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Breen, Michael and Gillanders, Robert

Dublin City University

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Does Corruption Ease the Burden of Regulation? National and Subnational Evidence

Michael Breen¹ and Robert Gillanders²

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Abstract

Does corruption ease the burden of regulation? We test this question using survey data on business managers' experience of dealing with regulation and corruption. We find that there is substantial within-country variation in the burden of regulation and that corruption is associated with worse regulatory outcomes across a range of indicators at the country and subnational level. Our results, which hold over a number of specifications, are inconsistent with the hypothesis that corruption greases the wheels of commerce by easing the burden of regulation on the average firm in poor regulatory environments. Rather, our results suggest that corruption increases the burden and imposes large costs on businesses.

JEL: D73; K20; L51; R50

Keywords: Corruption, regulation, governance, entrepreneurship, business regulation

¹ Dublin City University, School of Law and Government. Email: michael.breen@dcu.ie.

² Dublin City University Business School, and Hanken School of Economics. E-mail: rgillanders@gmail.com.

1. INTRODUCTION

Does corruption ease the burden of regulation by helping businesses to spend less time and resources dealing with red tape? Alternatively, do corrupt officials use red tape as a tool to extract larger bribes, forcing businesses to waste time and resources? Many studies conclude that corruption is associated with misgovernance and low-quality regulation (Banerjee, 1997; Djankov 2002; Guriev 2004; Breen and Gillanders 2012). However, a recent study finds that the burden of formal regulation does not correlate with managers' experience of dealing with regulation (Hallward-Driemeier and Pritchett, 2015: 123). Following this line of argument, we revisit the link between corruption and regulation using data on *de jure* regulation from the World Bank's Doing Business project and on *de facto* regulation from the World Bank's Enterprise Surveys, a series of global surveys that contain data on managers' experience of doing business. The surveys record the amount of time that firms spend dealing with overall regulation, as well as the extent to which they perceive that regulation is a major constraint on their operations.

We find that more corruption is associated with a greater regulatory burden on average, across a range of indicators at both the national and subnational level. The indicators include the time spent dealing with regulation, and the extent to which a) licenses and permits, b) tax administration, and c) customs and trade regulations are major constraints to doing business. As well as contributing to the literature on the determinants of regulation, these findings also have implications for a related literature on the growth effects of corruption. This literature argues that corruption may increase growth in environments where firms must contend with low-quality regulation and institutions.¹ Our results are inconsistent with this argument, in that they suggest that the average firm is impeded and constrained by corruption. However, this does not rule out the possibility that corruption facilitates growth by enabling the most efficient firms to avoid regulation. Finally, we find that the association between corruption and increased

regulatory burden continues to hold in countries and subnational units characterized by low-quality regulations and institutions.

This article is organized as follows. First, we review the empirical literature on the determinants of regulation and then we consider the role of corruption as an efficient ‘grease’. We then proceed to outline our data, method, and results. The results are presented in three parts: the first presents our findings regarding the overall association between corruption and regulation and the second and third parts describe the findings from our subnational analysis and subsample tests. Finally, we conclude with a discussion of the implications of our findings for research and policy.

2. LITERATURE

The quality of regulation is shaped by corruption, institutions, and a range of historical and geographic factors. However, previous empirical studies on the links between corruption and regulation have not differentiated between *de facto* and *de jure* regulation. The difference is important, as it may appear that stringent formal regulations are associated with more corruption when in practice firms may sidestep the costs of *de jure* regulation entirely. Furthermore, there is growing evidence that the burden of corruption and regulation differ considerably within countries. Some regions in a country may experience dramatically different levels of both, suggesting that we should look within, as well as across countries in order to understand the impact of corruption on regulation. We now describe the literature and present arguments on how to advance it to address these issues.

(a) The determinants of regulation

Regulation has the potential to help societies by reducing or eliminating market failures. However, some parts of society benefit more from shaping regulation than others. Special interest groups, in particular, may use their resources to capture the government agencies that

design and monitor compliance with regulations. Indeed, the public choice approach contends that regulation is often acquired by industries and designed for their benefit (Stigler, 1971). This outcome is known as regulatory capture, and it can happen through legal practices like lobbying and political donations or illegal practices like corruption (Laffont and Tirole, 1991).

In line with the public choice approach, many studies find that corruption affects the quality of regulation. Guriev (2004), for example, presents a theoretical model in which he finds that some kinds of corruption can reduce red tape, but the equilibrium level of red tape is always above the social optimum. Breen and Gillanders (2012) find that corruption is associated with worse business regulation in a sample of 100 countries from 2000 to 2009. However, that study and the majority of empirical studies on the determinants of regulation consider only *de jure* or formal regulation.² Even if corruption is responsible for a more complex and seemingly burdensome legal and regulatory environment, as Breen and Gillanders (2012) argue, does it necessarily follow that corruption imposes real burdens on firms? According to Hallward-Driemeier and Pritchett (2015: 123), there is little correlation between *de jure* and *de facto* measures of regulation: the stringency of formal regulation on the books is not correlated with managers' actual experience of dealing with regulation. There are two ways, in particular, that corruption may help firms to sidestep regulation. First, it may increase the legal requirements on firms, as corrupt officials use these requirements to extract bribes. Second, corrupt officials may be willing and able, for a fee or other benefit, to waive large swathes of legal requirements (Djankov *et al.*, 2002). The empirical question as to which of these mechanisms dominates is the focus of this article.

