Unpacking Compliance and "Leakages" in International Regimes: The Case of the OECD Anti-Bribery Convention

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Abstract

States and non-state organizations often only partially comply with international legal regimes. Such uneven compliance can generate "leakage"—actions that undermine the regime's intended effects by shifting misconduct to less constrained actors. This paper examines this dynamic in the OECD Anti-Bribery Convention (ABC), an international regime requiring member states to criminalize bribery of foreign public officials. We test the theory that the ABC's enforcement led to leakage, as firms from non-signatory countries increased bribery to exploit the constraints imposed on competitors from compliant states. Using a novel global dataset of documented cross-border bribery cases, a new measure of firm competition in foreign markets, and a difference-in-differences research design, we find that foreign bribery declined among firms headquartered in ABC signatories (compliance) but rose among competitor firms from non-signatories operating in the same industries and host countries. These results provide the first global evidence of both compliance and leakage effects following intensified enforcement of an international anti-corruption regime.

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Countries sign on to international legal regimes to combat transnational problems that cannot be eradicated by domestic actions alone (Krasner, 1982; Abbott and Snidal, 2000). Work on international regimes to combat pollution, establish safety standards, reduce illicit financial transactions, and harmonize taxes has demonstrated their remarkable success (Ruggie, 1982; Young, 2011; Lavenex, Serrano, and Büthe, 2021; Kudrle, 2014), but also highlighted the potentially countervailing effects of leakage, which occurs when actors both in and outside the regimes are incentivized to take actions that undermine their long-term objectives (Dijkstra, Mathew, and Mukherjee, 2011; Konisky and Woods, 2010). Leakage can be especially severe when regimes obligate compliance by both states and non-state actors within them, such as individuals, businesses, or civil society groups. (Buthe, 2004; Baradaran et al., 2012; Cooley and Sharman, 2017; Morse, 2019).

In this paper, we explore a well-documented leakage puzzle in the implementation of the cornerstone agreement of the international anti-corruption regime, the OECD-Anti-Bribery Convention (ABC). After the agreement entered the enforcement stage in 2010, evidence from work on Vietnam shows that bribery declined dramatically among "treated" multinational corporations (MNCs)—those from signatory countries—but increased equally sharply among "untreated" MNCs—those from non-signatories (Jensen and Malesky, 2018).[1] Explaining this anomaly, Chapman et al. (2021), developed a formal theory and hypothesized that the observed leakage was not limited to Vietnam, but was relevant globally and was caused by competitive spillover, as untreated MNCs took advantage of the constraints placed on their competitors by increasing their bribery in third-party states, a phenomenon labeled "bribe-switching" in the business management literature (Arbatskaya and Mialon, 2020; Bologna Pavlik and Desierto,

[1] Jensen and Malesky (2018) describe state members of the ABC as signatories. We employ the more precise "treatment" country, indicating that the state is both a signatory of the ABC and has passed through the enforcement stage (Phase 3) of the ABC, and thus is subject to the obligations therein. We compare this group to non-treatment countries that are either non-signatories or not yet in Phase 3. As a robustness test in Appendix E.2, we also consider a control group that includes only OECD-ABC signatory that have not yet entered Phase 3, which helps address concerns about selection bias.

2024). The more signatory MNCs compete with untreated businesses in third-party states, the more likely we will observe this transfer of corrupt activity. While the theory is compelling and intricate with clear observable implications, Chapman et al. (2021) primarily tested secondary predictions of their model on Vietnamese data. They were not in a position to test the spillover theory directly with data on bribe payments from foreign investors around the world.

We offer a direct, cross-national test of the theory's predictions. To do so, we developed a dataset documenting over one thousand cases of cross-border occurrences of alleged corruption between 2000 and 2019 that were discovered by a party outside of the country that exported bribery. This measure of the occurrence of cross-border corruption uniquely avoids conflating home-country judicial activism with corrupt behaviors, providing a measure of the briber received by public officials in each country (Escresa and Picci, 2017) and, of critical importance in this paper, the propensity of firms from a given country to bribe abroad (Picci, 2018).

We find evidence of significant changes following accession to enhanced ABC enforcement. Difference-in-differences (DID) analyses indicate that corruption abroad diminished by 135% more for firms in countries that entered enhanced enforcement ("treated") than for those of firms in countries that did not ("untreated"). However, a negative DID coefficient cannot distinguish whether such a change follows a compliance effect (treated firms reduce bribery), a leakage effect (untreated firms increase bribery), or a mixture of both.

To differentiate compliance from leakages in the composition of the detected change, we consider the degree of competition of a country's firms in foreign markets. We posit that leakages, if present, will be stronger where treated firms compete more intensely with firms from untreated countries. Here, untreated firms will "fill the bribery gap" left by competitors from treated countries who must comply with enhanced ABC enforcement, thereby causing the ABC effect to be a mix of compliance and leakage. We should therefore observe a more negative treatment effect as competition with untreated firms increases. To test this conditional effect, we introduce a measure of competition in third-country markets based on sectoral bilateral trade data. We employ this measure in a moderation analysis that uses appropriate interaction terms and a binning estimator suggested by Hainmueller, Mummolo, and Xu (2019).

We find evidence of both compliance and leakage behaviors following the intensified enforcement of the ABC. In third-party states where signatory firms did not compete significantly against non-signatories, the ABC induced compliance, leading to a reduction in bribe propensity of treated firms of about 100% of the pre-treatment benchmark average. In rough terms, the decline in corruption cases among treated firms was roughly equal to the total number of cases among treated firms before the treatment. Absent competition, this effect provides evidence of firms' compliance with the ABC following its enhanced enforcement. As competition with untreated MNCs increased, however, the ABC enforcement elicited a more negative effect, driven by an *increase* in bribery by untreated firms. We disentangle these leakage effects and calculate that, at extremely high levels of trade competition, the ABC enforcement's bribery reduction for treated firms was more than compensated by the increase in bribery for untreated firms. At the highest levels of trade competition, businesses from untreated countries exported nearly twice as many bribery cases as the number reduced by businesses from treated locations.

Our paper makes several contributions to existing literature. Most immediately, we apply the first statistical test of the effects of the ABC on firm-level bribe propensity on a global scale. Previous cross-national work has focused on how the ABC affected the decision of MNCs to invest in or trade with more corrupt countries but did not test the downstream implications for bribery (Crippa, 2025; Cuervo-Cazurra, 2008; D'Souza, 2012; Spencer and Gomez, 2011; Firth, 2023). While some studies provide evidence of firm-level bribery behavior (Jensen and Malesky, 2018; Brazys and Kotsadam, 2020; Vuong, Nguyen, and Phan, 2021), these research designs mostly explored evidence in a single country, leaving open the question of whether the findings could travel to other settings. More generally, our work extends the leakage literature by illustrating how global economic competition can constrain the effectiveness of international regimes. Finally, our work offers guidance for research on global value chains by identifying how the ABC impacted contracting relationships and potentially increased subcontracting to non-signatory partners in highly corrupt states (Antras, 2005; Antràs and Chor, 2013; Johns and Wellhausen, 2016; Moehlecke, Thrall, and Wellhausen, 2023).

Our argument proceeds as follows. In the next section, we review the literature on leakage

in international regimes to derive three hypotheses tested in our empirical section. In Section 2, we briefly explain the history of the ABC, how its signatories understand compliance, and the importance of Phase 3 of the peer monitoring mechanism. Section 3 describes the data and our two key measurement innovations: 1) the propensity to bribe abroad, which we use in the first, DID, part of the analysis; and 2) the degree of competition in third-country markets, which we use in the moderation analysis to identify the nature of the change that we detect following the stricter application of the ABC in its third phase. We describe both our analysis methods and core results in Section 4. Section 5 concludes.

1 Leakages in International Regimes

International regimes prescribe and proscribe a set of behaviors through norms or rules (Krasner, 1982) that are embedded in instruments of law that can be "soft"—recommendations, memoranda of understanding, guidelines—or "hard"—legally binding international treaties (Abbott and Snidal, 2000). These legal documents integrate constraints in participating countries' jurisdictions (Johns and Wellhausen, 2016). Although they are often aimed at constraining the behaviors of countries, as in the case of regimes preventing human rights violations, many regimes are crafted to affect the behavior of non-state actors, such as MNCs. This makes their actions paramount when evaluating compliance (Baradaran et al., 2012; Davis, 2023).

Regime effectiveness varies in prescribing and proscribing behaviors. A damaging possibility is that regimes may have counterproductive consequences, for instance, if their desired effect on participants also leads to "leakages" by encouraging actions that counter the regime's stated goals. At the extreme, partial success of an international regime could even be worse than no success at all, if it produces leakages so substantial that they worsen the underlying problem, perhaps because they also spill over in unpredictable ways to different policy areas.

Leakages in policies aimed at abating greenhouse gases are among the most well-studied examples of this phenomenon in the literature. Successful restrictions on greenhouse gases at home have been shown to generate increased emissions abroad—a phenomenon known as

"carbon leakage" (Babiker, 2005; Böhringer, Rosendahl, and Storrøsten, 2017)—due both to the decision of firms that are subject to the regime to relocate their activities to non-complying countries and the loss of market shares in favor of non-complying foreign competitors (Dijkstra, Mathew, and Mukherjee, 2011; Konisky and Woods, 2010; Levinson, 2023). This case hints at the relevance of compliance and leakages more generally, but also highlights the critical importance of non-state actors, particularly MNCs, within international regimes. The role of MNCs has increased over time and is consonant with a long phase of increased internationalization of human activities that only recently may have begun to recede. Corporations are also central in our research, which studies the anti-corruption international regime defined by the OECD Anti-bribery Convention (ABC) of 1997, an international treaty that currently has 46 signatories, who agreed to the criminalization in their home jurisdictions of bribes paid to foreign officials abroad.[2] The effects of this treaty generated the possibility of collecting data on cross-border occurrences of corruption that we use in this study.

When it comes to the overarching activities of multinational corporations, states use international regimes as a tool to punish MNCs for their transgressions of established social norms, and more generally to curb corporate malfeasance. Several examples exist of international regimes crafted with the purpose of regulating corporate behavior and eliciting firms' compliance with a set of norms. For example, the Financial Action Task Force produces recommendations to improve financial actors' anti-money laundering measures (Morse, 2019). Recent joint efforts between the OECD and the G20 have aimed at preventing corporate tax evasion via forum shopping and so-called "base erosion and profit shifting."[3] Returning to the emissions of greenhouse gases, multinational production is responsible for a predominant share

[2] See Abbott and Snidal (2002) for a historical reconstruction. The ABC also required "that the signatories adopt appropriate accounting and auditing standards to avoid off-the-book transactions, and that penalties are in place in case of omissions or falsification" (Picci, 2024, 23).

[3] See: https://www.oecd.org/en/topics/policy-issues/base-erosion-and-profit-shifting-beps.html (accessed last September 1, 2024).

of pollution[4] and, as we noted, the theme of "leakages" has received considerable attention in the literature (Babiker, 2005; Dijkstra, Mathew, and Mukherjee, 2011; Timilsina, 2022). Exacerbating the problem, the complex layers of MNC subsidiaries and shell companies can be used to hide illicit payments (Cooley and Sharman, 2017), evade taxes (Arel-Bundock, 2017), and even finance transnational terrorism (Sharman, 2010; Findley, Nielson, and Sharman, 2015).

These international regimes share the furthering of a desired set of behaviors, aimed at countering what are perceived to be otherwise weak corporate standards in foreign jurisdictions. But how effective are they, and is leakage a serious impediment to achieving their goals? Studying whether international regimes foster compliance with a set of promoted behaviors is complex. Because states self-select into agreement, underlying state preferences represent an unobservable omitted variable affecting both ratification and compliance (see Downs, Rocke, and Barsoom, 1996; Von Stein, 2005; Simmons and Hopkins, 2005; Lupu, 2013). Moreover, the IR literature typically evaluates compliance by studying state behavior, as in the case of human rights treaties (see Jo and Simmons, 2016). However, in the case of regimes regulating firms, private behavior is a better lens for evaluating compliance (Baradaran et al., 2012).[5]

Evidence on compliance with the OECD Anti-Bribery Convention, and in particular on the possible leakages that it may generate, is limited.[6] Some of the few studies that have focused on private actors' behavior have observed that firms respond positively to regimes against corruption (Jensen and Malesky, 2018) and those blacklisting countries for poor anti-money laundering practices (Morse, 2019). However, Jensen and Malesky (2018), in a single-country study of Vietnam, noticed the increased bribery of firms from non-signatory countries after the implementation and puzzled over it in their conclusion. To explain this puzzle, Chapman et al. (2021)

[4] 52% of all greenhouse gas emissions since mid-1700s are attributed to just 100 fossil fuel producer firms by the Carbon Disclosure Project, see: https://www.cdp.net/en/articles/media/new-report-shows-just-100-companies-are-source-of-over-70-of-emissions.

[5] Findley, Nielson, and Sharman (2013, 2015) find evidence that private actors disregard provisions in international regimes, showing little concern for their penalties and a significant likelihood to behave against norms.

[6] For an early contribution, see Kaczmarek and Newman (2011).

derived a formal model, showing that less productive firms that were not subject to anti-bribery regulations were more likely to bribe to access rents in foreign markets in response to their regulated competitors' reduction in bribery behavior. In other words, unregulated firms' foreign investments benefitted from the new burden imposed on their regulated competitors (Brazys and Kotsadam, 2020; Crippa, 2025). Crucially, the "leakage" of proscribed behavior was stronger precisely because of the effectiveness of international regimes. The authors concluded that "well-intentioned multilateral regulatory regimes produce unintended consequences" (Chapman et al., 2021, 388). Similar arguments have been raised about the "bribe-switching" from US firms to foreign firms after the passage of the US Foreign Corrupt Practices Act (FCPA) in 1977 (Trautman and Kimbell, 2018). Arbatskaya and Mialon (2020) theorize and provide stylized evidence that bribery increased by non-productive foreign firms after the removal of productive US firms as viable competitors, while Bologna Pavlik and Desierto (2024) demonstrate that foreign government officials shifted their bribe requests to illegal actors and sectors, leading to increases in the shadow economy and illicit economic behavior. Indeed, the complaints of US firms about the increased bribery of their competitors played a critical role in US efforts to internationalize the commitments under the OECD-ABC (Hines, 1995).

The key prediction of Chapman et al. (2021), which they were unable to test directly, is that global economic competition stimulates leakage. MNCs from around the world operate in third-party states, competing against each other to sell products and services to consumers, win valuable government procurement contracts, obtain licenses, access natural resources, or even just enter and operate businesses that are subject to local regulatory inspections. These standard business activities leave MNCs vulnerable to bribery requests from corrupt bureaucrats and politicians. Officials may be willing to exchange bribes for market entry, procurement contracts, licenses, and reductions in regulatory fines and penalties. Offering bribes entails costs for firms, as well as the risk that bribe-taking officials will not respect the terms of the informal contract agreed upon when receiving the bribe. However, the rents that firms extract from monopolistic positions secured through bribery are often large enough to justify this risk (Malesky, Gueorguiev, and Jensen, 2015; Zhu, 2017).

By reducing treated firms' bribery, the ABC increases untreated firms' willingness to engage in corruption where the two groups compete significantly. The implementation of the ABC raised the costs and risks of bribery for MNCs from treated states, as they now could be charged with crimes in their home states. As the risk of such charges increased with enhanced enforcement after 2010, treated MNCs reduced their investment and trading activities in corrupt third-party states (Chapman et al., 2021; Crippa, 2025; Cuervo-Cazurra, 2008; D'Souza, 2012; Firth, 2023; Spencer and Gomez, 2011). The reduced competition in third-party states raised the opportunities for MNCs from non-signatory countries, but it did not guarantee the payoffs. Untreated MNCs still needed to compete against similarly unconstrained competitors from other non-signatory states. In other words, the probability (p) for each untreated MNC to succeed in a particular business engagement increased even as the benefit (b) remained the same. Thus, removing competition from treated MNCs raised the expected value of the business activity ($E(v) = p \times b$), thereby increasing the payouts of risking bribery to obtain the business opportunity. In short, untreated companies could fill the "bribery gap" left open as treated firms comply with ABC enforcement, especially in contexts where the two groups compete.

