

“Leakage” in International Regulatory Regimes: Did the OECD Anti-Bribery Convention Increase Bribery?

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August 19, 2019

Abstract

Why do some regulatory regimes succeed while others fail? We examine one obstacle to successful regulation, “regulatory leakage,” in the context of the OECD Anti-Bribery Convention (ABC). Leakage occurs when regulated behavior decreases for actors under a regime’s jurisdiction, but increases among those outside of it. We analyze a formal model that demonstrates how the ABC may simultaneously reduce bribery among firms from member countries, while increasing bribery by firms from non-ABC member countries and lead ABC firms to subcontract bribery to domestic firms, resolving an outstanding puzzle in empirical work on the ABC. The result of such patterns can be a net positive, negative, or nil change in aggregate regulated behavior. We draw on these insights to examine new empirical evidence of MNC activity in Vietnam finding evidence for both regulatory leakage and subcontracting bribery.

Introduction

What makes regulatory regimes successful? International relations research has identified many challenges to successful regime activity, such as collective action, monitoring, and enforcement problems. In this paper we focus on one specific obstacle to overall regime success that highlights something of a paradox: when regimes successfully curtail a prescribed behavior among some actors, it may incentivize other actors to increase that behavior. Drawing parallels to work on sanctions, environmental policy, and foreign direct investment, we label this obstacle “regulatory leakage.”

Efforts to regulate undesirable behavior or control market externalities often suffer from some form of leakage. When the undesirable behavior is well-regulated in one jurisdiction, actors may engage in forum-shopping, moving to less well regulated jurisdictions where the consequences are absent or less severe. The globalization of production and the voluntary nature of treaty law make this a central problem in multilateral governance, as regulations are frequently adopted unevenly across countries. Regulatory leakage can also hinder domestic efforts to curtail negative externalities, as actors simply relocate to jurisdictions with more lax regulation. These patterns have been observed in the regulation of carbon emissions (Eichner and Pethig 2011, Babiker 2005), multinational corporations’ (MNCs’) evasion of environmental regulations (Eskeland and Harrison 2003, Dijkstra et al. 2011, Levinson 1996), or labor protections (Ayoub 1999; Moseley and Uno 2007, Moseley 2010) and the maintenance of multilateral sanctions (Early 2009, Early and Spice 2015, Tostensen and Bull 2002, Drezner 2000), among other issue areas.

Our starting point is a puzzling empirical pattern associated with the OECD Anti-Bribery Convention (ABC), and international convention requiring countries to criminalize bribery for firms investing abroad. Jensen and Malesky’s (2018) list experiment in Vietnam, an emerging market host country for FDI from firms of heterogeneous nationalities, uncovers a curious empirical pattern. After the inception of the ABC, bribery decreased (as intended) among firms from countries subject to the ABC. Yet, bribery appeared to *increase* among

non-subject firms after the ABC came online. This increase may have completely offset the reduction among ABC-subject firms. The ABC was effective, but only for firms from countries voluntarily subject to its regulations. It appears that an unintended consequence of the ABC was to “push” bribery onto a different set of firms. This is surprising. After all, why should firms that do not fall under the jurisdiction of the treaty be affected by it at all? We argue that the pattern can be understood as a form of regulatory leakage.

We develop a game-theoretic model of bribery behavior that can account for this pattern. The conclusions also speak to larger issues of regulatory leakage in multilateral regimes. In our model, n firms simultaneously decide whether to bribe to gain access to a potentially lucrative market. The market is competitive amongst firms that enter, but entry is restricted, which generates rents for market entrants. These rents dissipate as more firms enter. The benefits to entry are thus a function of the number of other firms expected to enter. However, firms possess private information about their own willingness to bribe for entry, owing perhaps to different budget constraints, corporate culture, or other unobservables that drive bribing behavior. This means that individual firms’ entry decisions are conditional on their own costs for entry *and* their beliefs about the distribution of other firms’ types.

We show that if a subset of firms is subject to an anti-bribery convention (or other form of regulation) that brings with it some probability of being caught and fined, the entry decisions of the two groups diverge. Subject firms will be deterred as the probability of being caught or the severity of the sanction increases. This deterrent effect is consistent with Jensen and Malesky’s (2018) findings. But because market rents are a function of the expected number of firms entering, in equilibrium non-subject firms enter at a higher rate. Indeed, this rate of entry increases as the number of subject firms goes up and as the strength of monitoring and enforcement of the regime increases. This points to an unintended consequence of treaties like the ABC. Although conventions with teeth—in this case, extraterritorial enforcement—can successfully deter bribery, they come with a tradeoff in competitive markets, where the deterrent effect on subject firms can translate into a per-

missive effect for non-subject firms. The overall welfare effects, in terms of the aggregate change in bribery, may be positive, negative, or neutral. Our theoretical model fills a crucial theoretical gap by analyzing of these countervailing effects.

We also study an extension in which subject firms can contract with a non-subject firm as a form of regulatory evasion. We explore how such a decision to sub-contract bribery depends on the level of monitoring and enforcement in a firm's home country and the required cost-sharing to bring in a partner firm for the purpose of evading the regime. When firms face a strong possibility of costly enforcement at home, they are more likely to engage in this form of regulatory evasion, especially if it requires only a small transfer to subcontracted firms.

In the next three sections, we discuss existing literature on leakage in multilateral governance, provide background on the ABC, and discuss the empirical finding from Jensen and Malesky (2018). We then motivate and introduce the formal model, which both explains regulatory leakage and predicts additional empirical patterns. Specifically, rates of bribery depend on levels of enforcement across the countries participating in the ABC. Consistent with the theoretical model, the data show that the introduction of the ABC reduced bribery amongst countries with strong enforcement regime, but slightly increased bribery by firms from weak-enforcement jurisdictions. We also find that existing firms from strong enforcement regimes are less likely to initiate bribes after the onset of the ABC. We then analyze newly-gathered survey data on subcontracting with foreign firms to evade ABC regulation. As anticipated by our theory, we find this practice most pronounced among firms from strong-enforcement jurisdictions. We close by discussing the implications of these results for anti-corruption efforts and regulatory regimes more generally.

Regulatory Leakage

We define regulatory leakage as the tendency of a proscribed behavior to move from an area where it is highly regulated, or from agents who are subject to more stringent regulation,

to less well-regulated areas or agents. Leakage occurs across issue areas. Local police, for instance, have long understood that demand for illicit activities is hard to suppress; such activities often simply relocate when police presence is increased in a particular area (cf. Ratcliffe 2005, Gabor 1981, Collins and Judge 2011). But the general phenomenon is possible in almost any arena in which there is differential enforcement or jurisdiction-specific rules.

Yet, despite the prevalence of regulatory leakage (sometimes called “spillover”), the phenomenon has received more attention in economics and climate policy than in political science or international relations. Babiker (2005), for example, analyzes a formal model of firm competition against the backdrop of the Kyoto Protocol, concluding that pollution reduction targets may result in considerable relocation of firms to jurisdictions with less stringent restrictions.¹ Firms in carbon-intensive industries with ready alternatives may avoid regulation by simply moving elsewhere. Likewise, anti-globalization activists have long been concerned about the possibility of MNCs evading environmental regulations and strict labor laws, possibly even driving governments to a regulatory “race to the bottom,” though empirical research in these issue areas generates mixed results (Mosely 2010, Moseley and Uno 2007, Chung 2009, Eskeland and Harrison 2003, Hallerberg and Basinger 2004). Here, firm mobility and differential levels of regulation facilitates “jurisdiction shopping,” where the aggregate result may be very little reduction in the overall level of the proscribed activity.

The literature on economic sanctions identifies a similar phenomenon, sometimes known as “sanctions-busting” (Early 2009, Early and Spice 2015, Tostensen and Bull 2002, Drezner 2000). Sanctions regimes rely on individual countries monitoring and enforcing their own firms, and potentially each other. Yet there are often varying levels of effort devoted to monitoring and enforcement across countries. This means that sanctions targets may simply seek alternative sources of illicit materials. Illicit trade is not eliminated, just redirected.

¹See also Kukik and Gerlagh (2003), Paltsev (2001), Aichele and Felbermayr (2015).

Here, again, the culprit is differential monitoring and enforcement regimes, which might allow sanction targets to circumvent prohibitions against trade in certain items by seeking out alternative suppliers. In this case, the problem is not firm mobility, and in fact a reduction in activity from firms in well-enforced areas works to the benefit of those in more lax jurisdictions. Firms from sanctions-busting states seize on profit-making opportunities generated by reduced activity from firms in sanctions-abiding states.

The key point is that regulatory logic is similar across issue areas. Differential enforcement allows some actors a competitive advantage if they can adapt their behavior in response to new opportunities or evade enforcement. As we detail below, our theory and evidence suggest a similar dynamic occurring after the inception of the OECD's ABC Convention. The Convention uses an "extraterritoriality" approach; countries must criminalize bribery in their domestic legal codes and hold their own firms accountable for illicit behavior abroad. In practice, countries vary in their efforts to monitor bribery, and the severity of punishment can likewise vary according to domestic law (Kaczmarek and Newmann 2011). And since the Convention is an international treaty, countries join voluntarily, leaving firms from non-participating countries outside its jurisdiction. These two features—differential levels of enforcement across member countries as well as member and non-member countries—creates the potential for regulatory leakage.

