Quarterly Journal of Political Science, 2021, 16: 387–427

"Leakage" in International Regulatory Regimes: Did the OECD Anti-bribery Convention Increase Bribery?

Terrence L. Chapman[1], Nathan M. Jensen[2], Edmund J. Malesky[3] and Scott Wolford[4]*

[1] *The University of Texas at Austin, Austin, TX 78712, USA; t.chapman@austin.utexas.edu*
[2] *The University of Texas at Austin, Austin, TX 78712, USA; natemjensen@austin.utexas.edu*
[3] *Duke University, Durham, NC 27708, USA; ejm5@duke.edu*
[4] *The University of Texas at Austin, Austin, TX 78712; swolford@austin.utexas.edu*

ABSTRACT

When do well-intended regulatory regimes have unintended consequences? 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. We also show how the ABC may lead firms from ABC member countries to shift to bribery through intermediaries. New empirical evidence of MNC activity in Vietnam shows evidence of both regulatory leakage and bribery through intermediaries.

*The authors thank audiences at Indiana University, the University of Texas at Austin, the 2016 International Political Society Conference, two anonymous reviewers and the editors of QJPS for their helpful suggestions. Edmund Malesky is a paid consultant for the USAID funded Vietnam Provincial Competitiveness Index project, which generously provided data for this article.

Online Appendix available from:
http://dx.doi.org/10.1561/100.00019193_app
Supplementary Material available from:
http://dx.doi.org/10.1561/100.00019193_supp
MS submitted on 30 October 2019; final version received 23 September 2019
ISSN 1554-0626; DOI 10.1561/100.00019193

Keywords: Corruption; bribery; OECD Anti-Bribery Convention; Vietnam; list experiment

When do well-intentioned multilateral regulatory regimes produce unintended consequences? Regulatory regimes face well-known challenges, such as free-riding, imperfect monitoring, and lax enforcement. This means that in many areas, seemingly good regulatory policy can produce outcomes at odds with stated goals. In this paper we focus on one class of unintended consequences that highlights something of a paradox: when regimes successfully curtail a proscribed 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 undesirable behavior is well-regulated in one jurisdiction, actors may engage in forum-shopping, moving to less well-regulated jurisdictions where 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 regulatory environments vary 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 (Babiker, 2005; Eichner and Pethig, 2011), multinational corporations' (MNCs') evasion of environmental regulations (Dijkstra *et al.*, 2011; Eskeland and Harrison, 2003; Levinson, 1996) or labor protections (Ayoub, 1999; Mosley, 2010; Mosley and Uno, 2007), and in the application of multilateral sanctions (Drezner, 2000; Early, 2009; Early and Spice, 2015; Tostensen and Bull, 2002).

Our starting point is a puzzling empirical pattern associated with the OECD Anti-Bribery Convention (ABC), an 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 heterogenous 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 incentivize bribery for firms from non-member countries. This finding is related to fears among U.S. firms that the 1977 passage of the U.S. foreign corrupt practices act (FCPA) would disadvantage them abroad. What is particularly surprising in the Jensen and Malesky (2018) study is that the ABC increased

the bribery behavior of non-subject firms. Firms from subject countries are disadvantaged, while bribery by non-subject firms has increased.

We develop a game-theoretic model of bribery behavior that explains this pattern and speaks to larger challenges of regulatory leakage in multilateral regimes. In our model, n firms decide whether to (a) bribe to gain access to a potentially lucrative market, (b) attempt access without bribing, or (c) stay out of the market. The market is competitive for firms that enter, but entry is restricted, which generates rents for market entrants. These rents dissipate as more firms enter. The benefits of entry are thus a function of the number of other firms that enter. However, firms possess private information about some aspects of their own productivity, which we model as directly affecting the costs of market entry. This means that individual firms' entry decisions are conditional on their own costs for entry *and* their beliefs about other firms' costs for entry.

We show that when 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 engaging in bribery and subsequently 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, including the rate of bribery itself, 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 permissive effect for non-subject firms.

We also analyze 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 bribe through an intermediary, a form of subcontracting, depends on the level of monitoring and enforcement in a firm's home country and the cost-sharing required 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. While laws like the FCPA forbid this sort of evasion, recent NGO reports and academic studies see it as an ongoing concern, as firms have developed strategies to maintain "plausible deniability."[1]

[1]See Transparency International (2010), Lambsdorff (2013), and Sartor and Beamish (2018).

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 introduce the formal model. Next, we empirically examine the effect of productivity and home country enforcement on bribery. Finally, we analyze new survey data on subcontracting with foreign firms to evade ABC regulation. 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: they can simply relocate when police presence increases in a particular area (cf. Collins and Judge, 2011; Gabor, 1981; Ratcliffe, 2005). But the general phenomenon is possible in almost any arena in which there is differential enforcement or jurisdiction-specific rules.

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.[2] 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 finds mixed evidence (Basinger and Hallerberg, 2004; Chung, 2014; Eskeland and Harrison, 2003; Mosley, 2010; Mosley and Uno, 2007). This scholarship often finds not a race to the bottom but standards increasing through patterns of diffusion. This "California effect" could lead to the diffusion of higher anti-bribery standards across the world (Vogel, 1995).

The literature on economic sanctions identifies a similar phenomenon, sometimes known as "sanctions-busting" (Drezner, 2000; Early, 2009; Early and Spice, 2015; Tostensen and Bull, 2002). Sanctions regimes rely on individual countries monitoring and enforcing their own firms, and each other. Yet, countries devote varying levels of effort, which means that sanction targets may simply seek alternative sources of illicit materials. Here, again, the culprit is differential monitoring and enforcement. A reduction in activity from firms in well-enforced areas works to the benefit of those in more lax jurisdictions. Firms

[2]See also Aichele and Felbermayr (2015), and Paltsev (2001).

from sanctions-busting states seize on profit-making opportunities generated by reduced activity from firms in sanctions-abiding states.

Differential enforcement allows some actors a competitive advantage if they can adapt their behavior in response to new opportunities or evade enforcement. Our theory and evidence point to a similar process after the implementation of the OECD's ABC Convention. The ABC 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 Newman, 2011). And since the ABC is an international treaty, countries join voluntarily, leaving firms from non-participating countries outside its jurisdiction. These two features — enforcement differentials not only between member countries but also between member and non-member countries — create 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, p. 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, 2008; Tyler, 2011).[3] Legal scholars have examined the motivations for the regulation for bribery. For example, Davis (2011) highlights that moralism, self-interest, and altruism can motivate the passage of anti-bribery laws. In many cases, firms prefer strong anti-bribery laws, which tie the hands of managers and reduce bribery demands from government actors (Perlman and Sykes, 2017). 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.[4]

In 1999, representatives from a group of advanced industrialized economies negotiated this 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

[3]This impetus is similar to Oatley and Nabors's (1998) description of the Basle Accord as "redistributive cooperation."

[4]Domestic 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).

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 (Hatchard, 2007; Spahn, 2012, 2013; Stephan, 2012; Tyler, 2011). By making this agreement binding for all firms from OECD countries as well as additional signatories, the convention intended to produce a level playing field for firms from signatory countries (Duvanova, 2007; Magusson, 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 (Cuervo-Cazurr, 2008; Habib and Zurawicki, 2002; Mauro, 1995; Wei, 2000). 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 (Ades and Di Tella, 1999; Bliss and Di Tella, 1997; Hellman *et al.*, 2000), and the impact 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. Even with strong enforcement, the expected costs of anti-bribery actions, relative to the benefits, are modest for most firms. For example, Karpoff *et al.* (2017) find that the benefits of bribery often exceed the costs as well as the reputational consequences for bribery, although if bribery includes financial fraud, the costs can be considerably higher.

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 involved examining whether parties to the treaty have successfully criminalized proscribed behavior in domestic law. Phase 2 examined the application of these laws. Phase 3, which examined 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).[5]

[5]This 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.

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 ABC had 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 at the end of 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 Malesky's (2018) technique 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 (Olken, 2009; Treisman, 2007), corruption is measured based on firm experiences during business registration and the process of obtaining a government procurement contract. Their "list experiment" side-steps this problem by presenting both a treatment and a control group with a list of activities, asking respondents to identify the number of activities they've engaged in (Ahart and Sackett, 2004; Coutts and Jann, 2011). The treatment group has a list that includes the sensitive behavior, while the control group does not. The analyst can then use the difference in means between treatment and control to identify how often firms engage in the sensitive behavior. Jensen and Malesky (2018) find that the ABC, after the peer review phase (Phase 3 at the end of 2009), 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 signatories. 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. 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.

Model

We analyze an n-firm model of market entry in which (a) rents dissipate as the number of entrants increases and (b) firms can enter either cleanly or via bribery, the latter of which ensures access at an additional upfront cost. Firms differ in their productivity, such that more productive firms pay a lower marginal cost for entry than less productive firms, rendering the former relatively less willing to pay a bribe to improve their chances of entry. A firm's productivity is private information, but other firms' priors are informed by a uniform type distribution. In practice, some elements of productivity are observable; firms pay close attention to their competitors, after all. But it's also reasonable to assume that some features of productivity, such as proprietary technologies, specialized management practices, or financial strategies, are known only within the firm (Kreps, 1990). These factors are important to firm's success in a market but unobservable to the competition.

We also consider two extensions. First, we allow k firms to be subject to an anti-bribery treaty, like the OECD ABC. Firms subject to the treaty risk their home countries catching and fining them if they bribe. We can think of the probability of being caught as the quality of monitoring a firm faces, while the cost of a fine can be thought of as the severity of enforcement. We examine how the bribing behavior of k subject 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 bribery through an intermediary 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.