Furthermore, the majority of empirical studies on the causes and consequences of regulation use the World Bank's *Doing Business* indicators to measure the quality of regulation. These indicators come from surveys which ask experts to comment on a small domestically owned manufacturing company, usually in a country's commercial capital. This focus may bias the

data towards the regulatory experience of firms in the center, which may differ considerably from the experience of firms across a country's regions, as administrative and state capacity to enforce compliance with regulation may differ significantly within countries. Monitoring in provinces may not be as stringent and there may be important differences in infrastructure, and population density, as well as other cultural and historical factors. Indeed, previous research finds that corruption can vary within an economy. For example, Cole *et al.* (2009) find that it varies in the case of China, Ledyeva *et al.* (2013) in Russia, and Gillanders (2014) across a sample of economies.

Of course, many factors besides corruption also contribute to the quality of regulation including institutional quality, geographic factors, and different legal traditions. Good institutions may produce better regulations and foster more accountability among the government agencies that design and enforce regulations. Furthermore, higher quality institutions may help societies to resist processes like regulatory capture and make it more difficult for special interest groups to lobby for regulation (or deregulation) that benefits only a narrow segment of society. In line with these arguments, Djankov *et al.* (2002) find that countries with larger, less democratic, and more interventionist governments regulate business entry more heavily. La Porta *et al.* (1997) find there is a strong association between different legal tradition and a broad range of regulatory outcomes, including the protection of investors. Similarly, Botero *et al.* (2004), find a strong association between legal tradition and the regulation of labor markets. In summary, the literature on the quality of regulation points to corruption, institutions, and historical factors as key predictors. However, a related literature on the growth-effects of corruption argues that there are particular circumstances in which corruption might be beneficial, which we now consider.

(b) *The conditional case for corruption?*

One of the most controversial debates in economics centers on whether corruption ‘greases’ or ‘sands’ the wheels of commerce. The debate centers on the effect of corruption in poor regulatory environments. If bribery works in these places, it may help businesses to reduce the cost of compliance with bad regulations, or speed things up when dealing with slow public officials, thus raising growth and productivity. On the other hand, corrupt officials may find it easier to use regulation as a tool to extract larger bribes where institutional quality is low, making it less likely that corruption will feed into higher growth. In this article, we do not focus on the growth-effects of corruption but we note that regulation is a central feature of this argument, as it is the primary channel through which the ‘grease’ of bribes affects growth and productivity.

While the literature advances the argument that corruption may increase growth under constraints, it is aware also of the potential costs of corruption. Bribery is an illegal and inherently risky activity. In most countries, severe cases are punished by imprisonment and in some countries, public officials have been executed for corruption. Moreover, the average firm may not realize any advantage from bribery if it is a tool used by corrupt public officials to harass firms according to their ability to pay bribes. Indeed, individual firms may benefit from paying a bribe to skip the queue but on average corruption may stifle firm activity through more burdensome regulation, as corrupt officials extract larger bribes from the most profitable businesses. Not to mention the possibility that an inefficient firm may pay the largest bribe by compromising on quality to do so (Rose-Ackerman, 1997). Finally, we should not assume that firms always direct bribes at regulations that strangle economic development when they may sometimes use bribery to circumvent or eliminate good regulations (Bertrand *et al.*, 2007).

There are many studies that test the impact of corruption on the economy. For example, Mauro (1995) finds that corruption is associated with lower growth in two datasets covering between 68 and 57 countries from 1971 to 1983. Méon and Sekkat (2005) find that corruption reduces

growth in a sample of 63 to 71 countries from 1970 to 1998 and that growth is even worse as governance deteriorates. However, Méon and Weill (2010) argue that testing overall impact of corruption on growth is not a direct test of the grease hypothesis; nor is an overall negative effect inconsistent with the idea that corruption may grease the wheels. Rather, they argue that researchers should focus on whether corruption helps countries with weak institutions to take advantage of their factor endowments. They study 69 countries from 2000 to 2003 using the World Bank's Control of Corruption (CC) and Transparency International's Corruption Perceptions Index (CPI). In some estimations, they find a statistically significant positive marginal effect of an increase in corruption on efficiency in poorly governed countries, and in others, the effect becomes insignificant in these countries (Méon and Weill, 2010:253). Following this study, Dreher and Gassebner (2013) find that corruption is associated with a higher rate of firm entry in the presence of administrative barriers to entry in a sample of 43 countries from 2003 to 2005, using the CC and CPI to measure corruption and the World Bank's Doing Business indicators to measure regulation.³

Both Méon and Weill's (2010) and Dreher and Gassebner's (2013) works are sophisticated in their approach to testing the grease hypothesis. However, like many studies in the literature, they rely on macro indicators of corruption perceptions. Aidt (2009:271), who finds against the hypothesis, argues 'that all the claims made about the corruption-growth nexus based on statistical analysis of the perception-based indices of corruption disappear when a cross-national index of managers' actual experience with corruption is used to approximate corruption.' Indeed, Kaufmann and Wei, (1999) find that firms which pay more bribes spend more time dealing with regulation and suffer a higher cost of capital, in a study that uses data from three worldwide firm-level surveys from 1995 to 1997. Fisman and Svensson (2007) find that the bribery rate is associated with a reduction in firm growth of three percent in a survey of Ugandan firms from 1995-97.⁴

(c) Lessons

The literature on the determinants of regulation and the related literature on the growth effects of corruption contain useful lessons for our study. The first is that we must distinguish clearly between regulation in principle and in practice if we are to understand whether corruption eases the burden of regulation. Ideally, empirical tests should incorporate measures of both *de facto* and *de jure* regulation, to understand how regulation is experienced by firms as well as its formal quality or lack thereof. The second is that there are reasons to expect that corruption and regulatory quality can vary within an economy. Finally, we must consider both the general association between corruption and regulation and the possibility that the impact of corruption on regulation is contingent on the existing institutional and regulatory context. Recent contributions on the contingent effect of corruption on the economy agree that it may have an overall negative effect while having a positive effect under some conditions, and it is possible that the same is true of the association between corruption and regulation.