The OECD Anti-Bribery Convention

In 1988, the United States amended the 1977 U.S. Foreign Corrupt Practices Act (US-FCPA). This amendment of one of the strongest existing anti-corruption acts formally required Congress to negotiate with other governments to coordinate anti-bribery efforts (George et al. 2000, 495) as a means of leveling the playing field between American firms that were constrained in their ability to bribe and firms from other countries that have few or no laws preventing their firms from bribing abroad (Pacini et al. 2002; Schmidt 2009; Tyler 2011). Thus, the United States, in an effort to reduce an extreme form of regulatory leakage

resulting from the FCPA, was actually the driving force behind a broad OECD initiative combating business bribery.²

In 1999, representatives from a group of advanced industrialized economies negotiated an ambitious global agreement to combat business corruption. The ABC, eventually signed and ratified by all OECD nations plus an additional six non-OECD countries, requires signatory states to pass domestic anti-bribery legislation that criminalizes bribery by their own firms in other countries. In so doing, signatories implemented the judicial concept of extraterritoriality, which tasks countries with policing the behavior of their own citizens and firms abroad. Business executives from Australia, for example, are legally forbidden from paying bribes to government officials in any country in the world. With 41 signatories as of 2016, the agreement is seen as a stunning legal achievement, institutionalizing the belief that both limited capacity to enforce anti-bribery laws (Kaczmarek and Newman 2011) and the incentives of government officials that may be the recipient of bribes can be overcome with home-country policing of foreign investment (Stephan 2012; Tyler 2011; Spahn 2012; Spahn 2013; Hatchard 2013). By making this agreement binding for all firms from OECD countries as well as additional signatories, the convention produced a level playing field for firms from signatory countries (Duvanova 2007; Magnusson 2013).

For some firms, the potential for reducing global bribery dramatically reduced the costs of doing business abroad. Bribery can be seen as a tax on business that is both illegal and uncertain (Mauro 1995; Wei 2000; Habib and Zurawicki 2002; and Cuervo-Cazurra 2008). This “tax” can include both the high cost of hiding the illegal activity (Schleifer and Vishney 1993) and the unpredictability of bribery due to political changes (Samphantharak and Malesky 2008). For other firms, the net impact of this agreement is mixed. Firms often bribe to win government contracts or obtain land and licenses, trading bribes for access to rents (Bliss and Di Tella 1997; Ades and Di Tella 1999; Hellman et al. 2000), and the impact

²Domestic legislation to improve the US-FCPA continues today, as lawmakers introduced legislation in August 2019 to criminalize bribery demands by foreign officials (see Richard L. Cassin, “To plug gap in FCPA, Congress considers ‘Foreign Extortion Prevention Act,’” *The FCPA Blog* 5 August 2019).

of this convention on their business is partially a function of how effective these bribes are in winning contacts and the effectiveness of their competitors' bribes.

The ABC's version of extraterritoriality relies at least in part on the concept of "peer review." Each state party to the treaty is examined periodically by an OECD Working Group, which produces a report intended to "name and shame" governments with lax enforcement of their firms' practices. Phase 1 involves examining whether parties to the treaty have successfully criminalized proscribed behavior in domestic law. Phase 2 examines the application of these laws. Phase 3, which examines the *de facto* behavior of firms and the country's application of appropriate extraterritorial enforcement, led to scathing reports of some countries' enforcement efforts in 2010 (Stevenson 2014; Tyler 2011).³

How effective is the peer review mechanism? In previous research, Jensen and Malesky (2018) examine the case of business bribery in Vietnam, a country host to foreign investment from a diverse set of home countries, including both ABC signatories and non-signatories. On the surface, the findings from this study point to the effectiveness of the convention in limiting bribery. Simply signing the OECD-ABC has no impact on host firms, but once countries became subject to peer-review of anti-bribery enforcement efforts that began with Phase 3 of the convention in 2009, firms from signatory countries dramatically reduced their bribery in Vietnam. An anti-bribery convention armed with the teeth of peer-review had a substantial impact on reducing bribery in Vietnam, pointing to a seeming success of international law.

Jensen and Maleksy (2018) utilized a technique that shields respondents from incriminating themselves or their firm over bribery (see also Malesky et al 2015). Unlike perception-based surveys that can be subject to bias (Treisman 2007; Olken 2009), corruption is measured based on firm experiences during business registration and the process of obtaining a government procurement contract. Employing the Unmatched Count Technique (UCT), con-

³This oversight activity takes a variety of forms. For instance, the OECD recently publicly recommended that Hungary increase its domestic enforcement of bribery laws. See Claudia Patricolo, "OECD concerned over Hungary's lack of bribery investigations," *Emerging Europe* 5 August 2019.

ventionally called a “list experiment,” the authors found that the ABC, after the peer-review phase of the convention (Phase 3), dramatically reduced bribery for signatory country firms. Prior to the ABC, signatories and non-signatories bribed at equally high rates. Over 20% of foreign firms paid bribes during registration and over 40% of firms paid bribes during government procurement bidding.

However, the study also uncovered a puzzle unnoticed by previous research. The ABC led to a reduction in bribery relative to non-convention signatories. For example, South Korean firms (ABC signatories) bribe at far lower rates than Taiwanese firms (ABC non-signatories) after the convention. But this relationship is partially driven by the *increased* bribery behavior of non-signatory firms. South Korean firms reduced bribery after the peer review process in the ABC, while Taiwanese firms increased their bribery. More generally, ABC signatories dramatically decreased their bribery as expected. The frequency of bribing behavior decreased from a remarkable 23.1% of firms to 11.5% of firms, providing clear evidence for the effectiveness of the convention for signatory firms. Nevertheless, these positive findings were coupled with a disturbing pattern among the firms from non-signatory countries, who more than doubled their propensity to bribe, from an already high 18.6% to a shocking 40.7% of firms. It appears that the ABC achieved its objective of decreasing bribery by subject firms while perversely increasing bribery by non-subject firms—potentially offsetting the Convention’s positive effects. It appears as if much, if not most, of the bribery formerly accounted for by firms subject to the treaty shifted to non-subject firms after the treaty came into force.

In the following section, we introduce and analyze a formal model of market entry requiring bribery that helps explain this pattern. We examine the entry decisions of firms before and after the OECD convention came into force. The latter period separates firms into subject and non-subject firms, which have different marginal rates of entry based on the likelihood of being caught bribing and the severity of the punishment if they are. Comparative statics on these parameters—which we refer to as monitoring quality and enforcement

costs—show that as the quality of monitoring and enforcement goes up for subject firms, more non-subject firms will bribe. We also present an extension in which the subject firms can choose to evade enforcement by sub-contracting with non-subject firms.

Model: The Market for Bribery

We analyze a simple model of market entry among n firms that differ in their marginal cost, or propensity, for bribery. This cost can be (a) the degree of budgetary slack, or the degree to which a firm possesses resources that can be devoted to bribery, or (b) how prone individual firms are to bribe, perhaps due to organizational cultures or experience in a particular investment environment. This conceptualization captures several factors that might affect the decision to bribe. First, firms vary in the level of liquid assets that can be diverted for use in bribery. Second, firms may have unique propensities to bribe based on various facets of their cost structure, corporate culture, and other unobservables. The marginal cost of bribery, firm i 's type, is private information, and firms simultaneously choose whether to bribe for entry, unaware of which other firms bribe. Yet because rents dissipate in markets with barriers to entry as the number of entrants increases, the value of entering the market is a function of the number of other entrants.

We also consider extensions of this basic model. First, we allow k firms to be subject to an anti-bribery treaty, like the OECD anti-bribery convention. Subject firms are vulnerable to some chance of being caught and fined by their home countries (these represent the firms from OECD signatory countries), and we allow the probability of detection (i.e. quality of monitoring) and the severity of the fine (i.e. enforcement strength) to vary. We examine how the bribing behavior of those k firms as well as the remaining $n - k$ firms changes in response to these parameters. Second, we allow subject firms the option to subcontract with a non-subject firm that can pay an entry bribe. Subcontracting avoids detection and fines but entails profit-sharing with the subcontracted firm. Thus, the decision over whether to evade the treaty by outsourcing bribery depends on the tradeoff between (a) reducing the

chance of detection and sanction and (b) the degree of necessary profit-sharing with a non-subject firm or subsidiary.

Baseline Model

Actors and Timing

We consider n firms that vary only in their marginal cost of bribing, x_i . The timing of the strategic-form game is:

1. Nature draws firm types x_i from the distribution $x_i \in U[0, \bar{x}]$.
2. Firms choose simultaneously and independently whether to pay a bribe, x_i
3. Entry contracts obtain and payoffs accrue.

Payoffs

Firms enter markets to capture rents, but rents decrease as more firms enter. Thus, the payoff for entry is

$$EU_i(\text{enter}) = \frac{1}{1+f^*} - x_i,$$

where f^* is the equilibrium number of *other* firms entering and x_i is the marginal cost of the bribe to firm i . Firm i receives 0 for staying out.

Information

Firm i 's marginal cost for making a bribe, or its budgetary slack, is private information; each firm knows its own type but not that of others. Nature draws types from a uniform distribution, such that $x_i \in U[0, \bar{x}]$, where $\bar{x} \leq 1$, which informs each firm's prior beliefs over each other firm's type.

Equilibrium

The appropriate solution concept is Bayesian Nash Equilibrium (BNE). At a BNE, each player-type chooses a strategy from which it has no profitable deviation, given the strategies of all other player-types and the probability distribution over the types.

Proposition 1. *There exists a BNE in which firms enter iff $x_i < \hat{x}_i$.*

To understand entry decisions in equilibrium, note that firm i enters when

$$\frac{1}{1+f^*} - x_i \geq 0,$$

or, rearranging in terms of the firm's marginal cost of bribing, when

$$x_i \leq \frac{1}{1+f^*}.$$

This entry rule lends itself to a straightforward interpretation: firms enter when their marginal cost of bribing is offset by the rents they expect to capture in the market.