By theorizing that leakage results from competition between treated and untreated firms, Chapman et al. (2021) distinguish compliance from leakage. However, when comparing responses by treated and untreated MNCs to the ABC enforcement, the two effects are observationally equivalent. Observing that treated firms reduced bribery after ABC enforcement by a higher degree than untreated ones could indicate: i) compliance with the ABC mandate (causing signatory firms to decrease bribery); ii) leakage (causing non-signatory firms to increase bribery); or iii) a mix of the two. Because leakage takes place in contexts of competition between the two groups of firms, we can formulate expectations on the dominance of the two effects *at varying levels of competition*. There should be no leakage effect in contexts with limited competition between treated and untreated MNCs. In these locations, treated firms' reduction in bribery (compliance) does not change untreated firms' decisions to bribe. Under conditions of high competition, compliance and leakage should both take place and reinforce one another—the stronger the compliance by treated firms, the larger the incentive for untreated

firms to bribe more as the probability of success in the market increases. In short, the gap in relative bribe propensity between the two groups should increase with competition. The logic leads to the following hypotheses:

H1. *(Overall effect): MNCs from ABC-signatories who entered the stronger enforcement stage (treated MNCs) have lower overall bribery compared to MNCs from either non-signatories or signatories that have not yet intensified enforcement (untreated MNCs).*

H2. *(Compliance effect): After stronger enforcement, treated MNCs reduced bribery more than untreated MNCs in contexts of low competition between the two groups.*

H3. *(Leakage effect): After stronger enforcement, untreated MNCs increased bribery in contexts of high competition between the two groups. Therefore, the after-treatment difference in bribery between treated and untreated MNCs should be greater (i.e. more negative) under conditions of high competition.*

While the Chapman et al. (2021) theory offered clear predictions that increases in bribery were more likely to take place where companies from ABC signatories were competing directly against non-signatories, they did not have the global data to test these predictions directly. They lacked both data on competition and actual bribery instances from MNCs around the world. Instead, they focused on secondary predictions from their model. They demonstrated that more productive firms bribe less, as a key prediction of their theory was that unproductive firms with little hope of surviving fair competition are more likely to use bribery as an entry strategy (p. 409). Secondly, they showed that the share of firms and capital entering Vietnam from countries that enforce the ABC declined after the Phase 3 enforcement stage began while increasing for firms from non-signatories or who were poor enforcers of the ABC (p. 411). Finally, they showed that firms from ABC enforcers were more likely to hide their bribes through sub-contracting to local Vietnamese businesses (p. 418), while firms from non-signatories did not feel compelled to engage in deception.

All of these findings are critical nodes in the theory that reductions in competition through Phase 3 of the ABC can explain the puzzle of increased bribery by firms from non-signatories, however, Chapman et al. (2021) acknowledge in their conclusions that their work cannot be the final word on the subject. First, both the original discovery of the anomaly (Jensen and Malesky, 2018) and their investigation are limited to Vietnamese data. Vietnam is a country

characterized by high competition between signatories and non-signatories, and therefore we still do not know if their theory's prediction that spillover is less likely in non-competitive environments is also upheld. Second, Chapman et al. (2021) do not have direct data on either competition between firms or bribe activity. They test the theory indirectly by looking at entry and exit decisions, but ultimately, analysts need to know whether actual bribe behavior changed. In our research design below, we develop and execute a strategy for resolving these limitations to provide a clean and direct test of their important hypotheses.

2 Compliance under the OECD Anti-Bribery Convention

A total of 46 countries are currently part of the ABC. Most participating countries joined the Convention in the years immediately following its signature at the end of 1997 and were relatively expeditious in approving the required legislation to implement the agreement. A minority joined in later years, most recently Romania and Croatia in 2023.[7]

Two features of the agreement are particularly important. The first feature is extraterritoriality, whereby signatories promise to pass domestic laws and enact legal procedures to punish firms or citizens who commit acts of bribery outside their borders (Darrough, 2010; Gutterman, 2023). Extraterritoriality in bribery punishments was first enacted by the US in the 1977 Foreign Corrupt Practices Act (FCPA), a statute that established legal liability for firms' bribery of foreign officials. However, after US businesses complained about being disadvantaged in international competition, the US amended the FCPA in 1988 to obligate negotiations with other countries to enshrine extraterritoriality in their domestic legal systems. The second feature is peer review, whereby signatories submit themselves to reports written by fellow members documenting their compliance with the different phases of the agreement (Spahn, 2012; Brewster, 2014), which we describe in more detail below.

The ABC international regime's emphasis on corporations underlines the presence of a

[7] See the ABC repository, which also lists adherents: https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0293 (last accessed: August 16, 2025).

two-tiered compliance problem. First, states themselves can be non-compliant with the regime by not passing appropriate legislation, not setting up requisite adjudication procedures, not investigating complaints, or not enforcing violations when found. Secondly, observing all these factors that affect their behavior, corporations may choose to bribe foreign officials abroad when it is in their interests. In fact, a state may comply with the ABC to the best of its ability and still not succeed in coercing its MNCs to refrain from bribing. Contrariwise, a state may not be compliant while its corporations choose not to bribe. This may be because the regime is enforced in third-country jurisdictions, a case of relevance when studying the ABC because the United States applied an expansive interpretation of jurisdiction and often sanctions of corporations headquartered elsewhere (Brewster, 2014). Or, corporations could feel other types of pressures, such as conformity with international norms that do not condone bribing.

The distinction between *de jure* and *de facto* compliance is also of relevance if we consider that states face a strong incentive to only mimic compliance with the ABC (Xu, 2024). In fact, *de facto* compliance places a country's firms, and possible "national champions," at a competitive disadvantage. The distinction, however, also applies to firms that may decide to formally comply with the regime, for example, by establishing anticorruption plans that may mitigate damage when caught red-handed, while not taking them seriously in practice.

Finally, our research design must confront the well-known problem of endogeneity caused by self-selection into international treaties (Von Stein, 2005). In the case of the ABC, for the OECD members who signed the Convention (as opposed to the eight non-OECD members who have signed it in more recent years),[8] endogeneity affected the accession of the whole block of countries, which represented the vast majority of countries that were relevant for the regime at hand, considering that OECD countries, at the time the agreement was finalized, encompassed the headquarters of most relevant corporations. However, consideration of the distinction between *de jure* and *de facto* compliance makes this observation moot, if we consider that, at least at the beginning, what signatories did was an act of *de jure* compliance with modest immediate

[8] See https://www.oecd.org/corruption/oecdantibriberyconvention.htm.

de facto implications. This highlights the importance of the different "phases" of enforcement of the ABC and, in particular, what we describe below as "Phase 3" or the Evaluation Stage.

The OECD, through its "OECD Working Group on Bribery,"[9] is the custodian of the ABC and has established an "open-ended, peer-driven monitoring mechanism to ensure the thorough implementation of the international obligations that countries have taken on under the Convention." This monitoring produces regular "country monitoring reports" containing "recommendations formed from rigorous examinations of each country."[10] Peer review reports are adopted by a consensus minus one rule, meaning that no single country can block a report (Spahn, 2012). And the reports can be scathing, publicly embarrassing countries and individual bribers for both their bribe activities and the non-enforcement of rules (Brewster, 2014). Signatories generally feel that negative reports are damaging, hurting the reputation of their multinational corporations when competing for opportunities abroad (Jensen and Malesky, 2018).

The peer review is structured in different phases. Phase 1 "evaluates the adequacy of a country's legal framework to fight foreign bribery and implement the Convention"[11] and corresponds to a check on *de jure* compliance. Phase 2, which "assesses whether a country is applying this legislation in practice," may be seen as indicating at least some preoccupations with *de facto* compliance. It is, however, Phase 3, which started in 2010, that, in focusing "on enforcement and cross-cutting issues, and unimplemented recommendations from Phase 2," most experts consider to be a direct evaluation by the OECD Working Group on Bribery of *de facto* compliance. The OECD Working Group on Bribery assesses member countries and decides their accession to Phase 3, based on a variety of criteria. Country reports focus on several

[9] It is "responsible for monitoring the implementation and enforcement of the OECD Anti-Bribery Convention, the 2021 Recommendation on Further Combating Bribery of Foreign Bribery in International Business Transactions and related instruments." See: https://www.oecd.org/daf/anti-bribery/oecdworkinggrouponbriberyininternationalbusinesstransactions.htm.

[10] See: https://www.oecd.org/corruption/oecdantibriberyconvention.htm.

[11] See, also for the quotations that follow, https://www.oecd.org/daf/anti-bribery/countrymonitoringoftheoecdanti-briberyconvention.htm

aspects that can be broadly grouped into two categories. One regards the "inputs" of compliance, such as the presence of training programs for judges who have the responsibility to deal with cases of international corruption. The other regards concepts that are more akin to compliance "outputs," such as the evidentiary proof required for convictions, and, more generally, the number of cases that are brought to court. It is an overall reading of this variegated evidence that leads the OECD Working Group to determine advancement to each phase of compliance.

Figure A.1 in Appendix A shows the rollout dates for Phase 3.[12] These dates represent the consensus view by the OECD Working Group, the custodian of the ABC, of a country's readiness to begin the enforcement stage. Jensen and Malesky (2018, 34) present evidence of the significance of Phase 3 while looking at the case of Vietnam. Using a list experiment "to measure changes in illegal and socially undesirable behavior in conjunction with the OECD-ABC," they find that "after the onset of Phase 3 in 2010, when the risk of noncompliance increased for firms subject to the OECD-ABC, those MNCs reduced their actual bribery relative to their non-signatory competitors." However, Davis (2023) has argued for more nuance, citing vagueness in the treaty's enforcement obligations and variation in interpretation of provisions.

Responding to Davis' concerns, a critical assumption of our analysis is that the onset of Phase 3 raised the risks of increased enforcement for MNCs of signatory states. In Figure 1, we use our original dataset to support our claim that the onset of Phase 3 corresponded to a dramatic increase in the degree of enforcement of anti-bribery legislation by ABC signatory countries. In the left-hand panel, we report the number of anti-bribery cases enforced by ABC signatories in the five years before and after the onset of Phase 3 (2010). While ABC signatories enforced 259 anti-bribery cases in the years 2005–2009, they enforced 641 cases between 2010 and 2014, the year by which most signatories had entered Phase 3.[13] This twofold increase in

[12]Out of the current 46 signatories, 41 have moved to Phase 3 to date, almost all (37) no later than 2014 and just one after the end-date of our analysis, 2019 (Russia, who started Phase 3 in 2022). We do not consider Phase 4, "on enforcement and cross-cutting issues tailored to specific country needs, and unimplemented recommendations from Phase 3" because only 12 countries accessed it before 2019.

[13]The exact number of anti-bribery cases differs from those reported by other sources, for in-

the application of anti-bribery legislation illustrates how enforcement intensified significantly with Phase 3. Although firms from signatory states likely expected increased enforcement from the onset of Phase 3 in 2010 when a schedule of accession dates was published, countries actually accessed Phase 3 in a staggered manner. In the right-hand panel of Figure 1, we account for this pattern by showing the number of cases enforced by ABC signatories in the five years before and after each individual signatory accessed Phase 3. Again, we observe that the number of enforced anti-bribery cases nearly doubles (growing from 355 to 674).

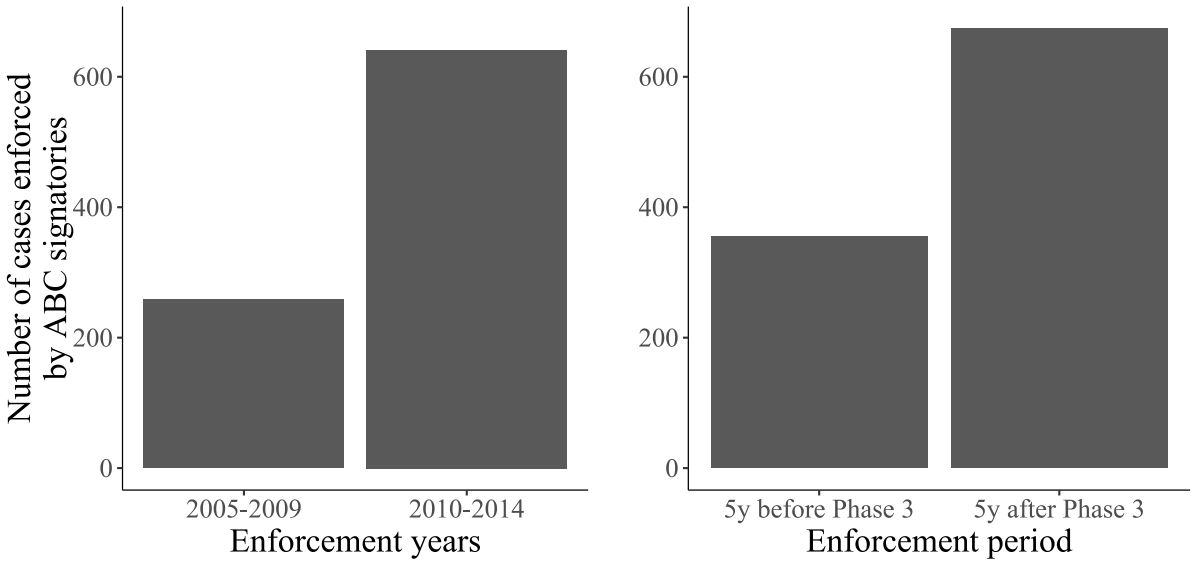

FIGURE 1: *Number of anti-bribery cases enforced by ABC countries before and after Phase 3*

Notes: Number of anti-bribery cases enforced by ABC signatories in the years 2005–2009 and 2010–2014 (left). Number of anti-bribery cases enforced by ABC signatories in the five years before and in the five years after the enforcer accessed Phase 3 (right).

Therefore, we feel confident in the claim that Phase 3 of the ABC peer review system, with its increase in enforcement, significantly augmented companies' expected costs of violating anti-bribery laws.[14] In the next section, we introduce our data, measures, and methods to pro-

stance the FCPA Clearinghouse, Transparency International, or TRACE International yearly reports, because of differences in the way individual cases are counted across these diverse sources. That notwithstanding, other sources report similar increases (e.g., Jensen and Malesky, 2018, Figure 1). See Appendix B for a further discussion of our dataset.

[14]Importantly, we also report (in Appendix E.1) that accession to Phase 2 did not have this same

vide evidence that such intensified enforcement increased compliance by firms from signatory countries, and simultaneously favored leakage to firms jurisdictionally outside of the ABC.

3 Data and Measures

To summarize the theoretical logic, we expect that Phase 3 of the ABC peer review system, which increased enforcement monitoring for member countries (Jensen and Malesky, 2018), reduced the difference in bribe propensity between firms that were subject to such increased enforcement of the agreement, as stated by H1. We compare two types of firms—treated and untreated. A *treated firm* is headquartered in a country that: 1) is a signatory to the ABC and 2) has passed Phase 3 implementation. An *untreated firm* is headquartered in a country that has not signed the agreement or has not yet begun Phase 3.[15] In our analysis, we first quantify the over-time evolution of the difference in bribe propensity between the two groups and estimate how this gap changed with the onset of Phase 3.

Although, at face value, a reduction in the bribe propensity gap might indicate increasing compliance of regulated firms with the ABC, we have discussed above that this effect can be mixed with *leakages*—spillover of proscribed behavior to the group of firms that are not subject to the (enhanced enforcement of the) regime—the untreated MNCs. We propose a way to distinguish between compliance and leakage effects that leverages a measure of competition between treated firms with untreated ones in foreign markets (as stated by H2 and H3). To provide these two pieces of evidence—(1) the decrease in the bribe propensity gap between treated and untreated firms following Phase 3 and (2) how such an effect varies based on competition with unregulated firms—we build new measures for bribe propensity and competition

effect, thus confirming Jensen and Malesky's (2018) proposition on the relevance of Phase 3 more generally.

[15] In Appendix E.2, we truncate our panel to restrict the control group solely to the not-yet-treated firms (i.e., those from ABC ratifiers that have not yet accessed Phase 3). This test significantly reduces our statistical power, so we caution readers about its limitations. We take its results purely as suggestive that our estimates do not hinge on self-selection.

with unregulated firms. In this section, we document how we construct these measures and our data sources. The result is a balanced panel covering 195 countries (193 UN members plus Hong Kong and Taiwan) observed over twenty years (2000–2019).

3.1 Measuring the Propensity to Bribe Abroad

Our analysis hinges on the possibility of assessing corruption (in the form of bribes) in a certain country. Measuring levels of corruption is notoriously complex. During the last few decades, such difficulties have given rise to a small industry attempting to improve upon the popular, but universally perceived as inadequate, indexes of corruption that are based on perceptions (measured by business and expert surveys) and not actual behavior.[16]

We use observed records of crime from an updated dataset of (alleged) cross-border bribery cases originally documented in Escresa and Picci (2017).[17] These data allow us to overcome the selection bias issues that affect most measures of recorded crime, namely the fact that observable crime levels in a particular home country depend on its judicial activism. In studying corruption, the number of observed cases of bribery by firms of a given country can increase if that country's government is more judicially active against its own firms, regardless of whether these companies have a higher propensity to bribe. In other words, the observed number of bribery cases enforced by the home country of bribing firms could represent the very enforcement effects that we intend to estimate. As a result, countries doing the most to combat corruption would be coded as the most corrupt—a severe and misleading mistake.

We overcome this problem by leveraging information about which jurisdictions first led the enforcement of a given case. We remove cases of corruption that were initiated by the home country of the bribe-paying business and only use cases of corruption reported by host countries or third-party countries aware of the transaction and therefore independent of the intensity of home-country enforcement. We use this piece of information and consider, for

[16]For a summary, see Picci (2024, chapter 3).