3. DATA AND METHOD

Our primary variables of interest come from the World Bank's Enterprise Surveys. These are representative firm-level surveys on a wide range of topics relevant to the business environment. From these surveys, we gathered two datasets, one consisting of country-level indicators and the other consisting of subnational indicators. The data is a highly unbalanced panel with some countries surveyed once and others surveyed multiple times.

We use four outcome variables that come from survey questions about the extent to which regulatory issues affect firm operations. Three of our four outcome variables come from questions about the extent to which a) tax administration, b) business licensing and permits, and c) customs and trade relations are constraints to the respondent's firm's operations. Our fourth outcome variable captures firms' responses to the following question:

*In a typical week over the last 12 months, what percentage of total senior management's time was spent in dealing with requirements imposed by government regulations?*⁵

Each of our regulatory constraint variables captures firm-level perceptions of the extent to which regulation is problematic because it is costly and (or) time-consuming.⁶ While not objective, they are at least based on the firm's own experiences as opposed to the perceptions of others. Furthermore, our variable which focuses specifically on the percentage of senior management time spent dealing with overall regulation provides a different view of the regulatory burden, as one can imagine situations where firms might consider something to be time-consuming but not necessarily burdensome and vice versa. At both levels of aggregation, when examining a constraint variable we are interested in the percentage of firms in each country or subnational unit that report that the factor in question is a major or very severe obstacle to their operations. Similarly, when examining the time spent dealing with regulations we are interested in the average number of hours reported.

Our subnational units do not necessarily correspond to real administrative or geographical regions. For example, Kazakhstan is divided into center, north, south, east, and west, whereas the areas surveyed in Kenya are Kisumu, Mombasa, Nairobi, and Nakuru. We obtained our macro-level averages of these variables from the Enterprise Surveys' website and for our subnational analysis, we generated averages of the firm-level data for each survey-unit. We dropped countries with only one region and regions with only one firm.

Our main explanatory variable is corruption. Following Gillanders (2014), we measure corruption from an Enterprise Survey question that asks whether corruption is No Obstacle, a Minor Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of the establishment. Like our outcome variables, this is not entirely objective because it contains a subjective appraisal but unlike common indices of corruption it is based on firms own

experiences of corruption. While we acknowledge the potential shortcomings of this measure, it has two desirable features. First, the commonly used metrics from Transparency International (CPI) and the World Bank (CC) are largely based on appraisals by so-called experts and therefore have been criticised on these grounds by many authors as being subject to perception biases (Svensson, 2003; Reinikka and Svensson, 2006; Fan, Lin and Treisman, 2009) and a tendency to lag reality (Knack, 2007; Kenny, 2009). Second, and crucially for our purposes, this firm-level information allows us to generate subnational indicators. Gillanders (2014) demonstrates that there is meaningful subnational variation in corruption according to this measure.

We control for the Rule of Law from the World Governance Indicators (WGI), as a proxy for institutional quality, and GDP per capita and land area in square kilometers from the World Development Indicators (WDI). Our subnational-level control variables are generated from the Enterprise Survey. Table A1 presents summary statistics for all of the variables used in this article.

Endogeneity is an obvious concern at both levels, and while we can include country fixed effects to account for omitted variables and unobserved heterogeneity, a simple and obvious reverse causality story, whereby poor regulation and regulatory practice incentivizes corruption, means that we must refrain from making any causal claims. Instrumental variable strategies have been implemented in cross-country settings to address this concern. For example, Breen and Gillanders (2012) use distance to the equator, ethnolinguistic fractionalization, and the age of the state as instruments for corruption. In our context, these instruments fail to pass the standard diagnostic and are suspect on an intuitive level. Furthermore, no comparable, or sensible, instruments can be generated from the Enterprise Surveys for use in the subnational case. Controlling for *de jure* regulation as we do in Table 4 below addresses this concern somewhat as it allows us to control for the formal burden of red

