Public Disclosure Authorized

Public Disclosure Authorized

WPS6949

Policy Research Working Paper 6949

Deals and Delays

Firm-level Evidence on Corruption and Policy Implementation Times

Caroline Freund
Mary Hallward-Driemeier
Bob Rijkers

The World Bank
Development Research Group
Finance and Private Sector Development Team
and Trade and International Integration Team
June 2014

Abstract

This paper examines whether demands for bribes for particular government services are associated with expedited or delayed policy implementation. The "grease the wheels" hypothesis, which contends that bribes act as speed money, implies three testable predictions. First, on average, bribe requests should be negatively correlated with wait times. Second, this relationship should vary across firms, with those with the highest opportunity cost of waiting being more likely to pay and face shorter delays. Third, the role of grease should vary across countries, with benefits larger where regulatory burdens are greatest. The data are inconsistent with all three predictions. According to the preferred specifications, ceteris paribus, firms confronted with demands for bribes take approximately 1.5 times longer to get a construction permit, operating license, or electrical connection than firms that did not have to pay bribes and, respectively, 1.2 and 1.4 times longer to clear customs when exporting and importing. The results are robust to controlling for firm fixed effects and at odds with the notion that corruption enhances efficiency.

This paper is a product of the Finance and Private Sector Development Team and the Trade and International Integration Team, Development Research Group. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at mhallward@worldbank.org or brijkers@worldbank.org.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

Produced by the Research Support Team

Deals and Delays

Firm-level Evidence on Corruption and Policy Implementation Times

Caroline Freund* Mary Hallward-Driemeier** Bob Rijkers**

JEL codes: K42, L51, O17, L25

Keywords: Governance, corruption, bribes, licenses, enforcement

---

* Peterson Institute for International Economics; ** Development Research Group, The World Bank. We thank Anna Kochanova for excellent research assistance and the editor, three anonymous referees, Marc Schiffbauer, Aart Kraay as well as seminar participants at the World Bank and University of Oxford for useful comments. This work was supported with funding from the governments of Norway, Sweden, and the United Kingdom through the Multidonor Trust Fund for Trade and Development (P1481495) and with funding from the government of Japan through the Knowledge for Change Program, (TF014655).

1 Introduction

Can corruption accelerate policy implementation? This question is part of the larger debate regarding the role of corruption in private sector development. Most studies conclude that corruption retards economic growth by distorting incentives, increasing transaction costs and aggravating uncertainty, leading to misallocation and underinvestment (Murphy et al, 1991, Shleifer and Vishny 1993, Rose-Ackerman 1997, Mauro, 1998, Fisman and Svensson, 2005). Yet, some have argued that corruption can enhance efficiency by enabling entrepreneurs to circumvent burdensome business regulation, or by incentivizing bureaucrats to work harder with bribes working as a piece rate (Leff 1964, Huntington 1968, Lui 1985, Lein 1986).

This paper revisits this issue by examining the relationship between requests for bribes and the time it takes to complete various regulatory requirements – getting construction permits, operating licenses, electrical connections, and clearing customs – using firm-level data from the World Bank Enterprise Surveys. More specifically, the paper tests three predictions implied by the "grease the wheels" hypothesis, which postulates that (i) firms confronted with bribes should get things done faster ceteris paribus. It also predicts that this relationship is heterogeneous both across firms and countries, with (ii) firms with a higher opportunity cost of waiting being willing to pay more and consequently facing shorter wait times, and (iii) bribing being more beneficial when regulation is onerous, such that the relationship between bribing and wait times should be starker in countries with more protracted *de jure* regulations.

In spite of extensive theoretical analysis of the relationship between regulation, corruption, and bureaucratic efficiency (see e.g. Acemoglu and Verdier, 2000, Aidt, 2003, Cadot, 1987, Schleifer and Vishny, 1993, Rose-Ackerman, 1975, 1999), examining the relationship between corruption and the efficacy of policy implementation itself has largely been neglected to date. Previous studies using firm-level data have studied the determinants of the incidence of corruption (Svensson, 2003) and its

(indirect) impact on firm performance in terms of employment and sales growth (Fisman and Svensson, 2007; Aterido, Hallward-Driemeier and Pages, 2011) as well as investment (O' Toole and Tarp, 2012), but not on the duration of policy implementation associated with the provision of particular government services. A notable exception is the study by Kaufmann and Wei (1999), which demonstrated that firms that pay bribes tend to spend more, not less, time with government officials overall. While suggestive, their paper neither examines actual implementation times nor controls for firm-fixed effects. Moreover, it does not systematically assess heterogeneity, which is an important but often overlooked corollary of the "grease the wheels" hypothesis.

Policy implementation times directly affect firm performance and are a very suitable metric for assessing government effectiveness both within and across countries (which perhaps explains why they feature prominently in cross-country comparisons of regulations such as the World Bank's *Doing Business* database). In addition, there is ample evidence that the impact of regulation on economic outcomes is contingent on its implementation, and that protracted policy implementation impedes trade (Freund et al., 2011), job creation (Freund and Rijkers, 2012), firm entry (Klapper, Laeven and Rajan, 2006), productivity (Nicoletti and Scarpetta, 2003) and growth (Djankov et al., 2005).

The World Bank Enterprise Surveys are well suited for analyzing the association between bribing and policy implementation duration. In addition to containing detailed information on firm characteristics, the surveys include questions on a set of government services or permits that might have been sought, whether extra payments or gifts were requested, and the time it took to complete the process. Having data on multiple transactions for the same firms not only allows for the testing of the robustness of results across services, it also allows for controlling for firm fixed effects, such that identification is based on variation in the incidence of bribe requests across different types of permit applications made by the same firm. The data also enable us to assess heterogeneity by means

of difference-in-difference designs and quantile regressions which allow for a differential impact of bribing across the distribution of policy implementation times.

Previewing our main findings, the results of this paper consistently demonstrate that demand for bribes are *not* associated with accelerated implementation, and instead tend to be associated with protracted policy implementation. According to our preferred estimates, firms confronted with demands for bribes or expectations that a gift must be paid on average take 1.5 times as long to get a construction permit, operating license or electrical connection ceteris paribus, and 1.2 and 1.4 times as long to clear customs for exporting and importing respectively. The positive association between demands for bribes and the duration of policy implementation remains when controlling for firm and entrepreneurs' (unobserved) characteristics, as well as using alternative bribe proxies, and helps explain the remarkable heterogeneity in de facto policy implementation times demonstrated by Hallward-Driemeier and Pritchett (2011).

The data are also at odds with the second and third testable predictions of the grease hypothesis, notably heterogeneity in the relationship between demands for bribes and policy implementation times across firms as well as across countries. Firms that are likely to pay higher bribe amounts do not report shorter delays when confronted with a request for a bribe ceteris paribus. Moreover, quantile regressions demonstrate that the association between bribes and delays holds across the distribution of policy implementation times; even for firms that get things done relatively quickly bribe demands are associated with delays. If those firms would have been able to get things done faster by paying bribes, one would have expected bribe demands to be associated with expedited implementation instead.[1] Last but not least, we find no evidence for the proposition that corruption enhances efficiency when the *de jure* business environment is burdensome.

[1] Nonetheless, we do find weak evidence that larger firms suffer longer delays when asked for bribes, a result which may perhaps reflect the greater complexity and scale of their operations In this regard, it is very re-assuring that our main results hold when controlling for firm fixed effects.

It should be noted that we cannot establish the direction of causation.[2] Even so, the association between bribes requests and delays is consistently significantly negative, which is at odds with the grease the wheels hypothesis predicting bribes would be associated with accelerated policy implementation times.

The remainder of this paper is organized as follows; the next section reviews related literature, distils testable predictions from it and explains our and econometric strategy. The third section describes the data. Results are presented in section four. A final section concludes.

2 Conceptual Considerations and Econometric Strategy

2.1 Competing Hypotheses: "Grease vs Sand"

Whether and if so, when, corruption enhances efficiency continues to be the subject of significant controversy (see e.g. Bardhan, 1997, and Svensson, 2005 for reviews of the literature). While the cross country correlation between corruption, underdevelopment and underinvestment has been appealed to as evidence for the conventional wisdom that corruption is typically detrimental to economic performance (Mauro, 1995), a substantial body of literature has been devoted to the idea that there are instances in which corruption may enhance welfare. A particularly prominent view is that in a second-best world corruption can compensate for the consequences of deficient institutions, which is at the root of the "grease the wheels" hypothesis stipulating that corruption enhances efficiency and especially so in environments characterized by bad bureaucracies and poor policies (Meon and Sekkat, 2005, Meon and Weill 2010), even if some resources have to be invested into corrupt activities.

