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Many developing country governments would like to attract investment and create jobs in manufacturing and high-tech industries. Heavy and unpredictable laws and regulations, frequent demands for bribes, high taxes, poor quality roads, slow and inefficient ports, and unreliable power, however, deter private investors. Moreover, political opposition and fiscal constraints prevent governments from resolving the many issues. Rather than attempting to solve everything everywhere, many governments have tried to fix problems in only small regions. These special economic zones (SEZs) often have lower taxes, more liberal regulation, and better infrastructure. This paper asks whether two facets of the investment climate—regulation and corruption—are less demanding in African and South Asian SEZs than elsewhere in the country. We find, on average, they are. Firms in the zones are less likely to pay bribes than firms outside the zones and spend less time dealing with inspections and regulations. However, this is not true in Africa; firms in African zones find corruption and regulation as troublesome as similar firms outside the zones.

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The data used in this paper are from the Enterprise Surveys (http://www.enterprisesurveys.org), The World Bank. Responsibility for all errors, omissions, and opinions rests solely with the author.

I. Introduction

Many developing countries see private investment as an instrument for creating jobs, boosting exports, and diversifying into manufacturing and high-tech industries. Although some have successfully attracted private and foreign investors, others have struggled. Private firms do not want to risk entering countries with costly and unpredictable regulations, unreliable electricity and roads, high taxes on formal businesses, and corrupt officials demanding bribes. When countries have poor business environments, private firms will search for more attractive destinations.

The best way to increase private investment would be to provide all firms with a better investment climate. Solving all problems across the entire country, however, can be challenging. Existing firms with market power often oppose policies that make it easier to start new businesses. Improving roads, ports, and electricity is expensive and time-consuming, especially when the country has underinvested for many years. Cutting taxes on formal businesses can damage public finances in countries with many informal firms. And reducing the burden of regulation can undermine the country's other social and environmental goals. Completing all needed reforms can be overwhelming and costly.

Governments, therefore, often adopt a second-best approach. Rather than trying to fix everything everywhere, they set up special economic zones (SEZs) that offer a more attractive business environment in a limited area. The zones offer benefits that will attract new, and often foreign, investors who might otherwise go elsewhere. Firms in the zones often pay lower taxes, avoid some regulations, get licenses more quickly, import raw materials more efficiently, and have more reliable power and transportation. The benefits differ across zones—although most offer either temporary or permanent tax benefits.

Despite their prominence, SEZs have not always successfully attracted new investment — especially in sub-Saharan Africa. With a few exceptions such as Mauritius, Farole (2011a) finds African zones have not significantly increased investment, created jobs, or boosted exports. Farole and Moberg (2014) argue the zones often fail because the investment climate in the African zones remains less attractive than in the countries' competitors.

This paper explores why some zones—including those in Africa—have failed to attract investment. It asks whether corruption and regulation—two important parts of the investment climate—are less onerous in the zones.[1] It uses data from the World Bank's Enterprise Surveys to compare the costs of corruption and regulation for firms inside and outside the zones. The advantage of Enterprise Survey data over other surveys is the Enterprise Surveys include identical data for firms inside and outside the zones.[2]

We find the zones have lighter and less corrupt regulatory regimes than other regions in the same countries.[3] SEZ firms spend less time, on average, dealing with government regulations and are less likely to pay bribes than other firms. This suggests the zones have reduced how much corruption and regulation cost firms.

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[1] This paper focuses on the bribes that zone firms pay. This is not, however, the only concern related to corruption in SEZs. Farole and Moburg (2014), for example, argue many land deals setting up the zones were 'rife with corruption.'

[2] Two earlier studies have used the same data to look at other questions. Davies and Mazhikeyev (2019) find firms inside SEZs are more likely to export than non-SEZ firms in open, but not closed, economies. Davies and others (2018) find firms in SEZs use energy more intensively than firms outside the zones.

[3] This is a different question than in Hartwell (2018), which compares corruption and other institutions in countries with and without zones.

Although some zones reduce the burden imposed by regulation and corruption, others do not. SEZs have been most successful in middle-income countries in South Asia. In contrast, firms inside and outside the zones in sub-Saharan Africa report similar problems with corruption and regulation, possibly explaining why many African SEZs have failed to attract significant investment.

II. Regulation and corruption in special economic zones

Special economic zones are areas within a country where taxes, regulations, and other investment climate policies are different from elsewhere in the country. Farole (2011a, 17) defines special economic zones as:

> *"…spatially delimited areas within an economy that function with administrative, regulatory, and often fiscal regimes that are different (typically more liberal) than those of the domestic economy."*

Because governments want to use the zones to attract private and foreign investment, boost exports, and create jobs, they adopt policies that will make the zones more attractive to private investors.

The number of special economic zones, and the number of countries with zones, has been growing. Using data from the International Labour Organization's database, Farole (2011a) reports there were 176 zones in 47 countries in 1986. By 2006, there were 3,500 zones in 130 countries. By 2015, there were 4,300 zones (Hartwell 2018).

As the number of zones has increased, they have become more diverse.[4] Different zones have different goals, offer different incentives, and cover different industries. The smallest zones can contain only a single firm, while the largest can cover entire regions or even the entire country.[5] Some focus on a single sector such as textiles or high tech industry, while others are large and diversified (Stein 2008). Some, such as free ports and export processing zones (EPZs), focus on exports while others do not.

Although different zones offer different benefits, tax incentives are among the most important. In Togo, twelve of seventeen firms in EPZs said tax incentives were the main reason they located in the zones.[6] Similarly, Kinyondo and others (2016) found firms in Tanzanian SEZs reported the same; tax incentives were the most important benefit they received. Finally, based on firm surveys in African SEZs, Farole (2011a) found tariffs and corporate taxes were the fourth and fifth most important criteria—out of eleven—when deciding where to invest.[7] Perhaps because of this, most special economic zones offer some tax incentives. In a survey of SEZs in twenty-six sub-Saharan

[4] Farole (2011a) and Foreign Investment Advisory Service (2008) provide rigorous definitions of different types of zones including commercial free zones, free trade zones, bonded warehouses, export processing zones, freeports, and free enterprises.

[5] Baissac (2011) notes countries sometimes have stopped requiring firms locate in a specific area, instead making the zone a legal space that allows the firm to operate anywhere within the country.

[6] Author's calculations using data from the 2009 World Bank Enterprise Survey for Togo. Three of the remaining firms said 'other' and two said labor costs.

[7] Taxes ranked lower in the non-Africa SEZs covered by the survey—sixth and eighth for taxes and tariffs.

African countries, Newman and Page (2017) found all but one offered some tax incentives to firms in the zones.

The zones do not only offer tax incentives; many also provide more liberal regulatory regimes.[8] Governments can allow firms to avoid complying with labor regulations, make hiring foreign managers and specialists easier, and reduce the number of required licenses—especially for importing and exporting (Farole 2011b, 2). Some zones also have specialized agencies that can either provide firms with the licenses they need or can help them get licenses from other departments (Farole and Moberg 2014; Moberg 2018). These 'one-stop-shops' can also help firms handle other laws and regulations—something especially important for foreign investors who are unfamiliar with the country. Firms in African zones ranked regulation as the third most important criteria (of eleven) when deciding where to invest, while firms in non-African zones ranked it fifth (Farole, 2011a).