[17]We refer to Appendix B for details on data sources and methods. The most recent version of the database is dated May 21, 2025.

each country, only observed cases of cross-border bribes that were paid by its firms but first enforced by another country. Such an "external viewpoint" allows us to overcome the selection bias presented above because (increased) judicial activity in a country is likely unrelated to whether other countries first detect bribery cases involving its firms.[18] We adopt this intuition to compute our measure of bribery. We count the number of cases of bribery paid by firms of a given country "headquarters country" (HQ)—to public officials in a "foreign country" (FO).[19]

Table 1: Cases of cross-border bribery, 2000-2019

First enforced in:	**Total cases**	**Positive Cases**	**Ongoing Cases**
Any country	1445	819	626
Headquarters country	787	468	319
Foreign country	307	123	184
Third country jurisdiction: US	231	152	79
Third country jurisdiction: other than the US	120	76	44
First enforced not in the HQ country	658	351	307

Source: Updated version (21 May 2025) of the dataset described in Escresa and Picci (2017). *Note:* The "headquarters country" corresponds to the main location of operations of the firm (not necessarily coinciding with the legal headquarters). The "foreign country" is where the act of alleged corruption took place. "First enforcement" corresponds to the country where a case first emerged. "Third-country jurisdiction" refers to cases that were first enforced neither in the headquarters nor in the foreign country. Positive cases refer to cases that were concluded with a judgment in favor of the prosecution or a settlement. Ongoing cases are those that are still pending or for which no further information is available.

Table 1 provides a summary of our data. We observe 1,445 cases of cross-border bribery. Of these, 819 are classified as "positive," meaning that they resulted in a conviction,[20] while 626 are still ongoing, or we were not able to determine their outcome. We distinguish cases according to the jurisdiction that "first enforced" them, that is, the country where a given case emerged for the first time. Most cases (787 out of 1,445) were first enforced in the country where the firm was headquartered (HQ), while a total of 307 cases first emerged in the foreign country where bribes were paid. The remaining cases were first enforced in so-called "third

[18] The intuition and related issues are introduced and discussed in more details in Escresa and Picci (2017)—who compute measures of corruption of public officials—and in Picci (2018), who measures the propensity of firms from a given country to bribe abroad.

[19] In Appendix C, we propose an alternative analysis using these data to compute the Bribe Payers Corruption Index (BPCI) of Picci (2018) in a two-group and two-period difference-in-differences (DID).

[20] Or in non-prosecution (or similar) agreements, broadly indicating culpability.

country jurisdictions"—we distinguish between enforcement by the United States (231 cases) and other third-country jurisdictions (120 cases). Not surprisingly, most cases originate in rich, industrialized countries, where the most important companies are headquartered.[21] For our main results, we consider "total cases," whether or not there was a conviction. This decision, which maximizes the number of available observations, is justified by the fact that the burden of proof is higher in cases of cross-border corruption, often resulting in false negatives. However, some cases resulted in an acquittal. In Appendix E.5 and F.3, we show that our results are not driven by cases that were eventually dismissed.

In Appendices E.6 and F.4, we also conduct two additional robustness tests to probe the validity of our bribery measure. We verify that our results are robust (in fact, stronger) when excluding cases first enforced in the country where bribes were paid ("foreign country"), to account for the possibility that host countries of foreign direct investment might increase their own judicial activity as a response to Phase 3, confounding our estimates. This could happen if host countries do not want to be embarrassed by the discovery of corruption within their borders. Second, we exclude cases enforced by the US as a third-country jurisdiction, to account for the possibility that trends in US enforcement change significantly with each country's accession to Phase 3.

3.2 Measuring Dyadic Competition

We introduce a novel measure aimed at capturing the intensity of competition between dyads of countries. We use this measure to identify the possible presence of leakage effects.

Various measures of competition between countries engaging in international trade have been proposed, based on correlations of product vectors of exported goods, as in Guasti and Koenig-Archibugi (2022). However, our theory requires a more specialized measure than those that are available to indicate the degree of competition between pairs of countries, not generically as they trade with the rest of the world, but focusing on third-country markets where they

[21] See Table B.1 in the Appendix.

are active. Such a need arises from the presumption that the size of any leakage effect of the ABC will be correlated with the degree of competition in well-identified third-country markets. We posit that, if country *i* begins enforcing the ABC while country *j* does not, any leakage, in terms of a better opportunity for *j*'s firms to bribe in *z* following country *i*'s "treatment," will be greater the stronger the competition between firms of *i* and *j* in *z*.

We need the competition measure to be such that it can be computed not only for individual countries, but also so that it can be easily aggregated for groups of countries, based on whether they have or have not accessed Phase 3 of the ABC. To the best of our knowledge, measures of this type have not been proposed previously.

We indicate with sim_{ijt} (similarity) the Pearson's correlation between the product vectors of every pair of countries i, j in year t. Further, we indicate with X_{ijt} total exports of country i to country j in t. We use a "." subscript to indicate a summation over a particular subscript. So, $X_{.jt} = \sum_{i=1}^{n} X_{ijt}$ represents total world exports to country j (n is the total number of countries).[22]

We define the following measure of competition between countries i and j in a third-country market z at time t:

$$comp_{ijzt} = sim_{ijt} \times \frac{X_{jzt}}{X_{.zt}} \tag{1}$$

It equals the overall technological similarity between country i and country j exports, weighted by the share of country j exports to z, relative to total world exports to country z.

[22] We use UN-Comtrade obtained from CEPII (see https://www.cepii.fr/ Gaulier and Zignago, 2010, data version `V202401b`). The data adopt the HS92 nomenclature and include a total of 5022 categories of goods (6-digit level). To compute sim_{ijt}, we aggregate these data at the 2-digit level, resulting in 97 categories of goods. Our choice of granularity reflects a trade-off between a desire for detail, and the known fact that more granular bilateral trade data tend to have many zeros. To compute X_{ij} and $X_{.j}$, we aggregate all types of commodities. In both cases, to smooth accidental yearly variations, we further sum trade data over five-year periods before the year of reference of the computed measures.

To illustrate the intuition behind this measure, consider i to be Italy, j to be Germany, and z the Philippines. Consider further j' to be China. Germany is much more distant from the Philippines than China and has lower overall exports. Because of "gravity," Germany (j) will then have a smaller share of world exports to the Philippines (z) compared to China (j'). This results in $X_{jz}/X_{.z} < X_{j'z}/X_{.z}$; that is, for the Philippines, the relative importance of imports from Germany, over total imports, is smaller than the relative weight of imports from China. For a given sim_{ijt} (technological similarity), our competition measure reflects the fact that Italy (i), when exporting to the Philippines (z), experiences more competition from China (j') than from Germany (j).[23]

We can also compute the measure for more than one country j belonging to a set of countries J, $j \in J$. This can be achieved by simple summation with the result representing the degree of competition of country i, with respect to a certain set of countries J, as they compete in market z. Eq. 2 shows such an aggregate measure, for a generic set of countries J (note the capital J index):

$$comp_{iJzt} = \sum_{j \in J} sim_{ijt} \times \frac{X_{jzt}}{X_{.zt}} \tag{2}$$

In our analysis, we use the aggregate measure of Eq. 2, computed for the set of countries J

[23]The competition measure that we propose permits simple aggregation over groups of countries. It adds up (by summing over z) to a meaningful measure of overall competition between pairs of countries: $comp_{ij.} = sim_{ij} \times \frac{X_{j.}}{X_{..}}$. The weighting factor is now the share of country j exports over total world exports. This aggregate measure is similar, but not identical, to the one proposed in (Guasti and Koenig-Archibugi, 2022). These authors use as a weight (that they indicate as vol_weight_{ij}) "the average share of exports of j across all products p." Such weighting scheme has two disadvantages with respect to ours. First, each share contributes to that average equally, regardless of the amount of trade in that particular good. This does not seem to be appropriate. Second, it is not amenable to easy aggregation (or decomposition by third-country markets z's), unlike the weight that we propose. Please note that (Guasti and Koenig-Archibugi, 2022) further "normalize" their measure, an issue that here we may ignore: such normalization is constant for all i, j, at a given time, and in our analysis we leverage exclusively on the cross-sectional variation of the competition measure.

that have not been treated; that is, that have not (yet) entered Phase 3 of the ABC. We call this measure $compNT_{iz}$ (NT standing for "not treated"). We normalize this variable to constrain it in the 0-1 interval.[24]

4 Research Design and Analysis

Our research design leverages the fact that, with Phase 3 of the ABC peer review, enforcement of the international regime increased (Jensen and Malesky, 2018) and that some countries, but not others, were "treated" in the form of such increased enforcement. Such a staggered treatment pattern allows us to identify its effects on the treated firms' bribe propensity.

4.1 Estimating Compliance: Difference-in-Differences Analyses

We estimate the effect of enhanced enforcement via the onset of Phase 3 on firms' bribe propensity using a DID research design. A DID estimates a treatment effect as the difference between over-time changes in the outcome for the treatment group and for the control group. For this to be a valid inference, DID analyses require a "parallel trends assumption" (PTA)—that the outcomes for the treated units would have run in parallel to the observed ones for control units, post-treatment, absent the treatment.[25] Second, DID designs assume a "stable unit treatment value assumption" (SUTVA): that the outcomes of every unit do not change with the treatment assignment of others. If the SUTVA is violated, the trend experienced by control units is not representative of what the treated ones would have experienced, absent the treatment, as it is "contaminated" by the treatment assignment itself. Contamination can bias the estimated mag-

[24] The distribution of this variable is presented at the bottom of Figure 3. Appendix F.5 demonstrates that our results do not hinge on such normalization of the competition measure.

[25] In a staggered-treatment event study, the PTA is implicitly extended to the multiple-period multiple-groups setup so that we assume parallel trends among counterfactual outcomes of treated and never-treated units as well as parallel trends among counterfactual outcomes of treated and not-yet treated ones (Roth et al., 2023). Because our DID designs do not include covariates, we do not engage with the growing literature discussing additional PTAs necessary for covariate adjustment (see Caetano et al., 2022).

nitude of the average treatment effect on the treated units (ATT) either downward or upward.

In our setup, we study behavioral leakages from the treated to the control group. That is, we explicitly allow the SUTVA to be violated, while holding that other violations of the PTA are not in place. Because of this, we refrain from interpreting DID estimates, as it is normally done (as ATTs). Instead, we interpret them purely as a measure of changes in the *relative* distance in bribe propensity, a bribe-propensity gap, between the two groups. At face value, a drop in the relative bribe propensity gap between treated and untreated firms can be characterized as increased compliance with the ABC and the anti-bribery regime, induced by treated firms reducing their bribe propensity. However, as we have discussed above, such an effect could be mixed with leakages in bribe propensity, characterized by untreated firms increasing bribery, which would decrease the bribery gap. We later propose a method to unpack the *compliance* and *leakages* effects.

We implement a full-fledged event-study DID with staggered treatment assignments, employing a wide variety of recently developed estimators. Our outcome variable is the count of reported foreign bribery cases exported by firms of a given country, first discovered by any other country. Equation 4 represents our event-study (the notation is drawn from Roth, 2024).

$$Bribery_{it} = \alpha_i + \beta_t + \sum_{r \neq -1} \delta_r \times 1[D_i = 1] \times 1[t = r + 1] + \varepsilon_{it} \tag{3}$$

The outcome is regressed on a unit and time fixed effects—α_i and β_t (a "two-way fixed effect", TFE)—and a set of interactions between the binary treatment (D_i) and a measure of relative temporal distance from the treatment (r). This "time to treatment" indicator takes the year before treatment (–1) as a baseline, so that every estimated δ_r quantifies how much the change in the outcome for the treated units between relative time r and the –1 baseline differs from the change experienced by untreated units. Estimates for δ_r after treatment ($r \geq 0$) quantify dynamic DIDs, whereas those for the pre-treatment period ($r < -1$) are analogous to placebo tests for the existence of observable pre-treatment differences in the outcome before the treatment, which could suggest a violation of the PTA.

A recent literature indicates that the model in Equation 4 can be biased by staggered treatment timing. This is induced by TFE operating multiple comparisons between units that are treated at different points in time, including "forbidden" comparisons that use already-treated units as a control group for later-treated ones, and averaging these comparisons using weights that can be negative in case of heterogeneous treatment effects for different treatment cohorts (Goodman-Bacon, 2021; Roth et al., 2023). To ensure our findings are not affected by such considerations, we adopt six[26] estimators that have been proposed as solutions, presenting them alongside the canonical TFE. Standard errors are clustered at the country i-level.

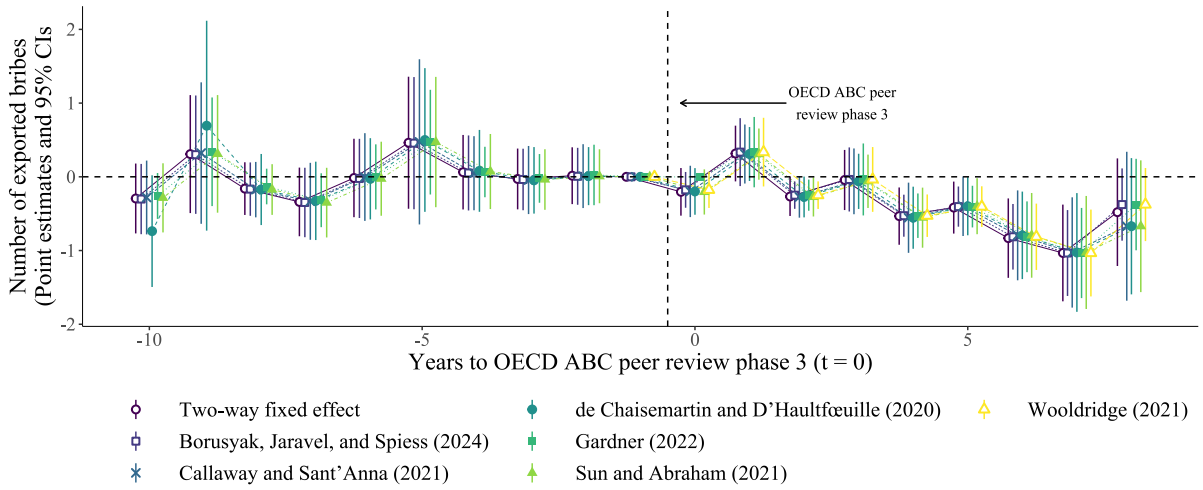

FIGURE 2: *The effect of Phase 3 of peer review of enforcement at the OECD ABC on the number of dyadic cases of cross-border bribery. Dynamic difference-in-differences estimates.*

Note: Results of dynamic differences-in-differences analysis with the count of exported bribery cases (first enforced by countries other than the firm's HQ) exported by firms of country HQ as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker. As countries enter the treatment at staggered times, the x-axis marks a relative "time to treatment" indicator.

[26]We consider estimators from Borusyak, Jaravel, and Spiess (2024), Callaway and Sant'Anna (2021), De Chaisemartin and d'Haultfoeuille (2020), Gardner (2022), Sun and Abraham (2021), and Wooldridge (2021). All these estimators suppress the "improper" comparison that uses already-treated units as the control group for the later-treated ones and then aggregate several group-time average treatment effects to estimate a dynamic DID. See Roth et al. (2023) for a discussion of some of these estimators and Appendix D for our brief presentation of the purpose of each algorithm.

Our findings support H1. Regardless of the DID estimator, Figure 2 shows a significant negative effect of the treatment on the group of treated countries, with some delay (captured by the lags) concerning the year of accession to Phase 3. Entry into Phase 3 reduces the bribe propensity of firms from signatory countries. Each estimated δ_r quantifies the reduction in bribery induced by the treatment for treated firms in year r, when compared to bribery observed in the baseline year of –1 (the year before treatment). Pre-treatment $\hat{\delta}_r$ are all statistically indistinguishable from zero and do not clearly trend in any direction. This indicates that the gap in bribe propensity between treated and untreated countries did not change significantly between a given pre-treatment year and the year before treatment. Neither were pre-treatment DID effects consistently trending in a given direction, lending support to the PTA. After treatment, instead, we observe a steady negative trend in the detected effects. The negative gap in bribe propensity between treated and untreated countries increases post-treatment with respect to year –1, indicating that firms treated under enhanced OECD ABC enforcement reduced their bribe propensity vis-à-vis untreated competitors. This statistically significant and negative effect is observed in year +2 following the treatment and is then consistently negative and statistically significant after year +4.[27] That the treatment effect is significant with a lag (and immediately in some robustness tests, e.g. Figure E.7) can be explained when considering that corruption is a sticky behavior and that it likely takes time to identify, investigate, and effectively reduce bribery.

Effect sizes are substantively important. The estimated reduction of about 1 case in the bribe propensity gap six years after treatment, for instance, corresponds to a –135% reduction compared to the average number of bribery cases recorded by treated countries before the treatment (0.74).[28]

[27] Although similar-sized, we report higher noise and statistical insignificance in year +8, due to the small number of observations.