Recall that f^* is the number of *other* firms entering in equilibrium, over which firm i forms an expectation based on prior beliefs about the distribution of marginal costs amongst the population of competitor firms. For any single firm, the probability that the above inequality holds is equal to $\frac{1}{\bar{x}(1+f^*)}$, which is simply the probability that $x_i < \hat{x}_i$. The probability for $n-1$ firms is $(n-1)(\frac{1}{\bar{x}(1+f^*)})$. Solving for f^* yields

$$f^* = \frac{1}{2} \left(\frac{\sqrt{4n + \bar{x}} - 4}{\sqrt{\bar{x}}} - 1 \right).$$

Substituting this into i 's entry rule, the type that is indifferent between entering or not is

$$x_i = \frac{2\sqrt{\bar{x}}}{\sqrt{\bar{x}} + \sqrt{\bar{x} + 4n - 4}} \equiv \hat{x}_i.$$

Firms make entry decisions by comparing their marginal cost of entry to expected profits, which are determined by the number of other entrants. This number is unknown because other firms' types are private information. In the absence of knowledge about precisely

which other firms will find it profitable to enter, the firm compares its own cost to an expectation formed by the total number of other possible competitors and the upper bounds on the distribution of firm types.

The equilibrium rate of entry is the proportion of firms whose marginal cost of bribery falls under \hat{x} relative to the upper bound on firms' expectations about the distribution of those costs:

$$\frac{\hat{x}_i}{\bar{x}} = \frac{2}{\bar{x} + \sqrt{\bar{x}\sqrt{\bar{x} + 4n - 4}}}.$$

In this baseline case, the rate of entry decreases in both the number of firms n and the upper bound of the type distribution, the former because of rent dissipation and the latter because any given state is less likely to find any available rents worth the cost of entry.

Equilibrium with Anti-Bribery Convention

We introduce the anti-bribery convention by introducing two parameters that define a second class of firm: those from ABC signatory countries. Suppose that being subject to the convention entails a probability of getting caught and sanctioned for bribing. But monitoring and enforcement are imperfect, so the probability of being observed making a bribe by the relevant authorities is $q \in (0, 1)$, and the penalty is $s > 0$. The expected cost is simply $q * s$, which is subtracted from the expected utility of bribing for firms from OECD signatory countries as follows:

$$EU_i(\text{enter}|\text{subject}) = \frac{1}{f^*} - x_i - qs$$

Next, suppose we have k firms from ABC signatory countries. The entry rule for the $n - k$ firms from non-signatory countries is simply the baseline entry rule established above,

$$x_i \leq \frac{1}{1 + f^*}.$$

However, the utility comparison for the k firms from OECD signatory countries is now

$$\frac{1}{f^*} - x_i - qs \geq 0.$$

Rearranging in terms of x_i yields

$$x_i \leq \frac{1}{f^*} - qs.$$

The entry rule for the k firms from signatory countries also has a straightforward interpretation: as available rents increase, and as the probability of being caught and sanctioned decreases, a firm is more likely to enter the market.

At the Bayesian Nash Equilibrium, entry decisions are made by two groups: k firms subject to the anti-bribery convention, for which each pays qs additional costs of entry, and $n - k$ firms not bound by it.

Proposition 2. *There exists a Bayesian Nash Equilibrium in which subject firms enter iff $x_i < x_s$ and non-subject firms enter iff $x_i < x_o$. All other types choose not to enter.*

A Bayesian Nash Equilibrium defines types x_s and x_o as those types indifferent over entry and no entry, where t^* and f^* are the expected number of entrants from the subject and non-subject groups, respectively. A non-subject firm enters if

$$\frac{1}{1 + f^* + t^*} - x_i \geq 0,$$

which yields

$$x_o = \frac{1}{1 + f^* + t^*}.$$

And a subject firm enters if

$$\frac{1}{1 + f^* + t^*} - x_i - qs \geq 0,$$

which yields an indifferent type

$$x_s = \frac{1}{1 + f^* + t^*} - qs.$$

Solving this system of equalities requires that we define f^* and t^* . First, f^* is a function of $n - k - 1$ other firms' types. If types are drawn independently from the uniform distribution

$x_i \sim U[0, \bar{x}]$, then the probability that any one firm joins is the probability that $x_i \leq \frac{1}{1+f^*+t^*}$, which is $\frac{1}{1+f^*+t^*}$. In turn, the expectation that $n-1$ firms join is

$$f^* = (n-k-1) \left(\frac{1}{\bar{x}(1+f^*+t^*)} \right),$$

and the expectation that $k-1$ firms would join is

$$t^* = \frac{k-1}{\bar{x}} \left(\frac{1}{1+f^*+t^*} - qs \right).$$

Solving for f^* and t^* yields

$$f^* = \frac{(1+k-n)(qs(k-1) - \bar{x} + \sqrt{(k-1)^2 q^2 s^2 + \bar{x}(4n-8-2qs(k-1) + \bar{x}))})}{2\bar{x}(n-2)}$$

and

$$t^* = \frac{(k-1)(qs(3+k-2n) - \bar{x} + \sqrt{(k-1)^2 q^2 s^2 + \bar{x}(4n-8-2qs(k-1) + \bar{x}))})}{2\bar{x}(n-1)}.$$

A positive number of subject firms enter when n not too large, or when

$$n < k+1 + \bar{x} \left(\frac{(1-qs)}{q^2 s^2} \right).$$

Otherwise, when n is too large, the available benefits aren't enough to convince the subject firms to bribe at all. With these components in place we can define the types that are indifferent over entry and non-entry, such that

$$x_o = \frac{2\bar{x}}{q(s-k s) + \bar{x} + \sqrt{(k-1)^2 q^2 s^2 + \bar{x}(4n-8-2qs(k-1) + \bar{x})}}$$

and

$$x_s = \frac{qs(3+k-2n) - \bar{x} + \sqrt{(k-1)^2 q^2 s^2 + \bar{x}(4n-8-2(k-1)qs + \bar{x})}}{2(n-2)}.$$

These types are indifferent over entry; types below the relevant cut-point enter, while types above do not.

We can use these cut-points to analyze the rates of entry that motivated the model. First, we show that as the number of subject firms k increases, the maximal type of non-subject firm that bribes (x_o) also increases. Therefore, as more firms are deterred from entry by the threat of being caught and punished for bribery, the more likely is any given non-subject firm to pay a bribe to enter the market.

Proposition 3. *Non-subject firms are more likely to enter as the number of subject firms increases.*

To prove this proposition, take $\frac{\partial x_0}{\partial k}$, which is positive for the entire range of parameter values (see Appendix).

We can also make a cross-equilibrium comparison by noting how the entry rate of non-subject firms varies across the model with no subject firms and the model with firms subject to the convention. Specifically,

Proposition 4. *In equilibrium, as q or s , or both, go to 0, the entry rate of non-subject firms converges to the entry rate of firms in the model with no OECD convention.*

To prove, set q or s to 0 in x_0 , and compare f^* across the two equilibria identified above (see Appendix).

Subcontracting to Non-Subject firms

The above analysis demonstrates that when firms become subject to the convention, and face a non-zero potential enforcement cost, their incentives to enter a market are diminished at the margin. At the same time, this may make market entry more lucrative for non-subject firms. Thus far, we've modeled firms as facing only two choices: enter or remain outside of a market. But subject firms may face a third option. Namely, they may sub-contract with consultants of law firms, usually domestic businesses, who assume responsibility for completing business registraion, licening, procurement, and inspection formalities, including handling any bribery payments necesitated along the way.⁴ These firms are not direct competitors, but rather service providers who facilitate entry by foreign firms. But importantly, they can directly pay any entry bribes and thus inoculate foreign, subject firms from behavior considered illicit in their home jurisdiction. This third option — sub-contracting

⁴See Bray (2005) for details.

for bribery — provides legal cover for subject firms, but at the cost of additional fees paid to the sub-contracted firm. This would be a reasonable adaptation in the face of such a regime. How does the possibility of bribery sub-contracting affect rates of bribery?

Consider an extension to the above model in which subject firms face three options. Subject firms may stay out of the market and receive a payoff of 0, enter the market and receive an expected payoff of $\frac{1}{1+f^*} - x_i - qs$, or enter the market through sub-contracting with a non-subject firm. We model the cost to the subject firm of contracting with a non-subject consulting firm as simply increasing the marginal cost of entry by some factor that represents the costliness of outsourcing with a non-subject firm. Let z be the rate at which the marginal cost of entry is increased when subcontracting for entry, whereby subject firms continue to pay the cost of bribing, but do so through their subcontractors or partners, so that the payoff to entry through sub-contracting is $\frac{1}{1+f^*} - z * x_i$, where $z > 1$. We assume that an adequate pool of potential subcontracting firms exists to meet the demand of subject firms.

The extension's Bayesian Nash Equilibrium resembles those constructed above. We identify three types of firms of subject firms: those who will never enter, those who will enter only through sub-contracting, and those who enter normally and run the risk of being identified and sanctioned.

Proposition 5. *There exists a Bayesian Nash Equilibrium in which subject firms enter without subcontracting if $x_i < x_B$, with subcontracting if $x_B \leq x_i < x_s$, and non-subject firms enter iff $x_i < x_o$. All other types choose no entry.*

A Bayesian Nash Equilibrium defines types x_S and x_o as those types indifferent over entry and no entry, where t^* and f^* are the expected number of entrants from the subject and non-subject groups, respectively. A non-subject firm enters when

$$\frac{1}{1+f^*+t^*} - x_i \geq 0$$

This implies that the cutpoint for indifference between entry and no entry for the non-

subject firms is

$$x_o = \frac{1}{1 + f^* + t^*}$$

The number of subject firm entrants is comprised of two groups in equilibrium: those that enter on their own and those that enter through subcontracting. Let t^* Let $t^* = v^* + w^*$ where v^* is the number of subcontracting firms and w^* is the number of non-subcontracting firms. A subject firm enters without subcontracting when

$$\frac{1}{1 + f^* + t^*} - x_i - qs \geq 0$$

This, in turn, implies

$$x_s = \frac{1}{1 + f^* + t^*} - qs$$

Firms from the group that are subject to the agreement enter with subcontracting when

$$\frac{1}{1 + f^* + t^*} - zx_i \geq \frac{1}{1 + f^* + t^*} - x_i - qs$$

Let the indifferent group between subcontracting and entering alone be x_B , such that

$$x_B = \frac{qs}{z - 1}$$

Note that this cutpoint reflects the ratio of cost of the two types of entry—the potential of being observed bribing (s) and the cost of being observed (q) and the rate at which the cost of entry increases when subcontracting (z).