[2] Note also that we are not identify the overall effects of corruption on policy implementation times, but instead document the differentials in policy implementation duration associated with being asked for a bribe within an already-corrupt system.

The efficiency enhancing impact of corruption can work through various channels. To start with, corruption may limit the adverse effects of inefficient regulations (Leff, 1964). In addition, the opportunity to receive side payments may enhance the quality of bureaucrats by raising their effective compensation (Leys, 1964 and Bailey 1966) and provide incentives to speed up service times in sluggish bureaucracies if bribes work as a piece rate. Moreover, corruption may enhance allocative efficiency if bribery is competitive and bureaucrats prioritize serving those with the highest willingness to pay, who presumably derive the greatest surplus from being served (Beck and Maher, 1986, Lien, 1986). The bribery models of Beck and Maher, (1986) and Lien (1986), for example, replicate the efficiency outcomes of competitive bidding.

In regards policy implementation duration the "grease the wheels" hypothesis predicts that ceteris paribus (i) bribe paying agents are likely to "get things done" faster. An important but often neglected implication of the "grease the wheels" hypothesis is heterogeneity in the relationship between bribes and implementation times, both across firms and countries. To start with, it predicts that (ii) firms with the highest opportunity cost of waiting, or the lowest ability to evade bureaucratic harassment, should be expected to be more willing to pay to avoid delays.[3] Firms with deeper pockets would also be more able to pay; the speed of policy implementation would likely increase with the size of the bribe payment. Moreover, (iii) the beneficial impact of corruption might be expected to be larger the more burdensome de jure regulations are. Where the formal requirements for compliance allow for long processing times and multiple procedures, the scope for speed money should be all the greater.

These efficiency arguments, however, may fail if officials inflict deliberate administrative delays to extract bribes (as suggested by Myrdal 1968). This ability to target specific firms to induce them

[3] As pointed out by Meon and Sekkat (2005), the auction analogy can break down when there is winner's curse, those most willing to pay are more willing to cheat on other dimensions (Rose-Ackerman, 1997), or policy implementation is not ex-post enforceable.

to pay bribes is at the heart of the "sand in the wheels" hypothesis which predicts that bribe demands will be associated with longer delays. Kaufmann and Wei (1999), for example, present an endogenous model of bribery and harassment which they model as a Stackelberg game in which the official moves first and chooses an optimal level of red tape to maximize bribe intake. Firms act as price-takers maximizing profits. The model predicts a positive, rather than a negative association, between bribery and red tape since bureaucrats will impose delays based on firms ability to pay, even though bribe payments themselves reduce effective red tape conditional on bureaucratic harassment.

However, this "sand in the wheels" hypothesis is not entirely compelling since one might anticipate that informed firms cognizant of the possibility that bureaucrats will impose delays on them might offer to pay bribes sooner to avoid additional delays. In addition, the "sand" hypothesis assumes bureaucrats are somehow able to price discriminate and detect which firms are willing to pay more than others. Cadot's (1987) model of the allocation of permits by officials systematically analyses the implications of different informational assumptions; when information is perfect and agents are perfectly informed about each other's type and discount rate, a unique separating equilibrium emerges in which agents benefitting from bribing, pay instantly when confronted with dishonest officials. However, uncertainty about the characteristics of the bureaucrat and the entrepreneur can result in multiple equilibria, in which delays serve as useful signals about one's type, akin to the literature on stalling in bargaining (Crampton 1992, Kennan and Wilson 1993, Babcock and. Loewenstein 1997, Abreu and Gul 2000, Thanassoulis 2005).

Thus, the main challenging in discriminating between these competing "grease" and "sand" hypotheses is identification of counterfactual outcomes. One would ideally run an experiment in which identical firms varying only in their willingness to bribe were exposed to different bureaucrats varying only in their propensity to engage in corrupt practices (and perhaps the de jure regulations which they are supposed to enforce) in the exact same location at the exact same time, as this would

provide a plausible identification of counterfactual outcomes. With the available cross-sectional data, we unfortunately cannot establish causality. We do not have precise information under what circumstances bribe proposals are being initiated, by whom, and when in the process the requests are made, and lack information on firms' and bureaucrats' subjective expectations. This especially limits our ability to test specific predictions of the "sand in the wheels" hypothesis which relies on strong informational assumptions on the part of the bureaucrat as (s)he is assumed to engage in price discrimination.

Nonetheless, the data contain rich detail on both bribes and wait times and enable us to control for an extensive set of observable determinants of corruption. The data thus allow for testing of various predictions of the "grease the wheels hypothesis", according to which bribes are associated with expedited implementation and according to which the relationship between bribes and policy implementation times should be heterogeneous across firms, with the extent to which bribery accelerates implementation times being correlated with both firms' willingness to pay and the severity of regulation. By contrast, the "sand" hypothesis predicts a positive association between bribes and wait times. Not finding such an association would amount to a rejection of this hypothesis.

2.2 Econometric Framework

2.2.1 Basic Testing Strategy

Our empirical strategy is to sequentially test the three predictions of the "grease" hypothesis discussed above. Section 2.2.1 discusses how we test the first prediction that demands for bribes ought to be associated with reduced implementation times ceteris paribus, and presents a number of robustness tests including a set of regressions in which we control for firm fixed effects as well as

bribe proxies that are less vulnerable to endogeneity. Section 2.2.2 explains how we test for heterogeneity in the association between bribe demands and policy implementation times, which underpins the second and third testable predictions of the "grease" hypothesis. It presents both difference-in-difference designs to test for heterogeneity associated with the magnitude of bribe payments and the severity of regulation, as well as quantile regressions which examine differences across the distribution of wait times.

To examine the first prediction implied by the "grease the wheels" hypothesis, the log of policy implementation time, i.e. number of days it takes to get a construction permit, export, import or obtain an operating license or electric connection, *t*, is modeled to be a function of firm characteristics X, a dummy indicating whether a bribe was solicited or expected, $Bribe$, and a random error term e.

$$t = \beta_B Bribe + \beta_X X + e$$

HO: $\beta_B = 0$ Corruption is not correlated with policy implementation times

HA1: $\beta_B > 0$ Corruption is associated with delayed policy implementation ("sand")

HA2: $\beta_B < 0$ Corruption is associated with expedited policy implementation ("grease")

If bribes are a means to avoid burdensome business regulation, one would expect their incidence to be correlated with shorter wait times (i.e. $\beta_B < 0$). Conversely, if corruption impedes policy implementation, one might expect bribe incidence to be associated with delays $(\text{i.e.}\, \beta_B > 0)$. Note that to account for cases in which firms reported to have waited less than a day, we use the log of one plus the number of days it took to get service as the dependent variable.

There are a number of potential problems with this testing strategy. The relationship could be driven by omitted variables impacting both the duration of policy implementation and the prevalence of corruption. This could be the case, for example, when bribing only occurs in certain circumstances, such as when excess demand for particular services leads to congestion. This could be at a sector level, to the extent requirements vary across sectors, or geographically if many firms in the same location seek the same license or permit at the same time. An alternative example of a "third factor" that could cause wait times and bribery to be (spuriously) correlated is complexity; it is feasible to imagine more complex projects being both more susceptible to corruption and facing longer policy implementation times.

Second, there is a possibility of reverse causation; one might worry that firms might be more likely to offer a bribe if they have had to wait for a while. Although the bribe request proxy we use asks specifically about demands for bribes and expectations thereof – and not about bribe offers initiated by firms – respondents could nonetheless confuse the two. Alternatively, one might expect a positive correlation between policy implementation times and bribe incidence, simply because entrepreneurs who have to wait longer are at heightened risk of being asked for bribes.

The use of subjective perceptions of bribe incidence and wait times aggravates these concerns. It is possible that unobserved firm characteristics, such as the entrepreneur's innate pessimism, affect both perceptions of bribe incidence and policy implementation times. Alternatively, firms that face longer delays to get things done might become more dissatisfied with regulatory agencies and consequently more likely to complain about corruption (even if there was none).

To mitigate these endogeneity concerns, we conduct a number of robustness checks. To start with, we include sector-country-year effects; if licenses are sector-specific, this would control

for congestion within sectors. As a robustness check, we also allow for city-sector-year effects to control for city-sector specific congestion, and the patterns remain.[4]

Second, we pool applications for different types of government services by the same firm and control for firm fixed effects. This should control for characteristics of the firm that could make it a target for bribes, as well as the complexity of the projects the firm is undertaking and needing permits for. Identification now comes from variation in the incidence of bribing across different type of government services provided to the same entrepreneur.

