "backdrop" to private ordering, interpreted in this case to mean a potentially corrupt transaction between a private firm and a corruptible official. If the corrupt transaction is modeled as a bargaining game, the expected awards under legal institutions of a certain quality determine the threat points of the parties involved. A better-quality judiciary essentially improves the threat point of the private firm and thus reduces the corrupt official's leeway for bargaining for a bribe. This is then naturally associated with a smaller likelihood for bribery and smaller bribe amounts.

The findings reported here are, of course, preliminary. "Proactive bribe-offering entrepreneurs" dominate the sample (versus respondents reporting "proactive bribe-seeking officials"), and it is not clear what would have obtained with a more balanced profile of respondents (although it is more than likely that replicate samples would have provided similar profiles of respondents given the well-known difficulties in doing business in the country); instruments can be further refined, for instance, industry-location averages are at the regional level rather than the city level and other measures of judicial quality could be explored; the construction of either data set does not lend itself to generalizing results for the entire country, for instance, not all regions represented in The Asia Foundation data set.

Still, results are statistically robust enough to suggest possible policy handles to deal with the dilemma of how to reduce bribery and corruption, especially when there are positive economic returns to bribery for firms. Follow-on questions for research would be what would be required to improve the judiciary and whether different reform interventions would be justified from a benefit-cost ratio point of view. The quality of the judiciary has to do with, for instance, cumbersome rules of court (or the degree of simplicity or complexity of rules), over-clogging of court dockets, compensation and benefits, and even the frequency of judicial corruption itself. The American Bar Association's Judicial Reform Index for the Philippines, released March 2006, finds that resource constraints complicate efficiency and corruption problems in the judiciary. Inadequate allocation of funds leads to deficiencies in maintenance, equipment, and supplies; these shortages force judges and clerks, particularly in the lower courts, to rely on local governments, "friends", or their own pockets as alternative sources of funds. Apart from simple

resource constraints, the lack of sufficient expertise or competence on the part of judges or lawyers to process cases in a timely fashion, political pressure which complicates the resolution of cases, and the poor design of the law which also renders cases complex contribute to poor judicial quality [Sereno et al. 2009].

Further research on the institutional quality of the judiciary and the costs of poor quality is warranted given the potential role that the judiciary plays at both the micro and macro levels of the economy. Objective indicators—such as the length of time before a case is decided, the number of corruption cases filed against a court in the Supreme Court or Sandiganbayan, the number of times a hearing is reset, and the like—may be considered. Such indicators provide a glimpse of transaction costs that the judicial system itself entails and can provide guidance as to where reform interventions may be most cost-effective.

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APPENDIX: Constructing the Judicial Quality Index

In the survey of judges used for this study, 1,072 judges from 14 out of 17 regions (Table A1) were asked to answer a comprehensive questionnaire covering various aspects of the courts and the legal system as a whole, such as the adequacy and/or efficacy of rules of court, the continuing trial system, court-annexed mediation, pre-judicature training, ongoing training, mediation, media relations, compensation and benefits, personal security, and the barangay justice system, as well as their opinions on the consistency of court decisions and the extent of corruption and corrupt personnel in each level of court.[16] The responses were mainly qualitative in nature and were transformed into a mathematically tractable form using Principal Components Analysis [Jolliffe 1986]. Principal Components Analysis provides an empirical methodology (rather than criteria from theory) for assigning weights to important factors, which are then used to develop an index. Basically, Principal Components Analysis compresses the variables into components by taking the variance of these variables and redistributing them orthogonally.

Indicators relating to corruption and corrupt personnel in the Court of Appeals, the Sandiganbayan, the Regional Trial Court (RTC), the Metropolitan/Municipal Trial courts (MTC), consistency of court decisions, court-media relations, and pre-judicature training of judges were tested. From among these indicators, the Principal Components Analysis identified four variables as most relevant: corruption in the RTC; corruption in the MTC; corrupt personnel in the RTC; and corrupt personnel in the MTC. The firms which have any dealings with the judicial system have the most direct contact with the RTC and MTC.

The values in the responses were recoded, with neutral-sounding answers grouped together: 1 Very Many; 2 Many; 3 Some; 4 No Answer/Don't Know/

[16] The data is disaggregated into 13 regions. The Cordillera Administrative Region, the Autonomous Region in Muslim Mindanao, and Caraga were not included in the study. Regions IV-A and IV-B are merged. Courts are disaggregated into the Regional Trial Court (RTC), Municipal Trial Court (MTC), Municipal Trial Courts in Cities (MTCC), Municipal Circuit Trial Court (MCTC), Metropolitan Trial Court (METC), and Shari'a Courts (SCC).