Our model bears some similarity with others that study coordination in market entry games, in that we examine the strategy of n firms which do not communicate and enter simultaneously.[6] Like those models, we also assume the payoff to entry depends on the number of other entrants. We deviate from such models by examining the effect of asymmetric incentives on some firms as a function of their jurisdictions being party to the ABC. By making firm type private information, our model resembles Laffont and Tirole's (1987)

[6]See, for example, Anderson and Egger (2007), Gary-Bobo (1990), Selten and Güth (1982), Sundali *et al.* (1995).

classic auction model, though we do not model a government actor and are not concerned with identifying optimal procurement strategies. Instead, we take the likelihood of firm success as given, and use the structure to generate leverage over how the Convention alters firm incentives and equilibrium rates and means of entry. Ours is thus a specific case of a more general class of models about simultaneous entry among many firms.

Baseline Model

Actors and Timing

We consider n firms with privately known productivity θ. The timing of the game is:

1. Nature draws n firm types $\theta \sim \mathrm{U}[0, \bar{\theta}]$.
2. Firms choose whether to not enter, enter "cleanly," or enter via bribery.
3. Nature determines whether clean entry is successful, but bribery ensures successful entry.[7]

Payoffs

Profits decrease in the number of other successful entrants. This gives us the following payoff function for firm i taking action a,

$$u_i(a) = \begin{cases} 0 & \text{if } a = \text{out} \\ (R - E[f]) - \theta(c + b) & \text{if } a = \text{bribe} \\ p(R - E[f]) - \theta c & \text{if } a = \text{clean}, \end{cases} \tag{1}$$

where θ is firm i's type, $R > 0$ is the value of market entry, $E[f]$ is the expected number of other entrants (clean and bribing), $c > 0$ is the cost of entry, $b > 0$ is the cost of a bribe, and $0 < p < 1$ is the probability of successful clean entry.

Information

Firm i's privately known productivity defines its type, θ, and shapes the marginal cost of entry, acting as a multiplier on both upfront costs and bribes. When θ is low, firm i is relatively productive, or a low-cost type; when θ is high, firm i is relatively unproductive, and thus a high-cost type. Some aspects of firm productivity are observable, but other aspects, such as proprietary

[7] Alternatively, we could model entry success via bribery as probabilistic, but the results only hinge on the assumption that bribery improves the chance of entry, so we fix the probability of bribery entry success at 1.

procedures, particular organizational cultures, and management practices are known only within the firm.[8] Yet these characteristics are important determinants of success in procuring entry into new markets, as they influence competitive bids. We assume $\theta \sim \mathrm{U}[0, \bar{\theta}]$, which informs each firm's prior beliefs over each other firm's type.

Equilibrium

We look for Bayesian Nash Equilibria (BNE), at which 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. We identify an equilibrium in which firms play a cut-point strategy, with the least productive firms staying out of the market, moderately productive firms bribing to guarantee entry, and the most productive firms attempting clean entry.

Proposition 1. *When* $p > \frac{c}{c+b}$ *and* $R > E[f]$, *there exists a Bayesian Nash Equilibrium at which firms enter cleanly when* $\theta < \theta_l$, *enter by bribing when* $\theta_l \leq \theta < \theta_h$, *and stay out when* $\theta_h \leq \theta$. *See Appendix for proof.*

In the Appendix, we identify θ_l and θ_h as the types indifferent between clean entry and bribery, and between bribery and no entry, respectively, where

$$\theta_h = \frac{bR\bar{\theta}}{(n-1)\left(b(2-p)p - c(1-p)^2\right) + b\bar{\theta}(b+c)}$$

and

$$\theta_l = \frac{(1-p)R\bar{\theta}(b+c)}{(n-1)\left(b(2-p)p - c(1-p)^2\right) + b\bar{\theta}(b+c)}.$$

Some firms bribe at our baseline BNE, which exists as long as clean entry is sufficiently likely to be successful and the total pie to be shared by entrants is sufficiently large. The most productive firms ($\theta < \theta_l$) pay such low costs for entry that, for a sufficiently large chance of success $\left(p > \frac{c}{c+b}\right)$, they accept the risks of clean entry. Moderately productive firms, however, choose to offset their relatively higher costs ($\theta_l \leq \theta < \theta_h$) with a bribe that guarantees entry. Finally, the least productive firms ($\theta \geq \theta_h$) stay out, because the costs of entry are simply too great to offset the rent dissipation caused by the entry of other, more productive firms. The condition $p > \frac{c}{c+b}$ has a straightforward interpretation, which is easy to see when rearranged as

$$1 - p < \frac{b}{c+b}.$$

[8] Kreps (1990) provides a good analysis.

The left side of the inequality represents the benefit of bribery, in terms of increased likelihood of entry success. The right side is the ratio of the price of a bribe to total entry costs. Thus, in order for the equilibrium to exist, the benefits of bribery must not exceed the ratio of the costs of clean entry to bribery.

At this baseline BNE, the expected number of entrants, or $E[f]$, is

$$n\left(\frac{\theta_h - \theta_l}{\bar{\theta}}\right) + n \cdot p\left(\frac{\theta_l}{\bar{\theta}}\right),$$

where the first term is the expected number of entrants via bribery and the second is the expected number of successful clean entrants. This means that any exogenous parameter that increases (decreases) θ_h will increase (decrease) the number of expected entrants via bribery, and any exogenous parameter that increases (decreases) θ_l will increase (decrease) the number of expected clean entrants. Clearly, both n, the number of other firms, and p, the probability of successful clean entry, increase $E[f]$. Next, we introduce a subset of firms subject to an anti-bribery convention.

Anti-bribery Convention

We introduce the anti-bribery convention by adding two parameters that define a group of firms from ABC signatory countries. Suppose that being subject to the convention entails a probability of getting caught and sanctioned for bribing. 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 $q \cdot s$, which we subtract from the expected utility of bribing for subject firms. Payoffs for non-subject firms are as defined in Equation (1), but for ABC-subject firms,

$$u_i(a|\text{subject}) = \begin{cases} 0 & \text{if } a = \text{out} \\ (R - E[f]) - \theta(c + b) - q \cdot s & \text{if } a = \text{bribe} \\ p(R - E[f]) - \theta c & \text{if } a = \text{clean.} \end{cases} \tag{2}$$

We study a cut-point BNE similar to that described in Proposition 1, but strategies differ for subject and non-subject firms.

Proposition 2. *When $p > \frac{c}{b+c}$ and $R > E[f] + qs$, there exists a Bayesian Nash Equilibrium at which non-subject firms enter cleanly if $\theta < \theta_{nl}$, enter via bribery if $\theta_{nl} \leq \theta < \theta_{nh}$, and stay out when $\theta_{nh} \leq \theta$, while subject firms enter cleanly if $\theta < \theta_{sl}$, enter via bribery if $\theta_{sl} \leq \theta < \theta_{sh}$, and stay out when $\theta_{sh} \leq \theta$. See Appendix for proof.*

Here again, we derive cutpoints θ_{nl} and θ_{nh}, and θ_{sl} and θ_{sh}, which define the types of non-subject and subject firms that are indifferent between clean

entry and bribery, and between bribery and no entry. To ease presentation we write the probabilities of non-subject and subject firms entering successfully as

$$\nu = p \cdot \frac{\theta_{nl}}{\bar{\theta}} + \frac{\theta_{nh} - \theta_{nl}}{\bar{\theta}} \quad \text{and} \quad \sigma = p \cdot \frac{\theta_{sl}}{\bar{\theta}} + \frac{\theta_{sh} - \theta_{sl}}{\bar{\theta}}, \tag{3}$$

respectively. The types that are indifferent are then:

$$\theta_{nh} = \frac{R - \nu(n-k-1) - \sigma k}{b+c} \quad \text{and}$$
$$\theta_{nl} = \frac{(1-p)(R - \nu(n-k-1) - \sigma k)}{b}$$

for non-subject firms and

$$\theta_{sh} = \frac{R - \nu(n-k) - \sigma(k-1) - qs}{b+c} \quad \text{and}$$
$$\theta_{sl} = \frac{(1-p)(R - \nu(n-k) - \sigma(k-1)) - qs}{b}$$

for subject firms. At this BNE, subject firms pay an additional expected cost compared to non-subject firms for entry via bribe, and the size of that cost is determined by q, the probability that a firm is caught bribing, and s, the size of the punishment.[9] This extra cost ensures that firms from ABC countries must expect a greater chance of success and higher profits in order to attempt entry. At the equilibrium, subject firms are less likely to enter than they are at the baseline equilibirum, while non-subject firms are more likely to enter; that is, the highest-cost subject type that enters is lower than the highest-cost non-subject type that enters ($\theta_{sh} < \theta_{nh}$).[10] Proposition 3 explains that this difference derives from the expected costs of bribery $q \cdot s$, which has the direct effect of discouraging subject firms from entering and the indirect effect of encouraging non-subject firms to enter and claim abandoned profits for themselves.

Proposition 3. *As $q \cdot s$ approaches zero, θ_{nl} and θ_{sl} converge on θ_l, and θ_{nh} and θ_{sh} converge on θ_h. See Appendix for proof.*

Proposition 3 shows that as the quality of monitoring (q) and/or the severity of sanction (s) decrease, the "playing field" becomes more equal. The direct reduction in subject-firm entry and its indirect increase in non-subject entry both diminish, and cut-points for both subject and non-subject firms

[9] This is an unrealized cost at the time of the entry decision. We refer to it as an expected cost because with probability q the firm will have to pay c at some future point. Thus it is separable from present productivity and entry costs.