[28] Appendix E.3 demonstrates results are robust to a non-staggered assignment that assumes all countries were treated in 2010 and therefore accounts for any anticipation effects that may have occurred among countries on the accession list but not yet formally treated.

These findings confirm that Phase 3 of the ABC peer review mechanism marked the beginning of stricter compliance with the ABC, reducing the gap in bribe propensity between the treatment and the control group. Importantly, we do not observe the same effects for Phase 2. In Appendix E.1, we perform a placebo test where we replicate the analysis of Figure 2 after redefining treatment cohorts using the Phase 2 onset calendar. Results do not suggest the presence of any discernible effect, which further corroborates our selection of Phase 3 as a turning point in compliance with the ABC. Furthermore, in Appendix E.2 we mitigate concerns about selection bias, caused by countries' self-selection into ABC ratifiers. We truncate our panel so as to restrict the control group to the not-yet-treated countries, thus excluding all never-treated ones. Thus, we compare treated MNCs with firms from countries that have ratified the ABC but have not yet entered Phase 3 at a given point in time. Because this test results in a significantly smaller panel with reduced statistical power, we caution readers that results should just be taken as suggestive that our estimates in Figure 2 are not driven by self-selection into the ABC. Finally, in Appendixes E.5 and E.6, we probe the validity of our corruption measures.

4.2 Unpacking Compliance and Leakage Effects: Moderation Analysis

As discussed above, because of potential violations of the SUTVA, our DID analyses only estimate a decrease in the *relative* gap in bribe propensity (either in the form of the BPCI or raw count of bribery cases) between firms that are subject to more thorough anti-bribery enforcement and those that are not. Such a decrease in the relative gap could indicate increased compliance following stricter regime enforcement but also could be mixed by indiscernible leakage effects, as bribe payments increase from non-member countries. In other words, the coefficient could conflate both *compliance* and *leakage* effects.

To distinguish between these two movements, we use our new measure for the competition from unregulated firms experienced by firms of country i in a foreign market z, $compNT_{iz}$. We posit that the size of any leakage effect of the ABC that may be present will be correlated with such a degree of competition. Firms that are not subject to stronger enforcement ("untreated" businesses) will take greater advantage of the fact that competitors are treated, in markets where

the competition of their firms with firms from treated countries is greater. If, on the other hand, treated countries trade different goods or services than untreated ones in a foreign market, we have fewer reasons to expect the presence of leakages. For these reasons, if there are leakages, we expect the treatment effect to be greater whenever competition in third-country markets is greater. In other words, the bribe propensity gap between treated and untreated firms in countries where treated firms do not experience competition from untreated ones should not include a leakage effect, at least relative to countries where competition is high.

We employ this measure in a dyadic dataset composed of all directed dyads between our 195 countries. Our outcome variable is $Bribery_{izt}$, operationalized as the number of bribery cases originated by firms from country i into foreign country z at time t. As above, we limit our attention to cases that have been first enforced outside the headquarters country, to remove the bias introduced by varying levels of judicial activism in signatory states. The binary treatment variable, $OECD\ Phase\ 3_{izt}$, takes the value 0 except for dyad-years where country i had entered Phase 3 of the OECD ABC peer review system, where it takes the value of 1.

If leakages are in place, the effect of Phase 3 should be stronger in countries z where treated firms compete strongly with untreated companies. We apply this intuition and perform an analysis of the effect of $OECD\ Phase\ 3_{izt}$, where the treatment is moderated by levels of competition in z with untreated firms. Effectively, we study heterogeneous treatment effects of the OECD ABC enforcement by comparing treated and untreated bribe exporters in countries where they do not compete with untreated rivals (where any effect could be only attributed to compliance) and in contexts where such competition is, instead, high (where effects can be attributed to a mix of compliance and leakages). Differences between these heterogeneous effects are informative of the extent to which leakages occur. Any lack of difference between estimated effects would indicate that no leakage is taking place.

We estimate linear models of $Bribery_{izt}$, interacting the treatment binary variable and our measure of $compNT_{izt}$. All models include dyad and year-fixed effects. The interaction setup prevents us from performing a fully-fledged event analysis, as in Figure 2, and evaluating pre-treatment trends. We mitigate endogeneity concerns by including time-varying control vari-

ables at the level of countries and at the level of a given dyad. We control for both countries' logged GDPs and for the (logged) total value of exports and imports in a dyad. Standard errors are clustered at the dyad level.

We depict heterogeneous treatment effects by applying the "binning estimator" proposed by Hainmueller, Mummolo, and Xu (2019). Intuitively, it replicates the fully-specified regression model (Model 3 of Appendix Table F.1) after "binning" the scale of the moderator variable over a given number of intervals (we choose three bins, defined by the terciles of the variable distribution, following the authors' suggestion) and interacting treatment variable with the bin, rather than with the continuous scale of the variable. This prevents interaction terms from severely interpolating an effect from the distribution of the moderator variable to values outside its scale, confusing researchers with spurious non-linear moderation effects.

We find evidence of compliance effect at low competition levels (H2) and of leakage effects, as competition increases (H3). The multiplicative interaction term of $compNT_{izt}$ and the treatment is negative and distinguishable from zero ($p < .05$).[29] Thus, the OECD ABC Phase 3 of enforcement monitoring elicited a more negative effect as competition with untreated firms in a dyad increased (consistent with H3). That is, in dyads where treated firms competed vigorously with untreated companies, we observe that the bribe-propensity gap increased to a much greater extent. The inclusion of time-varying control variables does not alter these conclusions.

Figure 3 depicts our binning estimation of the marginal effects of entering the OECD ABC Phase 3 at varying levels of trade competition with untreated firms (shown with the solid line). We also report the three-category estimates from the binning estimator and the distribution of the competition variable, distinguishing between treated and untreated dyads. We express estimated effect sizes as a percentage of the average number of bribery cases for an untreated or not-yet-treated dyad (for reference, this average value is 0.0007). In foreign countries (z) where firms experience little to no competition with untreated firms, we detect a small negative effect of enhanced enforcement on bribe propensity (left-hand side of the spectrum). The binning

[29] See Appendix Table F.1

estimator informs us that, in this tercile, the estimated effect amounts to a (statistically significant at p = .05) reduction in bribery by -0.0007 cases when comparing treated and untreated dyads (about a 100% reduction below the untreated group average). That is, in foreign countries where firms (treated or not) do not compete significantly with untreated companies, the entry into force of Phase 3 reduced bribe propensity by an amount comparable to the average bribe propensity of untreated countries (confirming H2).

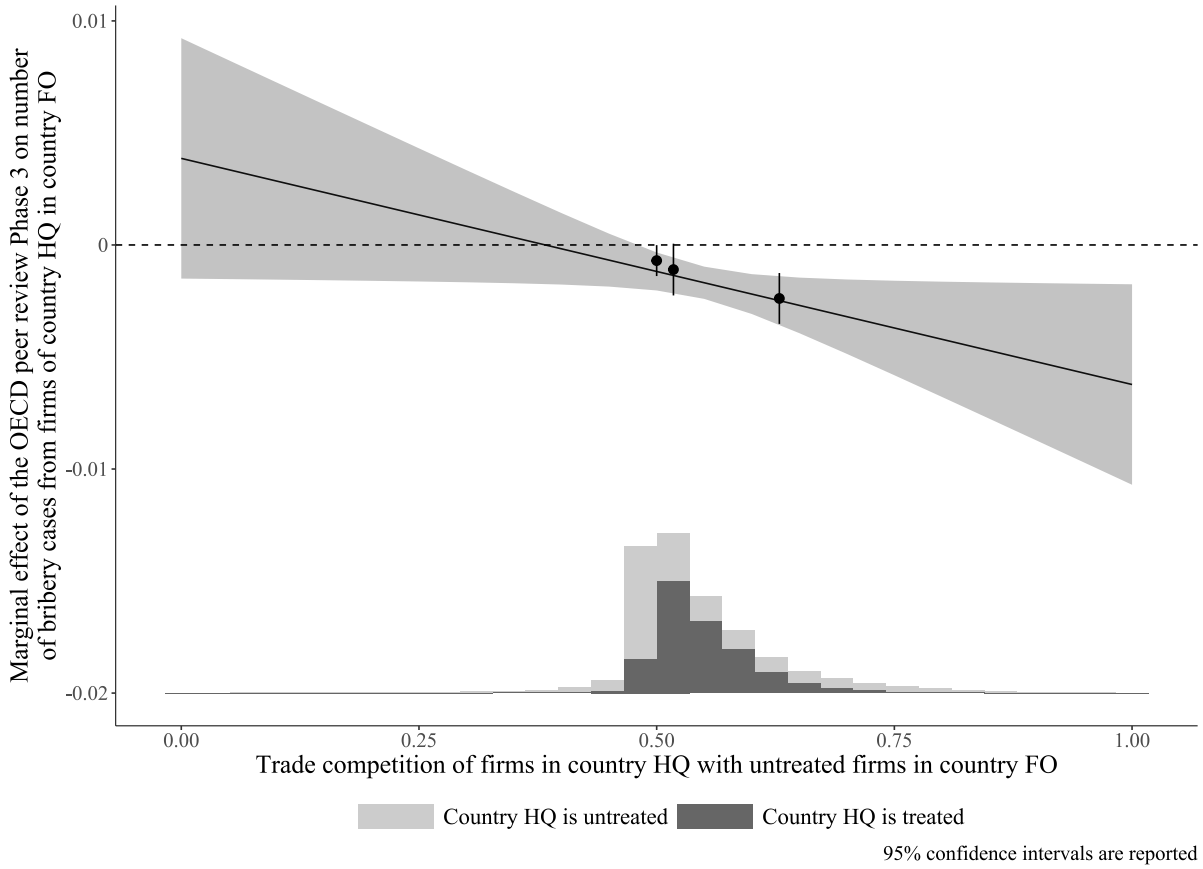

FIGURE 3: *Marginal effect of the OECD Phase 3 on Bribery at varying levels of competition with untreated firms*

Note: Least squares regression of the number of bribes from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Standard errors clustered at the country dyad level. Graph produced using the binning estimator suggested by Hainmueller et al. (2019). Figure replicates Model 3 of Appendix Table F.1, which controls for GDP of both countries and well as exports and imports between them.

The treatment effect of Phase 3, instead, increases in magnitude and becomes significantly more negative as competition with untreated rivals increases. This is indicated by the signif-

icantly negative slope of the solid line in Figure 3 (and by the binned estimates reported in the figure). In dyads at the second tercile of the competition measure, the OECD ABC enforcement reduced bribery of treated firms by about -0.001 cases (a -143% reduction below the 0.0007 benchmark average). At the third tercile, the estimated reduction is -0.002 (-286%). The negative treatment effect is significantly larger at higher terciles of the competition scale (third group's estimates) than it is at the lowest tercile (first group's estimate). Such effects are significantly different across the competition scale: the effect of Phase 3 at the third tercile of the competition variable is significantly higher than that at the first tercile by 0.002 (difference distinguishable from zero with p-value = 0.00699).

Finally, we decompose the effect of the OECD ABC enforcement into compliance and leakage effects by analyzing differences in estimated effect sizes across terciles of trade competition. To reiterate, compliance occurs when treated firms reduce bribery, while leakage arises if untreated firms increase it to fill this gap. In low-competition dyads, however, estimated effect sizes likely reflect pure compliance, as untreated firms lack incentives to adjust their behavior in response to treated firms' compliance because the two groups do not compete in the same sectors.[30] Focusing on the lowest tercile, we thus estimate a purely compliance-driven bribery reduction as about 0.0007 cases (-100%). Assuming such a compliance effect is constant across $compNT_{izt}$, we infer leakage effects of +0.0003 (i.e., -0.0007 + 0.001, or +43% of the average) and +0.0013 cases (-0.0007 +0.002, or +186% of the average) in the second and third terciles, respectively. This suggests that leakage effects more than compensate for compliance in contexts of high trade competition. As competition heightens, leakage results in an *increase* in bribery by untreated countries, ranging from one-half to almost twice as much as the average reduction in the number of bribery cases for treated countries.

We interpret these findings as indicating that the ABC enhanced enforcement generated a compliance effect, leading treated firms to reduce their bribe propensity abroad by a degree

[30]Notice that we do not claim that untreated firms do not bribe in dyads where trade competition with untreated firms is low—all we claim is that they do not experience a significantly different change in their bribe propensity than what treated firms also experience.

which is observationally undistinguishable and reinforced by the leakage it induced among the comparison group—the untreated firms—in markets with higher competition. This exercise also highlights practical problems for researchers who intend to study political actors' compliance with an international agreement, while suspecting that the agreement might have induced a spillover of the proscribed behavior to the intended comparison group, as in our case.

5 Conclusions

We considered compliance and leakage effects in the international regime defined by the 1997 OECD Anti-Bribery Convention (ABC), which led to the criminalization of bribery of foreign public officials by domestic private entities. This treaty resulted from lobbying by the United States that had taken a similar step with its FCPA in 1977. The United States hoped that, through this new instrument, it would level the playing field of international business and abate the negative domestic externalities of compliance, in the form of a competitive disadvantage of American firms vis-à-vis those not subjected to anti-corruption regulations.

Building off of theoretical advances by Chapman et al. (2021), we show that enforcement of the ABC produced intended and unintended consequences simultaneously around the world, the latter fueled by international business competition. Several DID estimators applied to an original dataset on occurrences of cross-border bribery show that enhanced enforcement of the ABC (in the form of Phase 3 of its peer review mechanism) decreased the propensity to bribe abroad among the treated countries' firms, relative to what was experienced by firms in untreated countries. We have shown that this effect combines a compliance effect—i.e., a reduction in bribery by treated firms—and a leakage effect—an *increase* in bribery by untreated firms in response to the compliance effect. We have characterized such leakage as occurring in contexts of high competition between treated and untreated firms, where untreated firms gain the opportunity to fill a "bribery gap" left by treated ones. By performing a moderation analysis employing a novel measure of pairwise competition in third-country markets, we offere a way to decompose the total estimated ABC effect into its compliance and leakage components.

We conclude that such leakage, driven by competitive spillovers, undermines the projected ABC goal of reducing global bribery. Our findings paint a striking resemblance to the historical context that made it necessary for the US to lobby for an internationalization of the FCPA via the ABC. Exactly as competition hindered the political feasibility of US anti-corruption until the late 1990s, rendering an OECD anti-corruption agreement necessary, we have shown that, even with a strong ABC in place, competition creates opportunities for untreated firms from non-signatory states to benefit from regulatory differences, ultimately increasing bribe opportunities for untreated firms. These considerations are particularly significant when considering the current US Administration's decision to pause enforcement of the FCPA, under concerns about American firms' competitiveness.[31] Rather than stepping down on international anti-corruption mandates, truly reducing bribery requires enrolling more countries in the ABC or similar international treaties and guaranteeing that they all enforce the document seriously. Without such assurances, competitive spillovers will likely continue to occur.

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[31] See: https://www.whitehouse.gov/presidential-actions/2025/02/pausing-foreign-corrupt-practices-act-enforcement-to-further-american-economic-and-national-security/.

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Appendix

Unpacking Compliance and "Leakages" in International Regimes: The Case of the OECD Anti-Bribery Convention

Contents

A Description of treatment assignment: OECD ABC Phase 3

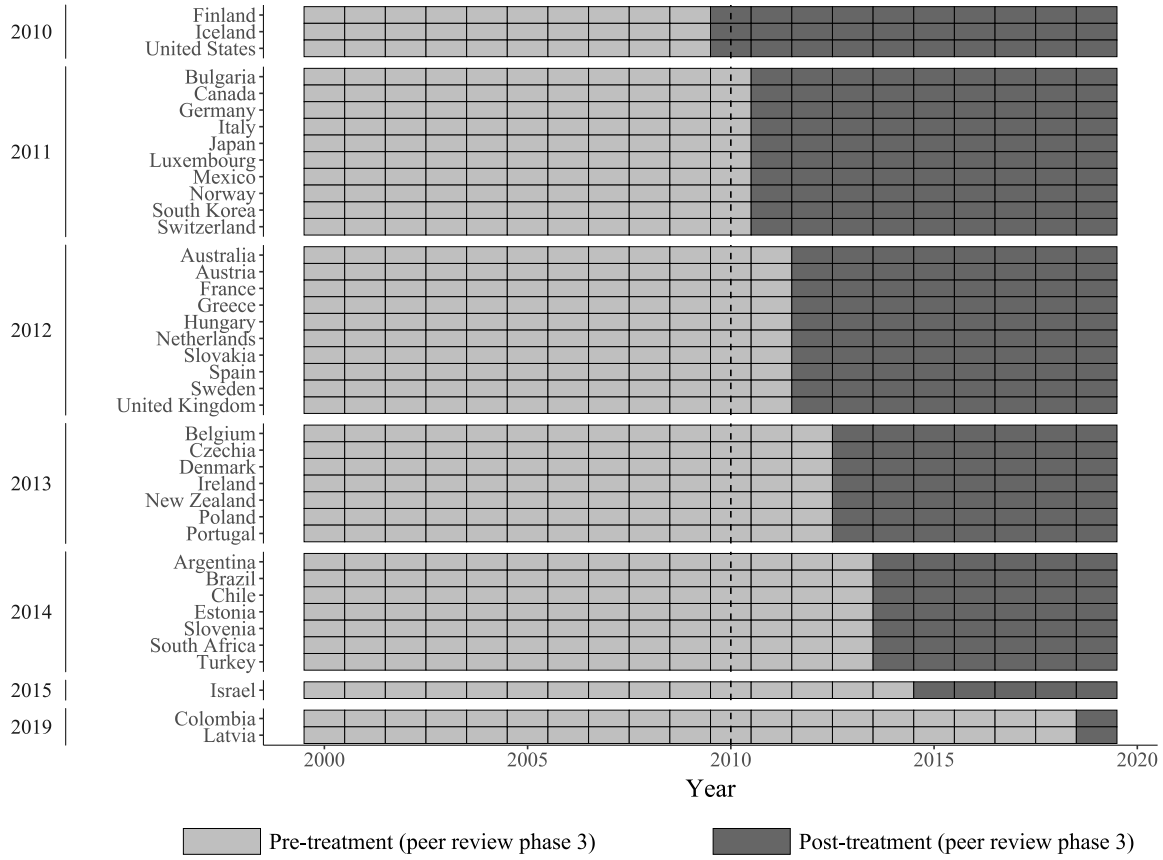

FIGURE A.1: *Rollout of the OECD ABC peer review Phase 3*

Notes: Peer review schedule constructed by consulting published country-specific peer-reviews (available at: https://www.oecd.org/en/topics/sub-issues/fighting-foreign-bribery.html) and planned reviews (available at: https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/fighting-foreign-bribery/Monitoring-Calendar-2016-2028_Updated-Nov-2024.pdf).