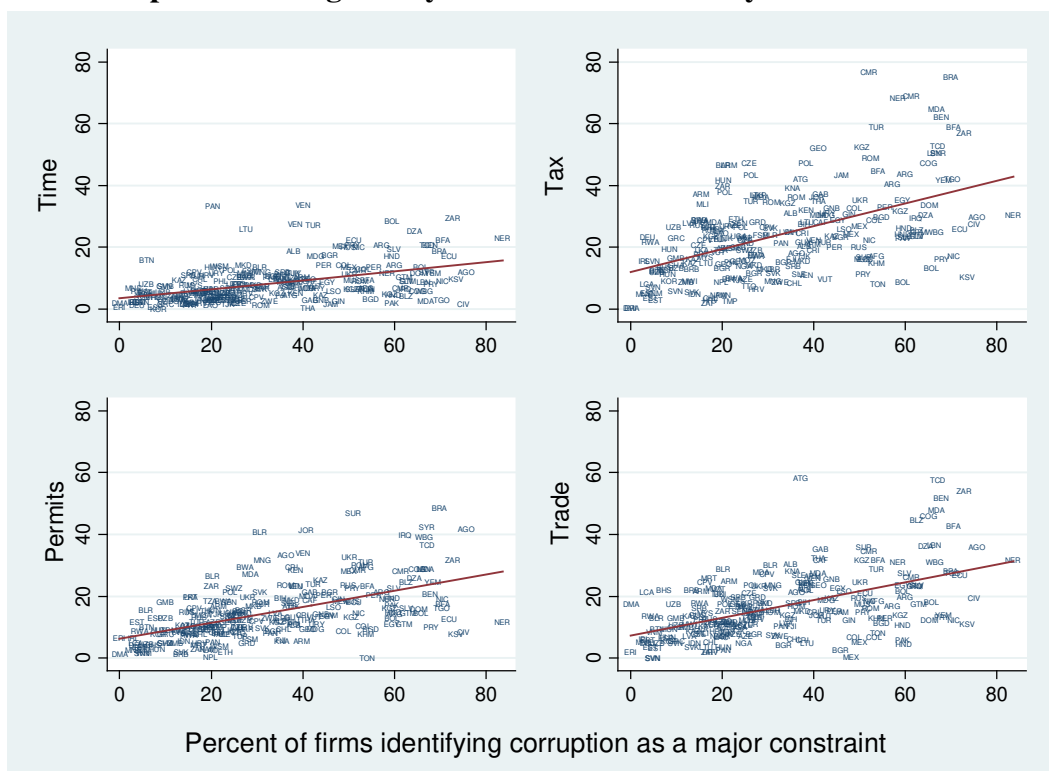
tape, and therefore some of the incentive to pay bribes related to regulation. Therefore, we proceed to present simple, yet carefully considered, OLS estimates of the relationship of interest and speak only of associations.

4. RESULTS

(a) Country-level results

Figure 1 illustrates a strong association between the extent to which corruption is viewed by firms within a country to be a problem and our four measures of regulatory burden. The first panel shows that the time spent by senior managers dealing with regulation increases as the percentage of firms identifying corruption as a major constraint increases. A similar relationship is evident in panels 2 to 4, which focus on how much of a problem tax, business licensing and permits, and trade are for firms. We now proceed to test their robustness to the inclusion of covariates.

Figure 1. Corruption and Regulatory Burden at the Country-Level



Note: Time is time spent dealing with overall regulation, Tax is the percentage of firms that report tax as a major constraint, Permits is the percentage of firms that report business licensing and permits as a major constraint, Trade is the percentage of firms that report customs and trade regulations as a major constraint.

Table 1 presents estimates of the relationship between corruption and our four regulatory constraint variables, controlling for several potentially important variables. First, we control for general institutional quality using the World Bank’s Rule of Law indicator. In places where the overall ‘rules of the game’ are better, this may translate also into a better business environment that imposes fewer unnecessary constraints on firms. Second, we control for GDP per capita to allow for the possibility that richer countries have greater state capacity and thus more effective regulatory systems. Finally, we control for the geographic size of a country because larger countries may be harder to administer and slower to reform.

We find that corruption is a significant predictor of the burden of regulation across our four outcomes: more corrupt countries tend to have more burdensome regulation, at least from the point of view of their firms. Furthermore, institutional quality, as measured by the Rule of Law,

is statistically insignificant, with the exception of the model in column 2 where tax administration is the outcome variable. These results are largely in line with the findings of Kaufman and Wei (1999) and Breen and Gillanders (2012). Interestingly, the senior managers of firms in richer countries report that they spend more of their time dealing with regulation but at the same time view some aspects of regulation as less burdensome. This reinforces the need to examine multiple aspects of the regulatory environment. Finally, the results pertaining to country size are mixed: our time and permits indicators are negatively affected by country size whereas country size is associated with firms reporting less burdensome trade and customs regulations.

Table 1. Country-Level Results

VARIABLES	(1) Time	(2) Tax	(3) Permits	(4) Trade
Corruption	0.14*** (0.023)	0.40*** (0.055)	0.22*** (0.033)	0.29*** (0.040)
Rule of Law	-1.21 (1.005)	3.73** (1.774)	-0.81 (1.125)	-0.03 (1.078)
GDP per capita (log)	1.24** (0.567)	-2.18** (0.873)	0.61 (0.553)	-1.79*** (0.625)
Area (log)	0.49*** (0.172)	0.80 (0.502)	0.93*** (0.269)	-0.92** (0.385)
Observations	215	216	216	215
R-squared	0.264	0.294	0.324	0.339

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The measures from our survey data capture, at least to some extent, the propensity of respondents to complain, whether about corruption or regulation. Therefore, as a robustness check columns 1-4 of Table 2 substitute the World Bank's Control of Corruption variable for the World Bank Enterprise Survey measure. The Control of Corruption differs considerably from the Enterprise Survey measure of corruption, as it is based on multiple data sources, including expert opinion. We drop the Rule of Law from these specifications as it is highly

correlated with the Control of Corruption variable (0.91). For the most part, these specifications are in line with our previous findings, with the exception of the burden of taxation which is no longer statistically significant at the 5 percent level.