[10] It's straightforward to show that $\theta_{sh} < \theta_{nh}$ when $R > E[f] + qs$.

converge on the cut-points in Proposition 1. Conversely, as q or s increase, so does the gap in entry decisions between subject and non-subject firms, with subject firms requiring higher productivity to enter. In practice, this gap not only exists between subject and non-subject firms, but also within subject firms due to extraterritorial enforcement. That is, in our model, q and s do not vary across subject firms, but in practice home country enforcement regimes vary in quality and severity. This logic is well understood amongst parties to the convention, and it is part of the rationale behind the peer review system. For a given level of productivity, firms from high enforcement countries (where q and/or s are high) are less likely to enter because they have to take into account the potential costs of enforcement. This, in essence, places them at a competitive disadvantage relative to their peers from more lax enforcement environments.

This gap is the motivation behind calls to expand participation in multilateral anti-bribery efforts. Firms that are party to the convention may be at a competitive disadvantage to non-subject firms; this is the direct effect of the convention. This also means that non-subject firms may face less competition, making entry more profitable, which we identify as the convention's indirect effect. To see why this is the case, recall that in the baseline model we can write the expected number of successful entrants via bribery as $n\left(\frac{\theta_h-\theta_l}{\bar{\theta}}\right)$ and via clean entry as $n \cdot p\left(\frac{\theta_l}{\bar{\theta}}\right)$. With firms divided into subject and non-subject groups, the expected number of competitors must incorporate expectations over both sets of cut-points. The expected number of competitors can thus be written as:

$$E[f] = (n-k)\left(p\frac{\theta_{nl}}{\bar{\theta}} + \frac{\theta_{nh}-\theta_{nl}}{\bar{\theta}}\right) + k\left(p\frac{\theta_{sl}}{\bar{\theta}} + \frac{\theta_{sh}-\theta_{sl}}{\bar{\theta}}\right). \tag{4}$$

The first term shows the total number of expected non-subject entrants, while the second shows the total number of subject entrants. The expected number of subject entrants will be lower than non-subject entrants because $\theta_{nl} > \theta_{sl}$ and $\theta_{nh} > \theta_{sh}$. In other words, the proportion of subject firms that fall within the middling and high ranges of productivity will be larger than the number of non-subject firms that fall within the middling and high ranges of productivity.

Figure 1 illustrates how the cut-point strategies of subject and non-subject firms compare to the baseline model. Subject firms are disincentivized to enter via bribery, which reduces the range of types that are willing to bribe. As a result, non-subject firms are incentivized to bribe relative to their counterparts in the baseline model. The relative effect of this shift in firms' expectations depends on k, or the number of subject firms. As the number of subject firms rises, more of the expected competition comes from the type distribution defined at subject firms' cut-points, θ_{sl} and θ_{sh}, which produces fewer expected entrants and encourages entry from non-subject firms relative to the baseline model. Both θ_{nl} and θ_{sl} rise in k, but the latter rises more quickly, ensuring that

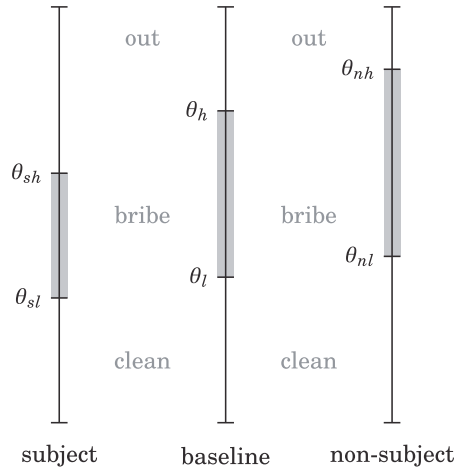

Figure 1: Cut-point strategies for non-subject and subject firms in the equilibrium with an anti-bribery convention, where types that bribe are highlighted in gray.

k not only increases entry among subject firms in general, but also specifically increases the rate of bribery as well, widening the range of non-subject firm types that bribe. Proposition 4 states the result.

Proposition 4. *When $p > \frac{c}{b+c}$ and $\bar{\theta}$ is sufficiently high, non-subject firms are more likely to bribe as the number of subject firms (k) increases. See Appendix for proof.*

This extension to the baseline model demonstrates that when some firms are subject to a bribery convention that entails a possible cost for bribing, non-subject firms will be (a) more likely to enter in general and (b) more likely to do so via bribery. Next, we turn to the possibility that even subject firms adapt to evade detection, a practice explicitly outlawed in the U.S. Foreign Corrupt Practices Act and in the ABC, but nonetheless is a growing concern among anticorruption experts.

Subcontracting to Non-subject Firms

When firms become subject to the convention, their incentives to enter the market are diminished at the margin, which makes market entry more lucrative for non-subject firms. Thus far, we have modeled firms as facing only three choices: enter via bribery, enter cleanly, or remain outside of a market. But subject firms may face a fourth option of subcontracting with consultants of law firms, usually domestic businesses, who assume responsibility for completing business registration, licensing, procurement, and inspection formalities,

including handling any necessary bribes.[11] Despite efforts to outlaw this strategy like the FCPA, identifying instances of bribery through intermediaries remains challenging.[12] These firms can directly pay any entry bribes and thus inoculate foreign, subject firms from behavior considered illicit in their home jurisdiction. This fourth option — subcontracting for bribery — provides legal cover for subject firms, but at the cost of additional fees paid to the subcontracted firm. How does the possibility of subcontracting affect rates of bribery?

Consider an extension to the above model with the following features: firms may stay out of the market, enter via bribery, enter via subcontracting, or enter cleanly. We model the cost to the subject firm of contracting with a non-subject consulting firm as simply increasing the cost of entry by some factor that represents the costliness of outsourcing with a non-subject firm. Let z be the cost of subcontracting. Like the models above, we fix the probability of successful entry via subcontracting at 1 identical to that under direct bribery. But under subcontracting, the subject firm avoids the possibility of being caught and sanctioned, so does not pay the expected cost $q \cdot s$.[13] We assume that the firm still provides the funds for bribery; subcontracting only provides plausible deniability of the exchange.[14] This provides the following payoffs for firm i, where we $\sigma = 1$ if i is a subject firm and $\sigma = 0$ otherwise:

$$u_i(a) = \begin{cases} 0 & \text{if } a = \text{out} \\ (R - E[f]) - \theta(c+b) - \sigma(q \cdot s) & \text{if } a = \text{bribe} \\ (R - E[f]) - \theta(c+b) - z & \text{if } a = \text{subcontract} \\ (R - E[f]) - \theta(c) & \text{if } a = \text{clean.} \end{cases} \tag{5}$$

Equation (5) makes clear that the key decision for subject firms is now whether to bribe directly or subcontract, as their utility for one versus the other varies only in the cost of subcontracting and the cost of bribing. Non-subject firms do not resort to subcontracting in this formulation, as they have no incentive to evade the regulatory regime. For subject firms, the difference between subcontracting versus bribing hinges on the cost of subcontracting, z, relative to the expected cost of sanctioning, $q \cdot s$. This game has two Bayesian Nash Equilibria, identified in Propositions 5.

[11] See Bray (2005) for details. Sartor and Beamish (2018) find evidence that MNCs are more likely to hire local intermediaries in corrupt states.

[12] See Lambsdorff (2013). Transparency International continues to flag this practice as a challenge to regulating corruption; see Transparency International (2010).

[13] Assuming there is no chance of being caught subcontracting simplifies the analysis, but all that is required for the following equilibrium is that the probability of being caught when subcontracting is lower than the probability of being caught utilizing direct bribery.

[14] This also means that it is never superior for non-subject firms to subcontract, because in so doing they incur both costs b and z, whereas they only incur cost b when directly bribing.

Proposition 5. *When $z < q \cdot s$, there exists a Bayesian Nash Equilibrium in which non-subject firms enter cleanly when $\theta < \theta_{nl}$, enter via bribery when $\theta_{nl} \leq \theta < \theta_{nh}$ and stay out when $\theta_{nh} \leq \theta$. Subject firms enter cleanly when $\theta < \theta_{sl}$, enter via subcontracting when $\theta_{sl} \leq \theta < \theta_{sh}$, and stay out when $\theta_{sh} \leq \theta$.*

When $z \geq q \cdot s$, there exists a Bayesian Nash Equilibrium in which non-subject enter cleanly when $\theta < \theta_{nl}$, enter via bribery when $\theta_{nl} \leq \theta < \theta_{nh}$, and stay out when $\theta_{nh} \leq \theta$. Subject firms enter cleanly when $\theta < \theta_{sl}$, enter via bribery when $\theta_{sl} \leq \theta < \theta_{sh}$, and stay out when $\theta_{sh} \leq \theta$. See Appendix for proof.

The first equilibrium describes a situation in which subcontracting is more cost-effective. The benefit of evading the regime and avoiding potential sanctioning is worth the cost of subcontracting. The second equilibrium describes a situation in which the degree of profit-sharing or other costs associated with subcontracting exceed the expected costs of being caught and sanctioned for bribing. Here, subject firms of middling productivity will enter via bribery rather than subcontracting, because it's more cost effective to risk sanctioning than to enlist a non-subject firm in the illicit activity. This suggests that firms from high enforcement countries that are subject to the ABC will be more likely to engage in subcontracting, while firms from low enforcement jurisdictions may continue to bribe despite being subject to the regulatory regime.

Implications

The equilibria identified above lead to a number of empirical implications. First, firm strategies follow a common pattern. More productive firms (lowest entry costs) see the added benefit of bribery as small relative to the cost. Firms with middling levels of productivity may see a substantial enough increase to entry success that they deem bribery worth the cost, while firms at the low end of the spectrum face such high entry costs they opt to stay out. This implication is a new addition to the literature, though perhaps consistent with findings that bribery declines with firm size, which some authors have viewed as a proxy for productivity (Bai *et al.*, 2019).

Second, Proposition 4 establishes that as the number of firms subject to the ABC increases, the rate of market participation (both through clean entry and bribery) of non-subject firms increases. This predicts the perverse effect of the convention. If 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 will instead 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.