If these policies reduce the cost of complying with regulation, zone firms should spend less time dealing with regulation than similar firms in other parts of the country. To test this, we must control for other differences between firms that affect the regulatory burden. For example, managers of exporting firms might spend more time dealing with customs than managers of non-exporting firms. If zone firms are more likely to export, it might appear the zones failed to reduce the regulatory burden if we do not control for this. This leads to our first hypothesis:

> *Hypothesis 1: All else equal, we would expect firms inside the zones to spend less time dealing with government regulation than firms outside the zones.*

Policies that liberalize regulation and cut taxes might also reduce corruption. Managers might be willing to pay small bribes if doing so allows them to get an import license more quickly or avoid installing expensive equipment to comply with environmental regulations. But when approvals are faster and complying with regulations less expensive or time-consuming, managers might be less willing to pay bribes.[9] Similarly, when taxes are low, businesses have less reason to bribe tax inspectors. Reforms that lighten the regulatory burden, reduce taxes, and streamline licensing procedures will reduce managers' reasons to pay bribes and bureaucrats' ability to ask for them.

Empirical studies support the idea that improving regulation also reduces corruption. Corruption is a smaller problem in countries with lighter regulation (Knack and Keefer 1995; Langbein and Knack 2010; Mauro, 1995). Similarly, bribes are more common in countries where registering a business takes longer (Djankov and others 2002; Svensson 2005). Finally, firms are more likely to pay bribes when they meet more often with government agencies and spend more time dealing with regulation (Clarke 2011; Gonzalez and others 2007).[10]

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[8] Newman and Page (2017, 24), for example, argue "To attract investment the SEZ authority needs to be able to streamline government services (including licenses, registration, utility connections, dispute setting, and fee setting)".

[9] Some studies have suggested bureaucrats might even create burdensome regulations so they can earn bribes from firms trying to avoid the regulations (Faria and others 2013; Shleifer and Vishny 1993).

[10] Reducing corruption could be particularly important for foreign investors from high-income countries where investors might be prosecuted in their home country if caught paying bribes (D'Souza 2012). Foreign direct investment is negatively correlated with corruption (Egger and Winner 2006; Habib and Zurawicki 2002).

Governments can also use direct policies to target corruption in the zones. For example, they can set up watchdogs to monitor corruption, pay officials higher salaries, or have 'one-stop-shops' that can issue licenses and permits, bypassing corrupt officials in existing agencies.

Although reducing corruption is difficult, reforms that only affect the zones might face less political opposition. Privileged interest groups outside the zones might not oppose—or even know about—reforms that only affect zone firms. Governments can therefore experiment with controversial policies and programs in the zones that would be too politically difficult for the whole country (Auty 2011; Moberg 2015; Stein 2008). For example, corruption watchdogs that focus only on zone officials might not threaten bribetakers outside the zones. Similarly, introducing a new licensing regime in a new SEZ will be less threatening if the government preserves the old regime elsewhere—especially if zone firms focus on exporting or competing with imports.[11] Officials working in agencies that process licenses might resist changes that simplify applications or eliminate licenses if they would lose their jobs or their opportunities to take bribes.[12] But if the reforms only affect new investors in the SEZs, they might feel less threatened. This leads us to our second hypothesis:

> *Hypothesis 2: All else equal, we would expect firms inside the zones to be less likely to pay bribes than firms outside of the zones.*

For the reasons outlined above, corruption and regulation should be less costly inside the zones. Newman and Page (2017), however, argue reform has not always succeeded in Africa. Among the SEZs and EPZs they studied, only some reduced regulation or improved institutions.

One problem is agencies that enforce regulations might not treat SEZ firms differently from other firms. First, overwhelmed agencies might find it difficult to quickly process applications from firms within the zones with their limited resources. Second, they might actively oppose the reforms. They might feel the regulations they enforce are important and so oppose reforms within the zones that weaken them. They might also oppose the reforms if they feel it affects their agency's power or undermines their ability to collect bribes. Third, they might lack the resources to effectively manage and enforce multiple regimes. The agencies might therefore fail to cooperate with zone officials.

One way to circumvent existing agencies is to set up independent agencies that directly regulate zone firms or help zone firms navigate the existing bureaucracy. Although 'one-stop-shops' seem attractive, these agencies often fail. One problem is they often lack the authority to issue licenses directly, instead relying on bureaucrats seconded from their parent agencies (Farole and Moberg 2014). Because these officials' appointments remain in their parent agencies, their interests might not change. They, therefore, might fail to process licenses and permits efficiently. In other cases, the one-stop-shop can only route the applications to the relevant agencies rather than processing them directly. Without the same incentives as one-stop-shop officials, officials in the existing agencies might treat applications from zone firms in the same way as they treat other applications. Further, workers in the one-stop-shops might not have the institutional power or influence to force recalcitrant officials to behave any differently. Consequently, the process in the

[11] See, for example, the discussion of EPZs in the Dominican Republic in Moberg (2018).

[12] Governments with limited resources sometimes use bribes to supplement officials' salaries (Cai and others 2011). When bureaucrats cannot support themselves without taking bribes, they might resist reform. Consistent with this idea, Sato (2009) argues low or declining government salaries lead to corruption.

zones is often no faster or less costly than elsewhere—a common problem in Africa.[13] Newman and Page (2017, 24) write: "There are few African countries where central SEZ authorities have the decision-making power over regulatory activities." They note the one-stop shop in Lesotho could not ensure officers from the various ministries worked together. They also note in other countries, including Tanzania, Nigeria, and Kenya, there was no formal institutional link between the agencies in the SEZs.

Another reason zones might not have lower regulatory burdens is they often make firms comply with extra rules (Moberg 2015). For example, firms might need to hire enough local workers, export enough, or invest enough in the zones. The new requirements introduce new opportunities for corrupt bureaucrats to ask for bribes and for firms to offer bribes to avoid complying. Based on a survey of twenty-four firms in Tanzanian EPZs, Kinyondo and others (2016) report officials inspected the average firm thirteen times to ensure they were fulfilling zone requirements. Most requirements related to exporting or fulfilling policy and technical requirements.

In summary, firms might find regulation and corruption less costly inside SEZs than elsewhere in the country. First, governments often adopt reforms—simplified regulatory regimes and one-stop-shops—that could reduce the regulatory burden in the zones. Lighter and improved regulation—and lower taxes—might also reduce firms' incentives to pay bribes and officials' ability to demand them. Second, political opposition might be lower if the government implements reform only in the zones, especially when the SEZ firms are new entrants focused on exporting. If these reforms succeed, firms might find regulation and corruption to be lesser constraints in the SEZs. But reforms sometimes fail and, therefore, the zones might not have less regulation or corruption.

III. Data

This paper uses data from the World Bank's Enterprise Surveys (WBES). We use all surveys completed since 2006 that contain information on whether the firm is in an SEZ. The resulting data set has information on 50 low- and middle-income countries in South Asia and sub-Saharan Africa (see Appendix for list).

The WBES surveys include manufacturing, retail, and other service firms with at least five workers. Because government agencies provide most lists for the sampling frames, the samples do not include informal or unregistered firms. Although the survey includes some firms with partial government ownership, it does not include fully government owned firms. Table 1 includes sample means of all the main variables in the analysis.

Special Economic Zones

This paper's main research questions are about regulation and corruption in the SEZs. The main independent variable shows whether the firm operates in an SEZ. The survey question reads: "Is your establishment located in an export processing or other industrial zone?" Before 2009, managers answered 'yes' or 'no'. After 2009, managers answered "export processing zone", "other

[13] Some observers, therefore, refer to 'one-stop-shops' as 'one-more-stop-shops' (Wells and Wint 1993; World Bank 2004).

Table 1. Sample statistics.

	Means
Firm is in an SEZ	38%
Ave. percent of time spent dealing with regulation	6.3
% of firms reporting paying bribes	26%
Age of firm	17.6
Number of Workers	105.7
% of firms exporting	19%
% of firms foreign owned	5%
% of firms partly government owned	0%

Note: Based only on observations in the regression in Column 3 of Table 2.

industrial zone", or "neither". The early surveys only tell us whether the firm is in a zone, not the type. In contrast, the later surveys also tell us whether the zone is an EPZ.