Like the equilibrium of the baseline game, f^* is a function of the $n - k - 1$ other firms' types. Since types are drawn independently from the uniform distribution $x_i \sim U[x, \bar{x}]$, the probability of a non-subject firm entering is the probability that $x_i \leq \frac{1}{1 + f^* + t^*}$, which is simply $\frac{1}{\bar{x}(1 + f^* + t^*)}$. The expectation that $n - 1$ non-subject firms join is then

$$f^* = (n - k - 1) \frac{1}{\bar{x}(1 + f^* + t^*)}$$

and the expectation that $k - 1$ subject firms join, following the same procedures, are

$$w^* = \frac{k - 1}{\bar{x}} \left(\frac{1}{1 + f^* + t^*} - qs \right)$$

and

$$v^* = \frac{k-1}{\bar{x}} \left(\frac{qs}{z-1} \right)$$

These equilibrium entry rates form a system of equations which can be solved to identify f^* , w^* , and v^* (see Appendix for full entry rates).

Implications

Proposition 3 establishes that as the number of firms subject to the ABC increases, the rate of bribery for non-subject firms increases. This predicts a perverse effect of an anti-bribery convention. If these subject firms are deterred, even at the margin, by the expected cost of being caught and sanctioned, some firms who would otherwise bribe and enter the market in a world with no convention will instead opt to stay out. This means analysts should observe less bribery by subject firms, which is, after all, what such agreements hope to accomplish. Because rents in markets with barriers for entry are decreasing in the number of entrants, however, the reduction in bribery from subject firms will create additional profit opportunities for non-subject firms. Bribery decreases amongst subject firms, but it increases amongst non-subject firms.

Proposition 4 shows that the degree to which these dual impacts of the convention obtain is a function of the quality of monitoring. Recall that the main effect of the convention is to generate some expected costs of bribery, represented by qs . As either or both of these parameters go to zero, the entry decision for subject firms converges to that of the non-subject firms. At the same time, the decision rule of the non-subject firms converges on that in the equilibrium with no convention. Increased monitoring and enforcement deters more subject firms, but because entry deterrence for these firms increases rents available for non-subject firms, it perversely increases bribery by non-subject firms.

These two propositions point to interesting overall welfare effects of any international regulatory convention generally, and any anti-bribery convention in particular. On the one

hand, if q and s are greater than 0, meaning there is some positive probability of being observed bribing and sanctioned, the convention will work as intended and reduce bribery *among subject firms*. On the other hand, this will tend to increase bribery *among non-subject firms*, and this tendency will be magnified as more firms become subject to the convention and as the quality of monitoring and severity of enforcement go up. Thus, the overall effect of the convention on bribery rates may be null, or even positive, depending on conditions. This logic should be cause for concern if the goal of the convention is to create general disincentives for bribery. If the convention applies unequally to firms from different countries, it may merely result in the generation of competitive barriers for firms from member countries.

Among state parties to the ABC, the peer review system is intended to “shame” one another into tougher enforcement, which, in theory should eliminate cross-country differences in enforcement levels. In practice some differences in remain, however, due to differences in societal norms and the capacity of the legal systems and criminal investigators. At the same time, firms from countries that are not party to the convention face a different set of rules altogether. To be sure, by establishing common obligations and a system of peer monitoring, the treaty improves upon collective action in of combating bribery. But as long as national jurisdictions vary and treaty participation rests on consent, the application of rules to some firms will alter incentives for others, resulting in spillover or leakage.

The model also shows how firms might devise strategies that take advantage of differential enforcement. Proposition 5 shows that once the baseline model is extended to include the possibility of subcontracting out bribing, entry decisions will be contingent on the marginal costliness of subcontracting relative to the strength of monitoring and cost of enforcement. The degree to which firms pursue this evasive adaptation will depend on expectations about the strength of monitoring and enforcement for themselves, but also indirectly for other firms. That is, firms’ expectations about the number of competitors they’ll face upon entry are based on the aggregation of other firms entry rules, which are them-

selves shaped by their marginal cost of entry relative to the strength of enforcement and monitoring. The relative cost of subcontracting may be based on a number factors, but Proposition 5 shows that whether subcontracting is attractive or not cannot be considered in isolation, but rather relative to the attractiveness of entry without subcontracting, which entails some risk of being caught and sanctioned. This means that, perhaps perversely, increasing the strength of monitoring and enforcement will tend to increase the evasive adaptation of subcontracting, thus further undermining the regime.

Empirical Analysis

We began this paper with an empirical puzzle from previous work, which showed that the ABC led to an increase in bribery by non-signatory countries. We developed a theoretical model to explain this pattern and showed that the ABC has this counter-intuitive effect due to the very effectiveness of the regime. By driving out firms that are from signatory countries, markets become less competitive and the available rents increase the returns to bribery. Thus, firms make decisions about bribery based on the relative risk of the activity versus the expected benefits: the higher expected rents, the greater the probability of bribery (Proposition 1). And after the ABC, firms from non-signatory countries have a greater incentive to bribe due to the decreased competitiveness and greater rents in these markets (Proposition 2).

Previous work showed that the ABC leads foreign actors to curtail their behavior in suspect environments, including reducing foreign direct investment and exports into highly corrupt countries. In this section we conduct additional empirical tests regarding the entry decisions and bribery decisions of firms. We begin with some simple descriptive analysis of patterns of foreign investment in Vietnam using the PCI data to explore Proposition 3. Do we see a decrease in entry of OECD-Convention signatories after 2009, when signatories were subject to peer review (Phase 3 of the Convention)?

The Vietnam Provincial Competitiveness Index (PCI) survey surveyed firm managers in eight waves from 2010-2017.⁵ This annual survey of 1,500 investors in Vietnam provides a nationally representative of foreign investment in Vietnam. We constructed a dataset of repeated cross-sections of firms for each wave. Further, to test our sub-contracting extension, we were able to insert new questions into the 2017 survey with the permission of the Vietnam Chamber of Commerce (VCCI), which administers the survey, and US-AID, which funds it. The top investors in Vietnam include a mix of OECD-ABC signatories (Vietnam's second largest investors of Japan and South Korea are both signatories) as well as non-signatories (top investor Taiwan as well as the fourth and fifth largest investors of China and Singapore). In total, investors from countries that are signatories of the OECD-ABC made up 42% of the foreign firms in the sample.

Figures 1 and 2 draw upon data collected by the Vietnamese Ministry of Planning and Investment (MPI) to depict the percentage of foreign firms entering Vietnam, measured as a percentage of total projects and as a percentage of total dollars of foreign investment (GSO 2019). Note that the spike in 2009 in Figure 2 is largely due to a decline in FDI caused by the global sub-prime crisis and not an increase in ABC enforcers entering into Vietnam.

When we break down these investments into ABC enforcement categories of enforcers and non-enforcers of the convention, we observe important differences in the patterns of investment. We code ABC firms by their level of enforcement that Transparency International deem to be active enforcers. They use a four-point coding scheme though the assessment has changed methodologically over time. To simplify, we use a two point aggregation. Countries are non-enforcers if they did not conduct an investigation or exact a punishment. They are enforcers if any overseas bribers were investigated or punished in the previous year.

Investments from non-enforcer countries increase from 2009 while investments from enforcer countries actually slightly decline after 2009 in Figure 1. Figure 2, measured as a percentage of dollars of investment, tells a similar story but with more annual variance.

⁵See <http://www.pcivietnam.org/> for methodological details.

Investment from non-enforcer countries grow in the period since 2009, while enforcer country investments see small declines. These patterns are consistent with propositions 3 and 4. Proposition 3 states that as the number of subject firms increases, the number of non-subject firms entering the market increases, while Proposition 4 ties this pattern to the strength of enforcement of subject firms. Figures 1 and 2 show that investment from non-enforcing countries increased after the inception of the ABC. The pattern for firms from non-signatories is less clear, showing a decrease in Figure 1, when measured as a percent total FDI projects, but an increase in Figure 2, when measured as percentage of all dollars. The most likely explanation for the differential effects is that existing investors from non-signatory firms increased the size of their investment projects after 2009 by renewing their licenses at the Ministry of Planning and Investment. These existing firms would be the best situated to take advantage of the reduction in competition. An alternative, but observationally equivalent explanation based on aggregate data, is that new firms from non-signatory countries invested more money in a fewer number of projects than other types of firms over this time period.

Table 1 below confirms the patterns evident in the figures. It reports results from a country-level difference-in-difference analysis of project and investment shares by enforcer type. Consistent with our theory, high enforcement countries tended to see decreases in investment and project share.