Third, Proposition 3 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 $q \cdot s$. 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 of the equilibrium with no convention. If enforcement varies across countries parties to the convention, it means that firms from weaker enforcement or no enforcement jurisdictions will behave more like 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. This logic should be cause for concern if the goal of the convention is to create general disincentives for bribery.

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 remain, however, due to variation in norms and the capacity of 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 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.

Fourth, 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 bribery, 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 will face upon entry are based on the aggregation of other firms' entry rules, which are themselves 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 cannot be considered in isolation, but rather relative to the attractiveness of entry via bribery, which entails some risk of being caught and sanctioned. This means that increasing the strength of monitoring and enforcement will tend to increase the evasive adaptation of subcontracting, thus further undermining the regime.

Empirical Analysis

To test these implications, we first revisit patterns of investment from subject and non-subject firms post-2009. The Vietnam Provincial Competitiveness Index (PCI) survey surveyed firm managers in eight waves from 2010 to 2017.[15] This annual survey of over 1,500 investors in Vietnam provides a nationally representative sample of foreign investment in Vietnam. We constructed a dataset of repeated cross-sections of firms for each wave. Furthermore, to test our subcontracting 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 ABC signatories (Vietnam's second and third 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 ABC made up 42% of the foreign firms in the sample.

Our first set of results looks at how productivity affects bribery. The second set of results examines the effect of home country enforcement on bribery. 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 and group countries into non-signatory, non-enforcer, and enforcer categories. Transparency International considers the number of anti-bribery cases, whether those cases involve "major" companies or set important precedent, and whether the cases carry substantial sanctions.[16] The coding is thus based on observed cases of prosecution, though does attempt to account for relative rates of bribery across countries by controlling for a country's share of world exports.[17] The third set of results reports patterns of bribing through intermediaries, or subcontracting. We relegate some analysis

[15] See http://www.pcivietnam.org/ for methodological details.
[16] See Transparency International (2018).
[17] See Table 5 in the Supplementary Information (SI) for coding by country.

to an online Supplemental Information document, and direct readers there when appropriate.

Firm Productivity

An initial implication of the model is that more productive firms should be less likely to bribe at all enforcement levels. This pattern is clearly shown in Figure 1. At high levels of productivity, the bribery behavior of all three types of firm (from non-signatory, non-enforcer, or enforcer countries) should converge, as bribery is less important for successful business activity in all cases. Our theory therefore implies the model depicted in Equation (3) below, where we study the relationship between productivity and bribery controlling for enforcement regime.

1. Firm-Level Productivity

$$\begin{aligned}\Pr(\text{bribe} = 1) = \beta_0 + \beta_1 \text{Non-Enforcer}_i + \beta_2 \text{Enforcer}_i \\ + \beta_3 \text{Productivity}_i + \beta_4 \text{LaborSize}_i + \phi_i + \gamma_i + \mu_i\end{aligned}$$

We test these implications of our analysis in Table 1. We measure the outcome variable of bribery during legislation with a direct question used in the PCI survey:

- Did you pay an informal charge to expedite the delivery of the registration license?[18] Yes/No/Don't Know

Of the 1,765 firms in the PCI 2018 survey, 57% answered "No", 27% answered "Yes", and 15% responded "Don't Know," because their registration took place too long before or because they were under a different manager. We drop these do not know answers in our analysis.

In previous years, the PCI-FDI survey used a list experiment for this, but changed to a direct question in 2017 to preserve room and time for other experimental questions in the survey. One serious concern is that the change to a direct question increased social desirability bias that might lead to lower admission of bribery overall and that admission could correlated with ABC status. Thankfully, this does not appear to be the case. Figure 2 studies the predicted bribery in the PCI-FDI sample using the list experiment approach between 2010 and 2016 and the direct approach used between 2017 and 2019 for all firms and for firms from high enforcement regimes. The first thing to notice is that these results recover the Jensen and Malesky (2018) finding that

[18]Informal charges or "chi phí không chıh thúc" is the Vietnamese euphemism for bribery. See this article in Youth Magazine as an example https://tuoitre.vn/chi-phi-khong-chinh-thuc-van-de-doanh-nghiep-20191217133613823.htm.

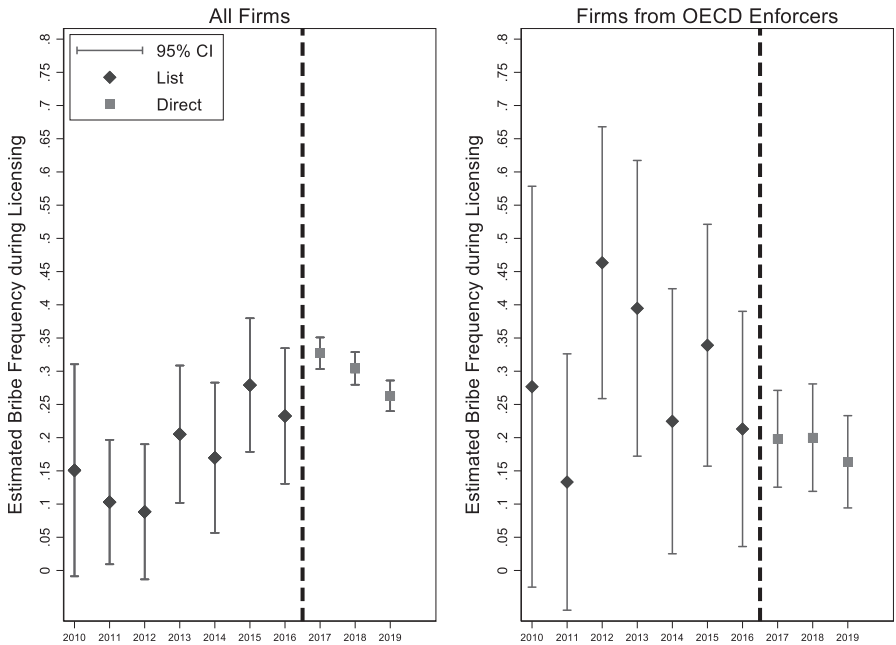

Figure 2: Average bribe frequency over time by list experiment or direct question.

bribe rates declined among high enforcers after Phase 3 and remain lower than other firms today. Second, the direct question does not seem highly influenced by social desirability bias. In fact, for all firms, reported bribery is higher and the variance around the bribe frequency with the direct question than when using the list experiment. Third, for ABC enforcers in particular, bribe frequency is nearly exactly the same 21% using the list experiment in 2016 and the direct question in 2017 through 2019. While it does not solve the problem entirely, it does make us confident that we can use the measure in an illustrative test of bribe payments and productivity.[19]

We proxy for productivity by using the logged value of 2017 sales reported in USD. Sales responses ranged from $145,000 USD to $661 million USD with the median firm reporting $3.6 million USD (SD-$40.4 million USD). Because of the high left skew in the distribution, we use the natural log for our empirical analysis.

[19]As a robustness test, we replicate the analysis using the two-stage list estimator recommended by Blair and Imai (2012) on the list experiment for investment licensing in the Jensen and Malesky (2018) dataset. The results, which show a similar decline in ABC in non-enforcers and similar convergence among productive firms, are reported in SI Table 8.

- Please estimate the total value of your sales of goods and services in LAST YEAR in USD

We chose sales, because while endogeneity is a concern with all measures of productivity, alternative measures such as profit and profit margin incorporate expenses, which is mechanically endogenous to bribes — higher bribes raise expenses and reduce profits. Sales also has the benefit of being less sensitive than profit margin to report for firms who are worried about additional attention from the tax authority. As a result, using sales provides a larger number of observations for analysis. Nevertheless, Figure 3 presents an added variable plot that demonstrates that our proxy is strongly associated with a firm's profit margin, measured as the natural log of the difference in sales and expenses in 2017 over the firm's total investment when it started operations in Vietnam. Figure 3 shows that, all else equal, each 1% increase in sales is associated with a 2.9% increase in profits over investment.[20] The regression is highly significant and demonstrates that sales is an appropriate proxy for productivity that is less likely than other measures to be influenced by mechanical endogeneity.

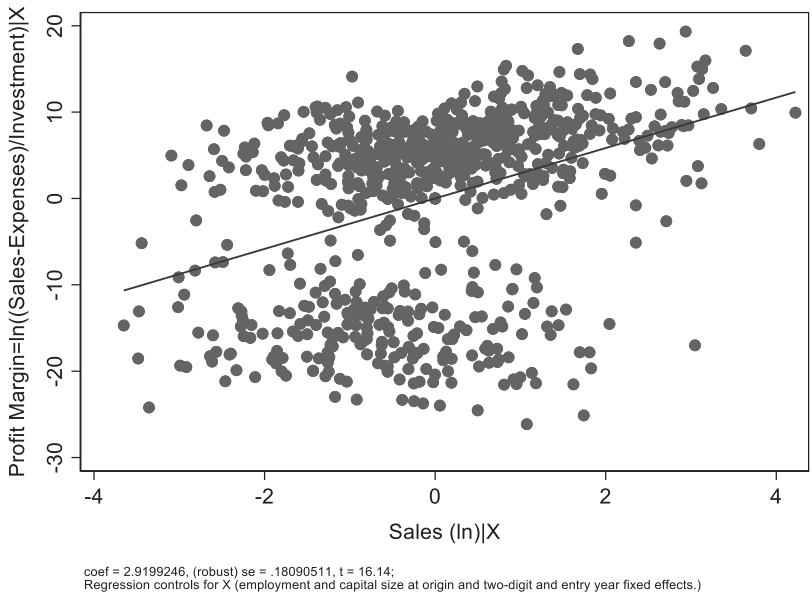

Figure 3: Relationship between proxies for productivity.

[20] See SI Table 7 for full regression results.