We also address this criticism by adding country dummies in columns 5-8. These dummies are added to our original specification in order to control for cultural and other unobserved characteristics that may drive the propensity to report problems. The findings from these models are broadly in line with those reported in Table 1; the magnitude of the coefficients are similar but corruption is no longer a statistically significant predictor of the time managers spend dealing with regulation.

Table 2. Country Level Results: Robustness Checks

	(1) Time	(2) Tax	(3) Permits	(4) Trade	(5) Time	(6) Tax	(7) Permits	(8) Trade
Control of Corruption	-1.98** (0.981)	-3.52* (1.874)	-3.65*** (1.198)	-3.10** (1.338)				
Corruption					0.12 (0.074)	0.40*** (0.121)	0.23*** (0.057)	0.37*** (0.076)
Rule of Law					0.60 (4.852)	-3.90 (8.902)	2.05 (3.771)	-2.43 (5.537)
GDP per capita (log)	1.14* (0.612)	-0.52 (1.133)	1.05* (0.612)	-1.41* (0.823)	7.86 (5.238)	-20.35** (8.260)	3.77 (4.799)	-9.87** (4.903)
Area (log)	0.64*** (0.217)	0.82 (0.586)	1.04*** (0.323)	-0.73* (0.417)	-68.19 (502.443)	1,011.88 (963.189)	139.50 (538.166)	-238.89 (479.569)
Country FE	No	No	No	No	Yes	Yes	Yes	Yes
Observations	215	217	217	216	215	216	216	215
R-squared	0.082	0.069	0.131	0.101	0.735	0.864	0.885	0.923

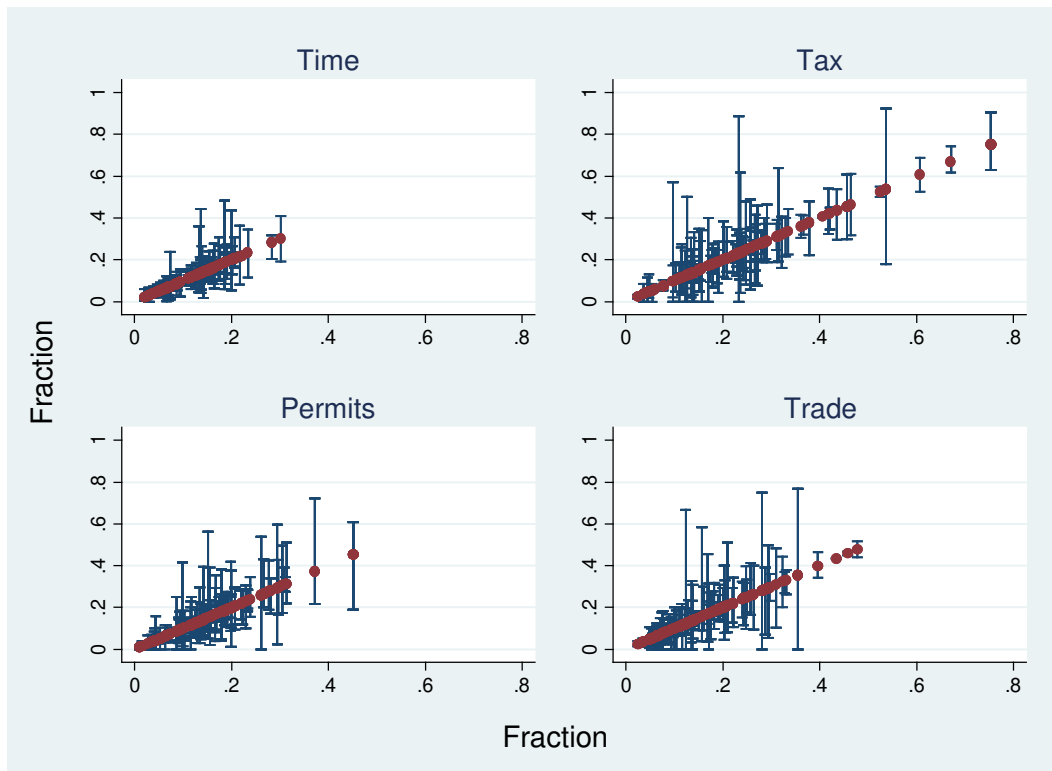
Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

(b) Subnational-Level Results

Having established that corruption is associated with more burdensome regulations at the country level, we proceed to test this relationship using subnational data. Figure 2 illustrates that there is substantial within-country variation to be explained in each of our four indicators. In this figure, the top of each bar represents the maximum observed subnational value within a country, the bottom the minimum, and the point is the average. We also observe that the within-

country variation does not have any obvious relationship to the average within a country, as the height of the bars does not increase as we move along the x-axis.

Figure 2. Within-in Country Variation in Regulatory Burden



Note: Time is time spent dealing with overall regulation, Tax is the percentage of firms that report tax as a major constraint, Permits is the percentage of firms that report business licensing and permits as a major constraint, Trade is the percentage of firms that report customs and trade regulations as a major constraint.