Figures 1 and 2 only address new firm entry, however, it is also that existing firms in Vietnam may have also changed their briber behavior. As a further test of proposition 1 and 2, we conceptualize "entry" as bribe initiation by firms that have already made the decision to invest in Vietnam. To test whether signatories and enforcers are less likely to initiate bribery, we included a number of questions on the supply and demand of bribery in the 2018 PCI. In Figure 3 we present data for all firms admitting they paid an informal charge, regarding who they believe initiated the bribe. Firms were invited to select: 1) they initiated themselves; 2) the bureaucrat initiated; and 3) there was no direct initiation as both parties

Figure 1: Percentage of Total FDI Projects by Home Country Enforcement, 2005-2015

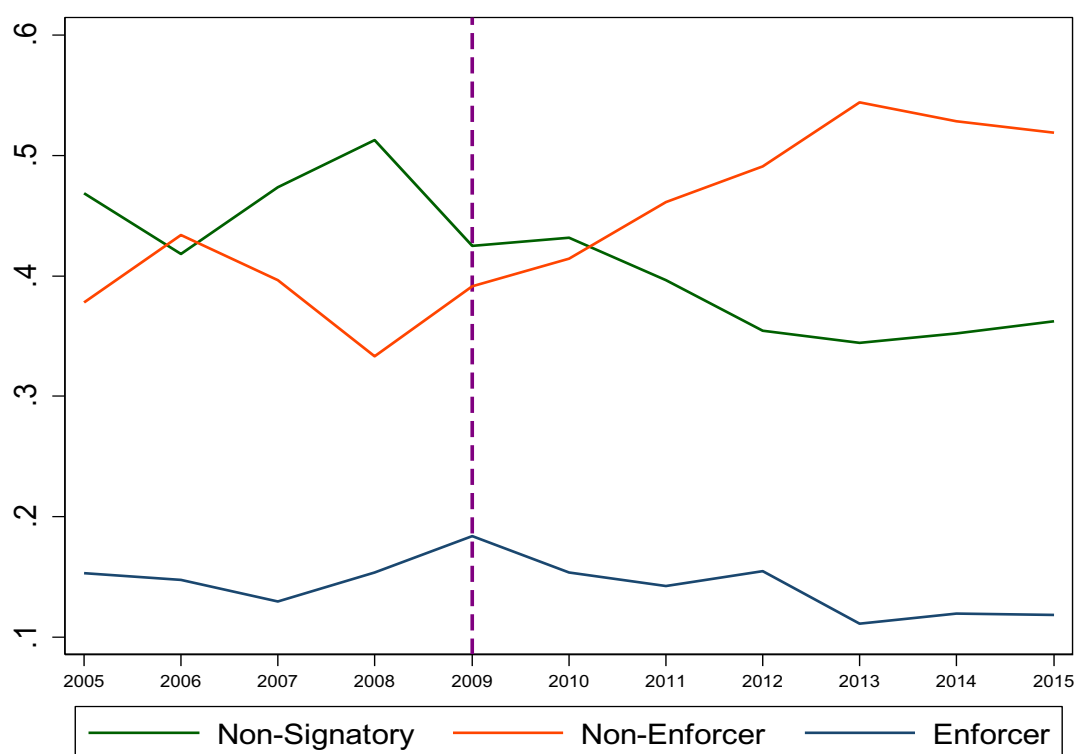


Figure 2: Percentage of Dollars of Investment by Home Country Enforcement, 2005-2015

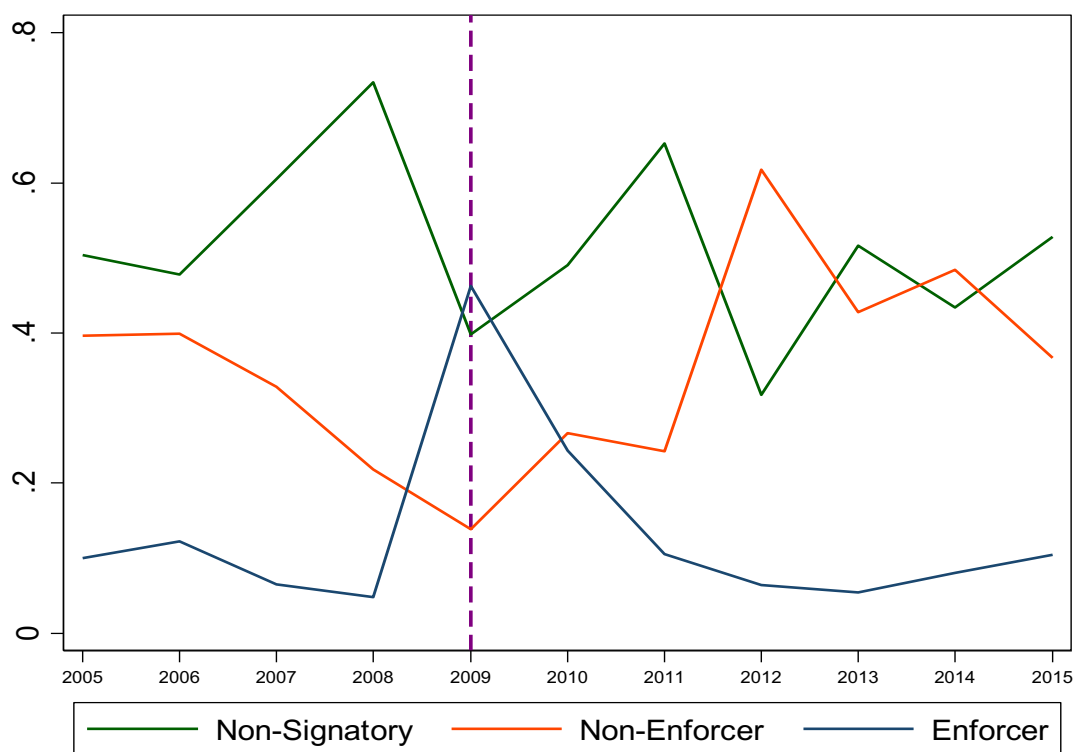


Table 1: Country Level Difference-in-Difference

Independent Variables	(1) Project Share	(2) Investment Share
Low Enforcement Regime =1	-0.073*** (0.024)	-0.248*** (0.076)
High Enforcement Regime =1	-.306*** (0.019)	-.384*** (0.095)
Phase 3	-0.086*** (0.022)	-0.054 (0.073)
Low Enforcement*Phase 3	0.193*** (0.034)	0.159 (0.106)
High Enforcement*Phase 3	0.066** (0.025)	0.003 (0.109)
Constant	0.460*** (0.017)	0.544*** (0.057)
Observations	33	33
R-squared	0.953	0.670
RMSE	0.0345	0.125

Robust standard errors in parentheses

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

were aware that bribery was expected.

Q1. During any of the inspections, did you provide a gift or informal payment to the examiner?

a. Yes (go to Q2)

b. No

Q2 Who initiated the informal payment?

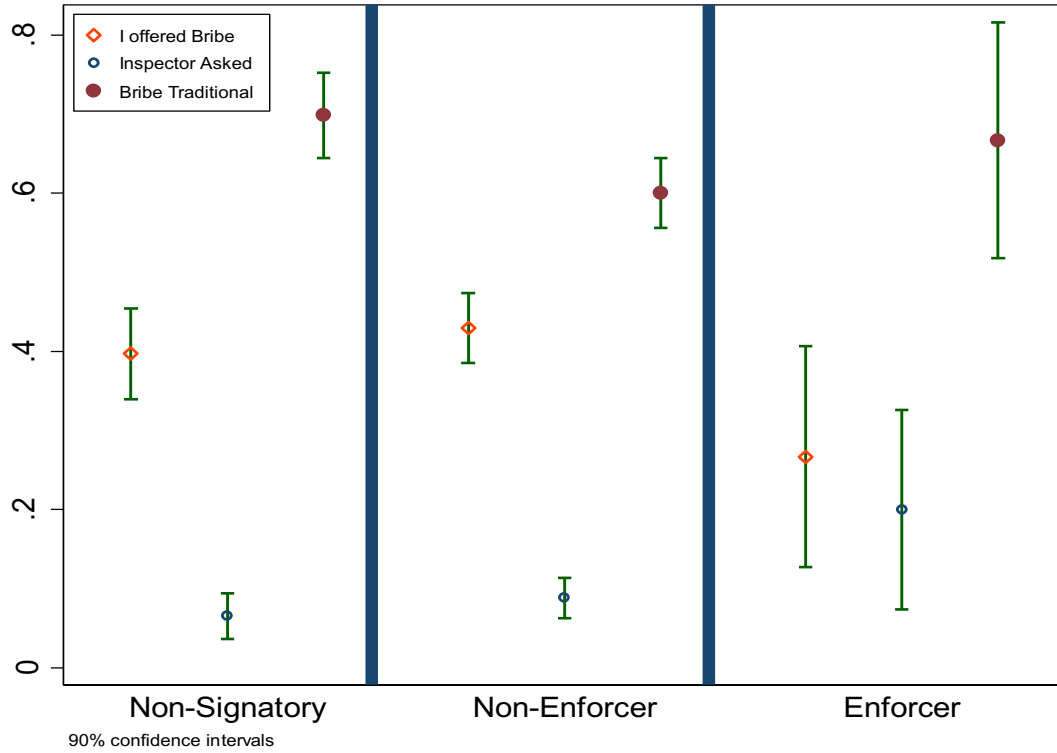
a. I offered it.

b. The examiner requested it.

c. It is a standard. Nobody needed to say anything.

Focusing on initiation by the firm, we see that firms from enforcement countries appear less likely to volunteer bribes themselves in Figure 3. Twenty-seven percent of enforcers

Figure 3: Bribe Initiation



initiated bribes compared to 39% of non-signatories and 43% of enforcers. Thus, this result is consistent with the predictions of our formal model and the entry decisions presented in Figures 1 and 2. Firms from high-enforcement signatory countries appear more likely than competitors to decrease business activities that lead to bribery.