Equation (3) also controls for firm labor size at the time of entry, to address the potential that bribery is correlated with firm size, and introduces fixed effects for entry year (ϕ) and two-digit sector (γ) to address heterogeneity in licensing procedures over time and for variance in reporting requirements by narrow industry. Standard errors are clustered at the home country level, as firms from the same country face the same reporting regime and home country culture, and therefore cannot be considered independent draws. We begin with unadjusted relationship in Model 1, add two-digit sector fixed effects (ISIC Rev 4) in Model 2, add controls for year of registration and size at origin in Model 3 to address different starting conditions, and drop China and Taiwan in Model 4. Results are shown in Table 1.

Consistent with our theory, we find that productivity is robustly associated with bribery. In the fully-specified Model 3, a 1% change in sales is associated with a 1.5% reduction in bribery during business entry. Consistent with our model, bribery is an attractive strategy for unproductive firms with little hope of surviving fair competition. Due to the costs and risk of detection, however, this strategy is unavailable for firms from high enforcement regimes. As productivity increases, however, the differential attractiveness of bribery dissipates.

In the online Supplemental Information (SI), we address two potential threats to this analysis — social desirability bias and endogeneity. First, to ensure that our results are not biased by the potential that reluctance to answer the direct entry question is also associated with sales, we re-run our analysis using the replication data Malesky and Jensen (2018), which used a list experiment to measure the probability of bribe at entry. Employing the Blair and Imai (2012) two-stage list estimator in SI Table 8, we also find a statistically significant relationship between logged sales and bribe at entry. The substantive size of the relationship is smaller, however. For each 1% increase in sales, firms are 0.7% less likely to bribe.

Second, we address the potential endogeneity in the relationship between sales and bribery in SI Table 9 using a two-stage least squares regression (2SLS), where we instrument for bribery using an index of management quality. Nicholas Bloom has spearheaded a large literature documenting strong associations between management quality and firm productivity, profitability and survival rates (Bloom and Van Reenen, 2007; Bruhn *et al.*, 2010; Bloom *et al.*, 2013, 2018, 2019). The 2018 PCI-FDI survey included a series of questions that allow us to replicate the Bloom *et al.* (2019) measures on a four-point scale, capturing the average score on three indicators of management quality: performance monitoring (information collection and analysis); target-setting (the use of short- and long-run targets) and incentives (reward high-performing employees; and retraining or removing under-performers).

In SI Table 9, we present the first- and second-stage models for the IV-2SLS estimation using the same control variables as in Table 3 above. We find strong

Table 1: Relationship between productivity and bribery.

Dependent variable: Paid bribe during licensing = 1	(1) Bivariate	(2) Sector FE	(3) Controls	(4) Drop China/Taiwan
Low enforcement regime = 1	0.007	0.021	0.006	0.042
	(0.036)	(0.031)	(0.035)	(0.034)
High enforcement regime = 1	−0.147	−0.134	−0.117	−0.090
	(0.050)	(0.050)	(0.049)	(0.054)
Sales (USD, ln)	−0.023	−0.022	−0.015	−0.013
	(0.008)	(0.007)	(0.006)	(0.006)
Employees at origin (1–8)			−0.021	−0.021
			(0.007)	(0.009)
Constant	0.693	0.680	0.407	0.386
	(0.094)	(0.093)	(0.103)	(0.104)
ISIC two digit fixed effects	No	Yes	Yes	Yes
Entry year fixed effects	No	No	Yes	Yes
Observations	1,019	1,014	984	792
Clusters	40	40	40	38
R-squared	0.012	0.037	0.059	0.073
RMSE	0.474	0.472	0.475	0.474

OLS with standard errors clustered at the country of origin level.

evidence in the first stage that management quality is a strong predictor of sales. A standard deviation improvement on the four-point scale (SD = 0.55) is associated with 18.15% increase in sales. In the second stage, we find that predicted sales is indeed associated with declining bribe during business entry. Caution should be taking in interpreting this result, however, as the instrument is quite weak, which may be leading to bias in the second-stage coefficient on logged sales.

Enforcement

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. Our theoretical model explains this pattern and shows that the ABC has a counter-intuitive effect due to the very effectiveness of the regime. By driving out firms 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 the expected rents, the greater the probability of bribery. 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 4).

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 aggregate data on firm entry to explore Proposition 2. Do we see a decrease in entry of ABC signatories after 2009, when signatories were subject to peer review (Phase 3 of the Convention)?

Figures 4 and 5 draw upon data from the Vietnam General Statistical Office (GSO) to depict the share 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 signatory categories of enforcers and non-enforcers of the convention, we observe important differences in the patterns of investment. Investments from non-enforcer countries increase from 2009 while investments from enforcer countries actually slightly decline after 2009 in Figure 4. Figure 4, measured as a percentage of dollars of investment, tells a similar story but with more annual variance. Investment from non-enforcer countries grew in the period since 2009, while enforcer country investments see small declines. These patterns are consistent with

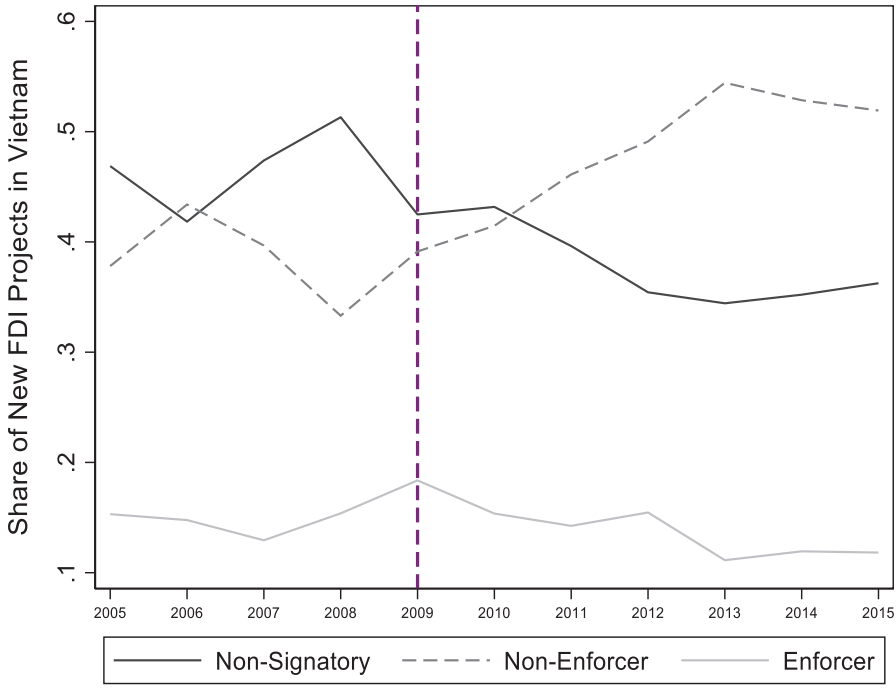

Figure 4: Percentage of total FDI projects by home country enforcement, 2005–2015.

Propositions 3 and 4. Proposition 4 states that as the number of subject firms increases, the number of non-subject firms entering the market increases, while Proposition 3 ties this pattern to the strength of enforcement of subject firms. Figures 4 and 5 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 4, when measured as a percent total FDI projects, but an increase in Figure 5, 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.[21]

[21] See SI Figures 1 and 2 depicting the logged total number of projects and new capital. The patterns are consistent with the share graphs here.

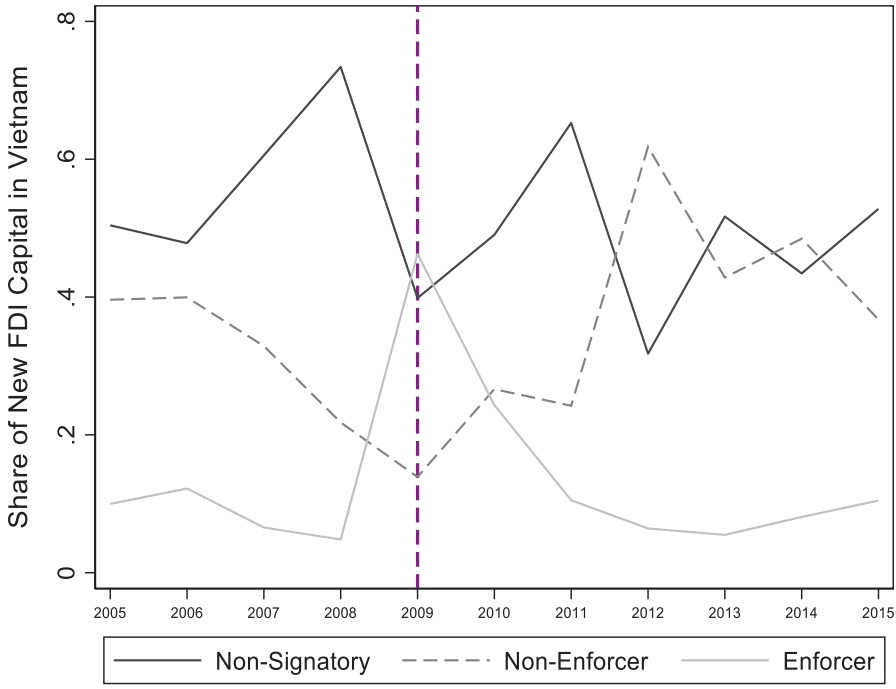

Figure 5: Percentage of dollars of investment by home country enforcement, 2005–2015.

In Table 2, we present 8 models, which are described by Equations (2) and (3). The first four models provide a direct statistical modeling of Figures 4 and 5, described in Equation (1) below. As in the figure, we aggregate all country scores to three enforcement levels (Non-Signatory, Non-Enforcer, and Enforcer), which are indexed by (e), and study the change in entry patterns for these three groups between and after the onset of Phase 3 at the end of 2009. The analysis covers eleven years for the three groups and therefore has thirty-three observations. Models 5–8, represented by Equation (2), however, present a similar analysis at the country level, studying an unbalanced panel of 41 countries over the 11 years with two-way country (γ) and year (ϕ) fixed effects.