EPZs are zones that focus on attracting foreign investment in export-oriented manufacturing. The zones often impose restrictions on firms to ensure they do not compete with domestic firms.[14] The EPZs might have different levels of corruption and regulation than other industrial zones. EPZ authorities might be more likely to regulate zone firms directly or help them deal with outside bureaucrats. But EPZs might also have stricter rules about firm behavior. Rules about exporting, investing, and hiring local workers might increase the burden of regulation and provide opportunities for corruption in the EPZs.

Because corruption and regulation might be different in EPZs and other zones, we run two regressions. The first, which we can run for the whole sample, includes a single dummy indicating the firm is in any zone. The second, which we can only run for the later surveys, includes separate dummies for EPZs and other industrial zones. Because the early surveys did not collect enough information to construct the two dummies, the sample is smaller when we include both.

Because only the sub-Saharan African and South Asian surveys included the question on SEZs, we can only include these countries in the sample. Although the WBES questionnaire always asks some core questions, regional and country teams at the World Bank can add some questions. Although the regional teams in sub-Saharan Africa and South Asia chose to add the question about SEZs to their regional surveys, teams in Latin America, Europe and Central Asia, East Asia, and the Middle East and North Africa did not do the same.

Corruption

The dependent variables measure whether firms say they pay bribes and how much time managers spend dealing with government regulations. We focus on objective rather than subjective questions for two reasons. First, it is easier to quantify the difference between SEZs and the rest of the country when using objective questions. Second, things other than corruption and regulation might affect answers to subjective questions about them.[15]

The question on corruption reads:

[14] See, for example, Moberg (2018) who discusses the political economy of the Dominican Republic's SEZs.
[15] See, for example, Clarke (2011).

> *We've heard that establishments are sometimes required to make gifts or informal payments to public officials to "get things done" with regard to customs, taxes, licenses, regulations, services etc. On average, what percent of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?* (World Bank 2007)

We use this question to make a dummy with a value 'one' if the manager reported firms must pay bribes. We focus on whether the manager says firms must pay bribes rather than on how much firms need to pay because earlier studies have found there are problems with the amounts they report. Managers can answer the question in local currency or as a percent of sales. Because the managers also report sales, we can calculate bribes either as a percent of sales or in local currency for all firms. Although it should not matter how the manager answers the question, it does (Clarke 2011; Malomo 2013). Firms that report bribes as a percent of sales report paying between four and fifteen times more than firms that report bribes in monetary terms. Further, this difference is not because of either observable or unobservable differences between firms that report bribes as a percent of sales and firms that report bribes in local currency (Clarke 2011). This suggests either managers who report bribes as a percent of sales over report them or managers who report bribes in local currency underreport them. Because we cannot compare the answers of managers who report in different ways, we focus on whether the firm paid a bribe.

Another important observation is the question asked what the manager thinks other firms do rather than what the firm does. The reason the survey does this is that it allows managers to report bribes without admitting they have done anything illegal. Although there are valid questions about how firms respond to indirect questions, we will assume managers answer them thinking about their own firm.[16] We can justify this in three ways. First, managers might recognize the survey asks the question indirectly to protect them and that the interviewer really wants to know what they do—not what they think their competitors do (Johnson and others 2002). Second, even if they do not recognize this, managers who pay bribes might believe others also pay bribes. This might be reasonable—people believe others act and think like they do even when others act and think differently (Ross and others 1977).[17] Third, it is convenient to do this for expositional reasons. It is less clumsy to write "firms in SEZs are less likely to pay bribes" than to write "firms in SEZs believe firms like theirs are less likely to pay bribes."

Zone firms were less likely to pay bribes than firms outside the zones. Whereas only 20 percent of firms in the SEZs reported paying bribes, about 30 percent of other firms did.

Regulation

The other dependent variable looks at how much time senior managers spend dealing with regulations, inspections, and other legal requirements. The question reads:

> *In a typical week over the last year, what percentage of total senior management's time was spent on dealing with requirements imposed by government regulations? [By senior management I mean managers, directors, and officers above direct*

[16] Earlier studies usually take this approach. See, for example, Clarke and Xu (2004); Johnson and others (2002), and Svensson (2003).

[17] This is called the false consensus effect.

supervisors of production or sales workers. Some examples of government regulations are taxes, customs, labor regulations, licensing and registration, including dealings with officials and completing forms.] (World Bank 2007)

Managers could spend all their time or no time dealing with regulation. Because of this, the amount is censored below at zero percent and above at 100 percent. In practice, few managers reported spending all their time dealing with government regulations (less than one percent), while many reported spending no time dealing with regulations (38 percent). Because of the censoring, we estimate the model as a two-sided Tobit model.

Firms inside and outside the zones spend similar time dealing with government regulations. On average, managers of zone firms said they spent 6.2 percent of their time dealing with regulations—only slightly lower than other firms' managers (6.3 percent).

IV. Econometric model and results

This section presents the econometric models we will use to test the hypotheses from Section II.

Econometric Model

The first model asks whether firms in special economic zones are less likely to pay bribes than other firms. The second asks whether firms in the zones spend less time dealing with government regulation than other firms.

To see whether SEZ firms are less likely to pay bribes, we assume the firm's propensity to pay bribes depends on whether it is in a zone and on other firm characteristics:

$$\text{Propensity to pay bribes}_{ij} = \alpha + \beta SEZ_{ij} + \gamma X_{ij} + \lambda_j + \varepsilon_{ij} \quad (1)$$

We do not observe the manager's propensity to pay bribes. Instead, we only see whether they said firms like theirs pay bribes. As discussed in the previous section, we assume managers who pay bribes will be more likely to answer 'yes' when asked whether firms like theirs pay bribes. We assume the error term, ε_{ij}, has a normal distribution and so estimate the model as a Probit model:

$$\text{Firm answers 'yes' to question about bribes}_{ij} = \begin{cases} 1 & \text{if} \quad \text{Propensity}_{ij} > 0 \\ 0 & \text{if} \quad \text{Propensity}_{ij} \leq 0 \end{cases} \quad (2)$$

The dummy showing whether the firm operates in an SEZ (SEZ_{ij}) interests us most. We code the dummy as 1 for SEZ firms and 0 otherwise. The post-2009 surveys asked whether the zone was an EPZ or a different industrial zone. For these surveys, we can therefore include two dummies indicating the type of zone. Because the early surveys did not collect information on zone type, including the two dummies reduces sample size. If the zones have less corruption, the dummy's coefficient will be negative.

As well as the SEZ dummy, the regression includes several controls (X_{ij}). These include three dummies representing whether the firm has foreign owners, whether it exports, and whether the government partly owns it.[18] Second, the regression also controls for the firm's age and size.[19] Third, the model also includes 34 industry dummies at the four-figure ISIC 3.1 level to control for differences in regulation across industries. If firms in some industries meet with government officials more often, they might face more frequent demands for bribes. Finally, it includes country-year dummies to control for differences between countries that affect the likelihood firms pay bribes. For example, firms might be more likely to pay bribes when a country has worse institutions, less effective courts, or where civil service pay is low. Because the regressions include country dummies, we can interpret the results as comparing SEZ firms with other firms in the same countries.

To see whether the burden of regulation is lower in SEZs than outside them, we also run the following regression:

$$\text{Percent of time spent dealing with regulations}_{ij} = \alpha + \beta SEZ_{ij} + \gamma X_{ij} + \lambda_j + \varepsilon_{ij}$$

The dependent variable measures how much time senior managers spend dealing with regulations, inspections, and other legal requirements. The variable is greater than or equal to 0 percent—some managers spend no time dealing with government requirements—and less than 100 percent—although few managers spend all their time dealing with regulation. We therefore estimate the model as a two-sided Tobit model, which assumes the error, ε_{ij}, has a normal distribution.

The variable that most interests us is the SEZ dummy. If zone firms spend less time dealing with regulations, the dummy's coefficient will be negative. If the burden is higher in the zones—perhaps because SEZ firms must file extra paperwork related to export or labor requirements—it will be positive.