In Table 2 we test the impact of the ABC on bribery initiation more directly with a linear probability model where the dependent variable takes on the value of 1 if the firm initiated the bribe and 0 if the bureaucrat or neither party initiated. Model 1 includes only dummy variables for firms from countries that are signatories and strong enforcers and firms from countries that are weak enforcers. Model 2 includes two-digit sector fixed effects based on the International Standard Industrial Classification (ISIC) and Model 3 includes sector fixed effects plus control variables if the firm is a subsidiary of an MNC (and therefore subject

Table 2: Bribe Initiation by ABC Enforcement Regime

DV: Bribe initiated by firm	(1) Bivariate	(2) Sector FE	(3) Controls
High Enforcement Regime = 1	-0.076*** (0.025)	-0.063*** (0.023)	-0.058** (0.023)
Multinational Corporation = 1			-0.033** (0.014)
Year of license			0.001 (0.002)
Employees at origin (1-8)	0.145*** (0.020)	0.144*** (0.017)	-2.268 (4.708)
ISIC Two Digit Fixed Effects	No	Yes	Yes
Observations	1,716	1,703	1,317
R-squared	0.003	0.021	0.033
RMSE	0.347	0.345	0.355
OLS with s.e.'s clustered by province, the primary sampling unit, in parentheses. (*** p < 0.01, ** p < 0.05, * p < 0.1)			

to internal rules and processes), the year of registration (as understanding of the bribery schedule may change with age), and the size of the firm upon initial entry (as larger firms tend to bribe less, because they are more valuable to bureaucratic gatekeepers). Our results are similar across all three specifications, illustrating that firms from strong ABC enforcer countries were less likely to initiate a bribe. In the fully specified Model 3, firms from high enforcement regimes are 5.8 less likely to initiate bribery than their less constrained competitors. These results confirm Proposition 2 for existing investors.

Drilling a little deeper into the initiation results, we explore an alternative hypothesis that government officials, knowing that ABC firms are limited in their ability to pay bribes, may be less likely to demand bribes from them, and instead will concentrate their bribe extraction efforts on firms that are less constrained. If this is the case, we should see firms from non-signatory and non-enforcement countries answering that bribes tend to be initiated by bureaucrats. Figure 3 shows that among all three groups of firms (enforcer, non-enforcer, non-signatory), bribes are generally understood as normal, ranging from 60 percent among non-enforcers to 70% of non-signatories. Differences were not significant

between groups. Importantly among firms of all three types, bureaucrats are also equally likely to initiate bribes. In fact, bureaucrats are marginally more likely to ask high enforcers for bribes (20% versus 8% in the other groups). These patterns paint a picture of the ABC working through deterring bribery initiation by firms investing from high enforcement countries, not because host country officials are shifting who they approach for bribes in response to the Convention.

Finally, we turn to Proposition 5, where we theorize that some ABC signatories can subcontract bribery to other parties, avoiding paying direct bribes. We note that this subcontracting is costly for firms and thus not all ABC signatories will choose this option.

We tested this Proposition by fielding an additional question on the 2018 PCI-Survey. We asked managers the following question: “To avoid culpability for paying informal charges, have you ever (Check all that apply):

1. Hired a law firm or business facilitator to complete the business procedure
2. Sub-contracted to another foreign firm to complete the business procedure
3. Sub-contracted to a Vietnamese firm to complete the procedure
4. None of the above”

We present this data in Figure 4.

We find that businesses across all three categories of home countries hire lawyers and consultants 30% of the time on average . Firms subject to these different domestic bribery laws are also equally unlikely to hire foreign firms for the purposes of avoiding direct bribers. Where we find that most striking results are in the comparison of firms from signatory countries, which are more likely to hire domestic firms to minimize bribery than other firms. Firms from enforcing countries hire domestic sub-contractors to avoid bribery 12.5% of the time, compared to only 4.7% and 6.9% for non-signatories and non-enforcers respectively.

Figure 4: Subcontracting with Consultants

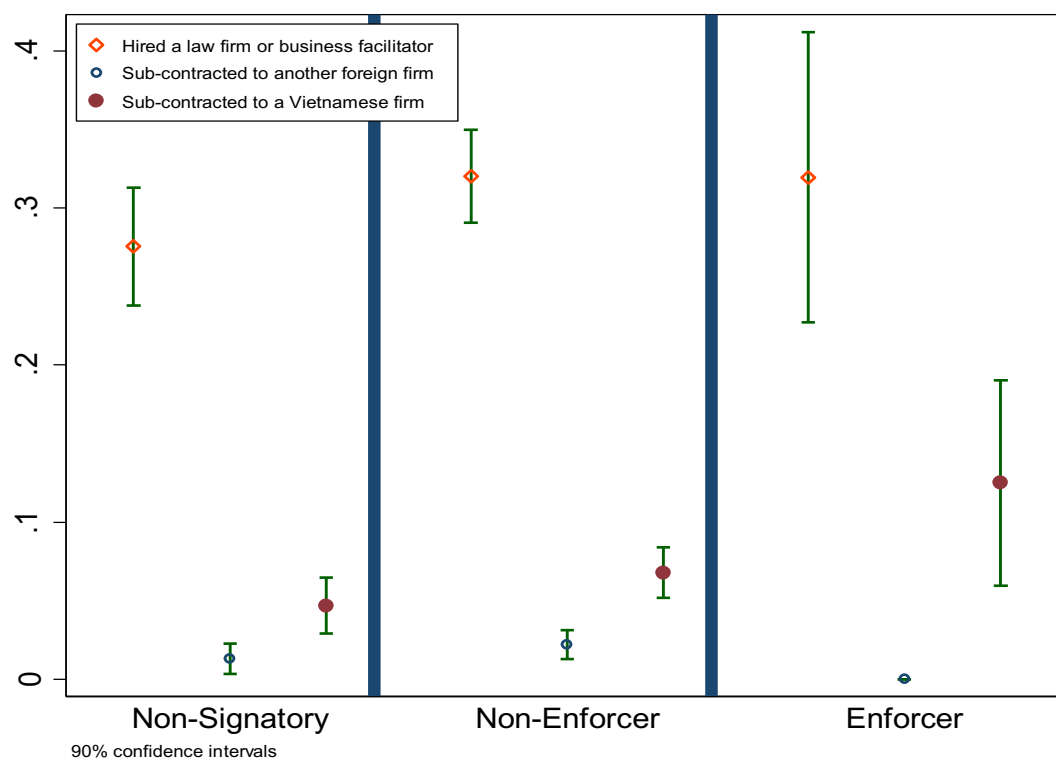


Table 3: Likelihood of Subcontracting by Enforcer Type

DV: Hired Vietnamese Subcontractor to Avoid Bribes	(1) Baseline	(2) FE	(3) Controls
Non-Enforcer	0.021 (0.016)	0.020 (0.018)	0.018 (0.019)
Enforcer	0.078* (0.043)	0.079* (0.044)	0.077* (0.045)
MNC			0.021* (0.011)
Registration Year			-0.001 (0.001)
Size at Origin			0.005 (0.004)
Constant	0.047** (0.013)	0.047** (0.014)	2.173 (2.626)
Sector FE	No	Yes	Yes
Observations	1,135	1,131	926
R-Squared	0.006	0.019	0.029
rmse	0.245	0.246	0.255

Robust standard errors, clustered by home country, in parentheses

** p < 0.01, * p < 0.05, *p < 0.10

The difference between enforcers and signatories is significant at the .1 level, while the difference between enforcers and non-enforcers is just shy of statistical significance.

We more formally test this in Table 3. where we use a similar model specification and sequence of adjustments as in Table 2 above. All three models point to similar results: ABC enforcers are 8 percent more likely to sub-contract to domestic firms in order to avoid bribery than non-signatories and 6 percent more likely than non-enforcers. The difference between enforcers and non-signatories is significant at the .1 level.

We are careful in the interpretation of these results for two reasons. First, our models explain a relatively small amount of variance in subcontracting decisions. Second, as we have noted in previous work, these direct questions can lead to under reporting of bribery, in particular for countries subject to the ABC convention. Thus, our findings are likely to underreport the use of domestic firms to avoid bribery, in particular for firms coming from

ABC enforcers.

These new empirical tests lead to further concerns about the effectiveness of the ABC. The convention doesn't just provide additional benefits to firms that are not subject to the convention; we find evidence that firms from strong enforcer countries are also willing to subcontract with domestic firms to avoid paying bribes directly.

Conclusion

This paper was motivated by the previous empirical finding that the OECD's Anti-Bribery Convention, while reducing bribery by firms from member countries, seems to increase bribery by firms from non-member countries. This result begged explanation. Why should firms that do not fall under the jurisdiction of a treaty be affected at all? We provide an answer rooted in the general logic of regulatory leakage, or the tendency of regulated behavior to shift to less well-regulated jurisdictions. Our game-theoretic model explores a market where bribery is necessary for entry and the rents to market activity depend on the number of competitors. In equilibrium, factors that increase the marginal cost of entry for a group of actors—even in expectation—can incentivize entry for other actors. The ABC may have done just this. By creating an effective form of peer-review enforcement it raised the costs of “paying to play” for subject firms. Yet, this increased the opportunity of acquiring rents for non-subject firms, incentivizing them to pay to play more often.

Our theoretical model provides an explanation for the unexpected finding that the ABC increased bribery among non-subject firms. But the model also generates additional observable implications about how differential enforcement across member states might affect these patterns. In an extension, we analyzed how subject firms might be able to evade enforcement by subcontracting with firms who do not fall under the Convention's jurisdiction. We examined these additional implications by looking at how patterns of FDI changed pre and post-ABC for firms from low enforcement and high enforcement home countries. The

evidence suggests that the OECD's bribery deterrent mattered most for firms from high enforcement environments and that such enforcement may have even encouraged increased participation by firms from low enforcement environments. We also analyzed results from a new question fielded in the Vietnam PCI and found that firms from these high-enforcement jurisdictions are most likely to engage in behavior likely designed to evade the Convention – namely, by subcontracting with non-subject firms who can engage in illicit behavior on behalf of the subject firms. This result further emphasizes a general point about leakage: the creative agency of actors can lead to regulatory evasion.