We present two outcome variables: 1) the share of new projects in year (y) from one of the enforcement groups; and 2) the share of new investment in year (y) from each of the enforcement groups. Studying the share of projects and investment has three attractive features for us. First, it allows for a close approximation of our theoretical predictions that investment from high enforcement countries will be replaced with investment from non-enforcers

and non-signatories. Second, standardizing by the total investment received that year side-steps modeling issues posed by inflation adjustments and serial correlation, as both the numerator and denominator include the price effect and therefore cancel each other out, allowing for easy comparisons across years. Third, the approach mitigates problems caused by serial correlation in the measurement over time of FDI, because the shares are directly comparable from year to year.

Some readers, however, may be concerned that using share treats investment as a zero-sum game, and does not take into account that investment may be increasing at different levels for all groups. In the SI Figures 1 and 2 and Table 4, therefore, we replicate our figures and the regression table using the non-share outcomes of total new projects and logged, inflation-adjusted total investment in millions of USD.

The basic model is a straightforward differences-in-differences estimator for each enforcement level, modeled with OLS. β_0, the constant, provides the estimate for non-signatories prior to the onset of Phase 3 of the ABC. β_1 and β_2 provide the additional share of investment of non-enforcers and enforcers prior to Phase 3. β_3 provides the change in share of investment for non-signatories after Phase 3, while β_4 and β_5, the diff-in-diff coefficients, depict the additional change in investment shares for non-enforcers and enforcers, respectively.

2. Enforcement level:

$$\begin{aligned}\text{share}_{ey} = {} & \beta_0 + \beta_1 \text{Non-Enforcer}_{ey} + \beta_2 \text{Enforcer}_{ey} + \beta_3 \text{Phase3}_y \\ & + \beta_4 \text{Non-Enforcer}_{ey} \times \text{Phase3}_y + \beta_5 \text{Enforcer}_{ey} \\ & \times \text{Phase3}_y + \mu_{ey}\end{aligned}$$

3. Country level:

$$\begin{aligned}\text{share}_{ey} = {} & \beta_0 + \beta_1 \text{Non-Enforcer}_{cy} + \beta_2 \text{Enforcer}_{cy} + \beta_3 \text{Phase3}_y \\ & + \beta_4 \text{Non-Enforcer}_{cy} \times \text{Phase3}_y + \beta_5 \text{Enforcer}_{cy} \\ & \times \text{Phase3}_y + \phi_y + \gamma_c + \mu_{cy}\end{aligned}$$

Because of the out-sized role played by Taiwanese and Chinese investment in Vietnam during this time, we provide sensitivity tests that drop these countries in order to ensure that our results are robust to their exclusion. Models 3 and 4 do this by aggregating to the enforcement levels excluding these countries, while Models 7 and 8 drop them directly from the analysis.

Consistent with Figures 4 and 5, in Table 2 we find that the share of new projects increased dramatically among non-enforcers, who took advantage of the added restrictions on their competitors. As a group, non-enforcers

Table 2: Enforcement regime level difference-in-difference.

	Aggregating by enforcement level				Country-level analysis			
	All		Drop China and Taiwan		All		Drop China and Taiwan	
Dependent variable	Project share (1)	Investment share (2)	Project share (3)	Investment share (4)	Project share (5)	Investment share (6)	Project share (7)	Investment share (8)
Low enforcement regime = 1	−0.073	−0.248	0.126	−0.126	−0.003	−0.002	−0.003	−0.002
	(0.024)	(0.094)	(0.030)	(0.089)	(0.002)	(0.006)	(0.002)	(0.006)
High enforcement regime = 1	−0.306	−0.384	−0.107	−0.263	0.004	0.004	0.004	0.005
	(0.019)	(0.116)	(0.026)	(0.109)	(0.001)	(0.006)	(0.001)	(0.006)
Phase 3 = 1	−0.086	−0.054	−0.021	−0.026	−0.002	−0.001	0.000	−0.000
	(0.022)	(0.092)	(0.026)	(0.090)	(0.002)	(0.003)	(0.001)	(0.003)
Low enforcement* Phase 3	0.193	0.159	0.128	0.135	0.008	0.007	0.007	0.007
	(0.034)	(0.130)	(0.036)	(0.125)	(0.003)	(0.007)	(0.002)	(0.007)
High enforcement* Phase 3	0.066	0.003	0.001	−0.021	−0.001	−0.004	−0.002	−0.004
	(0.025)	(0.134)	(0.028)	(0.126)	(0.001)	(0.008)	(0.001)	(0.008)
Constant	0.460	0.544	0.260	0.420	0.012	0.011	0.009	0.010
	(0.017)	(0.076)	(0.025)	(0.074)	(0.001)	(0.002)	(0.001)	(0.002)
Country fixed effects	No	No	No	No	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	Yes	Yes	Yes	Yes
Observations	33	33	33	33	935	935	913	913
R-squared	0.953	0.670	0.941	0.565	0.937	0.543	0.950	0.540
RMSE	0.0345	0.153	0.0357	0.148	0.01000	0.0296	0.00853	0.0293

Robust standard errors in parentheses.

increased their share of investment projects in Vietnam from 38.6% before Phase 3 to 49.3% afterwards, representing a 0.7 shift above their baseline level. This increase is significant at the .01 level. They also increased their monetary share of investment from 29.6% to 40.1%, representing a 0.5 standard deviation shift, although the diff-in-diff estimator is just shy of statistical significance for this estimation.

Similar results can be observed when we shift to the country-level analysis, where we find that individual countries in the non-enforcement category, increased their share of new projects after Phase 3 by 0.8% to 1.5% of the total project share, about a 0.2 standard deviation change. The investment share increased by similar levels, but is not statistically significant.

It is noteworthy that the R^2 is in the share of new projects is above .95 for both the enforcement level and country level regressions. This is likely caused by the very strong bivariate correlation between ABC enforcement status and project share, which is −.76. The bottom line is that, consistent with our theory, Vietnam's investment attraction has transitioned toward non-signatories and non-enforcers, and this explains the vast majority of the variation in investment pattern at the aggregate level, especially when we reduce the variation caused by year-to-year changes in levels by looking at overall shares.

Subcontracting

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):
  - Hired a law firm or business facilitator to complete the business procedure
  - Subcontracted to another foreign firm to complete the business procedure
  - Subcontracted to a Vietnamese firm to complete the procedure
  - None of the above"

We present this data in Figure 6.

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

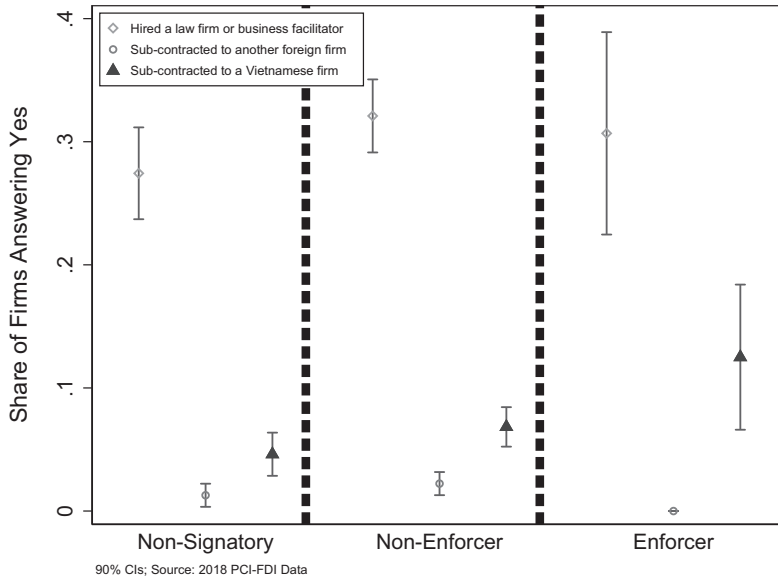

Figure 6: Subcontracting with consultants.

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 subcontractors to avoid bribery 12.5% of the time, compared to only 4.7% and 6.9% for non-signatories and non-enforcers respectively. 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. Model 1 includes only dummy variables for firms from countries that are signatories and strong enforces 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 controls for 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). Model 4 drops firms from China and Taiwan. All three models point to similar results: ABC enforcers are 8% more likely to subcontract to domestic firms in order to avoid bribery than non-signatories and 6% more likely than non-enforcers. The difference between enforcers and non-signatories is significant at the .1 level.

Table 3: Sub-contracting by ABC enforcement regime.

Dependent variable: Sub-contract to domestic firm = 1	(1) Bivariate	(2) Sector FE	(3) Controls	(4) Drop China/Taiwan
Low enforcement regime = 1	0.022	0.021	0.025	0.028
	(0.016)	(0.018)	(0.000)	(0.024)
High enforcement regime = 1	0.079	0.080	0.089	0.092
	(0.036)	(0.037)	(0.000)	(0.038)
Employees at origin (1–8)			0.003	0.003
			(0.000)	(0.003)
Constant	0.046	0.047	0.976	0.975
	(0.013)	(0.014)	(0.000)	(0.021)
ISIC two-digit fixed effects	No	Yes	Yes	Yes
Entry year fixed effects	No	No	Yes	Yes
Observations	1,151	1,147	1,082	865
Clusters	43	43	42	40
R-squared	0.007	0.020	0.055	0.061
RMSE	0.246	0.247	0.248	0.255

OLS with standard errors clustered at the country of origin 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 the 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 which firms can enter through bribery or clean entry and rents 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, and via bribery specifically, 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 generates additional observable implications about the relationship between productivity and bribery and how differential enforcement across member states might affect these patterns. The model suggests that more productive firms are less likely to bribe, a prediction borne out in the data. 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 ABC'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 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 activity that is hard to police within 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.[22] The clear implication 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.