The regression also includes the firm-level controls and country dummies included in the previous regression. Because the country dummies control for differences between countries, we can interpret the SEZ dummy as the difference in the regulatory burden between SEZ firms and other firms in the same country.

Main Results

Table 2 shows results from the regressions for whether the firm paid a bribe and for the percent of time spent dealing with regulations. Table 3 shows the marginal differences for firms located in special economic zones and other firms.

[18] Previous studies have found these are associated with the likelihood the firm pays bribes (Breen and others 2017; Clarke and Xu 2004; Rand and Tarp 2012; Svensson 2003).

[19] Size is measured by the number of workers. Previous studies have found large firms are more likely to pay bribes and pay more in bribes than do other firms (Breen and others 2017; Rand and Tarp 2012). We include a squared term to allow for a non-linear relationship. The firm's age might also affect whether firms pay bribes (Clarke 2019).

Table 2. Difference in bribes and regulation in SEZs.

	(1)	(2)	(3)	(4)
	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	20,491	13,579	23,428	15,818
Number of Country-Years	48	24	50	26
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	-0.130***		-1.381***	
[dummy]	(-5.21)		(-4.23)	
Firm is in export processing zone		-0.312***		-6.261***
[dummy]		(-5.03)		(-6.23)
Firm is in industrial zone		-0.255***		-2.385***
[dummy]		(-7.68)		(-4.36)
Other firm characteristics				
Age of firm	-0.014	0.032*	0.845***	1.344***
[year, natural log]	(-1.00)	(1.72)	(4.65)	(4.56)
Number of workers	0.325***	0.336***	3.589***	3.809***
[natural log]	(8.28)	(6.84)	(7.44)	(5.06)
Number of workers squared	-0.038***	-0.042***	-0.350***	-0.375***
[natural log]	(-7.86)	(-6.82)	(-6.03)	(-4.15)
Firm is an exporter	0.139***	0.139***	6.159***	9.177***
[Dummy]	(4.55)	(3.64)	(15.61)	(14.71)
Firm is foreign owned	-0.148***	-0.059	0.848	2.363*
[Dummy]	(-2.93)	(-0.75)	(1.29)	(1.92)
Firm is partly government owned	-0.273	0.002	-0.488	-1.524
[Dummy]	(-1.59)	(0.01)	(-0.22)	(-0.37)
Pseudo R-Squared	0.205	0.104	0.0224	0.0236
H0: Coefficients on EPZ and other zones equal (X2[1])		0.76		13.9
(p-value)		0.38		0.00***

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table 3. Marginal effects of being in SEZs.

	Probability that firm has paid bribe	% of time dealing with regulations
Firms in EPZs	12.7%	6.6
Firms in other Industrial Zones	13.8%	8.1
Firms outside of zones	19.5%	9.1
Difference between EPZ and non-SEZ firms	*-6.8%*	*-2.5*
Difference between firms in Industrial Zones and non-SEZ firms	*-5.8%*	*-1.0*
Firms in SEZs	23.8%	7.7
Firms outside of zones	27.1%	8.4
Difference between SEZ and non-SEZ firms	*-3.3%*	*-0.7*

Source: Author's calculations based upon data from the Zambia Business Survey MSME survey.
Notes: Levels are calculated by calculating the probability that the firm pays a bribe/engages in a particular transaction for each observation assuming each firm is in an EPZ, then assuming each firm is in another industrial zone, and then assuming that each firm is in neither type of zone. The probabilities for each firm are then averaged over all observations.

Likelihood of paying a bribe

Consistent with the first hypothesis, the SEZ dummy's coefficient is negative and statistically significant. This suggests firms in special economic zones are less likely to pay bribes than other firms.

When we separate the zones into export processing and other industrial zones, the coefficients on both dummies are negative and significant. This suggests firms in both EPZs and other industrial zones are less likely to pay bribes than other firms. The coefficient is larger for EPZ firms than for firms in other industrial zones. The difference between the two, however, is not statistically significant ($\chi^2[1] = 0.76$, p-value = 0.38).

Firms in zones are far less likely to pay bribes than other firms. The likelihood the average firm would pay a bribe would be 12.7 percent in an EPZ, 13.5 percent in some other industrial zone, but 19.5 percent outside the zones.[20] The six-percentage point difference means non-zone firms were close to 50 percent more likely to report paying bribes.

The difference is smaller—although still significant—in the regression with a single SEZ dummy. The likelihood the average firm would pay a bribe would be 23.8 percent inside the zones but 27.1 percent outside the zones—a 3.3 percentage point difference. The weaker results for the single dummy could be due to sample differences—the earliest surveys did not ask about the type of zone. We explore this further in the robustness checks.

Time spent dealing with regulation

Consistent with the second hypothesis, managers of SEZ firms spent less time dealing with regulations than managers of firms outside the zones. The SEZ dummy's coefficient and the EPZ and other zone dummies' coefficients are negative and significant. In contrast to bribes, however,

[20] To calculate the differences, we calculate the likelihood each firm would pay a bribe assuming it were in an EPZ, in another industrial zone, and not in a zone. The average likelihood is then calculated averaging over all firms.

firms in other industrial zones spend significantly more time dealing with regulations than do EPZ firms ($\chi^2[1] = 13.9$, p-value = 0.00).

These results might explain why SEZ firms are less likely to pay bribes. Because SEZ firms spend less time dealing with government officials, the officials might have fewer opportunities to ask for bribes. Further, when regulation is not too burdensome, managers might have less incentive to pay bribes to speed approvals or avoid complying.

Although the difference between SEZ firms and non-zone firms is significant, it is smaller than the difference for paying bribes—especially for firms in other industrial zones. The manager of the average firm would spend about 7.7 percent of his or her time dealing with regulations if in a zone but 8.4 percent if outside the zones. The difference is larger for firms in EPZs. The manager of the average firm would spend 6.6 percent of his or her time dealing with regulations if the firm were in an EPZ. But if not, he or she would spend more time dealing with regulation—9.1 percent if outside the zones and 8.1 percent if in a non-EPZ industrial zone.

Additional results and robustness checks

In this sub-section, we look at differences between zone and non-zone firms in different groups of countries. We run separate regressions by region, then by income, and then by how corrupt the country is. We also run some robustness checks. Table 4 summarizes the results from these additional regressions. Full results are available in the Appendix.

Breakdown by region

We first run separate models for Africa and Asia (see Table 4). The sample contains more African than Asian countries (39 compared with 9), but fewer African observations (8,318 compared with 12,154).

The results are weaker for Africa than for the whole sample. In Africa, SEZ firms are no more likely to pay bribes than non-zone firms. When the model includes two dummies—one for EPZs and one for other industrial zones—the EPZ dummy's coefficient remains insignificant. The other dummy's coefficient, however, is negative and significant.

The results for regulation are also weaker. Firms in African SEZs reported spending more, not less, time dealing with regulations than firms outside the zones. Senior managers would spend about 11.6 percent of their time dealing with government regulations at the average firm if it were in a zone compared with 10.7 percent if it were outside the zones. When we split the zones into EPZs and other zones, firms in other zones, but not firms in EPZs, report spending more time dealing with regulation.

In summary, firms in African SEZs do not face a lower regulatory burden than firms outside the zones and are no less likely to pay bribes. Thus, we do not find strong evidence supporting the idea that the regulatory environment in Africa is better inside than outside the zones.

Results for South Asia

In contrast to Africa, firms in South Asian SEZs face better regulatory environments than firms outside the zones (see Table 4). They are less likely to pay bribes and spend less time dealing with regulations than firms outside the zones.

Table 4. Robustness checks.