Table 3 presents our subnational results. We control for many of the same factors as the country level analysis. The first control variable – Courts – is our proxy for the quality of institutions, and captures the fraction of firms in a sub-national unit which report that the courts are a major or very severe obstacle to their operations. The second control variable is the average total cost of labor, which we use as a proxy for regional GDP since there is no direct measure in our dataset. The Enterprise Survey does not contain any geographic information that would allow us to control for area. When we control for these factors, columns 1, 4, 7, and 10 show us that there is a strong association between corruption and the burden of regulation at the subnational level. More corrupt subnational units tend to have more burdensome regulations in the eyes of

their firms. These findings lend support to Breen and Gillanders (2012). However, unlike Breen and Gillanders (2012) we do find a role for institutional quality, which is statistically significant in most of our specifications, except for the time spent dealing with regulation. Moreover, the magnitude of the institutional coefficient is larger than the corruption coefficient in most cases, suggesting that institutional quality also plays an important role in the quality of the business environment.

Columns 2, 5, 8, and 11 introduce country fixed effects to the specification as it is likely that country-level factors play a role in shaping both regulatory outcomes and corruption. Allowing for this cross-country heterogeneity, corruption is still associated with regulatory burden in most of our specifications, except senior management time spent dealing with regulation. Furthermore, the magnitude of the relationship is robust to the inclusion of country dummies, and the relationship between institutional quality and regulatory burden also holds.

To account for differences in industrial structures and other features which may influence firms' priorities, columns 3, 6, 9, and 12 include dummy variables to capture global region. We find that relative to sub-Saharan Africa, most regions find regulation to be less burdensome, although, in Europe, Central Asia, and Latin America and the Caribbean, senior managers spend more time dealing with regulation. While corruption is only significant at the 10 percent level in column 3, for the most part, our conclusions regarding corruption hold.

Taken together, our findings point to a consistent association between corruption and the burden of regulation at the subnational level, even when controlling for global region and macroeconomic characteristics. Our findings are in line with the results from the country level data and suggest that corruption generates a real burden for firms. We also see a role for broader institutional quality at this level: subnational units in which the courts are more of a constraint are places where the environment is less conducive to business.

The story is somewhat different when it comes to the time that senior managers spend dealing with regulation. Here, we find no meaningful association when we control for country fixed effects and global regions. In columns 2 and 3, corruption is not associated with the amount of time it takes to deal with overall regulation. Therefore, in subnational units where corruption is worse, different dimensions of regulation are a greater constraint on business but firms do not necessarily spend more time dealing with regulation. The burden of corruption on firms is still greater in these subnational units, but the cost of dealing with overall regulation is not necessarily time-consuming.

(c) Corruption under low-quality regulation and low-quality institutions

We now consider the conditional case for corruption; that is, the possibility that it can help in regimes that consist of low-quality regulation and weak rule of law. First, we present findings that control for *de jure* regulation using the World Bank's *Doing Business* rank and the sub-rankings from *Doing Business* that correspond to the specific measures of regulatory constraint that we collected from the Enterprise Surveys. In Table 4, columns 1-8 add the *Doing Business* rank as a control variable. Estimates for each of our four regulatory constraint variables are presented with and without country dummies. Columns 9-14 add the *Doing Business* sub-rankings pertaining to tax, permits, and trade as additional control variables. Estimates in these columns are also presented with and without country dummies.

Our findings regarding the association between corruption and the burden of regulation are robust to the inclusion of these variables and the size of the corruption coefficients is largely unchanged. However, the 'way things ought to be done' as measured by *Doing Business*, is associated with the real burden of regulation in several specifications. In particular, models which center on the regulatory constraints regarding tax, permits, customs and trade regulations exhibit some response to *de jure* regulation both in relation to the overall *Doing Business* rank and the more focused sub-rankings. Stricter regulations 'on the books' matters for the real

burden of regulation in some instances, but this does not undermine our earlier findings regarding corruption and the magnitude of the association is not very large. Furthermore, the *Doing Business* rank is arguably a reasonable proxy for the incentive to pay a bribe to avoid formal regulatory requirements. Therefore, its inclusion helps to address some of our concerns regarding reverse causality.

Table 5 presents our findings from sub-samples defined by *Doing Business* and Rule of Law performance. The sub-samples relate to subnational units that are in countries that score in the bottom 50th and 25th percentiles of the *Doing Business* rank and Rule of Law rank. In these sub-samples, the association between the overall time spent dealing with regulation and corruption is statistically insignificant. The statistical association between our other regulatory constraint variables and the level of corruption is consistent, for the most part, with the findings presented in Table 4. In fact, the magnitude of the association between corruption and regulatory constraint is greater in most cases across tax, permits, and trade. While it is still possible that corruption facilitates growth by enabling the most efficient firms to avoid regulation, overall, our findings do not support the hypothesis that corruption greases the wheels for the average firm under regimes that display poor regulation or weak institutions.⁷