Appendix

Proofs

Proof of Proposition 1. We proceed by identifying cut-points over θ that partition the type space into strategies (θ_l, θ_h), then establish that $0 < \theta_l < \theta_h$.

[22]See also Kelley *et al.* (Forthcoming) on whether human rights pressure can cause rights violations in neighboring states

First, firm strategies imply that

$$E[f] = n\left(p \cdot \frac{\theta_l}{\bar{\theta}} + \frac{\theta_h - \theta_l}{\bar{\theta}}\right),$$

which enters each player-type's payoffs for entry. Then, θ_h is the type indifferent over bribery and staying out, such that

$$0 = R - (n-1)\left(p \cdot \frac{\theta_l}{\bar{\theta}} + \frac{\theta_h - \theta_l}{\bar{\theta}}\right) - \theta_h(c+b),$$

and θ_l is the type indifferent over bribery and clean entry, such that

$$\begin{aligned} &R - (n-1)\left(p \cdot \frac{\theta_l}{\bar{\theta}} + \frac{\theta_h - \theta_l}{\bar{\theta}}\right) - \theta_l(c+b) \\ &\quad = p\left(R - (n-1)\left(p \cdot \frac{\theta_l}{\bar{\theta}} + \frac{\theta_h - \theta_l}{\bar{\theta}}\right) - \theta_l(c)\right). \end{aligned}$$

Solving this system of equations yields

$$\theta_h = \frac{bR\bar{\theta}}{(n-1)\left(b(2-p)p - c(1-p)^2\right) + b\bar{\theta}(b+c)}$$

and

$$\theta_l = \frac{(1-p)R\bar{\theta}(b+c)}{(n-1)\left(b(2-p)p - c(1-p)^2\right) + b\bar{\theta}(b+c)}.$$

Next, $\partial_\theta u(\text{clean}) < \partial_\theta u(\text{bribe}) < 0$, ensuring that superior types enter cleanly and inferior types enter with bribes. Finally, $\theta_l < \theta_h$, ensuring the existence of types willing to bribe, when $p > \frac{c}{b+c}$. This gives the following equilibrium strategies: enter cleanly when $\theta < \theta_l$, enter via bribery when $\theta_l \leq \theta < \theta_h$, and stay out when $\theta_h \leq \theta$

Proof of Proposition 2. Again, we establish cut-points on θ, though for both subject and non-subject firms. For this equilibrium,

$$E[f] = (n-k)\left(p \cdot \frac{\theta_{nl}}{\bar{\theta}} + \frac{\theta_{nh} - \theta_{nl}}{\bar{\theta}}\right) + k\left(p \cdot \frac{\theta_{sl}}{\bar{\theta}} + \frac{\theta_{sh} - \theta_{sl}}{\bar{\theta}}\right)$$

though to ease presentation we write the probabilities of a non-subject and subject firms entering successfully as

$$\nu = p \cdot \frac{\theta_{nl}}{\bar{\theta}} + \frac{\theta_{nh} - \theta_{nl}}{\bar{\theta}} \quad \text{and} \quad \sigma = p \cdot \frac{\theta_{sl}}{\bar{\theta}} + \frac{\theta_{sh} - \theta_{sl}}{\bar{\theta}}, \tag{6}$$

respectively. We present cut-points in reduced form, but full statements of their values are available from the authors upon request. Among non-subject firms, θ_{nh} is the type indifferent over bribing and staying out, such that

$$R - (n-k-1)(\nu) - k(\sigma) - \theta_{nh}(c+b) = 0,$$

and θ_{nl} is indifferent over bribing and clean entry, such that

$$\begin{aligned} R(n-k-1)(\nu) - k(\sigma) - \theta_{nl}(c+b) \\ = p(R(n-k-1)(\nu) + k(\sigma)) - \theta_{nl}(c). \end{aligned}$$

Among subject firms, θ_{sh} is the type indifferent over bribing and staying out, such that

$$R - (n-k)(\nu) - (k-1)(\sigma) - \theta_{sh}(c+b) = 0,$$

and θ_{sl} is the type indifferent over bribing and staying out, such that

$$\begin{aligned} R - (n-k)(\nu) - (k-1)(\sigma) - \theta_{sl}(c+b) - qs \\ = p\left(R - (n-k)(\nu) + (k-1)(\sigma)\right) - \theta_{sl}(c). \end{aligned}$$

Solving this system of equations yields

$$\theta_{nh} = \frac{R - \nu(n-k-1) - \sigma k}{b+c} \quad \text{and}$$

$$\theta_{nl} = \frac{(1-p)(R - \nu(n-k-1) - \sigma k)}{b}$$

for non-subject firms and

$$\theta_{sh} = \frac{R - \nu(n-k) - \sigma(k-1) - qs}{b+c} \quad \text{and}$$

$$\theta_{sl} = \frac{(1-p)(R - \nu(n-k) - \sigma(k-1)) - qs}{b}$$

for subject firms. Next, $\partial_\theta u(\text{clean}) < \partial_\theta u(\text{bribe}) < 0$ for both subject and non-subject firms, ensuring that superior types enter cleanly and inferior types enter with bribes.

Finally, we want to establish that $\theta_{sl} < \theta_{sh}$ and $\theta_{nl} < \theta_{nh}$ to ensure that some types of bribe among both subject and non-subject firms. First, as long as $R > E[f]$, $\theta_{nl} < \theta_{nh}$ is satisfied when $p > \frac{c}{b+c}$. Second, as long as $R > E[f] + qs$, $\theta_{sl} < \theta_{sh}$ is satisfied when

$$p > \frac{c}{b+c}\left(1 - \frac{qs}{R - (n-k)\nu - (k-1)\sigma}\right).$$

Therefore, $p > \frac{c}{b+c}$ is the binding constraint ensuring existence. This gives the following equilibrium strategies for subject firms: subject firms enter cleanly when $\theta < \theta_{sl}$, enter via bribery when $\theta_{sl} \leq \theta < \theta_{sh}$, and stay out when $\theta_{sh} \leq \theta$. Non-subject firms enter cleanly when $\theta < \theta_{nl}$, enter via bribery when $\theta_{nl} \leq \theta < \theta_{nh}$, and stay out when $\theta_{nh} \leq \theta$.

Proof of Proposition 3. We proceed by simple demonstration that as q or s or both go to 0, the expected utility for bribery for subject firms, $R - E[f] - \theta(c+b) - qs$ converges to that of non-subject firms, $R - E[f] - \theta(c+b)$. It directly follows that entry strategies will also converge, as in the baseline model, in which no firms were subject to the treaty.

Proof of Proposition 4. Non-subject firm types bribe when $\theta_{nl} \leq \theta < \theta_{nh}$, and this range increases in k, or

$$\frac{\partial(\theta_{nh} - \theta_{nl})}{\partial k} = \frac{pb - (1-p)c(\nu - \sigma)}{b(b+c)} > 0,$$

which is satisfied when $p > \frac{c}{b+c}$ and $\nu - \sigma$. The latter states that the probability of a non-subject type entering successfully is greater than the probability of a subject type entering successfully. Using Line (6)'s definitions of ν and σ, as well as the fully-characterized cut-points $(\theta_{nl}, \theta_{nh}, \theta_{sl}, \theta_{sh})$, $\nu - \sigma$ is true when

$$p > \frac{c}{b+c} \quad \text{and} \quad \bar{\theta} = \frac{bp(2-p) - c(1-p)^2}{b(b+c)}.$$

Therefore, when $\bar{\theta}$ is sufficiently high, a non-subject firm is more likely to bribe as the number of subject firms increases.

Proof of Proposition 5. We can construct the equilibria for the subcontracting extension identically to the procedure outlined in the proofs of Propositions 1 and 2. Because of the way subcontracting is modeled, as a cost (z) borne by subject firms in order to evade the expected cost of monitoring and enforcement $(q \cdot s)$, two possible cases exist. Either $z > qs$, in which it is never profitable to subcontract, or $z \leq qs$, which is always profitable to subcontract. Because it is an added cost to entry, it deters subject firms at the margins relative to the baseline case, as does the expected cost $q \cdot s$.

References

Ades, A. and R. Di Tella. 1999. "Rents, Competition, and Corruption". *American Economic Review* 89(4): 982–93.

Ahart, A. M. and P. 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): 101–14.

Aichele, R. and G. Felbermayr. 2015. "Kyoto and Carbon Leakage: An Empirical Analysis of the Carbon Content of Bilateral Trade". *Review of Economics and Statistics* 97(1): 104–15.

Anderson, S. P. and M. Egger. 2007. "Participation Games: Market Entry, Coordination, and the Beautiful Blonde". *Journal of Economic Behavior & Organization* 63: 120–37.

Ayoub, L. 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.

Babiker, M. 2005. "Climate Change Policy, Market Structure, and Carbon Leakage". *Journal of International Economics* 65: 421–45.

Bai, J., S. Jayachandran, E. J. Malesky, and B. A. Olken. 2019. "Firm Growth and Corruption: Empirical Evidence from Vietnam". *The Economic Journal* 129(618): 651–77.

Basinger, S. J. and M. Hallerberg. 2004. "Remodeling the Competition for Capital: How Domestic Politics Erases the Race to the Bottom". *American Political Science Review* 98(2): 261–76.

Blair, G. and K. Imai. 2012. "Statistical Analysis of List Experiments". *Political Analysis* 20(1): 47–77.