Column	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	**Corruption**			**Regulation**		
Coefficient on:	Special economic zone	Export processing zone	Other industrial zone	Special economic zone	Export processing zone	Other industrial zone
All	-0.130***	-0.312***	-0.255***	-1.381***	-6.261***	-2.385***
By Region						
Africa	0.037	0.008	-0.170**	1.503***	0.576	3.454**
South Asia	-0.267***	-0.554***	-0.315***	-3.364***	-9.366***	-4.006***
By Income Level						
Low income	0.023	-0.223**	-0.153*	0.350	-2.303*	0.835
Middle income	-0.219***	-0.340***	-0.268***	-3.259***	-8.254***	-3.429***
By income level and region						
Low-income Africa	0.096*	0.023	0.107	0.151	-2.931	-0.670
Low-income Asia	-0.067	-0.419***	-0.287***	0.734*	-0.366	2.172**
Middle-income Africa	-0.049	-0.033	-0.254***	3.121***	3.943	4.871**
Middle-income Asia	-0.344***	-0.594***	-0.314***	-6.264***	-13.569***	-5.507***
By Corruption						
High Corruption	-0.072**	-0.239***	-0.224***	1.106**	-0.969	2.274**
Low Corruption	-0.176***	-0.422***	-0.277***	-3.513***	-10.994***	-4.708***
Sample						
Small Sample	-0.265***	-0.312***	-0.255***	-3.056***	-6.261***	-2.385***

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.
Notes: Table reports coefficients from regressions like those in Table 2. The coefficient in Column (1) corresponds to the regression in Column (1) of Table 2, the coefficients in Columns (2) and (3) correspond to Column (2) of Table 2, the coefficient in Column (4) corresponds to the regression in Column (3) of Table 2, and the coefficient in Column (5) and (6) corresponds to the regression in Column (4) of Table 2. All regressions include control variables from Table 2 including country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

The regulatory environment is especially favorable in EPZs.[21] The likelihood the average firm would pay a bribe would be 7 percent if it were in an EPZ, compared with 11 percent if in a non-EPZ zone and 17 percent if outside a zone. Similarly, the manager of the average firm would spend

[21] We can reject the null hypothesis that the coefficients on the EPZ and other zone dummies are equal at a 1 percent level or higher in both regressions (p-values of 0.01 and 0.00). See bottom row of Table A3 in the Appendix.

3.7 percent of their time dealing with government regulations if in an EPZ. By comparison, he or she would spend 5.4 percent if in a non-EPZ zone and 7.0 percent if not in a zone. In summary, and in contrast to Africa, firms in South Asian SEZs—and especially in South Asian EPZs—spend less time dealing with regulation and were less likely to pay bribes than South Asian firms outside the zones.

Results by income

The results suggest SEZs have been more successful in South Asia than in Africa. Firms in South Asian SEZs were less likely to report paying bribes and reported spending less time dealing with regulation than other South Asian firms, while the same was not true in Africa. The South Asian sample, however, differs from the African sample in several ways. One way is the African sample is mostly from low-income countries (29 of 41 surveys) whereas the South Asian sample is more mixed (5 of 9 surveys are from low-income countries).[22] We, therefore, re-run the regressions by income class and then by income class and region.

SEZ firms in middle-income economies were less likely to report paying bribes and spent less time dealing with government regulations than similar firms outside the zones (see Table 4).[23] The differences between firms inside and outside the zones are large. The estimated likelihood the average firm would pay a bribe was 12.8 percent if it were in a zone compared with 17.5 percent if it were not. Similarly, we estimate, on average, managers would spend 7.3 percent of their time dealing with regulations if their firm were in a zone and 8.7 percent if not. Results are similar when we look at firms in EPZs and other industrial zones separately.

The results for low-income countries are more mixed. For the largest sample, when we do not distinguish between EPZs and other zones, SEZ and other firms were equally likely to pay bribes and spent similar time dealing with regulations. When we include two dummies, however, firms in both EPZs and other industrial zones were less likely to pay bribes than other firms. Firms in EPZs also spent less time dealing with government regulations. Even in the smaller sample with two dummies, however, the differences are smaller and less significant in low-income countries.

Breakdown by income class and region

As a next exercise, we divide the sample into four groups: low-income African countries, low-income Asian countries, middle-income African countries, and middle-income Asian countries. Doing this makes the samples smaller (see tables in the Appendix) and might, therefore, make it harder to find robust results, especially when we include the two dummies.

For middle-income Asian countries, we find a large difference between firms inside and outside SEZs. Firms inside SEZs were much less likely to report paying bribes and spent much less time dealing with government regulations than other firms. The estimated likelihood the average firm would pay a bribe was 8.5 percent if it were in a zone and 14.5 percent if not. Similarly, the estimated time the average firm's manager would spend dealing with regulation would be 7.7 percent if in a zone and 5.3 percent if not. Results are similar in the smaller sample with two dummies.

[22] Countries are classified based on World Bank criteria for low- and middle-income countries at the time the World Bank conducted the survey. We downloaded the World Bank's classification from the World Bank's webpage (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups).

[23] Full results are available in the Appendix.

For low-income countries in Africa, firms in SEZs were more, not less, likely to pay bribes than similar firms outside the zones. This result, however, did not hold in the smaller sample with two dummies. Further, SEZ and non-SEZ firms spend similar amounts of time dealing with regulations in these countries.

For middle-income African countries and low-income Asian countries, the results are more mixed. Firms in SEZs were less likely to report paying bribes, but the differences were sometimes not significant. Moreover, firms in SEZs reported spending more, not less, time dealing with regulations than other firms. But, again, the differences are not consistently significant.

In summary, the results are strongest for middle-income countries in South Asia. Firms in SEZs spent less time dealing with regulation and were less likely to pay bribes than firms outside the zones. Some evidence suggests firms in low-income countries in Asia and middle-income countries in Africa were also less likely to pay bribes—but the differences were not always significant. Firms inside zones in these countries, however, spend more, not less, time dealing with regulations. Finally, firms in zones in low-income countries in Africa were no less likely to pay bribes and spent no less time dealing with regulation than firms outside the zones.

High and low corruption countries

Rather than splitting the sample into middle- and low-income countries, we next split it by how corrupt the country is. Ranking countries based on the share of firms that paid bribes might be problematic. Because more firms will pay bribes when there are more sample firms in the zones, splitting the sample based on survey data might introduce endogeneity. We, therefore, use the Worldwide Governance Indicators to split the sample (Kaufmann and others 2009). Highly corrupt countries rank below the sample median on control of corruption, while less corrupt countries rank above it.[24]

Middle-income countries are less corrupt, on average, than low-income countries. Corruption was high in 9 of 21 middle-income countries and 24 of 37 low-income countries. The partial overlap between income and corruption could make it difficult to know which affects zone performance more.

When we run separate analyses for more and less corrupt countries, the results suggest corruption is lower in SEZs for both groups. The coefficients on the zone dummies are always significant and negative. They are, however, larger in the less corrupt countries.

The zone dummies' coefficients are also negative and significant in the less corrupt countries in the regulation regressions. This suggests the regulatory burden is lower inside the zones in less corrupt countries. In contrast, two of the coefficients are positive and statistically significant for more corrupt countries. This suggests, if anything, the regulatory burden in SEZs is greater in highly corrupt countries.

Restricting sample to smaller sample

As discussed earlier, the results for the smaller sample suggest zones affect corruption and regulation more than do the results for the full sample. The larger effects, which are visible for both EPZ firms and firms in other industrial zones, could occur because the two samples include different countries. If SEZs are more effective in some countries than others—and the earlier

[24] Higher scores on control of corruption mean corruption is better controlled.

results suggest they are—we might see different effects in the small and large samples. To see if this is the case, we rerun the regressions for the smaller sample including only a single dummy.