B Foreign bribery cases description

The foreign bribery cases are drawn from various sources. The main source is the TRACE Compendium,[32] a compilation of case summaries of anti-bribery enforcement, U.S. DOJ and SEC documents, and the FCPA Blog.[33] We also use the Shearman & Sterling database of cases,[34] OECD Country Reports, Transparency International, and the World Bank's Stolen Asset Recovery Initiative corruption case database.[35]

[32] See: http://www.traceinternational.org/Knowledge/Compendium.html.
[33] See: http://www.fcpablog.com/.
[34] See: http://fcpa.shearman.com/?s=matter&mode=list&tab=list.
[35] See: http://star.worldbank.org/corruption-cases/?db=All.

By "cross-border corruption," we mean any corrupt transaction involving a firm headquartered in a given country and at least one public official from a foreign country. We only include cases where the alleged briber is a company of some type, and the bribee is a public official—a category we consider to include politicians. That is, we exclude cases where the alleged briber is a public official (or a state), an individual not acting on behalf of a company, or where the bribee is not a public official. The cases compiled reflect actions that fall within the scope of legal liability across countries. A corrupt transaction may be prosecuted under criminal, civil, administrative, or regulatory law, each with different legal standards. This is reflected in the dataset through the government agencies pursuing each case. The dataset also includes cases at various procedural stages, including accusation, investigation, trial, conviction, acquittal, and dismissal.

We define a single case of international corruption as one incident involving a public official and a firm from two different countries, regardless of the number of individual respondents involved or whether multiple enforcement agencies file separate cases referring to the same incident. Occasionally, more than two countries are involved in the same corrupt event, resulting in multiple cross-border bribes. Because our aim is to track the incidence of cross-border corruption "flows," as represented by bribes, we count individual bilateral corruption events. For example, if the same bribery incident involves two firms headquartered in different countries bribing the same public official, we count this as two separate cases. For instance, the development of a gas field in Bonny Island, Nigeria involved a joint venture (TSKJ) of four firms headquartered in four different countries: *Eni Snamprogetti* (Italy, later bought by a Dutch firm), *Halliburton* (US), *Technip* (France), and *JGC Corporation* (Japan). This counts in our dataset as four occurrences of alleged corruption. Similarly, if a single firm bribes public officials in two different countries, each bribe is counted separately. Some cases involve repeated actions, such as the bribery of customs officials over time before detection. These are coded as a single event. Likewise, a one-time bribery involving a very large sum is still coded as one event.

We count bilateral corruption flows between the firm's headquarters country and the public official's country even when the transaction is carried out by a foreign subsidiary of the firm. In most cases, the foreign subsidiary is located in the country of the public official. In some instances, however, the subsidiary is based in a third country. See for instance the *Bio Rad* case, a US firm whose Singaporean foreign subsidiary allegedly bribed Vietnamese officials. These distinctions are recorded in the dataset.

We adopt a broad definition of cross-border corruption that includes cases still at the accusation stage. Such cases are coded as ongoing, even if they remain under investigation with no formal charges filed. Their status is updated as new information becomes available. Alleged cases are eventually coded as dropped if all investigating agencies close the matter without enforcement action. Other circumstances—such as the death of a defendant or the delisting of a firm from the US SEC—can also lead to a dropped classification. If an enforcement action has been concluded, the case is coded as positive. Here again, we take a broad view of enforcement, including the payment of civil fines, deferred prosecution agreements, and non-prosecution agreements. We also coded as positive those cases where the defendant is not found guilty of an FCPA violation but of a minor offense related to the corrupt act. We emphasize that our coding in no way constitutes a statement of guilt. We welcome any communication that could help refine our case classifications or correct any coding errors.

Table B.1 summarizes the portion of these data that we use in this article: the cross-border

bribery cases first-enforced in a country other than the home country of the bribe-payer MNC, by headquarter country (2010–2019). We report only countries with at least 10 detected cases.

HQ country	All cases	Positive cases	Ongoing cases
US	431	77	298
UK	101	36	55
DE	71	29	39
CH	63	9	53
FR	59	17	41
NL	41	10	20
IE	39	2	31
AU	30	16	13
CA	28	9	18
JP	26	4	21
IT	23	13	9
BR	23	3	19
SE	18	3	9
CN	12	1	9
NO	12	3	8
ES	11	5	3
IL	10	5	4
(etc.)			

TABLE B.1: Cases first enforced not in the home country, by MNCs' headquarters country (2010–2019)

Source: Updated version (21 May 2025) of the dataset described in Escresa and Picci (2017).
Note: The "headquarters country" corresponds to the main location of operations of the firm (not necessarily coinciding with the legal headquarters). The "foreign country" is where the act of alleged corruption took place. "First enforcement" corresponds to the country where a case first emerged. "Third-country jurisdiction" refers to cases that were first enforced neither in the headquarters nor in the foreign country. Positive cases refer to cases that were concluded with a judgment in favor of the prosecution or a settlement. Ongoing cases are those that are still pending or for which no further information is available. Countries with fewer than 10 "all cases" are omitted.

C 2×2 Difference-in-Differences using the BPCI

C.1 BPCI Phased Difference-in-Differences

Here, we show that we can obtain comparable results to our event-study staggered-treatment DID when computing and analysing the Bribe-Payer Corruption Index (BPCI) by Picci (2018). The BPCI applies the "external viewpoint" intuition described in the main text to assess the propensity of firms in each country to act corruptly abroad. This index considers the geographic distribution of cases, which is normalized by trade flows that proxy for the intensity of bilateral relations between dyads of countries. Cases that were not first enforced in the HQ are suitable for computing the BPCI. The number of cases that are not first enforced in the HQ country is reported in the last row of Table 1 of the main text.

The interpretation of the BPCI is simple. Assuming that firms in all countries had the same propensity to bribe abroad, all BPCI measures would equal 100. A BPCI value of 200 for a country indicates that its firms have a propensity to bribe abroad that is twice that of the world "average." In its original computation by Picci (2018), the BPCI indicates that firms from richer countries have a higher propensity to bribe abroad, mainly because it is mostly rich countries that host firms that are large enough to compete in foreign markets and employ bribery.[36] The BPCI may be computed in a manner that allows for aggregation of observations by years and countries, as we do in our analysis, where we distinguish whether and when countries were "treated" by the accession to Phase 3.

When interpreting results from using the BPCI, it is critical to bear in mind that the index is a measure of the propensity of firms in a country to bribe abroad relative to a world average level at a given time, but this average is latent and unobservable. In other words, the BPCI is a relative measure of bribe propensity, and its variations do not represent absolute changes in levels of the propensity to behave corruptly abroad in time. If, for example, the global propensity level of corruption abroad increases over time, and for a given country it also increases but less so, then its corresponding BPCI would decrease over time. In that situation, interpreting such a change as indicating a decreased propensity to behave corruptly would be incorrect—corruption propensity increased, just at a lower trajectory than the rest of the world. We discuss the implications of this BPCI property in terms of violating the "stable unit treatment value assumption" (SUTVA) when we adopt it in our DID analysis. Given these properties of the BPCI, we interpret its results as indicating changes in the relative bribe propensity between groups of firms (treated and untreated).

To reduce the staggered treatment assignment represented in Figure A.1 to the simplified setup, we assume a single treatment date, considering any country that has entered Phase 3 by this cutoff as treated, and the rest as control.[37] We then aggregate our individual bribery cases in two groups (control and treated countries, $D_i = \{0; 1\}$ and two periods (before and after the treatment cutoff date, $P_t = \{0; 1\}$ and compute the corresponding four values of the BPCI. Finally, we estimate the relative gap in BPCI for treated countries—those that entered Phase 3 by a certain cutoff- following the canonical DID. Our estimand, δ, represents the effect of Phase 3 on the relative bribe-propensity gap. It is the difference between the overtime change in the BPCI for treated countries when moving from the pre- to the post-treatment period, and the overtime change in the same period for the control group.

$$\begin{aligned}\delta =&[(BPCI_{it}|P_t = 1, D_i = 1) - (BPCI_{it}|P_t = 0, D_i = 1)] \\ &- [(BPCI_{it}|P_t = 1, D_i = 0) - (BPCI_{it}|P_t = 0, D_i = 0)]\end{aligned} \tag{4}$$

Because the treatment cut-off year in this analysis is an arbitrary choice, we replicate the exercise (and the BPCI computation) employing alternative treatment cut-off dates. We consider four possible cut-off dates, corresponding to all years between 2011 and 2014—those when a

[36] See the discussion in Picci (Picci, 2024, Chapter 3). See (Picci, 2018) for conditions that need to be satisfied for the BPCI to be valid.

[37] It is possible that all countries and their MNCs anticipated entry when the scheduled was announced in 2009. Consequently, in Figure C, we show that we can obtain similar results if we consider as "treated" any country that would enter Phase 3 of the peer review system by 2014, whose schedule was announced as early as 2010. In this test, our relevant cut-off date is the year 2010 itself.

significant number of countries entered Phase 3 (see Figure A.1). For each choice of year, we consider as treated those countries that were treated either in that year or previously.

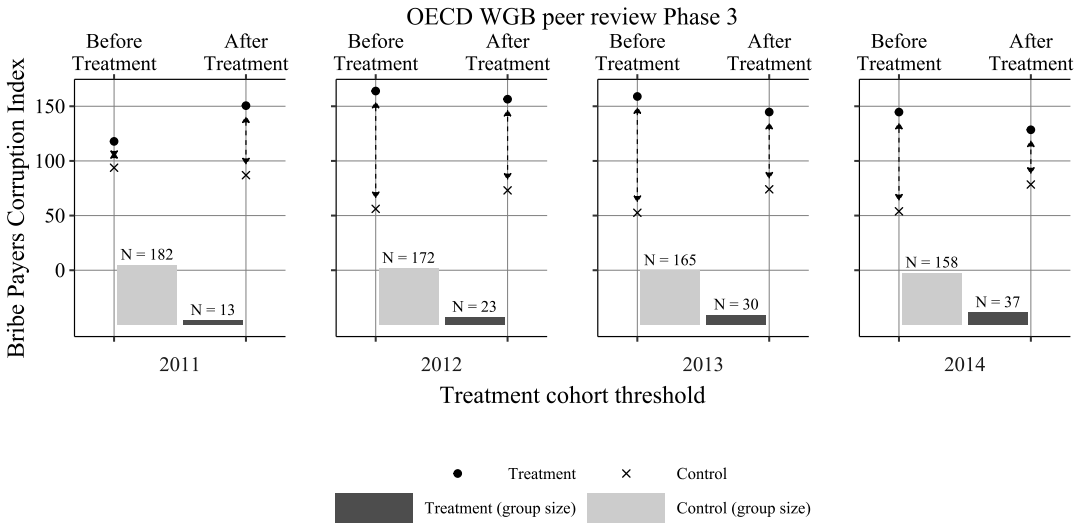

FIGURE C.1: *BCPI before and after treatment. Treated and untreated groups of countries.*

Source: Updated version (13 December 2022) of the dataset described in Escresa and Picci (2017). Authors' own calculation of the BPCI (Picci, 2018) for treated and untreated countries. Treatment status defined based on whether the country accessed Phase 3 of ABC enforcement after a given cohort threshold (x-axis).

Figure C.1 shows the results. At the bottom of the panel representing each one of the cutoff years that we have considered, we report the sizes of the two groups, treated and control. For example, by 2014, 36 countries had entered Phase 3 of the ABC, while the rest of the countries included in the analysis, 158, had not. We note that, in all cases, the treatment group has a higher value of the BPCI, reflecting the fact that those countries tend to have more advanced economies and are host to a greater number of firms that have an opportunity to bribe abroad. The vertical distance between the BPCI measures of treated and untreated countries, which are indicated by vertical arrows, describes the gap in bribe propensity for the two groups. We observe that, for all cut-off year choices except 2011,[38] the gap decreases after the treatment of Phase 3 entry occurs. The effect is more pronounced for the cut-off years 2013 and 2014. The reduction in the gap between the two groups, consistent with our hypothesis H1 above, indicates that their respective bribe propensity becomes more similar, after the treatment, than it was before. This could indicate a compliance effect—where treated firms reduce their bribe propensity—possibly mixed with a leakage effect—where control firms increase their own. Overall, Figure C.1 lends credence to the plausibility of the choice of accession to Phase 3 of the ABC as a turning point in compliance, consistent with findings by Jensen and Malesky (2018) focusing on Vietnam.

[38] When we choose 2011 as a cut-off year, the distance between the propensities to bribe abroad of treated and control group increases. However, the treatment group in this case is extremely limited, amounting only to 12 countries. The extent to which this result can be substantively interpreted is thus limited.

C.2 BPCI Difference-in-Differences with Global Cutoff in 2010

Here, we test robustness of our 2×2 difference-in-differences analysis of the BPCI by proposing an alternative way to aggregate the index. We consider as "treated" all countries that entered Phase 3 of the OECD ABC peer-review system by 2014. These countries knew about the peer-review when the schedule was announced in 2010. So their firms might have anticipated upcoming increased enforcement and might have changed their behavior accordingly. As such, we impose, as a cut-off year, to distinguish pre vs post-treatment cases, the year 2010 itself.

Figure C.2 reports our results. Confirming what we found in the main text, the BPCI decreases after treatment, indicating a drop in bribe propensity for treated *vs* control firms, following the announcement of the Phase 3 peer review.

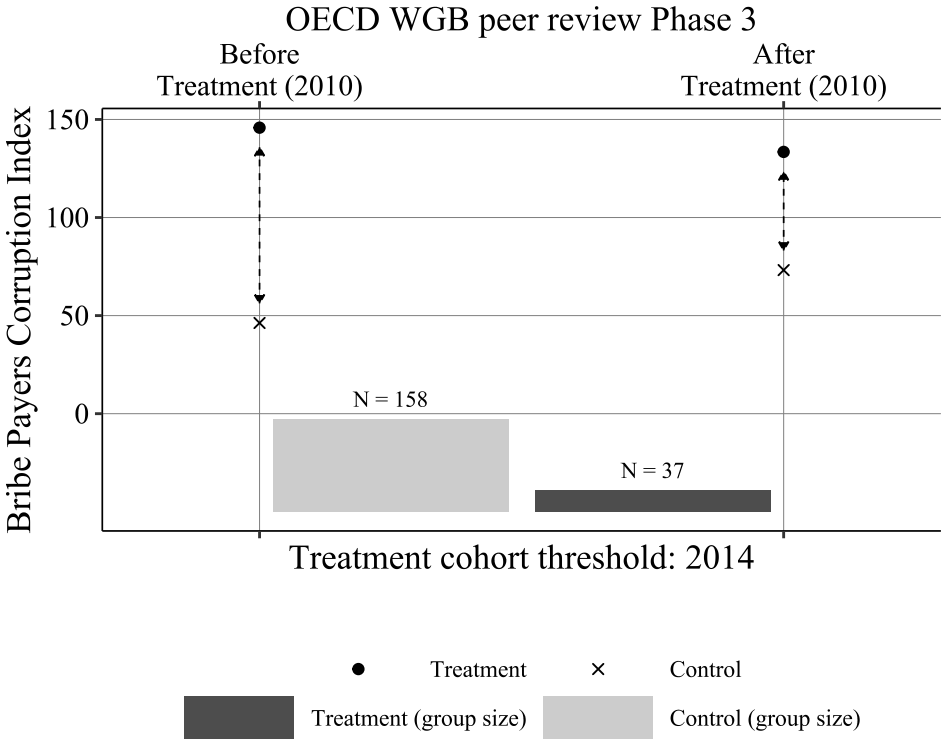

FIGURE C.2: *BPCI before and after treatment announcement as of 2010. Treated countries are those with treatment coming by 2014.*

Source: Updated version (13 December 2022) of the dataset described in Escresa and Picci (2017). Authors' own calculation of the BPCI (Picci, 2018) for treated and untreated countries. Treatment status defined based on whether the country accessed Phase 3 of ABC enforcement after a given cohort threshold (x-axis).