Do our results mean that the ABC is a failure? Far from it. Previous work shows that the Convention works to deter corruption for firms subject to its jurisdiction. Our work simply provides the caveat that there are limits to the aggregate effect a treaty like the ABC can have on illicit activity. Those limits exist because of differential enforcement across jurisdictions, which allows that illicit activity to leak across jurisdictional boundaries. The implicit solution is to expand the ABC's jurisdiction when and where possible. Current member countries have an interest in seeing this happen, as do their firms, who may face a competitive disadvantage when forced to play by the rules in a dirty game.

The contribution of our regulatory leakage theory extends beyond the direct explanation for the countervailing effects of the ABC to other international regulatory efforts more generally. In a wide range of policy areas, efforts are being made to internationalize regulation in order to combat international threats that are hard to police within the jurisdiction of individual countries. Important examples include environmental and labor protections, anti-money laundering efforts, and rules to combat profit-shifting by MNCs. In all of these cases, compliance by signatories to the agreement generates competitive opportunities for those outside the agreement, potentially leading to similar countervailing effects as agents of non-signatories increase their activity proscribed behaviors. The clear implications of our theory is that to reduce regulatory leakage efforts should be made at the design stage to include as many relevant parties as possible and to strengthen enforcement procedures

for signatories. Doing so will reduce the number of actors who can exploit the regulatory constraints of competitors.

References

- [1] Ades, Alberto, and Rafael Di Tella. 1999. "Rents, Competition, and Corruption." *American Economic Review* 89 (4): 982–993.
- [2] Ahart, Allison M., and Paul R. Sackett. 2004. "A New Method of Examining Relationships between Individual Difference Measures and Sensitive Behavior Criteria: Evaluating the Unmatched Count Technique." *Organizational Research Methods* 7 (1): 101-114.
- [3] Aichele, Rahel, and Gabriel Felbermayr. 2015. "Kyoto and carbon leakage: An empirical analysis of the carbon content of bilateral trade." *Review of Economics and Statistics* 97.1 (2015): 104-115.
- [4] Ayoub, Lena. 1999. "Nike Just Does It—And Why the United States Shouldn't: The United States' International Obligation to Hold MNCs Accountable for Their Labor Rights Violations Abroad." *DePaul Business Law Journal* 11: 395-442.
- [5] Babiker, Mustafa. 2005. "Climate Change Policy, Market Structure, and Carbon Leakage." *Journal of International Economics* 65: 421-445.
- [6] Basinger, S. J., & Hallerberg, M. 2004. "Remodeling the competition for capital: How domestic politics erases the race to the bottom." *American Political Science Review* 98(2), 261-276.
- [7] Blair, Graham, & Imai, Kosuke. 2012. "Statistical analysis of list experiments." *Political Analysis* 20(1): 47-77.
- [8] Bliss, Christopher and Rafeal Di Tella. 1997. "Does Competition Kill Corruption?" *The Journal of Political Economy* 101 (5): 1001-1023.
- [9] Bray, John. 2005. "The Use of Intermediaries and Other Alternatives to Bribery." In *The New Institutional Economics of Corruption*, edited by Johann Graf Lambsdorff, Markus Taube and Matthias Schramm, Routledge: London and New York, 23-41
- [10] Chung, Sunghoon. 2014. "Environmental Regulation and Foreign Direct Investment: Evidence from South Korea." *Journal of Development Economics* 108: 222-236.

- [11] Collins, Alan and Guy Judge. 2011. "Differential enforcement across police jurisdictions and client demand in paid sex markets." *European Journal of Law and Economics* 29(1): 43-55.
- [12] Coutts, Elizabeth and Ben Jann. 2011. "Sensitive Questions in Online Surveys: Experimental Results for the Randomized Response Technique (RRT) and the Unmatched Count Technique (UCT)." *Sociological Methods & Research* 40 (1): 169-193
- [13] Cuervo-CazurrÃ¡, Alvaro. 2008. "The Effectiveness of Laws against Bribery Abroad." *Journal of International Business Studies* 39(4): 634-651.
- [14] Dijkstra, Bouwe R., Anuj Joshua Mathew, and Arijit Mukherjee. 2011. "Environmental Regulation: An Incentive for Foreign Direct Investment." *Review of International Economics* 19(3): 568-578.
- [15] Drezner, Daniel W. 2000. "Bargaining, Enforcement, and Multilateral Sanctions: When is Cooperation Counterproductive?" *International Organization* 54(1): 73-102.
- [16] D'Souza, Anna. 2012. "The OECD Anti-Bribery Convention: Changing the Currents of Trade." *Journal of Development Economics* 97: 73-87.
- [17] Duvanova, Diana. 2007. "Bureaucratic Corruption and Collective Action: Business Associations in the Postcommunist Transition." *Comparative Politics* 39 (4): 441-461.
- [18] Early, Bryan R. "Sleeping With Your Friends' Enemies: An Examination of Sanctions-Busting Trade." *International Studies Quarterly* 53(1): 49-71.
- [19] Early, Bryan R. and Robert Spice. 2015. "Economic Sanctions, International Institutions, and Sanctions Busters: When Does Institutionalized Cooperation Help Sanctioning Efforts?" *Foreign Policy Analysis* 11: 339-360.
- [20] Eichner, Thomas and Rüdiger Pethig. 2011. "Carbon Leakage, The Green Paradox, and Perfect Future Markets." *International Economic Review* 52(3): 767-805.
- [21] Eskeland, Gunnar S. and Ann E. Harrison. 2003. "Moving to Greener Pastures? Multinationals and the Pollution Haven Hypothesis." *Journal of Development Economics* 70(1): 1-23. Gabor, Thomas. 1981. "The Crime Displacement Hypothesis: An Empirical Examination." *Crime and Delinquency* 27(3): 390-404.

- [22] George, Barbara Crutchfield, Kathleen A. Lacey, and Jutta Birmele. 2000. "The 1998 OECD Convention: An Impetus for Worldwide Change in Attitudes toward Corruption in Business Practices." *American Business Law Journal* 47: 485-525.
- [23] Habib Mohsin and Leon Zurawicki. 2002. "Corruption and Foreign Direct Investment." *Journal of International Business Review* 10.6: 687-700.
- [24] Hatchard, John. 2007. "Recent Developments in Combating the Bribery of Foreign Public Officials: A Cause for Optimism." *U. Det. Mercy L. Rev.* 85: 1-29.
- [25] Hellman, Joel S., Geraint Jones, and Daniel Kaufman. 2000. "Are foreign investors and multinationals engaging in corrupt practices in transition economies?" *Transition* 11(3-4): 4-7.
- [26] Jensen, Nathan M., and Edmund J. Malesky. 2018. "Nonstate Actors and Compliance with International Agreements: An Empirical Analysis of the OECD Anti-Bribery Convention." *International Organization* 72(1): 33-69.
- [27] Jeong, Yujin and Robert J. Weiner. 2012. "Who Bribes? Evidence from the United Nations? Oil-For-Food Program." *Strategic Management Journal* 33: 1363-1383
- [28] Kaczmarek, Sarah C. and Abraham L. Newman. 2011. "The Long Arm of the Law: Extraterritoriality and the National Implementation of Foreign Bribery Legislation." *International Organization* 65(4): 745-70.
- [29] Karkkainen, B.C. 2006. "Information-Forcing Regulation: Penalty Defaults, Destabilization Rights, and New Environmental Governance." Pp. 293-322 in *Law and New Governance in the EU and the US*, eds. G. de B  rca and J. Scott. Oxford: Hart.
- [30] Knack, Steven F. 2006. "Measuring corruption in Eastern Europe and Central Asia: a critique of the cross-country indicators." *World Bank Policy Research Working Paper* No. 3968, Washington, D.C..
- [31] Kraay, Aart and Murrel, Peter. 2013. "Misunderestimating Corruption." *World Bank Policy Research Working Paper* No. 6488, Washington, DC.
- [32] Kuik, Onno, and Reyer Gerlagh. 2003. "Trade liberalization and carbon leakage." *The Energy Journal*: 97-120.

- [33] Levinson, Arik. 1996. "Environmental Regulations and Manufacturers' location choices: Evidence from the Census of Manufactures." *Journal of Public Economics* 62(1): 5-29.
- [34] Mauro, Paulo, 1995. "Corruption and Growth." *Quarterly Journal of Economics* 110(3): 681-712.
- [35] Mosley, Layna. 2010. *Labor rights and multinational production*. Cambridge University Press.
- [36] Mosley, Layna, & Saika Uno. 2007. "Racing to the Bottom or Climbing to the Top? Economic Globalization and Collective Labor Rights." *Comparative Political Studies* 40(8), 923â€“948.
- [37] (OECD) Organization for Economic Cooperation and Development. 2007. *Bribery in Public Procurement: Methods, Actors, and Counter-Measures*. Paris: OECD.
- [38] OECD. 2011. *Convention on Combating Bribery of Foreign Public Officials in International Business Transactions and Related Documents*. Paris: OECD.
- [39] OECD. 2012. *Phase 3 Report on Implementing the OECD Anti-Bribery Convention in Hungary*. Paris: OECD.
- [40] OECD. 2013. *OECD Working Group on Bribery Annual Report*. Paris: OECD.
- [41] OECD. 2014. *OECD Foreign Bribery Report: An Analysis of the Crime of Bribery of Foreign Public Officials*. Paris: OECD. <<http://dx.doi.org/10.1787/9789264226616-en>>.
- [42] OECD. 2014. *Phase 3 Report on Implementing the OECD Anti-Bribery Convention in Turkey*. (October) <<http://www.oecd.org/daf/anti-bribery/TurkeyPhase3ReportEN.pdf>>.
- [43] OECD Country Monitoring. (n.d.). Phase 1 country monitoring of the OECD Anti-Bribery Convention <<http://www.oecd.org/daf/anti-bribery/antibriberyconvention/phase1countrymonitoringoftheoecdantibriberyconvention.htm>>.
- [44] OECD Revised Schedule. (n.d.). Schedule for Phase 3 Evaluations. <http://www.oecd.org/daf/anti-bribery/antibriberyconvention/RevisedPhase3Schedule_ENdoc.pdf>.