When we do this, the coefficient on the single SEZ dummy becomes larger than in the full sample in both the bribe and regulation regressions (see Table 4). In both cases, the single dummy's coefficient is close to, but slightly larger than, the coefficient for other industrial zones. This suggests the stronger results for the separate dummies are due to sample differences. One possible reason is South Asian firms dominate the small sample; they make up three-quarters of the small sample, but only 60 percent of the full sample. The stronger results in the small sample might therefore reflect that SEZs affect corruption and regulation more in South Asia than in Africa.

V. Discussion and conclusions

Many developing countries, including most in Africa, have established special economic zones, aiming to attract investment, create jobs, and increase exports. By offering an appealing bundle of liberal regulation, low taxes, and high-quality infrastructure, governments hope to entice private and foreign firms into the zones. Despite these efforts, some zones have not attracted much private investment—especially in sub-Saharan Africa (Farole 2011a). Foreign Investment Advisory Service (2008, 1) notes "successes in East Asia and Latin America have been difficult to replicate, particularly in Africa, and many zones have failed."

This paper suggests one reason for the zones' limited success—regulation is less burdensome only in some countries. Although we find less corruption and more liberal regulation inside some countries' zones, we do not find gains everywhere. The most consistent improvements were in middle-income countries in South Asia. Firms in South Asian zones were less likely to pay bribes and spent less time dealing with regulation. In contrast, firms in African SEZs spent more, not less, time dealing with regulation and were no less likely to pay bribes than other firms. If the zones fail to liberalize regulation, firms will only locate in the zones if they receive generous tax breaks or subsidies.

The limited success the zones have had in reducing corruption and liberalizing regulation is disappointing for another reason. Successful zones might convince government officials and voters to demand similar national reforms (Hartwell 2018).[25] Stein (2008, 9), for example, writes: "The zone allows an experimental forum to develop habits that will lead to efficiencies that can be emulated elsewhere in the country while at the same time building up trust with foreign investors." But the zones will inspire reforms elsewhere, only if they succeed. This paper's results might therefore partly explain why earlier studies have found corruption is no lower in countries with SEZs (Hartwell 2018).[26] If corruption is lower only in middle-income countries' zones, it is not surprising zones do not inspire reforms that reduce corruption in other countries.

This paper could be extended in several ways. One way to expand the analysis would be to collect similar data in other regions. SEZs might perform better elsewhere than they do in Africa.

[25] Successful reforms in the zones might also create interest groups that support business-friendly reforms (Auty 2011; Moberg 2018). The zone firms might be a counterweight to entrenched interests such as government bureaucrats or import-substituting local industries.

[26] Although Hartwell (2018) finds property rights are better protected and it takes less time to import and export goods in countries with SEZs, he also finds corruption is higher in countries with SEZs.

It would, therefore, be useful to collect similar data for other regions including East Asia and Latin America.

A second useful way to expand the analysis would be to collect better information on the zones and the benefits they offer. The gains were larger in export processing zones than in other industrial zones; EPZ firms reported spending less time dealing with regulation than firms in other zones. Unfortunately, we had little information on the zones, other than whether they were EPZs. More information on the zones might allow us to better understand what incentives and requirements work best.

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Appendix

Table A1: List of countries in main model.

Country	Obs.	EPZ and other zones separate?	Country	Obs.	EPZ and other zones separate?
Afghanistan 2014	246	Yes	Kenya 2007	395	No
Angola 2006	211	No	Madagascar 2009	319	Yes
Angola 2010	58	Yes	Malawi 2009	136	Yes
Bangladesh 2007	1,482	No	Mali 2007	301	No
Bangladesh 2013	1,390	Yes	Mali 2010	58	Yes
Benin 2009	65	Yes	Mauritania 2006	80	No
Bhutan 2009	241	No	Mauritius 2009	170	Yes
Botswana 2006	43	No	Mozambique 2007	340	No
Botswana 2010	84	Yes	Namibia 2006	104	No
Burkina Faso 2009	188	Yes	Nepal 2013	472	Yes
Burundi 2006	102	No	Niger 2009	98	Yes
Cameroon 2009	211	Yes	Nigeria 2007	945	No
Cape Verde 2009	81	Yes	Nigeria 2014	1,733	Yes
Central African Republic 2011	25	Yes	Pakistan 2007	802	No
Chad 2009	103	Yes	Pakistan 2013	529	Yes
Côte d'Ivoire 2009	311	Yes	Rwanda 2006	58	No
Dem. Republic of Congo 2006	148	No	Rwanda 2011	58	Yes
Dem. Republic of Congo 2010	106	Yes	Senegal 2007	259	No
Eritrea 2009	107	Yes	South Africa 2007	678	No
Ethiopia 2011	165	Yes	Sri Lanka 2011	495	Yes
Gambia 2006	31	No	Swaziland 2006	66	No
Ghana 2007	291	Yes	Tanzania 2006	267	No
Guinea 2006	125	No	Togo 2009	99	Yes
Guinea Bissau 2006	47	No	Uganda 2006	290	No
India 2014	8,511	Yes	Zambia 2007	304	No

Note: Observations are the number of observations in the regression in Column 3 of Table 2.

Table A2. Difference in bribes and regulation in SEZs, Africa only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	8,318	3352	9260	4175
Number of Country-Years	39	18	41	20
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	0.037		1.503***	
[dummy]	(0.99)		(2.86)	
Firm is in export processing zone		0.008		0.576
[dummy]		(0.08)		(0.28)
Firm is in industrial zone		-0.170**		3.454**
[dummy]		(-2.53)		(2.46)
Other firm characteristics				
Age of firm	-0.023	0.079**	0.035	-0.045
[year, natural log]	(-1.14)	(2.31)	(0.12)	(-0.06)
Number of workers	0.275***	0.191**	5.243***	7.656***
[natural log]	(4.63)	(2.27)	(6.53)	(4.46)
Number of workers squared	-0.038***	-0.030**	-0.572***	-0.814***
[natural log]	(-4.76)	(-2.56)	(-5.39)	(-3.53)
Firm is an exporter	0.198***	0.288***	5.129***	9.247***
[Dummy]	(4.58)	(4.61)	(8.28)	(6.67)
Firm is foreign owned	-0.110**	-0.046	0.452	0.022
[Dummy]	(-2.02)	(-0.52)	(0.60)	(0.01)
Firm is partly government owned	-0.244	0.118	1.723	-1.164
[Dummy]	(-1.27)	(0.42)	(0.64)	(-0.19)
Pseudo R-Squared	0.140	0.122	0.0201	0.0242
H0: Coefficients on EPZ and other zones equal (X2[1])		2.70		1.63
(p-value)		0.10		0.20

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Income classifications are based on the World Bank's rankings for the year of the survey. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A3. Difference in bribes and regulation in SEZs, South Asia only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	12,154	10,207	14,168	11,643
Number of Country-Years	9	6	9	6
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	-0.267***		-3.364***	
[dummy]	(-7.75)		(-8.03)	
Firm is in export processing zone		-0.554***		-9.366***
[dummy]		(-6.51)		(-8.28)
Firm is in industrial zone		-0.315***		-4.006***
[dummy]		(-8.05)		(-7.29)
Other firm characteristics				
Age of firm	0.001	0.021	1.370***	1.607***
[year, natural log]	(0.06)	(0.94)	(5.80)	(5.33)
Number of workers	0.456***	0.484***	2.802***	2.049**
[natural log]	(8.05)	(7.44)	(4.46)	(2.52)
Number of workers squared	-0.050***	-0.056***	-0.262***	-0.183*
[natural log]	(-7.43)	(-7.18)	(-3.61)	(-1.94)
Firm is an exporter	0.053	0.015	6.736***	8.311***
[Dummy]	(1.19)	(0.29)	(12.99)	(12.51)
Firm is foreign owned	-0.277*	0.115	3.222*	8.599***
[Dummy]	(-1.65)	(0.55)	(1.89)	(3.48)
Firm is partly government owned	-0.579		-5.157	-6.613
[Dummy]	(-1.40)		(-1.26)	(-0.91)
Pseudo R-Squared	0.246	0.0788	0.0149	0.0124
H0: Coefficients on EPZ and other zones equal (X2[1])		7.71		22.21
(p-value)		0.01		0.00