Table 3. Subnational Level Results

VARIABLES	(1) Time	(2) Time	(3) Time	(4) Tax	(5) Tax	(6) Tax	(7) Permits	(8) Permits	(9) Permits	(10) Trade	(11) Trade	(12) Trade
Corruption	0.07*** (0.023)	0.03 (0.033)	0.05* (0.026)	0.20*** (0.050)	0.19*** (0.061)	0.18*** (0.052)	0.12*** (0.036)	0.19*** (0.047)	0.13*** (0.038)	0.13*** (0.039)	0.16*** (0.047)	0.16*** (0.038)
Courts	0.06 (0.037)	0.02 (0.050)	0.06 (0.041)	0.45*** (0.090)	0.20** (0.084)	0.48*** (0.088)	0.29*** (0.067)	0.22*** (0.058)	0.30*** (0.065)	0.33*** (0.068)	0.28*** (0.067)	0.34*** (0.065)
Cost of Labour (log)	0.01*** (0.002)	0.01*** (0.005)	0.01*** (0.003)	0.00 (0.006)	0.02** (0.008)	0.01 (0.006)	0.00 (0.004)	0.01** (0.006)	0.01 (0.004)	-0.01 (0.004)	0.02*** (0.006)	0.01* (0.004)
Europe and Central Asia			0.02* (0.012)			-0.09*** (0.020)			-0.05*** (0.016)			-0.10*** (0.016)
Latin America and the Caribbean			0.04*** (0.015)			-0.06** (0.024)			-0.05*** (0.016)			-0.12*** (0.017)
Rest of the World			-0.01 (0.012)			-0.10*** (0.021)			-0.08*** (0.017)			-0.09*** (0.019)
Country dummies	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes	No
Observations	423	423	423	423	423	423	423	423	423	423	423	423
R-squared	0.193	0.602	0.230	0.323	0.770	0.365	0.289	0.716	0.326	0.313	0.686	0.413

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Subnational Level Results and Doing Business Rank

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Time	Time	Tax	Tax	Permits	Permits	Trade	Trade	Tax	Tax	Permits	Permits	Trade	Trade
Corruption	0.07*** (0.024)	0.03 (0.033)	0.17*** (0.053)	0.19*** (0.061)	0.13*** (0.038)	0.19*** (0.047)	0.10** (0.038)	0.16*** (0.047)	0.19*** (0.048)	0.19*** (0.061)	0.14*** (0.036)	0.19*** (0.047)	0.11*** (0.038)	0.16*** (0.047)
Courts	0.04 (0.037)	0.00 (0.050)	0.44*** (0.090)	0.19** (0.087)	0.30*** (0.070)	0.21*** (0.060)	0.34*** (0.063)	0.29*** (0.068)	0.40*** (0.087)	0.19** (0.087)	0.31*** (0.071)	0.21*** (0.060)	0.36*** (0.065)	0.29*** (0.068)
Cost of Labour (log)	0.02*** (0.003)	0.02*** (0.005)	0.01 (0.006)	0.02** (0.008)	0.00 (0.005)	0.01* (0.006)	0.00 (0.004)	0.02*** (0.006)	0.01 (0.006)	0.02** (0.008)	-0.00 (0.004)	0.01* (0.006)	0.00 (0.004)	0.02*** (0.006)
Doing Business rank	0.00 (0.000)	0.00 (0.000)	0.00*** (0.000)	0.00 (0.001)	0.00 (0.000)	0.00*** (0.001)	0.00*** (0.000)	0.00** (0.001)						
Tax rank									0.00*** (0.000)	0.00 (0.001)				
Permits rank											-0.00 (0.000)	0.00** (0.001)		
Trade rank													0.00*** (0.000)	0.00** (0.000)
Country dummies	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Observations	413	413	413	413	413	413	413	413	413	413	413	413	413	413
R-squared	0.198	0.605	0.341	0.769	0.307	0.717	0.397	0.689	0.375	0.769	0.305	0.717	0.375	0.689

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. Sample splits by Doing Business Rank and Rule of Law

	Doing Business bottom 50% (1-4)				Rule of law bottom 50% (5-8)				Doing Business bottom 25% (9-12)				Rule of law bottom 25% (13-16)			
	(1) Time	(2) Tax	(3) Permits	(4) Trade	(5) Time	(6) Tax	(7) Permits	(8) Trade	(9) Time	(10) Tax	(11) Permits	(12) Trade	(13) Time	(14) Tax	(15) Permits	(16) Trade
Corruption	0.02 (0.067)	0.39*** (0.073)	0.25*** (0.068)	0.12** (0.052)	0.07 (0.070)	0.16 (0.100)	0.17** (0.076)	0.12 (0.088)	0.04 (0.065)	0.36*** (0.109)	0.40*** (0.103)	0.03 (0.060)	-0.00 (0.050)	0.16 (0.115)	0.28*** (0.102)	0.17 (0.136)
Courts	-0.07 (0.074)	0.04 (0.078)	0.11 (0.088)	0.22*** (0.069)	-0.11 (0.098)	0.19 (0.169)	0.15 (0.114)	0.40*** (0.145)	-0.05 (0.058)	0.15 (0.113)	0.15* (0.083)	0.30*** (0.088)	0.08 (0.061)	0.08 (0.193)	0.21 (0.148)	0.18 (0.198)
Cost of Labour (log)	0.01 (0.008)	0.01 (0.008)	0.01 (0.008)	0.00 (0.006)	0.01* (0.006)	0.02** (0.012)	0.02** (0.008)	0.01 (0.012)	-0.01 (0.010)	0.00 (0.010)	0.00 (0.009)	-0.00 (0.008)	0.01 (0.006)	0.01 (0.015)	0.01 (0.012)	0.00 (0.013)
Constant	-0.01 (0.087)	0.04 (0.115)	-0.01 (0.084)	0.02 (0.081)	-0.08 (0.092)	-0.26 (0.167)	-0.03 (0.125)	-0.10 (0.167)	0.18 (0.151)	-0.03 (0.148)	-0.01 (0.123)	0.04 (0.114)	-0.06 (0.079)	-0.02 (0.186)	-0.03 (0.165)	0.04 (0.161)
Observations	212	212	212	212	160	160	160	160	104	104	104	104	76	76	76	76
R-squared	0.537	0.740	0.690	0.579	0.642	0.757	0.714	0.684	0.512	0.709	0.644	0.499	0.751	0.762	0.704	0.655