Third, we also address the potential for endogeneity from the use of firms' subjective measures of bribes. In addition to firms' own responses, we use alternative proxies such as the leave-out-mean of firms in the same sector, same country and same size class. Since this measure is not "polluted" by entrepreneurs' idiosyncratic characteristics, it likely mitigates endogeneity bias (Escribano and Guash, 2005).

We also construct a measure of firms' latent pessimism. Following Van Praag and Ferrer-I-Carbonnel (2004), we first run a number of ordered probit models of firm's perceptions of the severity of various constraints not directly connected with obtaining a construction license (and clearing customs, getting an operating license or an electrical connection) on firm size, sector, country and year dummies. Subsequently, a principal component analysis is performed on the residuals of these regressions. The first principal component is used as a proxy for entrepreneurs' latent pessimism. Relatedly, firms were asked how severe a constraint they consider corruption. To the extent that this is a proxy for their likelihood to complain and exaggerate policy implementation times, one might expect that when confronted with bribes, such firms would be particularly likely to exaggerate. We will show that this is not the case.

[4] This still does not allow for the possibility that there is within-city-sector-year variation, for example induced by seasonality in the propensity to submit applications (or processing them). Ideally, we would have liked to control for the precise timing of applications and the number of concurrent applications but such data are unfortunately not available.

2.2.2 Accounting for Heterogeneity

According to the "grease" conceptualization of corruption the association between demands for bribes and policy implementation times is heterogeneous, depending on firm's willingness and ability to pay and avoid bribes (hypothesis 2), as well as how burdensome regulation is (hypothesis 3). To assess these distinct possibilities, the bribe indicator is interacted with salient explanatory variables, such as firm productivity, firm size, proxies for the magnitude of the bribe, and indicators of how burdensome the regulatory environment is. For example, to assess whether or not policy implementation varies with the magnitude of potential bribe payments, we interact the bribe dummy with an indirectly elicited measure of the magnitude of bribe payments, notably the share of revenue entrepreneurs think the typical firm spends on bribes. This indirect elicitation method is used to avoid implicating the respondent of wrongdoing (Svensson, 2002). To the extent that this is a good proxy for firm's willingness to pay and correlates with actual bribe amounts, it allows us to test, albeit indirectly, whether higher bribe payments are associated with faster implementation times using a simple difference-in-difference design;

$$t = \beta_B Bribe + \beta_X X + \beta_A Bribeamount + \beta_{BA} Bribe * Bribeamount + e$$

If higher bribes result in expedited implementation one would expect β_{BA} to be negative. A similar testing strategy is used to examine the hypothesis that the impact of the impact of bribe requests depends on *de jure* rules, proxied by a binary indicator of whether regulations are burdensome, here

defined as taking more than 200 days according to the *Doing Business* indicators which record mandated *de jure* policy implantation times[5]:

$$t = \beta_B Bribe + \beta_X X + \beta_R Burdensome\ \ Regulation + \beta_{BR} Bribe * Burdensome\ Regulation + e$$

If corruption is particularly efficient grease when rules are more burdensome one would expect β_{BR} to be negative.

An alternative means to examine whether OLS regressions, which provide estimates of average effects, obscure heterogeneity, whereby some firms (perhaps those that do not pay) suffer from corruption, but others (perhaps those who do pay) benefit, we run quantile regressions, using as dependent variable policy implementation times demeaned by the country-sector-year average, such that the resulting estimates are not driven by cross-country differences. If firms that get things done rapidly do so because they pay bribes, one would expect the coefficient associated with bribe demands to be negative at lower parts of the distribution.

3 Data

The World Bank Enterprise Surveys are the main data source used in this paper. The surveys have been conducted in 107 countries and contain detailed information on firm characteristics, such as their sector, location, sales, capital stock, size, ownership structure, management, and their manager's subjective perceptions of the business climate and obstacles to doing business.[6] Figure 1 shows how entrepreneurs rated the severity of various constraints, and demonstrates that corruption

[5] Note that we choose an arbitrary cutoff of 200 days since it is a round number close to the sample median, with 47.8% of firms in our sample being located in countries where it should take less than 200 days to obtain a construction permit.
[6] We exclude countries where information on bribes was not collected.

is a salient concern, with 41% of firm managers considering it a major or severe constraint – the most common of the potential constraints to be ranked as such alongside electricity access.[7]

<FIGURE 1 HERE>

The data also contain information on how long it took firms to obtain construction permits, operating licenses, electrical connections, and to clear customs for importing and exporting. These self-reported policy implementation times will be our key dependent variables. The surveys furthermore asked entrepreneurs whether *"In relation to that application for a construction permit* [operating license/electrical connection/clearing customs] *was an informal payment or gift expected or requested*?" The answers to these questions will be our key explanatory variables. The descriptive statistics presented in Table 1 suggest that demands for such side payments are prevalent; 19%, 17% and 14% of firms reported having been either expected to, or explicitly asked to, pay a bribe when applying for a construction permit, operating license, electrical connection, respectively. In a subset of Middle Eastern and Northern African countries, firms were also asked about whether they were asked for bribes when dealing with customs, where corruption appears even more rife. As many as 38% and 44% of firms in our data reported having been asked to pay a bribe when dealing with customs to export and import respectively.

We complement the data on de facto policy implementation times with information on the *de jure* time it should take to get things done from the Doing Business Indicators. Figure 2 plots the 10th percentile, median, and 90th percentile *de facto* log policy implementation times in a given country-year reported by entrepreneurs surveyed by the World Bank Enterprise Surveys against the

[7] The figure may suggest that corruption is the most important constraint facing firms. Note, however, that when managers asked which constraint they considered to be the most important, corruption features less prominently, with 6% of managers considering it their most pressing problem, making it the fourth most burning issue, after finance (16%), electricity (14%), competition from the informal sector (14%), and tax rates (11%).

amount of time it should take to get these things done according to the Doing Business indicators.[8] A striking feature of the data is the tremendous variability in policy implementation times, which is only loosely correlated with the amount of time it should take to get these things done. Interestingly, within-country variability appears to dominate cross-country variability (see also Hallward-Driemeier and Pritchett, 2011).

<FIGURE 2 HERE>

That this heterogeneity is related to the incidence of demands for bribes is demonstrated in Figures 3a-3c, which plot kernel density estimates of the amount of time it takes to get various things done, demeaned by the country-sector-average in the relevant year, separately for firms that report being asked for bribes and ones that do not.[9] While there is substantial overlap across these distributions, the distribution for the firms that indicated being confronted with bribes tends to lie to the right of that of firms that were not. Bribe requests thus appear to be associated with protracted policy implementation on average. Also note that the kernel density graphs for firms reporting bribes are unimodal;[10] If corruption benefitted a few privileged firms, but not others, one might expect to see a bimodal distribution.

<FIGURE 3 HERE>

[8] A certain degree of divergence between the de facto policy implementation times documented in the Enterprise Surveys and the de jure times recorded in the Doing Business database is to be expected since the latter are based on specific assumptions about a hypothetical firm. For example, in the case of getting a construction permit, it is inter alia assumed that the hypothetical firm is based in the largest city, is fully domestically and privately owned, has 5 owners and has 60 employees. Yet, vast variability in policy implementation times remains even after we confine the sample to a subset of firms very similar to this hypothetical firms (These results are not presented here to conserve space, but available from the authors upon request).

[9] These patterns also persist if we demean by sector-country-year averages. Results are not presented here to conserve space, but available from the authors upon request.

[10] The only exception is the graph for the time it takes to clear customs when exporting, but note that this may in part reflect the fact that there are far fewer observations.

Thus, prima facie, the data show that corruption is a salient concern for entrepreneurs, that policy implementation times vary across firms and are at best loosely correlated with de jure policy implementation times, and, moreover, that firms that were confronted with demands for bribes on average take longer to get things done.

4 Results

4.1 Which Firms Are Asked for Bribes?

To set the stage for the analysis that follows, we first examine which firms are most likely to be confronted with bribe requests by running a simple probit model with a binary indicator of whether or not a firm was asked for a bribe when applying for a construction permit as the dependent variable. In the first specification, presented in Table 2, we only include controls for firm size and its square, as well as country-sector-year dummies. Inclusion of these dummies is motivated by the desire to compare firms that are as similar as possible; identification comes from comparing firms within the same country within the same sector who applied for a permit the same year. In the second specification we add controls for capital intensity proxied by capital per worker, the log of the age of the firm, ownership dummies, whether or not the firm exports and the manager's experience, education and gender. These dummies proxy for managerial competence and potential differential treatment by gender. The third column adds output per worker as an additional control variable to assess whether more productive firms are more likely targets. Since this variable is potentially endogenous (more productive firms may have more resources to bribe and/or corruption may make firms more productive), it is entered separately. Finally we examine the relationship between bribe requests, firm visibility and level of interaction with public officials, by controlling for

whether or not a firms is ISO certified, formal, has attempted to secure a government contract in the past year, was visited by tax officials, and the share of the manager's time that is spent dealing with regulations, variables which are all potentially endogenous. Since not all explanatory variables are available for all firms, the sample gets progressively smaller as we add explanatory variables.[11] Standard errors are clustered by country and year.