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Income classifications are based on the World Bank's rankings for the year of the survey. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A4. Difference in bribes and regulation in SEZs, low income only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	8,479	2,846	9,902	3,635
Number of Country-Years	32	14	34	16
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	0.023		0.350	
[dummy]	(0.60)		(0.97)	
Firm is in export processing zone		-0.223**		-2.303*
[dummy]		(-2.06)		(-1.65)
Firm is in industrial zone		-0.153*		0.835
[dummy]		(-1.80)		(0.76)
Other firm characteristics				
Age of firm	-0.035*	0.021	-0.037	-0.623
[year, natural log]	(-1.70)	(0.55)	(-0.20)	(-1.28)
Number of workers	0.340***	0.403***	3.885***	5.142***
[natural log]	(5.98)	(4.32)	(7.74)	(4.29)
Number of workers squared	-0.035***	-0.044***	-0.289***	-0.314**
[natural log]	(-5.09)	(-3.93)	(-4.86)	(-2.24)
Firm is an exporter	0.235***	0.349***	2.164***	2.877**
[Dummy]	(5.02)	(4.30)	(5.05)	(2.61)
Firm is foreign owned	-0.268***	-0.343***	0.615	2.498*
[Dummy]	(-4.30)	(-3.07)	(1.09)	(1.88)
Firm is partly government owned	-0.530**		1.214	4.079
[Dummy]	(-2.30)		(0.62)	(0.60)
Pseudo R-Squared	0.192	0.116	0.0369	0.0467
H0: Coefficients on EPZ and other zones equal (X2[1])		0.29		3.60
(p-value)		0.59		0.06*

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Income classifications are based on the World Bank's rankings for the year of the survey. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A5. Difference in bribes and regulation in SEZs, middle income only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	11,973	10,688	13,526	12,183
Number of Country-Years	16	10	16	10
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	-0.219***		-3.259***	
[dummy]	(-6.66)		(-6.05)	
Firm is in export processing zone				-8.254***
		-0.340***		
[dummy]		(-4.39)		(-6.15)
Firm is in industrial zone				-3.429***
		-0.268***		
[dummy]		(-7.28)		(-5.28)
Other firm characteristics				
Age of firm	0.005	0.037*	1.605***	1.942***
[year, natural log]	(0.25)	(1.71)	(5.19)	(5.32)
Number of workers	0.348***	0.362***	3.362***	3.643***
[natural log]	(6.11)	(6.01)	(4.05)	(3.84)
Number of workers squared	-0.046***	-0.048***	-0.404***	-0.435***
[natural log]	(-6.38)	(-6.26)	(-3.99)	(-3.77)
Firm is an exporter	0.032	0.057	9.381***	11.159***
[Dummy]	(0.78)	(1.29)	(14.35)	(14.71)
Firm is foreign owned	0.004	0.226*	0.951	1.483
[Dummy]	(0.04)	(1.93)	(0.67)	(0.73)
Firm is partly government owned	0.117	0.205	-3.435	-3.433
[Dummy]	(0.45)	(0.78)	(-0.77)	(-0.67)
Pseudo R-Squared	0.0994	0.0959	0.0170	0.0149
H0: Coefficients on EPZ and other zones equal (X2[1])		0.85		12.83
(p-value)		0.36		0.00***

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.
Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Income classifications are based on the World Bank's rankings for the year of the survey. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A6. Difference in bribes and regulation in SEZs, low income Africa only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	5,097	1,172	5,510	1,527
Number of Country-Years	27	11	29	13
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	0.096*		0.151	
[dummy]	(1.94)		(0.27)	
Firm is in export processing zone		0.023		-2.931
[dummy]		(0.15)		(-1.14)
Firm is in industrial zone		0.107		-0.670
[dummy]		(0.72)		(-0.31)
Other firm characteristics				
Age of firm	-0.038	-0.013	-0.182	-1.142
[year, natural log]	(-1.48)	(-0.25)	(-0.65)	(-1.31)
Number of workers	0.323***	0.244	4.168***	6.573**
[natural log]	(3.89)	(1.41)	(4.64)	(2.48)
Number of workers squared	-0.045***	-0.041*	-0.387***	-0.648*
[natural log]	(-4.00)	(-1.71)	(-3.26)	(-1.89)
Firm is an exporter	0.249***	0.442***	1.612**	-0.537
[Dummy]	(4.11)	(3.51)	(2.39)	(-0.25)
Firm is foreign owned	-0.172**	-0.278**	0.926	3.537*
[Dummy]	(-2.57)	(-2.21)	(1.32)	(1.86)
Firm is partly government owned	-0.540**		3.579	8.790
[Dummy]	(-1.98)		(1.37)	(0.96)
Pseudo R-Squared	0.149	0.162	0.0355	0.0416
H0: Coefficients on EPZ and other zones equal (X2[1])		0.18		0.54
(p-value)		0.67		0.46

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Income classifications are based on the World Bank's rankings for the year of the survey. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A7. Difference in bribes and regulation in SEZs, low income Asia only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	3,367	1,664	4,392	2,108
Number of Country-Years	5	3	5	3
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	-0.067		0.734*	
[dummy]	(-1.03)		(1.77)	
Firm is in export processing zone		-0.419***		-0.366
[dummy]		(-2.60)		(-0.26)
Firm is in industrial zone		-0.287***		2.172**
[dummy]		(-2.66)		(2.18)
Other firm characteristics				
Age of firm	-0.013	0.060	0.191	-0.089
[year, natural log]	(-0.37)	(1.13)	(0.82)	(-0.19)
Number of workers	0.556***	0.618***	4.381***	5.054***
[natural log]	(6.27)	(5.14)	(8.10)	(4.80)
Number of workers squared	-0.051***	-0.062***	-0.333***	-0.318***
[natural log]	(-5.05)	(-4.51)	(-5.55)	(-2.70)
Firm is an exporter	0.198**	0.234**	2.517***	4.613***
[Dummy]	(2.54)	(2.11)	(5.10)	(4.51)
Firm is foreign owned	-0.749***	-0.073	1.979	5.971**
[Dummy]	(-3.50)	(-0.22)	(1.58)	(2.41)
Firm is partly government owned	-0.231		-3.832	-57.150
[Dummy]	(-0.46)		(-1.26)	(-0.04)
Pseudo R-Squared	0.260	0.108	0.0298	0.0386
H0: Coefficients on EPZ and other zones equal (X2[1])		0.52		2.51
(p-value)		0.47		0.11

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Income classifications are based on the World Bank's rankings for the year of the survey. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A8. Difference in bribes and regulation in SEZs, middle income Africa only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	3,204	2,161	3,750	2,648
Number of Country-Years	12	7	12	7
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	-0.049		3.121***	
[dummy]	(-0.87)		(2.97)	
Firm is in export processing zone		-0.033		3.943
[dummy]		(-0.25)		(1.27)
Firm is in industrial zone		-0.254***		4.871**
[dummy]		(-3.28)		(2.55)
Other firm characteristics				
Age of firm	0.007	0.138***	0.410	0.883
[year, natural log]	(0.21)	(3.06)	(0.65)	(0.82)
Number of workers	0.226***	0.176*	7.082***	8.404** *
[natural log]	(2.65)	(1.81)	(4.67)	(3.61)
Number of workers squared	-0.033***	-0.027*	-0.812***	-0.861** *
[natural log]	(-2.81)	(-1.94)	(-4.04)	(-2.68)
Firm is an exporter	0.139**	0.260***	9.178***	13.769* **
[Dummy]	(2.20)	(3.50)	(7.70)	(7.31)
Firm is foreign owned	-0.003	0.262*	0.059	-2.660
[Dummy]	(-0.03)	(1.92)	(0.03)	(-0.81)
Firm is partly government owned	0.304	0.400	-6.104	-10.534
[Dummy]	(1.02)	(1.26)	(-1.00)	(-1.25)
Pseudo R-Squared	0.109	0.117	0.0124	0.0158
H0: Coefficients on EPZ and other zones equal (X2[1])		2.53		0.08
(p-value)		0.11		0.77