- [45] Olken, Benjamin. 2009. "Corruption Perceptions vs. Corruption Reality." *Journal of Public Economics* 93 (7-8): 950-964.
- [46] Olken, Benjamin and Rohini Pande. 2012. "Corruption in Developing Countries." *Annual Review of Economics* 4: 479-505.
- [47] Pacini, Carl, Judyth A. Swingen, and Hudson Rogers. 2002. "The Role of the OECD and EU Conventions in Combating Bribery of Foreign Public Officials." *Journal of Business Ethics* 37: 385-405.
- [48] Paltsev, Sergey V. 2001. "The Kyoto Protocol: Regional and Sectoral Contributions to the Carbon Leakage." *The Energy Journal* 22(4), 53-79.
- [49] Ratcliffe, Jerry H. 2005. "Detecting Spatial Movement of Intra-Region Crime Patterns Over Time." *Journal of Quantitative Criminology* 21(1): 103-123.
- [50] Rodriguez, Peter, Klaus Uhlenbruck, and Lorraine Eden. 2005. "Government Corruption and the Entry Strategy of Multinationals." *Academy of Management Review* 30 (2) 383-396.
- [51] Samphantharak, K and EJ Malesky. 2008. "Predictable corruption and firm investment: evidence from a natural experiment and survey of Cambodian entrepreneurs." *Quarterly Journal of Political Science* Vol. 3, pp. 227-267.
- [52] Sandholtz, Wayne, and Mark Gray. 2003. "International Integration and National Corruption." *International Organization* 57(4): 761-800.
- [53] Schleifer, Andrei and Robert W. Vishney. 1993. "Corruption." *Quarterly Journal Economics* 108 (3): 599-617.
- [54] Seligson, Mitchell A. 2006. "The Measurement and Impact of Corruption Victimization: Survey Evidence from Latin America." *World Development* 34(2): 381-404.
- [55] Spahn, Elizabeth. 2012. "Multi-Jurisdictional Bribery Law Enforcement: The OECD Anti-Bribery Convention." *Virginia Journal of International Law* 53(1): 1-52
- [56] Spahn, Elizabeth. 2013. "Implementing Global Anti-Bribery Norms: From the Foreign Corrupt Practices Act to the OECD Anti-Bribery Convention to the UN Convention against Corruption." *Int'l & Comp. L. Rev.* 23: 1-21.

- [57] Spencer, Jennifer and Carolina Gomez. 2011. "MNEs and Corruption: The Impact of National Institutions and Subsidiary Strategy." *Strategic Management Journal* 32(3): 280-300.
- [58] Stephan, Paul B. 2012. "Regulatory Competition and Anticorruption Law." *Virginia Journal of International Law* 53(1): 53-74.
- [59] Stevenson, Matthew. 2014. "Expansion of the Anti-Bribery Convention: A Skeptical View." *The Global Anticorruption Blog*. March 25. <<http://globalanticorruptionblog.com/2014/03/25/expansion-of-the-oecd-anti-bribery-convention-a-skeptical-view/>>.
- [60] Tostensen, Arne and Beate Bull. 2002. "Are Smart Sanctions Feasible?" *World Politics* 54(3): 373-403.
- [61] Treisman, Daniel. 2007. "What We Have Learned about The Causes of Corruption from Ten Years of Cross-National Empirical Research?" *Annual Review of Political Science*. 10: 211-44.
- [62] Tyler, Andrew. 2011. "Enforcing Enforcement: Is the OECD Anti-Bribery Convention's Peer Review Effective." *Geo. Wash. Int'l L. Rev.* 43: 137-172.
- [63] Uhlenbruck Klaus, Peter Rodriguez, J Doh, and Lorraine Eden L. 2006. "The impact of corruption on entry strategy: evidence from telecommunication projects in emerging economies." *Organization Science* 17(3): 402-414.
- [64] Vietnam Chamber of Commerce and Industry (VCCI). 2012. *The Vietnam Provincial Competitiveness Index: Measuring Economic Governance for Private Sector Development. 2012 Final Report*. Paper #18. Vietnam Competitiveness Initiative and the United States Agency for International Development: Ha Noi, Vietnam, Chapter 4. <www.pcivietnam.org.vn>
- [65] Vietnam Chamber of Commerce and Industry (VCCI). 2013. *The Vietnam Provincial Competitiveness Index: Measuring Economic Governance for Private Sector Development. 2013 Final Report*. Paper #19. United States Agency for International Development: Ha Noi, Vietnam. <www.pcivietnam.org.vn>
- [66] Wei, Shang-Jin. 2000. "How Taxing is Corruption on International Investors?" *Economics and Statistics* 82 (1): 1-11.

- [67] World Bank. 2010. *World Development Indicators*. Available at <http://data.worldbank.org/> (accessed on Feb. 4, 2011).
- [68] Zucman, Gabriel. 2014. "Taxing across borders: Tracking personal wealth and corporate profits." *The Journal of Economic Perspectives* 28(4): 121-148.

Formal Appendix

Proof of Proposition 3. To prove this proposition, take the first partial derivative of x_o with respect to k ,

$$\left(\frac{2qs\bar{x}}{\sqrt{\bar{x}(\bar{x} - 2(k-1)qs + 4n - 8) + (k-1)^2q^2s^2}} \right) \times \left(\frac{2qs\bar{x}}{\sqrt{\bar{x}(\bar{x} - 2(k-1)qs + 4n - 8) + (k-1)^2q^2s^2} + \bar{x} + q(s - ks)} \right),$$

which is sure to be positive for $\bar{x} > 0$, $k > 2$, $0 < q < 1$, $s > 0$, $n > k$. □

Proof of Proposition 4. To prove this proposition, note that $x_O - x_S = qs$. As either q or s , or both, goes to zero, $x_O - x_S$ approaches zero. □

Entry rates for equilibrium with subcontracting:

$$f^* = \frac{\sqrt{(k-n+1)^2((k-1)qs(z-2) - (z-1)\bar{x})^2 + 4(n-2)(z-1)^2\bar{x}}}{2(n-2)(z-1)\bar{x}} + \frac{k(z-1)\bar{x} - (n-1)((z-1)\bar{x} + qs(z-2)) + k^2(-q)s(z-2) + knqs(z-2)}{2(n-2)(z-1)\bar{x}}$$

$$w^* = \frac{(k-1)(-\sqrt{(k-n+1)^2((k-1)qs(z-2) - (z-1)\bar{x})^2 + 4(n-2)(z-1)^2\bar{x}}) + \bar{x}(k-kz))}{2(n-2)(z-1)\bar{x}(k-n+1)} + \frac{(n-1)((z-1)\bar{x} + qs(2n(z-1) - 3z + 2)) + k^2qs(z-2) + kqs(-3nz + 4n + 4z - 4))}{2(n-2)(z-1)\bar{x}(k-n+1)}$$

$$v^* = \frac{(k-1)qs}{(z-1)\bar{x}}$$

The following condition on z must hold in order for $f^* > 0$:

$$\frac{\bar{x}(qs - 1) + q^2s^2(n - 2k)}{\bar{x}(1 - qs) + q^2s^2(k - n + 1)} + z > 0$$

Empirical Appendix

Table 4: Descriptive Statistics

Variable	N	Mean	SD	Min	Max
Non-Signatory=1	1,687	0.36	0.48	0	1
Non-Enforcer=1	1,687	0.57	0.50	0	1
Enforcer=1	1,687	0.07	0.25	0	1
Bribe Offered=1	1,765	0.14	0.35	0	1
Bribe Requested	1,765	0.03	0.17	0	1
Bribe Norm	1,765	0.22	0.41	0	1
Subcontract to Vietnamese Firm=1	1,181	0.06	0.24	0	1
Subcontract to Foreign Firm = 1	1,181	0.30	0.46	0	1
Year of License	1,683	2009.3	5.6	1989	2017
Labor at Origin	1,665	2.7	1.6	1	8

Table 5: Bivariate Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12
(1) Non-Signatory=1	1											
(2) Non-Enforcer=1	-0.7924*	1										
(3) Enforcer=1	-0.1925*	-0.2920*	1									
(4) Bribe Offered=1	-0.200	0.04	-0.0543*	1								
(5) Bribe Requested=1	-0.0300	0.02	0.04	0.0296	1							
(6) Bribe Norm=1	0.0237	-0.01	-0.03	-0.0013	0.1262*	1						
(7) Subcontract to Viet. Firm=1	-0.0478	0.02	0.0643*	-0.0617*	0.0389	0.0342	1					
(8) Subcontract to For. Firm=1	-0.0213	0.05	-0.03	-0.0289	-0.0261	0.0001	0.1811*	1				
(9) Hired a Law Firm=1	-0.0408	0.04	0.01	-0.0104	0.0327	-0.0041	0.0403	0.0565	1			
(10) MNC	-0.030	0.01	0.0816*	-0.0556*	-0.0249	0.0314	0.0519	0.0562	0.0759*	1		
(11) Year of License	-0.1565*	0.1889*	0.0	-0.0291	0.0139	-0.0537*	-0.0162	0.0592*	0.1079*	0.0558	1	
(12) Labor at Origin	0.0832*	-0.0755*	0.0	0.0542*	0.0046	0.0383	0.0442	0.007	-0.1470*	0.0145	-0.4376*	1

*Significant at the .05 level