<TABLE 2 HERE>

Overall, these models explain a modest share of the variance, with pseudo R^2s ranging from 0.145 to 0.169. The results yield a number of interesting associations. To start with, larger firms are more likely to be asked for bribes. Second, international orientation matters; the marginal effects calculated at the sample mean suggest that foreign owned firms are ceteris paribus approximately 5 to 7 percent less likely to be confronted with bribe requests, whereas exporting firms are some 6 to 7 percent more likely to be asked for a bribe.[12] Third, there is a statistically significant association between bribe demands, time spent with government officials and inspections. Firms that were visited by tax officials are ceteris paribus 9.5% more likely to have been asked for a supplemental payment or gift. Note that the other variables are not systematically statistically significant predictors of bribe incidence. In particular, we do not find evidence for differential treatment of firms based on the characteristics of the manager. We also do not find evidence for the notion that more capital intensive firms are easier targets, though this finding might (in part) reflect the quality of our capital stock proxy.

[11] The pattern of results is not qualitatively affected by the consequent sample selection. Results are available from the authors upon request, but not presented to conserve space.
[12] The correlation between exporting and foreign ownership is 0.17.

4.2 Basic Results of Bribe Requests and Implementation Times

Now that we have demonstrated which firms face the highest incidence of bribe requests, we turn to the results of focal interest, notably the relationship between bribe requests and policy implementation times. This section focusses on examining whether bribe demands are correlated with accelerated implementation on average, whereas the next section analyzes whether there is heterogeneity in the relations between bribe demands and policy implementation times depending on firm's ability to pay and the complexity of the *de jure* regulatory environment.

The baseline results are presented in Table 3, which regresses the self-reported time it took to obtain a construction permit on a host of firm-characteristics. The specifications broadly mimic those presented in Table 1; all specifications include country-sector-year dummies included to ensure identification is based on comparing firms within the same sector and country at one point in time. The second specification includes additional characteristics for the size of the firm and its square, which proxy inter alia for the firm's visibility and the potential complexity of the requested permit, its age, capital intensity, ownership structure, whether or not it exports, and characteristics of the manager. The third and preferred specification adds output per worker as a proxy for productivity and firm's ability to pay, while the fourth adds controls for visibility and proxies for the intensity of interaction with government officials. Standard errors are again clustered by country and year.

<TABLE 3 HERE>

Starting with the results of focal interest, requests for bribes are associated with strongly and significantly protracted implementation times. This association is statistically significant at the 1% level, robust to including various proxies for various firm characteristics (column 2), firm productivity (column 3), as well as firm's visibility and interaction with public officials (column 4).

Moreover, the associated effect is large and economically meaningful; on average, firms that are confronted with bribes have to wait approximately 1.5 to 1.8 times as long for their construction permit as firms that were not asked for bribes; note that we take the exponent of the coefficient associated with bribe demands to arrive at these comparisons.

Size is also correlated with policy implementation,[13] with larger firms facing especially long delays; although we saw in section 4.1 that the largest firms are the least likely to be asked for bribes, they suffer the longest delays when they are. However, none of the other variables are consistently statistically significant, individually or jointly; neither government nor foreign owned firms, nor exporters benefit from expedited policy implementation all else being equal. Younger firms appear more likely to wait longer, although this is not always significant. Overall, these specifications explain between 32 and 36% of the observed variance across firms.

4.2.1 Robustness

Table 4 repeats the exercise for other regulatory transactions, using as the base specification the one used in Table 3 column 3, i.e. with a rich set of firm characteristics including labor productivity. Standard errors are clustered by country and year. Column 1 reports the effects of a bribe request on the time it takes to receive an operating license, column 2 for an electrical connection, column 3 for clearing customs to export and column 4 for clearing customs for imports. In each case the effect of a bribe request is significantly and positively associated with an increase in delays. The coefficient is smaller for exports, but still significant at the 5 percent level. Across all the different transactions, the same pattern emerges. For ease of interpretation, Table 5 summarizes the delays in implementation associated with bribe demands by taking the exponent of the coefficient on bribe demands. The coefficient estimates imply that firms confronted with a request for a bribe

[13] Size and its square are always jointly significant at the 1% significance level.

when applying for an operating license or electrical connection tend to wait 1.5 times as long as firms that were not confronted with such demands ceteris paribus. Firms confronted with demands for bribes when obtaining customs clearances have to wait 1.1 times as long as firms that were not asked for bribes when exporting and 1.4 times as long when importing. Thus, the delays associated with corruption are sizeable.

<TABLE 4 HERE>

<TABLE 5 HERE>

Table 6 then exploits the fact that we have information on multiple transactions per firm. By pooling the transactions together, we can control for firm fixed effects. Standard errors are clustered by firm-year. Note that firms that only applied for one type of government service are excluded from the estimation sample. We also exclude firms that made multiple applications but either reported never to have been asked for a bribe or that reported to have been confronted with demands for bribery in each instance since such firms do not exhibit variation in bribe propensity across applications; Identification now comes from differences within firms across the transactions and whether bribes were requested or not. This approach also helps control for differences in the susceptibility of firms to bribe request, potential complexity of the activities firms are involved in and other (unobserved)time-invariant characteristics correlated with bribing that might otherwise also explain wait times. This is a more stringent test that the earlier approaches. The pattern of results remains robust.

We further test the robustness of the results using the Z-score of the delay times (calculated by country sector and year) in Column 2 of Table 5. This controls for the differences in the

distribution of wait times across the various types of transactions. We also test additional measures that help control for potential endogeneity. Column 3 reports the results from using the 'leave out the mean' measure of bribes. And finally, column 4 expands the set of fixed effects to include application-country-year effects rather than separate dummies for each type of application. The results are robust: bribe requests continue to be correlated with significantly slower implementation. Also note that the estimated delay in policy implementation associated with bribe requests is similar in magnitude to those documented in Table 5; conditional on firm fixed effects and service type, bribe demands are associated with an increase in service time by a factor of 1.5 (column 3) to 1.8 (column 1).

<TABLE 6 HERE>

Table 7 presents specifications that assess the robustness of the striking association between bribes and slower policy implementation, using specifications very similar to those presented in column 3 in Table 3, but with some modifications. First, the specification presented in column 1 uses the number of days in levels as opposed to logarithms as the dependent variable. The results are qualitatively robust and the estimates imply that firms confronted with demands for bribes have to wait 33 days longer to get a construction permit than firms that were not ceteris paribus.

Second, the specification presented in column 2 includes an additional control for firms' latent pessimism.[14] Although this indicator enters statistically significantly at the 1% level suggesting pessimistic entrepreneurs are more likely to report longer wait times, the coefficient associated with bribe incidence remains positive, large and statistically significant.

[14] The Principal Component Analysis across the subjective severity of a lack of educated workforce, access to land, access to finance and competition from the informal sector as a constraint to doing business that was used to construct this indicator is not presented here to conserve space, but available from the authors upon request.

<TABLE 7 HERE>

Third, column 3 includes as an explanatory variable the self-reported severity of corruption as a constraint to doing business. This variable enters statistically significantly, but its inclusion hardly impacts the coefficient estimate associated with bribe requests.

Fourth, to assess whether geographic congestion might be driving the results, in column 4 we include city-sector-year (as opposed to country-sector-year) dummies and the results remain robust.

In summary, although we cannot establish causality, the association between protracted policy implementation and demands for bribes or expectations thereof appears fairly robust across the various robustness checks.[15]

5 Heterogeneity

Now that we have established that on average bribe demands are associated with delays, we assess whether the data demonstrate heterogeneity in the relationship between bribe incidence and speed of policy implementation.