Refused; 5 A Few; and 6 Very Few/None. Then Likert scales—the coded numbers which are used for indicating the survey response—were banded in order to have a unit of measure between the values 0 and 1 using the formula: $X_{banded} = [X_i - \min(X)]/ [\max(X) - \min(X)]$. Thus, the progression of values from 1 to 6, indicating an improvement in evaluation of corruption, was transposed to values from 0 to 1.

The summary statistics of the four original variables are presented in Table A2, while the summary statistics after the transformation is presented in Table A3.

Next, five different indices were constructed by using different permutations of the four indicators. Depending on which combination was used, their respective factor loadings were added and used as a denominator. The particular factor loading was then divided by this denominator in order to generate a weight. The mean value per region of a given indicator was then multiplied with its respective weight in order to generate the overall score for the Index for that particular region.

The five permutations are described below (Table A4) together with respective factor loadings and weights (Table A5) and overall score (Table A6).

For the purposes of this paper, we present results using Index 1. However, the same results were obtained regardless of the index used. Results are available upon request.

TABLE A1

	Court						
Region	**RTC**	**MTC**	**MTCC**	**MCTC**	**METC**	**SCC**	**Total**
I	45	25	7	20	0	0	97
II	24	5	3	11	0	0	43
III	58	29	14	9	0	0	110
IV-A and IV-B	51	43	13	15	0	0	122
V	43	17	11	12	0	0	83
VI	48	14	19	28	0	0	109
VII	31	11	17	21	0	0	80
VIII	25	23	2	19	0	0	69
IX	13	1	7	4	0	0	25
X	30	0	8	27	0	0	65
XI	22	16	12	0	0	0	50
XII	12	1	4	7	0	12	46
NCR	133	0	0	0	40	0	173
Total	535	185	117	173	40	22	1072

TABLE A2

Indicator	Response	Mean	Standard deviation
Corruption in the RTC	1 – Very Many 2 – Many 3 – Some 4 – A Few 5 – Very Few/ None 6 – No Answer 7 – Don't Know 9 – Refused	4.553172	2.217612
Corruption in the MTC		4.841418	2.303945
Corrupt personnel in the RTC		4.441231	2.201836
Corrupt personnel in the MTC		4.627799	2.207383

TABLE A3

Indicator	Mean	Standard deviation
Corruption in the RTC	.5755	.2681
Corruption in the MTC	.5798	.2543
Corrupt personnel in the RTC	.5621	.2670
Corrupt personnel in the MTC	.5864	.2668

TABLE A4

Index	Components
Index 1	All four indicators
Index 2	Corruption in the RTC and corruption in the MTC
Index 3	Corruption in the RTC and corrupt personnel in the RTC
Index 4	Corruption in the MTC and corrupt personnel in the MTC
Index 5	Corrupt personnel in the RTC and corrupt personnel in the MTC

TABLE A5

	Index 1		Index 2		Index 3		Index 4		Index 5	
Indicator	**Factor loading**	**Weight**	**Factor loading**	**Weight**	**Factor loading**	**Weight**	**Factor loading**	**Weight**	**Factor loading**	**Weight**
Corruption in the RTC	0.4882	0.2442	0.4882	0.5024	0.4882	0.4872	-	-	-	-
Corruption in the MTC	0.4835	0.2418	0.4835	0.4976	-	-	0.4835	0.4849	-	-
Corrupt personnel in the RTC	0.5139	0.2571	-	-	0.5139	0.5128	-	-	0.5139	0.5001
Corrupt personnel in the MTC	0.5136	0.2569	-	-	-	-	0.5136	0.5151	0.5136	0.4999
Total	1.9992	1	0.9717	1	1.0021	1	0.9971	1	1.0275	1

TABLE A6

Region	Index 1	Index 2	Index 3	Index 4	Index 5
I	0.596921	0.57732	0.584721	0.609181	0.615457
II	0.548302	0.567419	0.529398	0.567301	0.530223
III	0.529875	0.535512	0.534219	0.525509	0.524545
IV-A and IV-B	0.507127	0.5008	0.499243	0.515051	0.513111
V	0.620587	0.61561	0.602348	0.638918	0.625294
VI	0.614832	0.62567	0.606022	0.623687	0.604583
VII	0.59721	0.606159	0.582372	0.612123	0.588747
VIII	0.626673	0.604313	0.611966	0.641455	0.64782
IX	0.624054	0.624116	0.627487	0.620604	0.623995
X	0.586089	0.586027	0.561578	0.610723	0.586147
XI	0.639024	0.63799	0.640103	0.63794	0.640001
XII	0.622754	0.626129	0.621405	0.62411	0.619562
NCR	0.531325	0.549167	0.536505	0.526118	0.514452