D Staggered-Treatment Difference-in-Differences Estimators

Here, we offer an extremely synthetic presentation of each of the staggered-treatment difference-in-differences estimators employed in the main text. Borusyak, Jaravel, and Spiess (2024) propose an imputation estimator that relaxes treatment effect heterogeneity assumptions. Callaway and Sant'Anna (2021) offer a doubly-robust estimator which just requires the researcher

to have a correct outcome or treatment model specification for recovering unbiased estimates (in our case, we keep these models to a minimum of a unit and time FE). De Chaisemartin and d'Haultfoeuille (2020) is robust to the presence of heterogeneous treatment effects. Gardner (2022) separates unit and time fixed effects and treatment effect estimation in a two-stage DID, identifying the first from untreated units and the second by comparing treated and untreated units, after removing the estimated fixed effects. Sun and Abraham (2021) prevents the improper comparison and poses a constrain to the weights computed by TFE to ensure they are non-negative and sum to 1. And Wooldridge (2021) proposes a fully-saturated "extended two-way fixed effect" whose reference point is the year before treatment, which can then be turned into a standard event analysis by computing marginal effects.

E Staggered-Treatment Difference-in-Differences: Robustness and Placebos

E.1 Placebo Test: Using Phase 2 to Define Treatment

In Figure E.1, we perform a placebo test by replicating our staggered-treatment DID analysis when using the timing of entering into Phase 2 of the ABC peer review system as a treatment threshold.

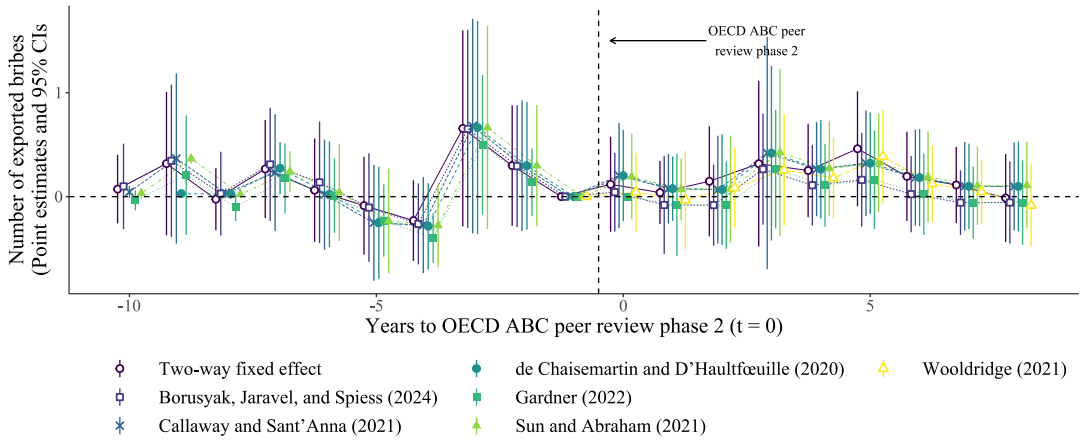

FIGURE E.1: *Placebo test: The effect of Phase 2 of peer review of enforcement at the OECD ABC on the number of dyadic cases of cross-border bribery*

Note: Results of dynamic differences-in-differences analysis with number of bribery cases as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Cut-off is a placebo test using Phase 2 rather than Phase 3 in Figure 3. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker.

E.2 Accounting for Selection into the ABC

Here, we re-estimate our event study after truncating the panel to consider only not-yet-treated countries in the control group. That is, we limit the panel to the countries that ever ratified

the ABC and entered Phase 3 of the peer review system. The staggered DID, in this restricted panel, compares only treated with not-yet-treated countries at any given point in time. We stress that this test significantly restricts our sample size, as there are only 40 countries that have entered Phase 3, thus only 800 observations to model. This small sample is particularly problematic given that the multiple interaction terms introduced by staggered difference-in-differences estimators render them extremely data-hungry (Roth et al., 2023). We therefore caution our readers against interpreting these estimates substantively. Given the extremely limited statistical power, we take results from this test only as evidence that our main findings do not hinge on self-selection into the ABC.

Furthermore, entirely removing never-treated countries exacerbates the problem of "forbidden comparisons" for the two-way fixed effect estimator. Absent never-treated observations, the comparisons between treated and *already*-treated countries, at any given point in time, gain much more weight (Goodman-Bacon, 2021). For this reason, here we do not report the two-way fixed effect estimator, which would likely return nonsensical results. We report results solely for the other six estimators, which are designed to remove such forbidden comparisons.

Results, reported in Figure E.2, are very similar to those presented in the main text. Notwithstanding the much smaller sample, we detect a negative effect on year +2, and a consistently negative effect after year +4. Albeit, we stress again, results from such test should be taken with more than a grain of salt, we can conclude that selection into the ABC is likely not biasing our main findings.

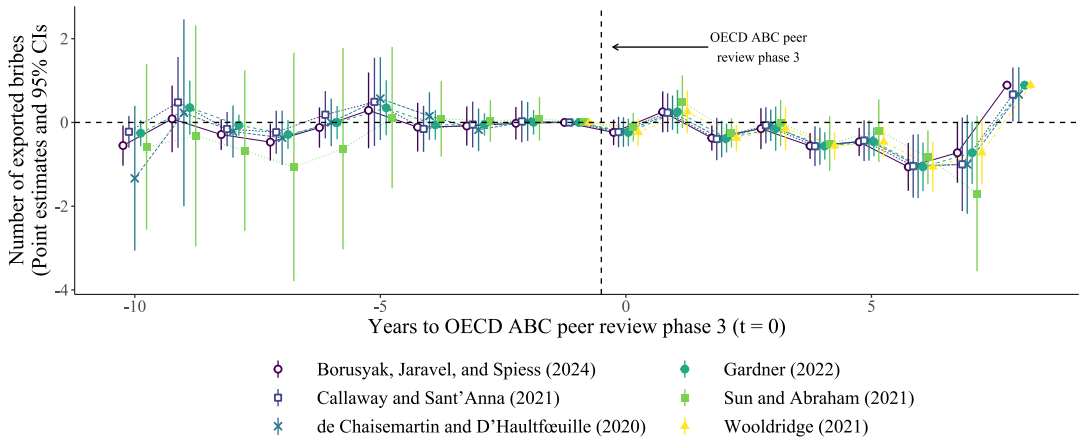

FIGURE E.2: *The effect of Phase 3 of peer review of enforcement at the OECD ABC on the number of dyadic cases of cross-border bribery, dynamic difference-in-differences when comparing treated countries with not-yet-treated ones only (i.e, ABC but not yet entered Phase 3)*

Note: Results of dynamic differences-in-differences analysis with the count of exported bribery cases (first enforced by countries other than the firm's HQ) exported by firms of country HQ as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker. As countries enter the treatment at staggered times, the x-axis marks a relative "time to treatment" indicator. The panel considers only countries that have ever entered Phase 3 of the ABC peer-review monitoring system.

E.3 Non-staggered treatment: Post-2010 effect

We provide an additional DID analysis against concerns of staggered treatment assignment by considering as "treated" all countries that were scheduled to enter Phase 3, after 2010. This model assumes that merely being placed on the schedule creates an anticipation effect among firms that alters their behavior even years before their home country completes the accession. Because this model assumes a single treatment data and is not staggered across units, we estimate dynamic ATTs from a canonical TFE. Results, in Figure E.3, show a negative effect starting from about the year 2016, when a critical mass of ABC signatories had entered Phase 3 (see Figure A.1) and after a significant increase in enforcement (Figure 1).

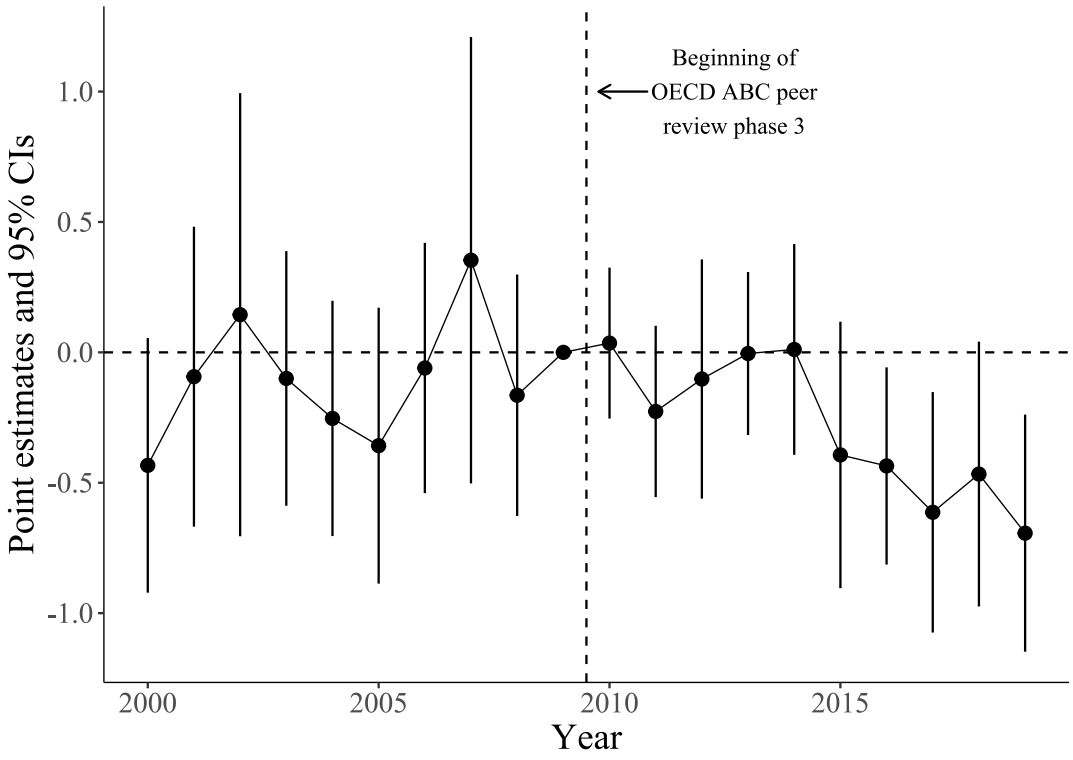

FIGURE E.3: *The post-2010 effect of Phase 3 of peer review of enforcement at the OECD ABC on the number of dyadic cases of cross-border bribery. Dynamic difference-in-differences estimates without staggered treatment.*

Note: Results of a dynamic differences-in-differences analysis with the count of exported bribery cases (first enforced by countries other than the firm's HQ) exported by firms of country HQ as the outcome variable. The graph displays the differences-in-differences coefficient from a two-way fixed effect model where all countries entering Phase 3 are considered as treated post 2010. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker.

E.4 Modeling Dyadic Number of Bribery Cases

In Figure E.4, we replicate our procedure when modeling the dyadic dataset measuring the number of bribes exported by firms from country i to foreign country j at time t. Treatment

timing and clustered standard errors are defined at the country i-level. Unit-FE is defined at the ij dyad level.

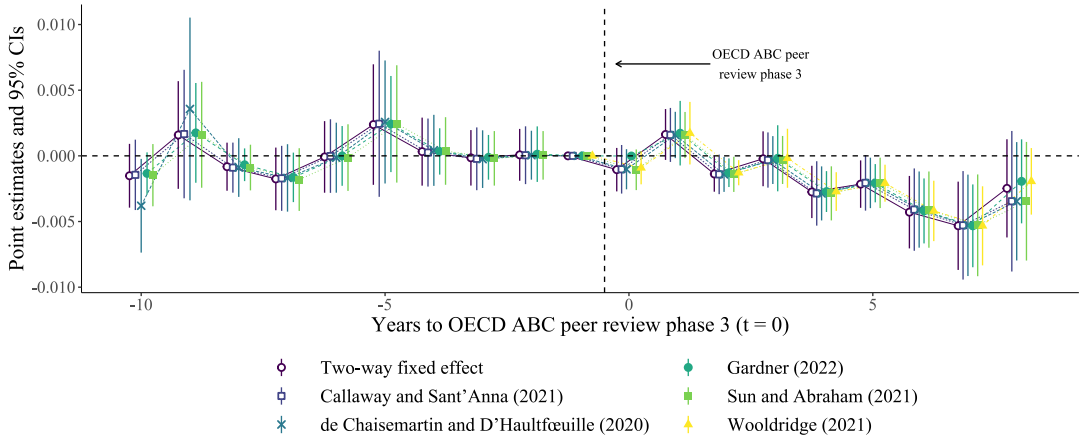

FIGURE E.4: *The effect of Phase 3 of peer review of enforcement at the OECD ABC on the number of dyadic cases of cross-border bribery*

Note: Results of dynamic differences-in-differences analysis with the count of exported bribery cases (first enforced by countries other than the firm's HQ) in a given dyad as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker. As countries HQ enter the treatment at staggered times, the x-axis marks a relative "time to treatment" indicator.

E.5 Alternative Measurement of Bribery Cases

In Figure E.5, we show results from our analysis when considering only bribery cases with status defined as "ongoing" or "positive" (that is, we excluded dropped cases). Results are consistent with those presented in the main text. In Figure E.6, we offer a "placebo" test by considering only cases with status defined as "dropped." Results are insignificant and lend confidence that our findings are driven by actual cases of bribery (rather than allegations or dropped cases).

E.6 Change Definition of Relevant First-Enforcement

We replicate our staggered difference-in-differences analysis when excluding cases first-enforced by the foreign country where bribery occurs. This test ensures that our results are not confounded by an increase in judicial activity in the countries that host foreign direct investment, where corruption occurs, as a result of the MNCs' home countries entering Phase 3 of the OECD ABC peer review system—for instance, as an attempt by these countries to appear more suitable hosts of foreign investment. Results are shown in Figure E.7. We find that the treatment effect is negative and significant immediately after the treatment, remaining significant in the following years.

We also replicate our staggered difference-in-differences analysis when excluding cases first-enforced by the US as a third-country jurisdiction (extraterritorial cases). This test ensures

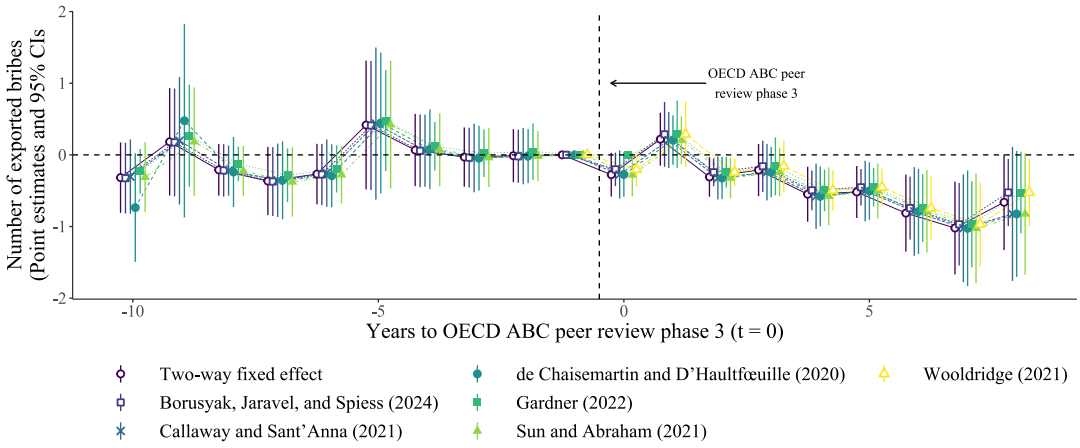

FIGURE E.5: *The effect of Phase 3 of peer review of enforcement at the OECD ABC on cases defined as "ongoing" or "positive" (i.e., excluding "dropped" cases)*

Note: Results of dynamic differences-in-differences analysis with the count of "ongoing" or "positive" exported bribery cases (first enforced by countries other than the firm's HQ) in a given dyad as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker. As countries HQ enter the treatment at staggered times, the x-axis marks a relative "time to treatment" indicator.