Table 8 explores whether the association between bribe incidence and policy implementation is heterogeneous across firms. All specifications control for firm characteristics and country-sector-year dummies unless otherwise indicated. To start with, in column 1 the bribe indicators is interacted

[15] We also tried to account for the endogeneity of bribe request using instrumental variables but could not find any instruments that were both plausible theoretically and sufficiently strong empirically. Another potential concern is selection bias, since not all firms apply for construction permits, operating licenses, or trade internationally. However, the direction of potential selection bias is a priori ambiguous. On the one hand one might expect such bias to work in the opposite direction of the results we get; firms that would anticipate prohibitively protracted implementation times or a particularly high likelihood of being asked for bribe would presumably be less likely to apply. On the other hand, the firms that are observed to apply arguably value the services they desire more than firms that do not, but we obviously cannot rule out this possibility altogether.

with output per worker demeaned by the country average to assess whether the impact of bribes on policy implementation times varies with firm productivity (perhaps because they are more willing to pay). Although the estimated interaction effect is positive, it is not statistically significant; the null hypothesis that more productive firms are not able to get things done faster cannot be rejected.

<TABLE 8 HERE>

Second, interactions between firm size and bribe requests are included in the specification presented in column 2. Larger firms suffer longer delays when confronted with demands for bribes, since the interaction between bribe incidence and firm size and its square are jointly statistically significant. One possible explanation for this finding is that their projects are characterized by greater complexity and hence longer wait times.[16]

Third, by including a proxy for the share of profits firms perceive other firms to pay in bribes on an annual basis, we assess whether the relationship between demand for bribes and implementation times varies with the likely magnitude of bribe payments. The results are robust to controlling for this proxy for the severity of corruption, and, moreover, the interaction term between the bribe-amount and bribe incidence is not statistically significant. Thus, these results do not support the prediction of the "grease" hypothesis that corruption accelerates implementation for firms with a higher willingness to pay.

Fourth, we assess the relationship between de facto policy implementation times reported in the Enterprise Surveys and de jure time it should take to get these things done as proxied by the Doing Business indicators. Specifically, we create a dummy indicating whether a country has burdensome regulation, defined here as in countries in which it takes at least 200 days to get a

[16] This finding further reinforces the importance of the robustness check of including firm level fixed effects that should help control for the complexity of the projects firms undertake.

construction permit according to the Doing Business measures. To assess whether policy implementation is longer in countries with more burdensome *de jure* regulations specification 5 only includes sector and year dummies in addition to the indicators of burdensome regulation and bribe demands. While the coefficient estimate associated with burdensome regulation is positive, *de jure* policy implementation times are not significant predictors of firms' de facto self-reported experiences ceteris paribus. In column 6 we reintroduce country-sector-year dummies and interact the burdensome regulation dummy with bribe incidence. The interaction between de jure regulation and bribe incidence, while negative, is statistically insignificant. Thus, these results are not consistent with the third testable prediction of the view of corruption as "grease", which predicts a significantly negative interaction.

As a final test to examine whether corruption is associated with delayed policy implementation for some, but not for others, we estimate a series of quantile regressions presented in Table 9, with standard errors clustered by country and year. The dependent variable is the Z-score of the time it takes to obtain a construction permit computed for each country-sector-year separately, such that resulting coefficients are to be interpreted as reflecting variation in policy implementation relative to the country-sector average in a given year. Z-scores have the added advantage of normalizing the variance. If corruption was beneficial for a favored few entrepreneurs, one would expect coefficient estimates associated with self-reported bribe incidence at the lower parts of the distribution (i.e. those firms that get things done relatively quickly) to be negative, or, at minimum, smaller than in the upper parts of the distribution (those firms that take a long time to get things done). Interestingly, the coefficient estimate associated with bribe payments is positive and significant throughout the distribution. That is, the quantile regression analysis does not attest to a pattern of heterogeneity whereby a select group of firms benefits while others suffer.

<TABLE 9 HERE>

6 Conclusions

While the increasing availability of micro-data has spurred a nascent literature on the impact of corruption on firm-performance, its impact on the efficacy of policy implementation itself has been largely neglected. Yet, whether corruption is associated with accelerated or delayed policy implementation is at the heart of the debate about whether corruption obstructs private sector development or instead enables it by allowing firms to mitigate the adverse effects of burdensome bureaucracy. Moreover, policy implementation times are a good metric for accessing public sector performance and delaying or accelerating policy implementation is one of the most direct channel(s) by which public officials can affect firm performance.

Using the World Bank's Enterprise Surveys from 107 countries, this paper examines three testable predictions implied by the "grease the wheels" hypothesis. To start with, we test whether the duration of policy implementation is shorter for firms confronted with demands for bribes. The data reject this hypothesis. Instead, they exhibit a strong and statistically significant association between de facto policy implementation and demands for bribes; according to our preferred specifications firms confronted with demands for bribes take approximately 1.5 times as long to get a construction permit, operating license or operating license and 1.2 and 1.4 times longer to clear customs when exporting and importing ceteris paribus. These associations are robust to controlling for manager's latent pessimism, and controlling for the subjective severity of corruption. The association between bribing and delays also obtains when pooling applications across different types of government services and controlling for firm-fixed effects as well as other firm's corruption reports.

Second, an often overlooked implication of the "grease the wheels" hypothesis is heterogeneity across firms in the relationship between bribe demands and policy implementation times, with speed of implementation increasing with firms' willingness to pay. While the association between bribe demands and policy implementation times is heterogeneous across firms, with larger firms facing longer delays, the data do not seem to support the hypothesis that some firms benefit from being asked for bribes. To start with, even firms that are likely to pay a substantial amount in bribes tend to face delays when confronted with bribe requests. Second, the distribution of policy implementation times for firms that indicated being asked for bribes is not bimodal, but unimodal instead. Last but not least, quantile regressions suggest that, when confronted with bribe demands, firms at the bottom end of the waiting time distribution face delays which are as long as those faced by firms at the upper end of this distribution.

Third, the data also reject the hypothesis that when regulation is more burdensome, opportunities to bribe are especially beneficial in accelerating policy implementation. We do not find evidence that the association between bribe demands and delays varies with how burdensome *de jure* regulation as proxied by the Doing Business indicators is.

To sum up, although we cannot establish causality and have to be cognizant of the limitations of self-reported subjective cross-sectional data, our results are at odds with the proposition that corruption helps mitigate bureaucratically induced inefficiency. Instead, in the World Bank Enterprise Surveys data corruption is consistently associated with protracted policy implementation.

References

Abreu, D., & Gul, F. (2000)." Bargaining and reputation" *Econometrica*, *68*(1), 85-117.

Babcock, L., & Loewenstein, G. (1997). "Explaining bargaining impasse: The role of self-serving biase". *Advances in behavioral economics*, 326.

Aterido, R., Hallward-Driemeier, M. and Pages, C. (2011). "Big constraints to small firms' growth? Business environment and employment growth across firms," *Economic Development and Cultural Change*, 59(3): 609-648.

Acemoglu, D. and Verdier, T. (2000). 'The choice between market failure and corruption', American Economic Review, vol. 90(1), pp. 194–211

Bardhan, P. "Corruption and development: a review of issues" (1997). *Journal of Economic Literature,* 35 (3), 1320–1347

Beck, P. J. and Maher, M. W. (1986). "A comparison of bribery and bidding in thin Markets", *Economics Letters* 20(1): 1- 5.

Cadot, O. (1987). "Corruption as a gamble." *Journal of Public Economics* 33: 223-44.

Crampton, P. C., & Tracy, J. S. (1992). "Strikes and holdouts in wage bargaining: Theory and data" *American Economic Review*, 82, 100–121.,

Djankov, S., McLiesh, C and Ramalho, R. (2006)."Regulation and growth," *Economics Letters*, 92(3): 395-401.

Djankov, S. Freund, C. and Pham, S.C. (2010). "Trading on Time," *The Review of Economics and Statistics,* 92(1), 166-173.

Fisman, R. and Svensson, J. (2007). "Are corruption and taxation really harmful to growth? Firm level evidence", *Journal of Development Economics* 83(1): 63-75.

Freund, C. and Rijkers, B. (2012) "Employment Miracles" IMF Jacques Polak Annual Conference Paper.

Escribano, A., & Guasch, J. L. (2005). *Assessing the impact of the investment climate on productivity using firm-level data: Methodology and the cases of Guatemala, Honduras, and Nicaragua*. World Bank Policy research paper 3621.

Hallward-Driemeier, M. and Pritchett, L., (2011). "How business is done and the 'Doing Business' indicators: the investment climate when firms have climate control," Policy Research Working Paper Series 5563, The World Bank.

Huntington, S. P. (1968). *Political Order in Changing Societies*, New Haven: Yale University Press.

Kaufmann, D. and Wei, S.J. (1999) "Does "Grease Money" Speed Up the Wheels of Commerce?,"NBER Working Papers 7093, National Bureau of Economic Research, Inc.

Mauro, P. (1995). "Corruption and growth", *Quarterly Journal of Economics,* 110: 681-712.

Méon, P.G. and Sekkat,K. (2005). "Does corruption grease or sand the wheels of growth?" *Public Choice*,. 122(1): 69-97.