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Income classifications are based on the World Bank's rankings for the year of the survey. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A9. Difference in bribes and regulation in SEZs, middle income Asia only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	8,745	8,510	9,776	9,535
Number of Country-Years	4	3	4	3
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone [dummy]	-0.344*** (-8.19)		-6.264*** (-9.95)	
Firm is in export processing zone [dummy]		-0.594*** (-5.68)		-13.569*** (-9.13)
Firm is in industrial zone [dummy]		-0.314*** (-7.31)		-5.507*** (-8.48)
Other firm characteristics				
Age of firm [year, natural log]	0.006 (0.25)	0.008 (0.33)	1.740*** (4.95)	1.764*** (4.89)
Number of workers [natural log]	0.522*** (6.37)	0.542*** (6.53)	1.114 (1.09)	1.159 (1.12)
Number of workers squared [natural log]	-0.065*** (-6.44)	-0.066*** (-6.55)	-0.154 (-1.27)	-0.153 (-1.25)
Firm is an exporter [Dummy]	-0.092 (-1.57)	-0.079 (-1.34)	8.816*** (11.22)	9.195*** (11.48)
Firm is foreign owned [Dummy]	-0.005 (-0.02)	0.100 (0.37)	1.981 (0.63)	6.132* (1.73)
Firm is partly government owned [Dummy]			-7.136 (-0.98)	-5.471 (-0.67)
Pseudo R-Squared	0.0490	0.0505	0.0135	0.0102
H0: Coefficients on EPZ and other zones equal (X2[1])		7.27		30.47
(p-value)		0.00***		0.00***

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.
Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Income classifications are based on the World Bank's rankings for the year of the survey. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A10. Difference in bribes and regulation in SEZs, high corruption countries only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	8,363	4,360	10,327	5,669
Number of Country-Years	27	15	28	16
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	-0.072**		1.106**	
[dummy]	(-1.97)		(2.33)	
Firm is in export processing zone		-0.239***		-0.969
[dummy]		(-2.80)		(-0.63)
Firm is in industrial zone		-0.224***		2.274**
[dummy]		(-4.06)		(2.22)
Other firm characteristics				
Age of firm	-0.045**	0.051*	0.188	0.050
[year, natural log]	(-2.15)	(1.71)	(0.69)	(0.09)
Number of workers	0.303***	0.285***	4.837***	6.123***
[natural log]	(5.90)	(4.40)	(7.69)	(5.32)
Number of workers squared	-0.030***	-0.031***	-0.421***	-0.506***
[natural log]	(-4.72)	(-3.76)	(-5.59)	(-3.60)
Firm is an exporter	0.236***	0.297***	6.212***	10.253***
[Dummy]	(5.46)	(5.46)	(11.20)	(9.89)
Firm is foreign owned	-0.252***	-0.116	0.247	0.658
[Dummy]	(-3.55)	(-1.11)	(0.27)	(0.35)
Firm is partly government owned	-0.317	0.170	-1.639	-3.348
[Dummy]	(-1.48)	(0.58)	(-0.58)	(-0.57)
Pseudo R-Squared	0.160	0.0611	0.0234	0.0265
H0: Coefficients on EPZ and other zones equal (X2[1])		0.03		3.65
(p-value)		0.09		0.06

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Corruption is based on scores from the World Governance Indicators' scores for the year of the survey. Countries below the sample median are treated as high corruption and countries above the sample median are treated as low corruption. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A11. Difference in bribes and regulation in SEZs, low corruption countries only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	12,087	9,167	13,101	10,149
Number of Country-Years	21	9	22	10
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	-0.176***		-3.513***	
[dummy]	(-5.06)		(-7.68)	
Firm is in export processing zone		-0.422***		-10.994***
[dummy]		(-4.45)		(-8.09)
Firm is in industrial zone		-0.277***		-4.708***
[dummy]		(-6.40)		(-7.27)
Other firm characteristics				
Age of firm	0.015	0.018	1.247***	1.671***
[year, natural log]	(0.77)	(0.76)	(5.10)	(4.91)
Number of workers	0.405***	0.454***	2.095***	1.712*
[natural log]	(6.24)	(5.58)	(2.81)	(1.67)
Number of workers squared	-0.053***	-0.058***	-0.245***	-0.204*
[natural log]	(-6.56)	(-5.80)	(-2.72)	(-1.68)
Firm is an exporter	0.028	-0.004	5.724***	8.055***
[Dummy]	(0.64)	(-0.08)	(10.17)	(10.29)
Firm is foreign owned	-0.017	0.058	1.185	2.846*
[Dummy]	(-0.24)	(0.46)	(1.28)	(1.75)
Firm is partly government owned	-0.296		-0.813	-4.015
[Dummy]	(-1.02)		(-0.24)	(-0.66)
Pseudo R-Squared	0.0824	0.0541	0.0217	0.0212
H0: Coefficients on EPZ and other zones equal (X2[1])		2.33		21.45
(p-value)		0.13		0.00***

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Corruption is based on scores from the World Governance Indicators' scores for the year of the survey. Countries below the sample median are treated as high corruption and countries above the sample median are treated as low corruption. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.

Table A12. Difference in bribes and regulation in SEZs, low corruption countries only.

	Firm pays bribes (dummy)		% of time spent dealing with regulation	
Observations	13,579	13,579	15,818	15,818
Number of Country-Years	24	24	26	26
Sector Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
Firms is in a special economic zone				
Firm is in special economic zone	-0.265***		-3.056***	
[dummy]	(-8.44)		(-5.90)	
Firm is in export processing zone		-0.312***		-6.261***
[dummy]		(-5.03)		(-6.23)
Firm is in industrial zone		-0.255***		-2.385***
[dummy]		(-7.68)		(-4.36)
Other firm characteristics				
Age of firm	0.032*	0.032*	1.364***	1.344***
[year, natural log]	(1.74)	(1.72)	(4.63)	(4.56)
Number of workers	0.335***	0.336***	3.786***	3.809***
[natural log]	(6.82)	(6.84)	(5.03)	(5.06)
Number of workers squared	-0.041***	-0.042***	-0.378***	-0.375***
[natural log]	(-6.81)	(-6.82)	(-4.17)	(-4.15)
Firm is an exporter	0.137***	0.139***	9.035***	9.177***
[Dummy]	(3.60)	(3.64)	(14.50)	(14.71)
Firm is foreign owned	-0.061	-0.059	2.104*	2.363*
[Dummy]	(-0.77)	(-0.75)	(1.72)	(1.92)
Firm is partly government owned	-0.003	0.002	-1.886	-1.524
[Dummy]	(-0.01)	(0.01)	(-0.46)	(-0.37)
Pseudo R-Squared	0.104	0.104	0.0234	0.0236

Source: Author's calculations based upon data from the World Bank Enterprise Survey data.

Notes: t-statistics in parentheses. All regressions include country and sector dummies (ISIC 4-figure). The bribe variable is a dummy and so the model is a Probit model. The regulation variable is censored at 0 and 100 percent and so the model is a Tobit model. Corruption is based on scores from the World Governance Indicators' scores for the year of the survey. Countries below the sample median are treated as high corruption and countries above the sample median are treated as low corruption. ***, **, and * statistically significant at 1%, 5%, and 10% significance levels.