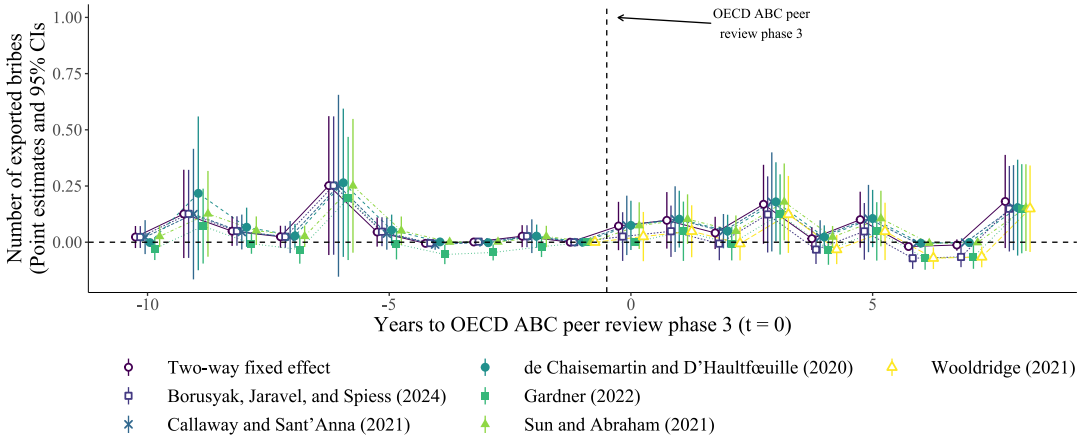

FIGURE E.6: *The effect of Phase 3 of peer review of enforcement at the OECD ABC on cases defined as "dropped" (placebo test)*

Note: Results of dynamic differences-in-differences analysis with the count of "dropped" exported bribery cases (first enforced by countries other than the firm's HQ) in a given dyad as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker. As countries HQ enter the treatment at staggered times, the x-axis marks a relative "time to treatment" indicator.

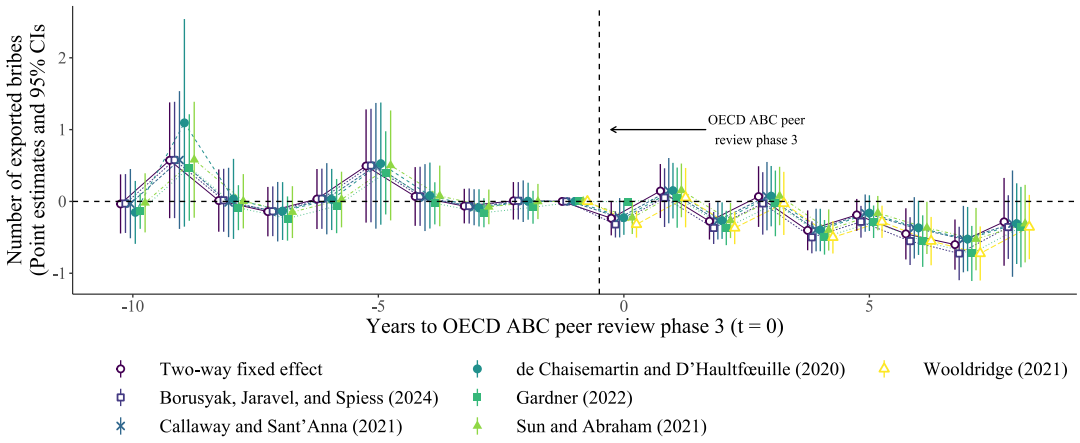

FIGURE E.7: *The effect of Phase 3 of peer review of enforcement at the OECD ABC on bribery cases (excluding enforcement by the country where corruption occurs)*

Note: Results of dynamic differences-in-differences analysis with the count of exported bribery cases (first enforced by countries other than the firm's HQ and foreign country where corruption occurs) in a given dyad as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker. As countries HQ enter the treatment at staggered times, the x-axis marks a relative "time to treatment" indicator.

that our results are not confounded by an increase in judicial activity in the US as a result of the MNCs' home countries entering Phase 3 of the OECD ABC peer review system. Results are shown in Figure E.8. We find a consistent negative and significant effect beginning since year +4 after the treatment, similarly to what we documented in the main text.

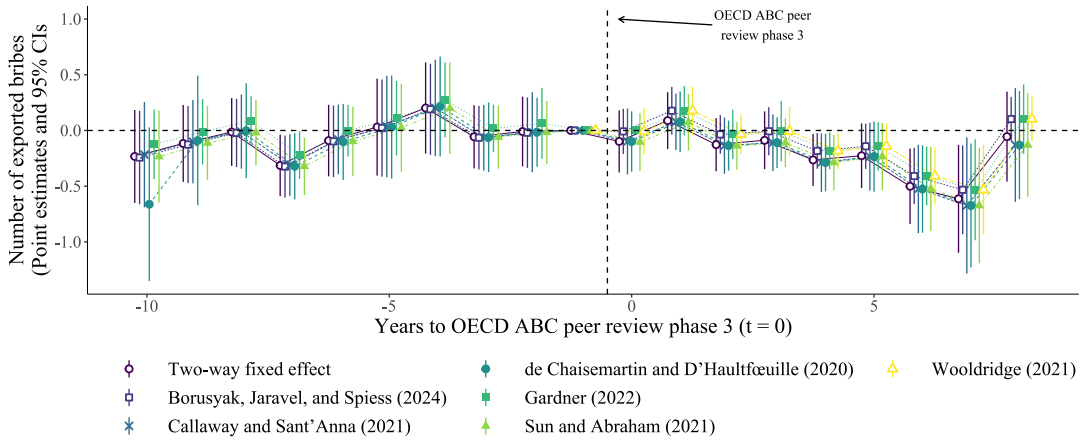

FIGURE E.8: *The effect of Phase 3 of peer review of enforcement at the OECD ABC on bribery cases (excluding enforcement by the US as a third country jurisdiction)*

Note: Results of dynamic differences-in-differences analysis with the count of exported bribery cases (first enforced by countries other than the firm's HQ and the US) in a given dyad as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker. As countries HQ enter the treatment at staggered times, the x-axis marks a relative "time to treatment" indicator.

F Moderation Analysis: Robustness

F.1 Disclosure of results

F.2 Staggered-Treatment Difference-in-Differences

We perform a moderation analysis in a DID setting by carrying out our event analysis of Figure 2 for two distinct groups of countries: those that have a degree of competition lower than the observed median, and those that have a higher degree of competition. Finding a bigger effect of treatment for the former group, as we do, provides *prima facie* evidence that there is a leakage effect. Figure F.1 presents the results.

We observe a negative and significant effect of the treatment only for bribery towards countries where firms experience a higher than average degree of competition with untreated firms (lower panel). The effects of Phase 3 on bribery in countries where competition with untreated firms is below the median (upper panel), on the other hand, are insignificant. This result offers initial evidence regarding the presence of leakages in the propensity to bribe abroad: we find that the bribe propensity gap between treated and untreated firms does not decrease homogeneously. Decreases are only observable where treated firms experience higher competition by untreated ones.

F.3 Alternative Measurement of Bribery Cases

In Table F.2, we repeat the analysis presented in Table F.1, after limiting the models to the cases that have not been dropped—i.e., those that are either "positive" or "ongoing". Figure

Table F.1: The effect of the OECD ABC Phase 3 on bribery in dyads with strong and weak competition of untreated firms

	No. of bribes from MNC of HQ in FO		
	(1) Base	(2) GDP	(3) Trade
OECD Phase 3 × Competition	-0.009+	-0.010*	-0.010*
	(0.005)	(0.005)	(0.005)
OECD Phase 3	0.003	0.004	0.004
	(0.003)	(0.003)	(0.003)
Competition	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
HQ GDP (log)		0.000+	0.000+
		(0.000)	(0.000)
FO GDP (log)		-0.000	-0.000
		(0.000)	(0.000)
Exports (log)			0.000
			(0.000)
Imports (log)			-0.000
			(0.000)
Dyad FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Num.Obs.	653391	632084	632084
R2	0.095	0.095	0.095
R2 Adj.	0.039	0.039	0.039

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001

Least squares regression of the number of bribes from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Coefficient in parentheses with standard errors clustered at country dyad level. Model 1 is the unadjusted model, controlling for only dyad and year fixed effects. Model 2 adds controls for both dyad country GDPs. Model 3 controls for imports and exports between HQ country and FO country.

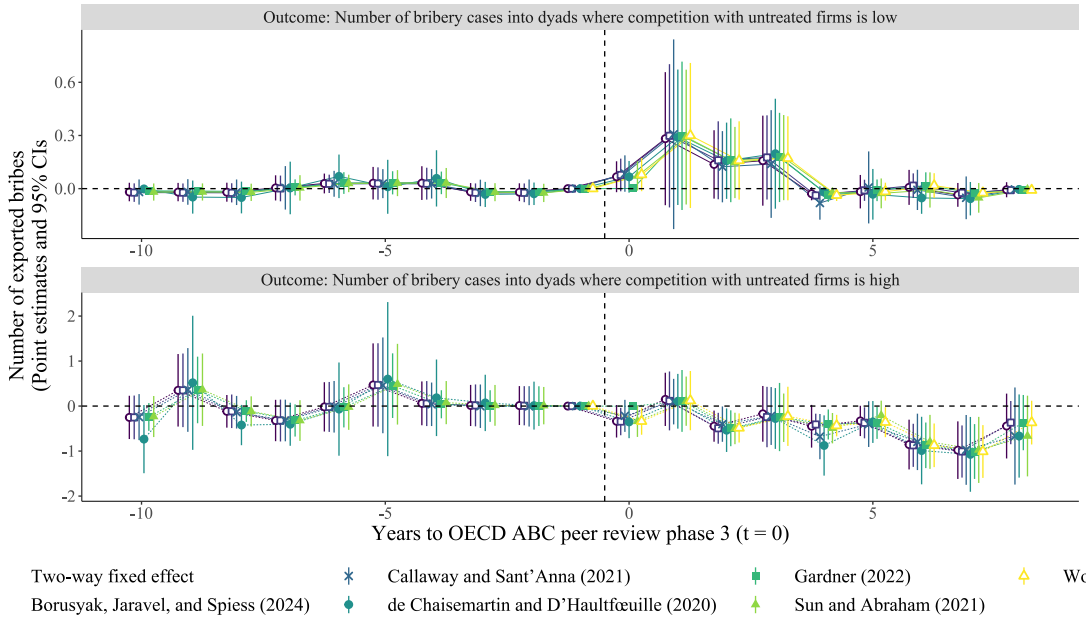

FIGURE F.1: The effect of Phase 3 of peer review of enforcement at the OECD ABC, separately for levels of competition. Dynamic difference-in-differences estimates.

Note: Results of dynamic differences-in-differences analysis with the count of exported bribery cases (first enforced by countries other than the firm's HQ) in a given dyad as the outcome variable. The graph displays the differences-in-differences coefficient using multiple estimators to address potential bias caused by staggered treatment. Range bars represent 95% confidence intervals (CIs). Dashed line at zero represents null effect marker. As countries HQ enter the treatment at staggered times, the x-axis marks a relative "time to treatment" indicator.

F.2 replicates the marginal effect analysis of Figure 3 (and "binning" estimator) for this outcome variable.

We perform a further "placebo" test by replicating our moderation analysis using as an outcome variable the number of dropped bribery cases (where we would expect not to see any significant effect). Table F.3 and Figure F.3 replicate Table F.1 and Figure 3 with this placebo outcome variable. Confirming that enhanced ABC enforcement and competition impact only the number of actual bribery cases, and not the dismissed ones, results are statistically insignificant.

F.4 Change Definition of Relevant First-Enforcement

Similarly to what we did in Section E.6, here we replicate our competition analysis *i*) after excluding all cases first-enforced by the "foreign country" (that where bribery occurs)—Table F.4 and Figure F.4; and *ii*) after excluding all cases first-enforced by the US as a third-country jurisdiction—Table F.5 and Figure F.5.

We find stronger effects when excluding cases first-enforced in the country where bribery occurs (Figure F.4), which reinforces our estimation of strong leakages in contexts of high competition. However, we find weaker effects when excluding cases first-enforced by the US as a third-country jurisdiction (Figure F.5).

Table F.2: The effect of the OECD ABC Phase 3 on the number of positive and ongoing bribery cases in dyads with strong and weak competition of untreated firms

	No. of bribes from MNC of HQ in FO		
	(1) Base	(2) GDP	(3) Trade
OECD Phase 3 × Competition	-0.009*	-0.010*	-0.010*
	(0.004)	(0.005)	(0.005)
OECD Phase 3	0.003	0.003	0.003
	(0.002)	(0.003)	(0.003)
Competition	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)
HQ GDP (log)		0.000	0.000+
		(0.000)	(0.000)
FO GDP (log)		-0.000	-0.000+
		(0.000)	(0.000)
Exports (log)			0.000*
			(0.000)
Imports (log)			-0.000
			(0.000)
Dyad FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Num.Obs.	653391	632084	632084
R2	0.096	0.096	0.096
R2 Adj.	0.040	0.040	0.040

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001

Least squares regression of the number of positive or ongoing bribery cases from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Coefficient in parentheses with standard errors clustered at country dyad level. Model 1 is the unadjusted model, controlling for only dyad and year fixed effects. Model 2 adds controls for both dyad country GDPs. Model 3 controls for imports and exports between HQ country and FO country.

Table F.3: The effect of the OECD ABC Phase 3 on the number of dropped bribery cases in dyads with strong and weak competition of untreated firms

	No. of bribes from MNC of HQ in FO		
	(1) Base	(2) GDP	(3) Trade
OECD Phase 3 × Competition	-0.000	-0.000	-0.000
	(0.002)	(0.002)	(0.002)
OECD Phase 3	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)
Competition	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
HQ GDP (log)		0.000	0.000
		(0.000)	(0.000)
FO GDP (log)		0.000	0.000
		(0.000)	(0.000)
Exports (log)			-0.000
			(0.000)
Imports (log)			-0.000
			(0.000)
Dyad FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Num.Obs.	653391	632084	632084
R2	0.056	0.057	0.057
R2 Adj.	-0.002	-0.002	-0.002

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001

Least squares regression of the number of dropped bribery cases from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Coefficient in parentheses with standard errors clustered at country dyad level. Model 1 is the unadjusted model, controlling for only dyad and year fixed effects. Model 2 adds controls for both dyad country GDPs. Model 3 controls for imports and exports between HQ country and FO country.

Table F.4: The effect of the OECD ABC Phase 3 on bribery in dyads with strong and weak competition of untreated firms (excluding cases first-enforced by the foreign country)

	No. of bribes from MNC of HQ in FO		
	(1) Base	(2) GDP	(3) Trade
OECD Phase 3 × Competition	-0.008*	-0.009**	-0.009**
	(0.003)	(0.003)	(0.003)
OECD Phase 3	0.003	0.003+	0.003+
	(0.002)	(0.002)	(0.002)
Competition	0.001**	0.001*	0.001*
	(0.000)	(0.000)	(0.000)
HQ GDP (log)		0.000**	0.000**
		(0.000)	(0.000)
FO GDP (log)		-0.000**	-0.000**
		(0.000)	(0.000)
Exports (log)			0.000
			(0.000)
Imports (log)			-0.000
			(0.000)
Dyad FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Num.Obs.	653391	632084	632084
R2	0.078	0.078	0.078
R2 Adj.	0.022	0.021	0.021

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001

Least squares regression of the number of bribes from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Coefficient in parentheses with standard errors clustered at country dyad level. Model 1 is the unadjusted model, controlling for only dyad and year fixed effects. Model 2 adds controls for both dyad country GDPs. Model 3 controls for imports and exports between HQ country and FO country.

Table F.5: The effect of the OECD ABC Phase 3 on bribery in dyads with strong and weak competition of untreated firms (excluding cases first-enforced by the US)

	No. of bribes from MNC of HQ in FO		
	(1) Base	(2) GDP	(3) Trade
OECD Phase 3 × Competition	-0.001	-0.002	-0.002
	(0.004)	(0.004)	(0.004)
OECD Phase 3	-0.000	0.001	0.001
	(0.002)	(0.002)	(0.002)
Competition	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
HQ GDP (log)		0.000	0.000
		(0.000)	(0.000)
FO GDP (log)		0.000	0.000
		(0.000)	(0.000)
Exports (log)			0.000
			(0.000)
Imports (log)			-0.000
			(0.000)
Dyad FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Num.Obs.	653391	632084	632084
R2	0.089	0.089	0.089
R2 Adj.	0.033	0.032	0.032

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001

Least squares regression of the number of bribes from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Coefficient in parentheses with standard errors clustered at country dyad level. Model 1 is the unadjusted model, controlling for only dyad and year fixed effects. Model 2 adds controls for both dyad country GDPs. Model 3 controls for imports and exports between HQ country and FO country.