Méon, P.J. and Weill, L. (2010). "Is Corruption an Efficient Grease?" *World Development*, Elsevier, vol. 38(3), pages 244-259, March.

Myrdal, G. (1968) *Asian drama*. Vol. II. New York: Random House.

Murphy, K., Shleifer, A. and Vishny, R. (1991). "The allocation of talent: Implications for growth", *Quarterly Journal of Economics* 106: 503-530.

Kennan, J., and Wilson, R. B. (1993). "Bargaining with private information." *Journal of Economic Literature*, *31*, 45-45.

Klapper, L., Laeven,L, and Rajan, R. (2006). "Entry regulations as a barrier to entrepreneurship" *Journal of Financial Economics*, 82(3), 591–629.

Leff, N. (1964). "Economic development through bureaucratic corruption, " *The American Behavior Scientist* 8: 8-14.

Lein, D.H. D. (1986). "A note on competitive bribery games", *Economics Letters,* 22(4): 337-341.

Lui, F. (1985). "An equilibrium queuing model of bribery", *Journal of Political Economy* 93: 760-781.

Mauro, Paolo, (1995). "Corruption and Growth," *The Quarterly Journal of Economics* 110(3): s 681-712.

Nicoletti, G. and Scarpetta, S. (2003). "Regulation, productivity and growth: OECD evidence", *Economic Policy*, vol. 18(36): 9-72.

O.Toole, C.M and Tarp, F. (2012). "Corruption and the Efficiency of Capital Investment in Developing Countries," Working Papers UNU-WIDER Research Paper , World Institute for Development Economic Research

Rose-Ackerman, S. (1997) "The Role of the World Bank in Controlling Corruption", *Law and Policy in International Business*, 29:93-114.

Rose-Ackerman, S. (1975). "The economics of corruption", *Journal of Public Economics*, 4:187–203.

Rose-Ackerman, S. (1999). Corruption and Government, Causes, Consequences and Reform, Cambridge, UK:Cambridge University Press.

Shleifer, A. and Vishny, R. (1993). "Corruption", *Quarterly Journal of Economics,* 108(3).

Svensson, J. (2003). "Who must pay bribes and how much? Evidence from a cross section of firms", *Quarterly Journal of Economics* 118: 207-230.

Svensson, J. (2005). "Eight questions about corruption", *Journal of Economic Perspectives* 19(5): 19-42.

Thanassoulis, John. (2005) *Optimal Stalling While Bargaining*. Department of Economics, University of Oxford.

Wei, S.-J. (2000). "How Taxing is Corruption on International Investors?" *Review of Economics and Statistics*, February 2000, 82(1): 1-11.

Van Praag, B. and Ferrer-i-Carbonell, A. (2004) Happiness Quantified (Oxford: Oxford University Press).

Figure 1: Constraints to Doing Business

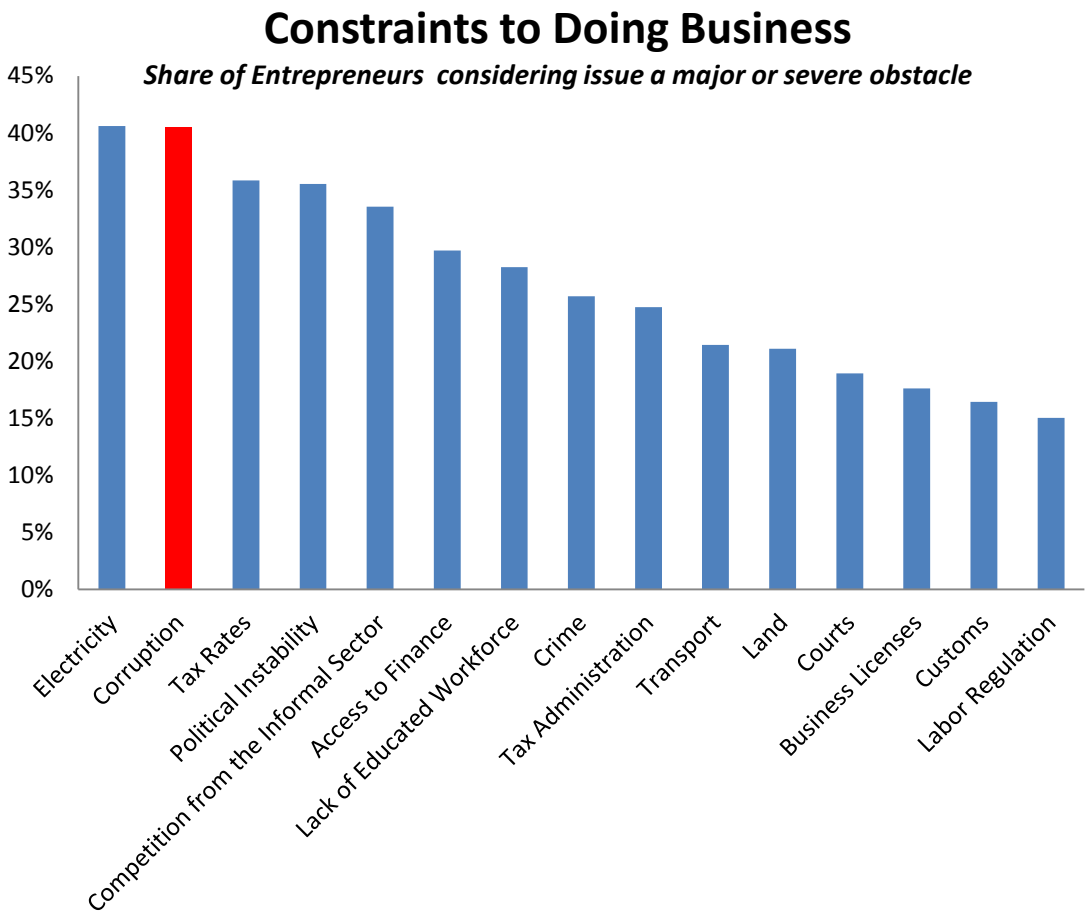
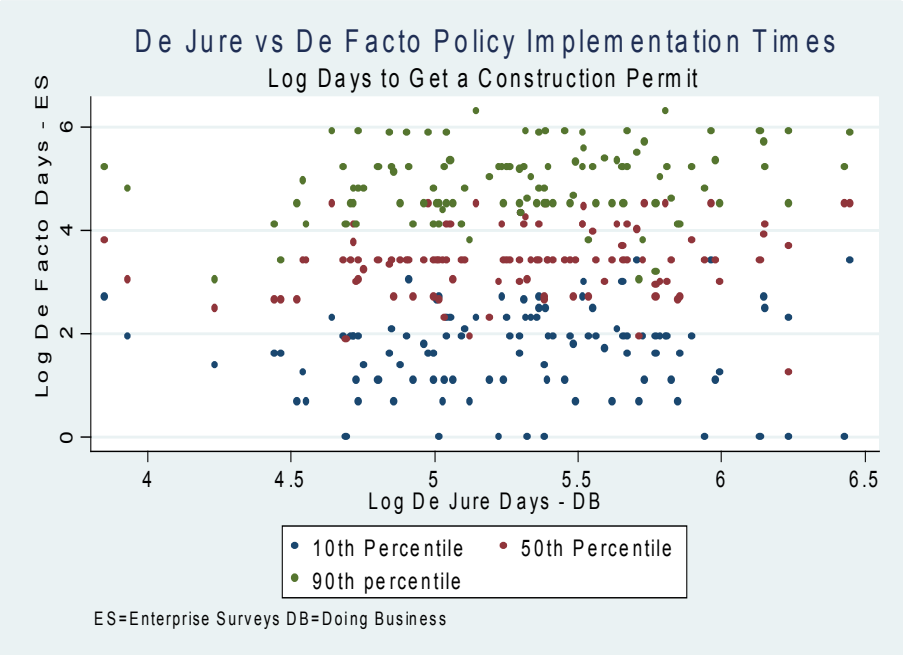
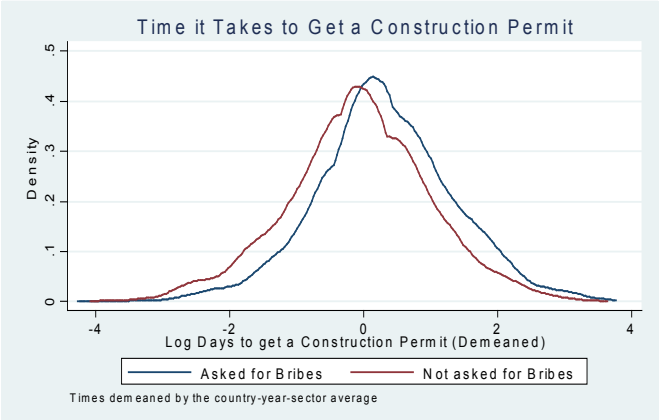