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5. CONCLUSION

We have presented evidence that regulation is likely to be a greater burden in more corrupt places. In these places, business managers tend to report spending more time dealing with regulation and that a wide range of regulatory issues are greater obstacles to their operations. These findings are robust to additional exogenous controls and alternative measures of the main variables. We extended our analysis to consider whether these associations hold at the subnational level, and when controlling for *de jure* regulation, and in sub-samples characterized by weak regulations and low-quality institutions. Again, we find that corruption is associated with more burdensome regulation in almost all specifications. In summary, it seems that corruption does not ease the burden of regulation but probably makes it worse by imposing additional costs on businesses.

Our findings lend support to previous work which argues that misgovernance is partly responsible for low-quality regulation (Djankov, 2002; Guriev 2004; Breen and Gillanders, 2012), as well as a large body of research which finds that corruption has a negative impact on many social and economic outcomes (Gupta, 2002). Our findings suggest that policymakers should implement institutional and policy reforms to address the quality of regulation. However, institutional reforms by themselves may not be enough to improve the business environment if corrupt officials find ways to work around them. Strategies to control corruption, in addition to top-down institutional reforms, are a path to an improved business environment. Such reforms include monetary incentives, information and transparency measures, and investment in technologies that increase the costs of corruption. For example, an experiment in disseminating information regarding school capitation grants in Uganda was successful in reducing the amount of public funds wasted through corruption (Reinikka and Svensson, 2005). Such experiments could be developed specifically for the business environment.

Finally, our results have implications for the hypothesis that corruption greases the wheels of an economy that suffers from poor institutions. While our results are not enough evidence to reject outright the hypothesis, they do lead us to question elements of that argument that link corruption to less burdensome regulation and thus greater productivity and growth. If corruption positively affects growth under weak governance, we suggest that it must do so through other channels than lifting the average regulatory burden on firms.

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¹ This literature has been debated in economics since Leff (1964). Early contributions include the political scientist Samuel P. Huntington, who said that ‘in terms of economic growth, the only thing worse than a society with a rigid, overcentralized, dishonest bureaucracy is one with a rigid overcentralized, and honest bureaucracy’ (1968, p. 386). However, the debate has deeper roots in history. The earliest discussion that we can find which uses the grease/sand terminology is Henry St. John Bolingbroke’s (1754) *Dissertation upon Parties*. In this text, Bolingbroke asserts that ‘corruption serves to oil the wheels of government, and to render the administration more smooth and easy.’

² There is a large literature on the effects and effectiveness of regulations covering a number of topics, including economic development (Gillanders and Whelan 2014), macroeconomic performance (Loayza *et al.* 2005), increased productivity and output (Aghion *et al.* 2009), and entrepreneurship (Klapper *et al.* 2006).

³ In addition to these studies, some studies find that corruption attracts FDI (Egger and Winner, 2005), leads to the development of efficiency-enhancing black markets in centrally planned economies (Levy, 2007), and increases in output and productivity growth (Vial and Hanoteau, 2010).

⁴ These are just a selection from a wide literature focused primarily on economic outcomes. See Campos *et al.* (2010), for a meta-analysis of 41 empirical studies on corruption and growth. It finds that the vast majority of studies either find against the hypothesis that corruption is good for the economy, or are inconclusive.

⁵ The survey clarifies: *‘By senior management I mean managers, directors, and officers above direct supervisors of production/sales workers. Some examples of government regulations are taxes, customs, labor regulations, licensing and registration, including dealings with officials and completing forms.’*

⁶ We exclude the extent to which labour regulations are viewed as a constraint because labour regulations capture how workers are treated by their employers, as well as red tape.

⁷ In further tests we interacted the level of corruption with the Doing Business rank and the Rule of Law, as the latter two variables may moderate the effect of corruption. The results are not presented here but are available on request. They are largely in agreement with our findings from Table 5.

Table A1. Data

	<i>N</i>	Mean	Min.	Max.	Std. D.
<i>Country-level data</i>					
Time	223	8.39	0.10	33.60	6.38
Tax	225	24.41	0.40	76.70	14.30
Permits	225	14.99	0.10	48.50	9.31
Trade	224	16.83	0.00	58.40	10.56
Corruption	224	33.65	0.00	83.70	19.69
Rule of Law	220	-0.32	-1.95	1.65	0.74
GPD per capita (log)	222	7.39	4.55	10.30	1.22
Area (log)	220	11.80	5.56	16.61	2.00
Control of Corruption	220	-0.31	-1.62	1.86	0.71
<i>Subnational-level data</i>					
Time	434	0.12	0.00	0.48	0.08
Permits	434	0.17	0.00	0.72	0.12
Trade	434	0.15	0.00	0.77	0.13
Corruption	434	0.38	0.00	0.92	0.22
Courts	423	0.19	0.00	0.80	0.15
Cost of Labour (log)	434	12.60	8.37	17.01	1.59