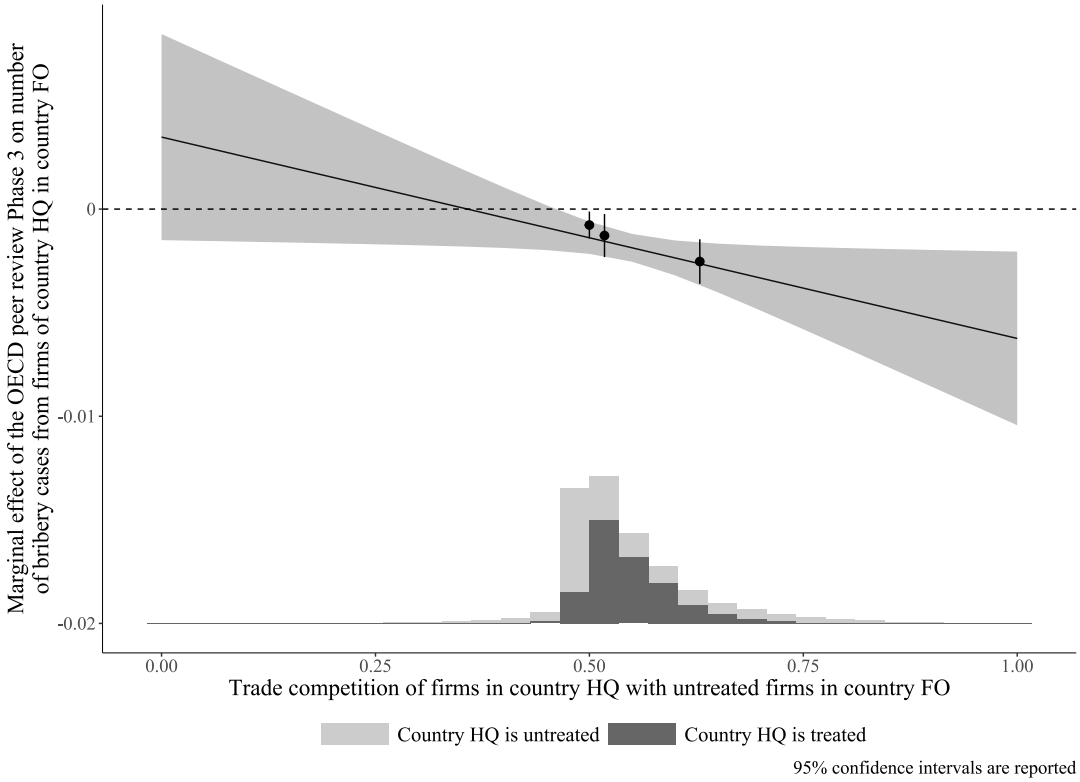

FIGURE F.2: *Marginal effect of the OECD Phase 3 on number of ongoing and positive bribery cases at varying levels of competition with untreated firms*

Note: Least squares regression of the number of positive and ongoing bribery cases from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Standard errors clustered at the country dyad level. Graph produced using the binning estimator suggested by Hainmueller, Mummolo, and Xu (2019). Figure replicates Model 3 of Appendix Table F.2, which controls for GDP of both countries and well as exports and imports between them.

F.5 Non-Normalized Competition Measure

In Table F.6 and Figure F.6, we repeat our moderation analysis (Table F.1 and Figure 3) after substituting our normalized competition measure with its raw version, to verify that transforming the variable to range over the 0–1 interval is inconsequential for our results.

Table F.6: The effect of the OECD ABC Phase 3 on bribery in dyads with strong and weak competition of untreated firms. Non-transformed measure of competition

	No. of bribes from MNC of HQ in FO		
	(1) Base	(2) GDP	(3) Trade
OECD Phase 3 × Competition (non-transformed)	-0.005+	-0.005*	-0.005*
	(0.002)	(0.002)	(0.002)
OECD Phase 3	-0.001**	-0.001**	-0.001**
	(0.000)	(0.000)	(0.000)
Competition (non-transformed)	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
HQ GDP (log)		0.000+	0.000+
		(0.000)	(0.000)
FO GDP (log)		-0.000	-0.000
		(0.000)	(0.000)
Exports (log)			0.000
			(0.000)
Imports (log)			-0.000
			(0.000)
Dyad FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Num.Obs.	653391	632084	632084
R2	0.095	0.095	0.095
R2 Adj.	0.039	0.039	0.039

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001
Least squares regression of the number of bribes from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Coefficient in parentheses with standard errors clustered at country dyad level. Model 1 is the unadjusted model, controlling for only dyad and year fixed effects. Model 2 adds controls for both dyad country GDPs. Model 3 controls for imports and exports between HQ country and FO country.

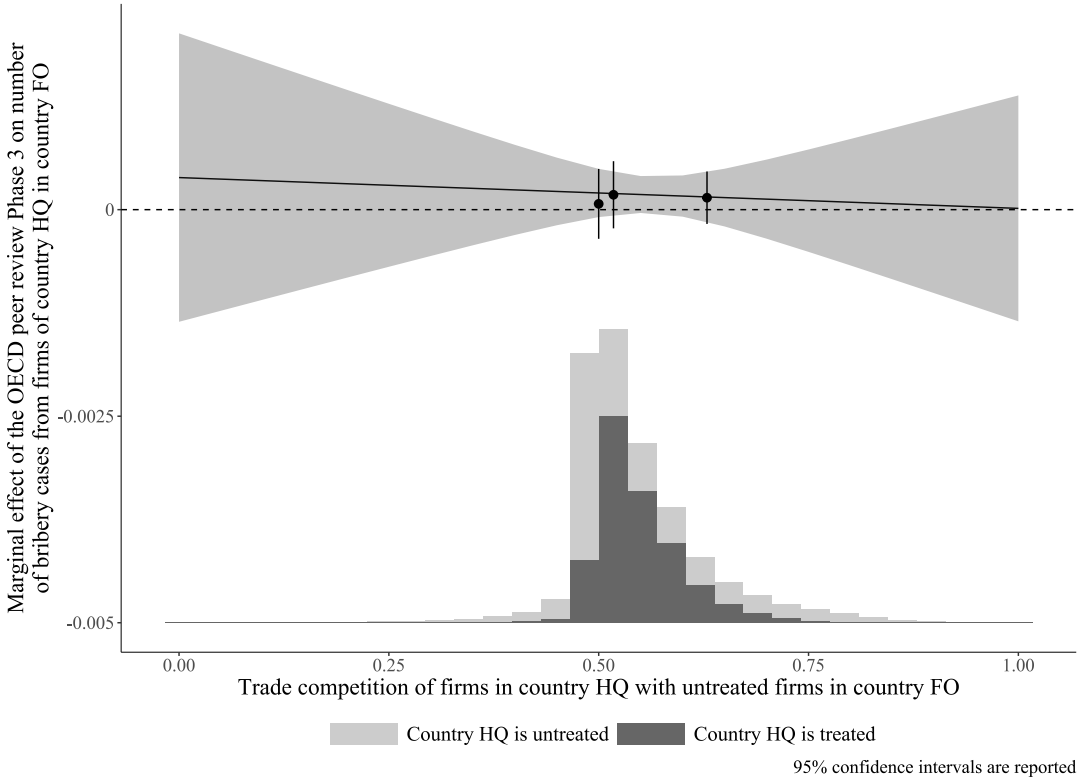

FIGURE F.3: *Marginal effect of the OECD Phase 3 on number of dropped bribery cases at varying levels of competition with untreated firms*

Note: Least squares regression of the number of dropped bribery cases from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Standard errors clustered at the country dyad level. Graph produced using the binning estimator suggested by Hainmueller, Mummolo, and Xu (2019). Figure replicates Model 3 of Table F.3, which controls for GDP of both countries and well as exports and imports between them.

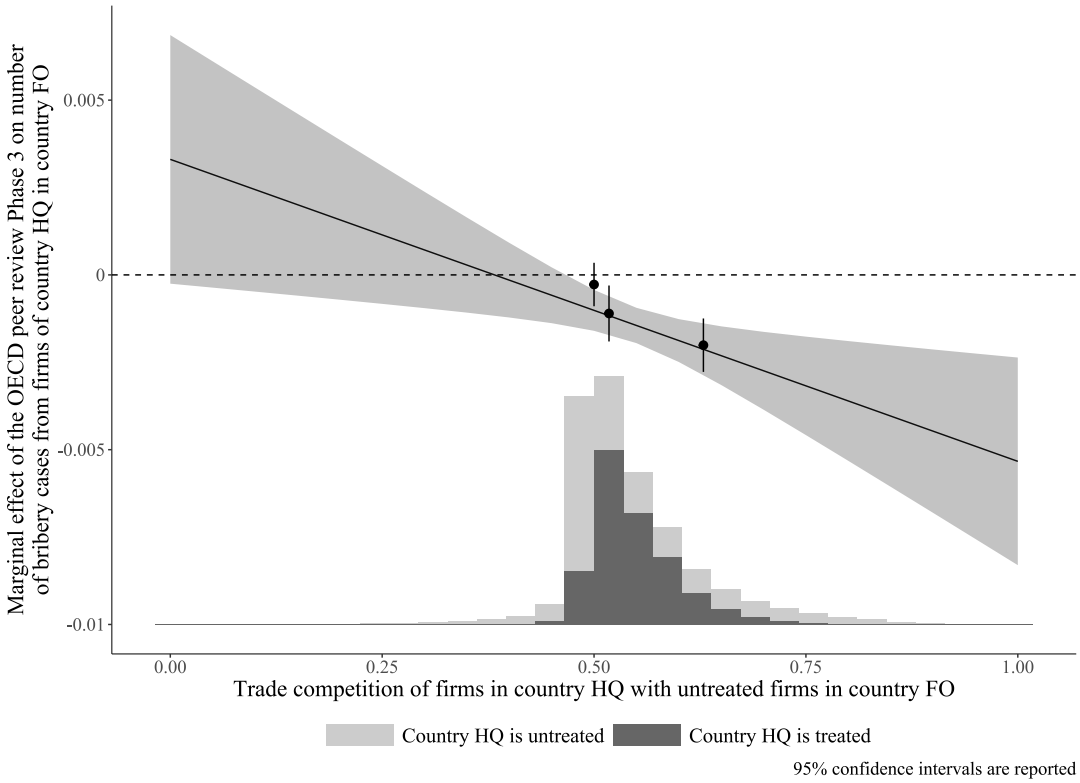

FIGURE F.4: *Marginal effect of the OECD Phase 3 on number of bribery cases (excluding those first-enforced in the country where bribery occurs) at varying levels of competition with untreated firms*

Note: Least squares regression of the number of bribery cases from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Standard errors clustered at the country dyad level. Graph produced using the binning estimator suggested by Hainmueller, Mummolo, and Xu (2019). Figure replicates Model 3 of Table F.4, which controls for GDP of both countries and well as exports and imports between them.

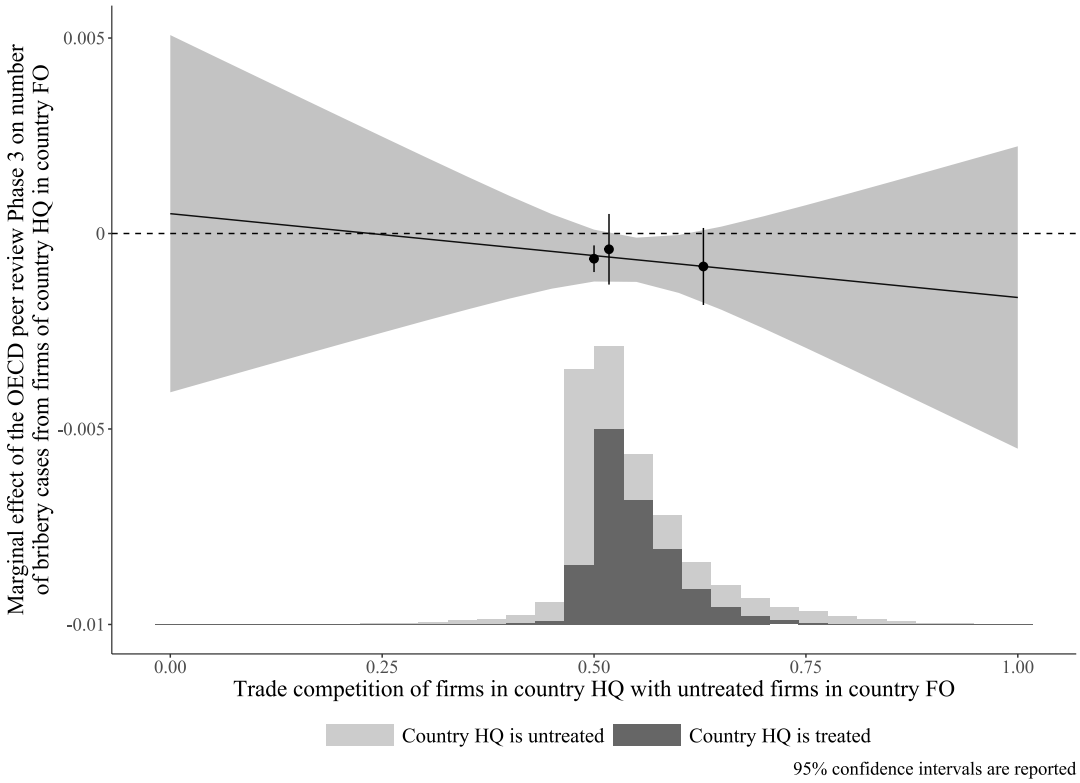

FIGURE F.5: *Marginal effect of the OECD Phase 3 on number of bribery cases (excluding those first-enforced by the US as third-country jurisdiction) at varying levels of competition with untreated firms*

Note: Least squares regression of the number of bribery cases from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition. Standard errors clustered at the country dyad level. Graph produced using the binning estimator suggested by Hainmueller, Mummolo, and Xu (2019). Figure replicates Model 3 of Table F.5, which controls for GDP of both countries and well as exports and imports between them.

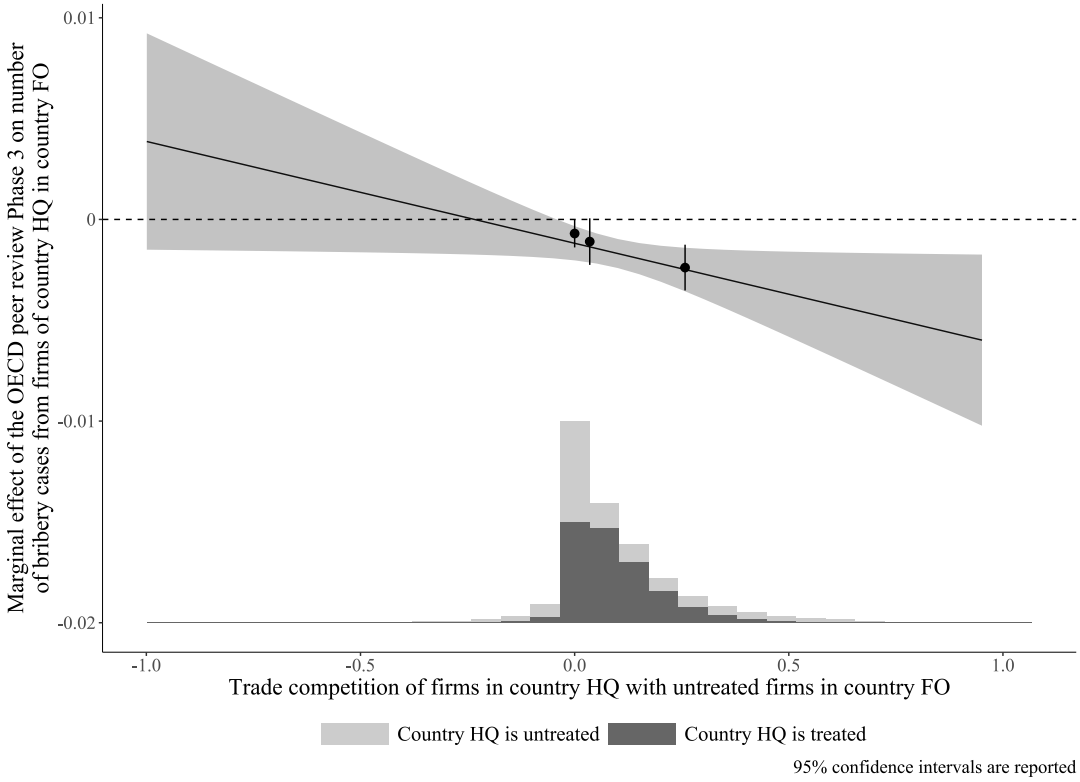

FIGURE F.6: *Marginal effect of the OECD Phase 3 on number of bribery cases at varying levels of competition (non-transformed) with untreated firms*

Note: Least squares regression of the number of bribery cases from MNC from the country in which the firm is headquartered (HQ Country) in the country of foreign operations (FO Country) on the interaction of treatment and dyadic competition (non-transformed). Standard errors clustered at the country dyad level. Graph produced using the binning estimator suggested by Hainmueller, Mummolo, and Xu (2019). Figure replicates Model 3 of Table F.6, which controls for GDP of both countries and well as exports and imports between them