Bliss, C. and R. Di Tella. 1997. "Does Competition Kill Corruption?" *The Journal of Political Economy* 101(5): 1001–23.

Bloom, N., E. Brynjolfsson, L. Foster, R. Jarmin, M. Patnaik, I. Saporta-Eksten, and J. Van Reenen. 2019. "What Drives Differences in Management Practices?" *American Economic Review* 109(5): 1648–83.

Bloom, N., B. Eifert, A. Mahajan, D. McKenzie, and J. Roberts. 2013. "Does Management Matter? Evidence from India". *The Quarterly Journal of Economics* 128(1): 1–51.

Bloom, N., A. Mahajan, D. McKenzie, and J. Roberts. 2018. "Do Management Interventions Last? Evidence from India". The World Bank.

Bloom, N. and J. Van Reenen. 2007. "Measuring and Explaining Management Practices across Firms and Countries". *The Quarterly Journal of Economics* 122(4): 1351–408.

Bray, J. 2005. "The Use of Intermediaries and Other Alternatives to Bribery". In: *The New Institutional Economics of Corruption*. Ed. J. G. Lambsdorff, M. Taube, and M. Schramm. Routledge: London and New York, 23–41.

Bruhn, M., D. Karlan, and A. Schoar. 2010. "What Capital is Missing in Developing Countries?" *American Economic Review* 100(2): 629–33.

Chung, S. 2014. "Environmental Regulation and Foreign Direct Investment: Evidence from South Korea". *Journal of Development Economics* 108: 222–36.

Collins, A. and G. Judge. 2011. "Differential Enforcement across Police Jurisdictions and Client Demand in Paid Sex Markets". *European Journal of Law and Economics* 29(1): 43–55.

Coutts, E. and B. 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): 169–93.

Cuervo-Cazurr, A. 2008. "The Effectiveness of Laws against Bribery Abroad". *Journal of International Business Studies* 39(4): 634–51.

Davis, K. E. 2011. "Why Does the United States Regulate Foreign Bribery: Moralism, Self-interest, or Altruism". *NYU Ann. Surv. Am. L.* 67: 497.

Dijkstra, B. R., A. J. Mathew, and A. Mukherjee. 2011. "Environmental Regulation: An Incentive for Foreign Direct Investment". *Review of International Economics* 19(3): 568–78.

Drezner, D. W. 2000. "Bargaining, Enforcement, and Multilateral Sanctions: When Is Cooperation Counterproductive?" *International Organization* 54(1): 73–102.

Duvanova, D. 2007. "Bureaucratic Corruption and Collective Action: Business Associations in the Postcommunist Transition". *Comparative Politics* 39(4): 441–61.

Early, B. R. 2009. "Sleeping With Your Friends' Enemies: An Examination of Sanctions-Busting Trade". *International Studies Quarterly* 53(1): 49–71.

Early, B. R. and R. Spice. 2015. "Economic Sanctions, International Institutions, and Sanctions Busters: When Does Institutionalized Cooperation Help Sanctioning Efforts?" *Foreign Policy Analysis* 11: 339–60.

Eichner, T. and R. Pethig. 2011. "Carbon Leakage, The Green Paradox, and Perfect Future Markets". *International Economic Review* 52(3): 767–805.

Eskeland, G. S. and A. E. Harrison. 2003. "Moving to Greener Pastures? Multinationals and the Pollution Haven Hypothesis". *Journal of Development Economics* 70(1): 1–23.

Gabor, T. 1981. "The Crime Displacement Hypothesis: An Empirical Examination". *Crime and Delinquency* 27(3): 390–404.

Gary-Bobo, R. 1990. "On the Existence of Equilibrium Points in a Class of Asymmetric Market Entry Games". *Games and Economic Behavior* 2: 239–46.

George, B. C., K. A. Lacey, and J. 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.

Habib, M. and L. Zurawicki. 2002. "Corruption and Foreign Direct Investment". *Journal of International Business Review* 10(6): 687–700.

Hatchard, J. 2007. "Recent Developments in Combating the Bribery of Foreign Public Officials: A Cause for Optimism". *U. Det. Mercy L. Rev.* 85: 1–29.

Hellman, J. S., G. Jones, and D. Kaufman. 2000. "Are Foreign Investors and Multinationals Engaging in Corrupt Practices in Transition Economies?" *Transition* 11(3–4): 4–7.

Jensen, N. M. and E. 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.

Kaczmarek, S. C. and A. L. Newman. 2011. "The Long Arm of the Law: Extraterritoriality and the National Implementation of Foreign Bribery Legislation". *International Organization* 65(4): 745–70.

Karpoff, J. M., D. S. Lee, and G. S. Martin. 2017. "Foreign Bribery: Incentives and Enforcement". Available at SSRN 1573222.

Kelley, J., B. Simmons, and A. Strehznev. Forthcoming. "Testing for Negative Spillovers: Is Promoting Human Rights Really Part of the Problem". *International Organization*.

Kreps, D. M. 1990. "Corporate Culture and Economic Theory". *Perspectives on Positive Political Economy* 90: 109–10.

Laffont, J.-J. and J. Tirole. 1987. "Auctioning Incentive Contracts". *Journal of Political Economy* 95(5): 921–37.

Lambsdorff, J. G. 2013. "Corrupt Intermediaries in International Business Transactions: Between Make, Buy, and Reform". *European Journal of Law and Economics* 35: 349–66.

Levinson, A. 1996. "Environmental Regulations and Manufacturers' Location Choices: Evidence from the Census of Manufactures". *Journal of Public Economics* 62(1): 5–29.

Magusson, W. 2013. "International Corporate Bribery and Unilateral Enforcement". *Columbia Journal of Transnational Law* 51(2): 360–417.

Malesky, E. J., D. D. Gueorguiev, and N. M. Jensen. 2015. "Monopoly Money: Foreign Investment and Bribery in Vietnam, a Survey Experiment". *American Journal of Political Science* 59(2): 419–39.

Mauro, P. 1995. "Corruption and Growth". *Quarterly Journal of Economics* 110(3): 681–712.

Mosley, L. 2010. *Labor Rights and Multinational Production*. Cambridge University Press.

Mosley, L. and S. Uno. 2007. "Racing to the Bottom or Climbing to the Top? Economic Globalization and Collective Labor Rights". *Comparative Political Studies* 40(8): 923–48.

Oatley, T. and R. Nabors. 1998. "Redistributive Cooperation: Market Failure, Wealth Transfers, and the Basle Accord". *International Organization* 52(1): 35–54.

Olken, B. 2009. "Corruption Perceptions vs. Corruption Reality". *Journal of Public Economics* 93(7–8): 950–64.

Pacini, C., J. A. Swingen, and H. Rogers. 2002. "The Role of the OECD and EU Conventions in Combating Bribery of Foreign Public Officials". *Journal of Business Ethics* 37: 385–405.

Paltsev, S. V. 2001. "The Kyoto Protocol: Regional and Sectoral Contributions to the Carbon Leakage". *The Energy Journal* 22(4): 53–79.

Perlman, R. L. and A. O. Sykes. 2017. "The Political Economy of the Foreign Corrupt Practices Act: An Exploratory Analysis". *Journal of Legal Analysis* 9(2): 153–82.

Ratcliffe, J. H. 2005. "Detecting Spatial Movement of Intra-region Crime Patterns Over Time". *Journal of Quantitative Criminology* 21(1): 103–23.

Samphantharak, K. and E. J. Malesky. 2008. "Predictable Corruption and Firm Investment: Evidence from a Natural Experiment and Survey of Cambodian Entrepreneurs". *Quarterly Journal of Political Science*: 227–67.

Sartor, M. A. and P. W. Beamish. 2018. "Host Market Government Corruption and the Equity-based Foreign Entry Strategies of Multinational Enterprises". *Journal of International Business Studies* 49: 346–70.

Schleifer, A. and R. W. Vishney. 1993. "Corruption". *Quarterly Journal Economics* 108(3): 599–617.

Schmidt, T. W. 2008. "Sweetening the Deal: Strengthening Transnational Bribery Laws Through Standard International Corporate Auditing Guidelines". *Minn. L. Rev.* 93: 1120–45.

Selten, R. and W. Güth. 1982. "Equilibrium Point Selection in a Class of Market Entry Games". In: *Games, Economic Dynamics, Time Series Analysis, a Symposium in Memoriam of Oskar Morgenstern*. Ed. M. Deistler, E. Furst, and G. Schwödiauer. Wien: Phsyica-Verlag.

Spahn, E. 2012. "Multi-jurisdictional Bribery Law Enforcement: The OECD Anti-bribery Convention". *Virginia Journal of International Law* 53(1): 1–52.

Spahn, E. 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.

Stephan, P. B. 2012. "Regulatory Competition and Anticorruption Law". *Virginia Journal of International Law* 53(1): 53–74.

Stevenson, M. 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/>.

Sundali, J. A., A. Rapoport, and D. A. Seale. 1995. "Coordination in Market Entry Games with Symmetric Players". *Organizational Behavior and Human Decision Processes* 62(2): 203–18.

Tostensen, A. and B. Bull. 2002. "Are Smart Sanctions Feasible?" *World Politics* 54(3): 373–403.

Transparency International. 2010. *Avoiding Corruption Risks in the City: The Bribery Act of 2010*. London, UK: Transparency International.

Transparency International. 2018. *Exporting Corruption: Progress Report 2018, Assessing Enforcement of the OECD Anti-bribery Convention*. Berlin, Germany: Transparency International.

Treisman, D. 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.

Tyler, A. 2011. "Enforcing Enforcement: Is the OECD Anti-bribery Convention's Peer Review Effective". *The George Washington International Law Review* 43: 137–72.

Vogel, D. 1995. *Trading Up: Consumer and Environmental Regulation in the Global Economy*. Cambridge: Harvard University Press.

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