Figure 2: Policy Implementation Variability

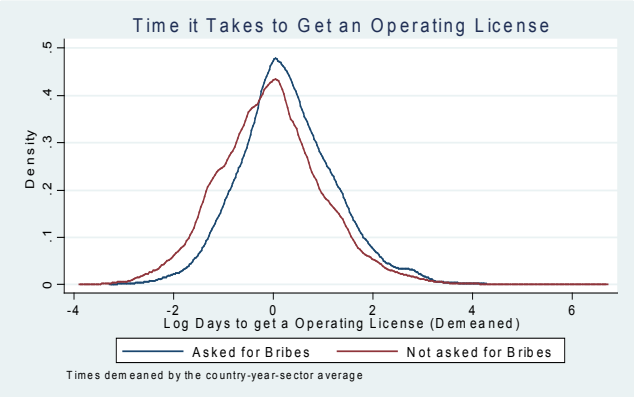


Note: this graph only use the latest available year for each country

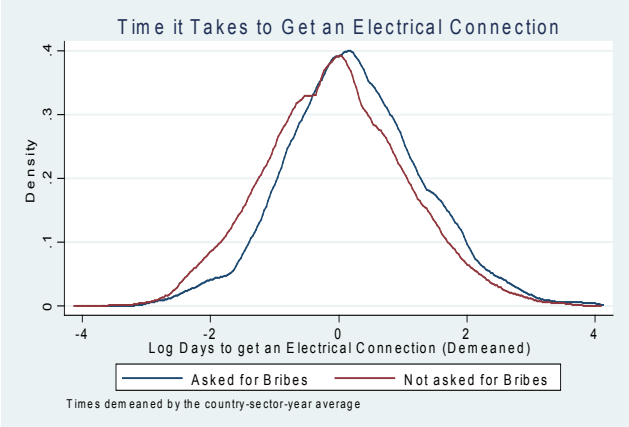
Figure 3: Kernel Density of The amount of Time it takes to get a construction permit , operating license and electrical permit – by bribe incidence



N=7649



N=15001



N=9955

Table 1: Descriptive Statistics

Descriptive Statistics					
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Time to get a construction permit(log)*	7933	3.53	1.29	0.00	7.69
Time to get an operating license (log) *	15680	2.58	1.28	0.00	9.21
Days to get an electrical connection (log) *	10128	2.69	1.30	0.00	7.98
Average export time (log) *	10178	1.52	0.85	0.00	5.20
Average import time (log) *	11964	2.02	0.97	0.00	5.71
Bribe request - construction permit	9854	0.19	0.39	0.00	1.00
Bribe request - operating license	16593	0.16	0.37	0.00	1.00
Bribe request - electrical connection	11547	0.14	0.35	0.00	1.00
Bribe request – exporting	719	0.38	0.49	0.00	1.00
Bribe request – importing	780	0.43	0.50	0.00	1.00
lnL	63334	3.33	1.39	-1.79	8.28
ln(Y/L)	56485	9.38	2.32	-6.62	22.97
ln(K/L)	25926	7.71	2.76	-10.86	21.31
Any female owners	56130	0.35	0.48	0.00	1.00
Manager's Experience	61351	16.74	10.54	0.00	49.00
firm age	63106	18.23	16.67	0.00	210.00
Public	62488	0.01	0.12	0.00	1.00
Foreign	62488	0.12	0.33	0.00	1.00
Exporter	63273	0.23	0.42	0.00	1.00
ISO Certified	61623	0.20	0.40	0.00	1.00
Formal	52968	0.87	0.34	0.00	1.00
Government Contract	44194	0.19	0.39	0.00	1.00
Time spent dealing with regulations	59862	0.13	0.19	0.00	1.00
Visited by Tax Officials	62643	0.61	0.49	0.00	1.00
Perceived Bribe Amount	49118	0.07	0.21	0.00	1.00
Optimism	53463	0.00	1.19	-5.36	4.09

Note: *Indicates we take log (1+Days to get the relevant service); we use this transformation to allow for observations which reported implementation time to be zero.

Table 2: Who gets asked for bribes?

Who is asked for Bribes? Probit Model -Marginal effects *Dependent Variable: Asked for a Bribe*	(1)	(2)	(3)	(4)
lnL	0.053***	0.053	0.055	0.039
	(0.020)	(0.044)	(0.045)	(0.061)
lnL^2	-0.007***	-0.008*	-0.009*	-0.008
	(0.002)	(0.005)	(0.005)	(0.006)
ln(K/L)		0.013**	0.011*	0.013
		(0.005)	(0.007)	(0.010)
Any female owners		0.009	0.001	-0.001
		(0.028)	(0.029)	(0.038)
Manager's Experience		-0.006	-0.005	0.006
		(0.016)	(0.017)	(0.022)
Firm age (log)		0.010	0.009	0.017
		(0.013)	(0.014)	(0.022)
Public		0.062	0.089	0.167*
		(0.122)	(0.120)	(0.099)
Foreign		-0.071***	-0.066**	-0.053
		(0.025)	(0.027)	(0.035)
Exporter		0.061***	0.059***	0.072**
		(0.018)	(0.019)	(0.031)
ln(Y/L)			0.004	0.006
			(0.009)	(0.014)
ISO Certified				-0.037
				(0.029)
Formal				-0.039
				(0.056)
Government Contract				0.002
				(0.038)
Time spent dealing with regulations				0.116
				(0.081)
Visited by Tax Officials				0.095***
				(0.025)
Country-Sector-Year Dummies	Yes	Yes	Yes	Yes
Pseudo R2	0.145	0.143	0.145	0.169
N	7,428	2,547	2,406	1,283

Note: *** p<0.01, ** p<0.05, * p<0.1.
Standard errors are heteroscedasticity robust and clustered by country-year

Table 3: Wait Times for Construction Permits

The Determinants of the Time it Takes to get a Construction Permit – OLS *Dependent Variable: Log (1+ Days it Takes to get a Permit)*				
	(1)	**(2)**	**(3)**	**(4)**
	coef/se	**coef/se**	**coef/se**	**coef/se**
Bribe request - construction permit	0.549***	0.426***	0.424***	0.379***
	(0.055)	(0.075)	(0.072)	(0.099)
lnL		0.053	0.045	-0.114
		(0.118)	(0.115)	(0.149)
lnL^2		0.001	0.002	0.017
		(0.012)	(0.012)	(0.016)
ln(K/L)		0.017	0.021	0.028
		(0.016)	(0.021)	(0.022)
Any female owners		0.073	0.064	0.066
		(0.055)	(0.053)	(0.067)
Manager's Experience		0.065	0.080	0.121
		(0.051)	(0.052)	(0.076)
Firm age (log)		-0.069*	-0.065	-0.061
		(0.038)	(0.040)	(0.052)
Public		-0.054	-0.070	-0.068
		(0.377)	(0.375)	(0.429)
Foreign		0.028	0.028	0.009
		(0.078)	(0.077)	(0.080)
Exporter		0.078	0.067	0.130
		(0.075)	(0.079)	(0.119)
ln(Y/L)			-0.002	-0.018
			(0.028)	(0.036)
ISO Certified				0.047
				(0.099)
Formal				-0.065
				(0.125)
Government Contract				0.145
				(0.088)
Time spent dealing with regulations				-0.041
				(0.172)
Visited by Tax Officials				0.027
				(0.077)
F-test joint significance		5.09(99)	5.26 (2,99)	1.86(2,62)
Ln L and lnL^2		0.0078	0.0067	0.1649
Country-Sector-Year Dummies	Yes	Yes	Yes	Yes
R2	0.319	0.359	0.361	0.338
Adjusted R2	0.209	0.214	0.213	0.159
Number of observations	7,649	2,863	2,763	1,602

Note: *** p<0.01, ** p<0.05, * p<0.1.
Standard errors are heteroscedasticity robust and clustered by country-year

Table 4: Wait Times for Other Regulatory Transactions

Alternative Policy Domains **Operating Licenses, Electrical Connections, Exporting and Importing - OLS** *Dependent Variable: Log (1+Days it Takes to…)*				
Dependent Variable ***: Log 1 +time it takes to get***	***An Operating License***	***An Electrical Connection***	***Customs Clearance to Export***	***Customs Clearance to Import***
	(1) **coef/se**	**(2)** **coef/se**	**(3)** **coef/se**	**(4)** **coef/se**
Bribe request – operating license	0.443*** (0.089)			
Bribe request – electrical connection		0.370*** (0.083)		
Bribe request – clearing customs to export			0.139** (0.068)	
Bribe request – clearing customs to import				0.306*** (0.059)
Firm Controls	Yes	Yes	Yes	Yes
Country-Sector –Year Dummies	Yes	Yes	Yes	Yes
R2	0.376	0.335	0.147	0.167
Adjusted R2	0.291	0.225	0.081	0.098
Number of observations	4,696	3,674	393	403

Note: *** p<0.01, ** p<0.05, * p<0.1.
Standard errors are heteroscedasticity robust and clustered by country and year.
Firm controls are lnL, lnL^2, ln(K/L), Any female owners, manager's experience, firm age (log), public ownership, foreign ownership, and exporter dummies, and ln(Y/L).

Table 5: Summary of Baseline Results – Delays Associated with Bribes

Summary of Baseline Results – Delays Associated with Bribes		
Service Type	***Estimated Delay Associated with Bribe Requests***	***Specification***
	Penalty factor: ratio of the wait time faced by firms confronted with bribe demands to that of those that were not	
A Construction Permit	1.77	(Table 3, Column 1)
	1.73	(Table 3, Column 2)
	1.53	(Table 3, Column 3)
	1.46	(Table 3, Column 4)
An Operating License	1.56	(Table 4, Column 1)
An Electrical Connection	1.45	(Table 4, Column 2)
Customs Clearance to Export	1.15	(Table 4, Column 3)
Customs Clearance to Import	1.36	(Table 4, Column 4)

Table 6: Controlling for Firm Fixed Effects

Policy Implementation Times and Bribes – Controlling for Firm Fixed Effects				
Dependent Variable	*Log (1+Days it takes to get Service)*	*Z-score days it takes to get Service*	*Log (1+Days it takes to get Service)*	*Log (1+Days it takes to get Service)*
	(1)	**(2)**	**(3)**	**(4)**
	coef/se	**coef/se**	**coef/se**	**coef/se**
Bribe Requests				
Bribe Request	0.571***	0.340***		0.472***
	(0.042)	(0.034)		(0.041)
Leave out Mean Bribe Request			0.409***	
			(0.085)	
Type of Service				
Electricity Connection	-0.644***	0.078***	-0.658***	
	(0.029)	(0.023)	(0.030)	
Water Connection	-0.660***	0.093***	-0.683***	
	(0.034)	(0.028)	(0.036)	
Phone Connection	-0.992***	0.117***	-1.017***	
	(0.029)	(0.023)	(0.031)	
Operating Licenses	-0.525***	0.082***	-0.528***	
	(0.028)	(0.023)	(0.029)	
Firm Fixed Effects	Yes	Yes	Yes	Yes
Country-Year-Application Dummies	No	No	No	Yes
Number of observations	31,778	30,476	30,662	31,778
Number of Firms	13.320	13.006	13.306	13.046
R2	0.655	0.585	0.653	0.705
Adjusted R2	0.406	0.275	0.396	0.478

Note: *** p<0.01, ** p<0.05, * p<0.1
Standard errors are heteroscedasticity robust and clustered by firm and year.
The omitted service category is construction permits
Z-scores are computed by country-sector-year

Table 7: Robustness

Robustness Checks - OLS *Dependent variable: Time it takes to get a construction permit*				
Dependent Variable	***Days (level)***	***Log(1+Days)***	***Log(1+Days)***	***Log(1+Days)***
	(1) **coef/se**	**(2)** **coef/se**	**(3)** **coef/se**	**(4)** **coef/se**
Bribe request – Permit	33.057*** (9.218)	0.399*** (0.070)	0.417*** (0.068)	0.447*** (0.089)
Pessimism		0.110*** (0.035)		
Subjective severity of Corruption			0.040* (0.021)	
Firm Controls	Yes	Yes	Yes	Yes
Country-Sector –Year	Yes	Yes	Yes	Yes
City-Sector-Year	No	No	No	Yes
R2	0.272	0.335	0.368	0.474
Adjusted R2	0.104	0.173	0.220	0.200
Number of observations	2,763	2,502	2,711	2,763

Note: *** p<0.01, ** p<0.05, * p<0.1.
Standard errors are heteroscedasticity robust and clustered by country and year.
Firm controls are lnL, lnL^2, ln(K/L), Any female owners, manager's experience, firm age (log), public ownership, foreign ownership, and exporter dummies, and ln(Y/L).

Table 8: Heterogeneity

Exploring Heterogeneity – Interaction Terms
Dependent Variable: Log (1+days it takes to get a construction permit)

	(1) coef/se	(2) coef/se	(3) coef/se	(4) coef/se	(5) coef/se	(6) coef/se
Bribe request – Construction	0.417***	-0.004	0.380***	0.382***	0.373***	0.505***
Permit	(0.073)	(0.500)	(0.073)	(0.078)	(0.125)	(0.117)
Demeaned ln(Y/L)*Bribe	0.032					
Request	(0.054)					
Demeaned lnL*Bribe request		0.123				
		(0.235)				
Demeaned lnL^2*Bribe request		-0.004				
		(0.024)				
Perceived Bribe Amount			-0.178	-0.172		
			(0.133)	(0.223)		
Perceived Bribe Amount				-0.015		
*Bribe request				(0.288)		
Burdensome Regulation (DB)					0.121	
					(0.116)	
Burdensome Regulation (DB)					-0.086	-0.158
*Bribe request					(0.191)	(0.140)
F-test joint significance		2.39(2,99)				
Interaction terms		0.0968				
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Country-Sector-Year Dummies	Yes	Yes	Yes	Yes	No	Yes
Sector Dummies	No	No	No	No	Yes	No
Year Dummies	No	No	No	No	Yes	No
R2	0.361	0.362	0.395	0.395	0.077	0.361
Adjusted R2	0.213	0.214	0.236	0.236	0.067	0.214
Number of observations	2,763	2,763	2,392	2,392	2,763	2,763

Note: *** p<0.01, ** p<0.05, * p<0.1.
Standard errors are heteroscedasticity robust and clustered by country and year.
Firm controls are lnL, lnL^2, ln(K/L), Any female owners, manager's experience, firm age (log), public ownership, foreign ownership, and exporter dummies, and ln(Y/L).
Burdensome Regulation (DB) is a dummy that takes the value 1 if the *de jure* time it takes to get a construction permit according to the Doing Business Indicators exceeds 200 days and zero otherwise.

Table 9: Quantile Regressions

Quantile Regressions					
Dependent Variable: The time it takes to get a Construction permit (Z-scores)					
Quantile	**10**	**30**	**50**	**70**	**90**
	coef/se	**coef/se**	**coef/se**	**coef/se**	**coef/se**
Bribe request – Construction Permit	0.397***	0.441***	0.308***	0.330***	0.296***
	(0.077)	(0.054)	(0.066)	(0.057)	(0.094)
lnL	0.157	0.099	-0.003	-0.088	-0.174
	(0.118)	(0.085)	(0.101)	(0.087)	(0.139)
lnL^2	-0.008	-0.005	0.004	0.011	0.017
	(0.013)	(0.009)	(0.011)	(0.010)	(0.015)
ln(Y/L)	-0.013	0.001	0.015	0.009	-0.010
	(0.023)	(0.015)	(0.018)	(0.016)	(0.027)
ln(K/L)	0.015	0.004	0.004	0.007	0.005
	(0.019)	(0.013)	(0.016)	(0.014)	(0.023)
Any female owners	0.051	0.037	-0.006	-0.006	-0.018
	(0.068)	(0.047)	(0.056)	(0.048)	(0.081)
Manager's Experience	0.107**	0.082**	0.074*	0.099***	0.136**
	(0.051)	(0.035)	(0.043)	(0.037)	(0.060)
Firm age (log)	-0.061	-0.001	-0.033	-0.017	-0.006
	(0.044)	(0.031)	(0.038)	(0.033)	(0.054)
Public	-0.284	-0.065	-0.198	-0.286	0.420
	(0.266)	(0.191)	(0.229)	(0.198)	(0.313)
Foreign	-0.056	0.020	0.039	0.013	0.022
	(0.090)	(0.064)	(0.078)	(0.068)	(0.111)
Exporter	0.051	0.006	0.023	0.030	0.065
	(0.071)	(0.050)	(0.061)	(0.053)	(0.090)
Number of observations	2,706	2,706	2,706	2,706	2,706

Note: *** p<0.01, ** p<0.05, * p<0.1
Standard errors are heteroscedasticity robust and clustered by country and year.
Z-scores are computed by country-sector-year