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Rent(s) Asunder: Sectoral Rent Extraction Possibilities and Bribery by Multinational Corporations

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Dimitar Gueorgiev, Edmund Malesky, and Nathan Jensen

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This paper was written to offer a more precise test of the impact of globalization on corruption. Earlier versions of this manuscript were presented at the conference on Multinational Corporations (Krakow Poland), Princeton University Seminar on International Political Economy, the American Political Science Association Annual Conference, and the International Political Economy Society.

Rent(s) Asunder:

Sectoral Rent Extraction Possibilities and Bribery by Multinational Corporations

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Abstract: We argue that openness to foreign investment can have differential effects on corruption, even within the same country and under the exact same domestic institutions over time. Our theoretical approach departs from standard political economy by attributing corruption motives to firms as well as officials. Rather than interpreting bribes solely as a coercive "tax" imposed on business activities, we allow for the possibility that firms may be complicit in using bribes to enter protected sectors. Thus, we expect variation in bribe propensity across sectors according to expected profitability which we proxy with investment restrictions. Specifically, we argue that foreign investment will not be associated with corruption in sectors with fewer restrictions and more competition, but will increase dramatically as firms seek to enter restricted and uncompetitive sectors that offer higher rents. We test this effect using a list experiment, a technique drawn from applied psychology, embedded in a nationally representative survey of 10,000 foreign and domestic businesses in Vietnam. Our findings show that the impact of domestic reforms and economic openness on corruption is conditional on polices that restrict competition by limiting entry into the sector.

The increasing economic and political importance of Foreign Direct Investment (FDI) in the global economy generally, and in emerging markets in particular, has inspired a great deal of academic work devoted to uncovering the economic and political consequences of these flows. A recent branch of this work has focused on assessing the impact of economic openness on corrupt behavior by government officials. The dominant perspective in the literature suggests that opening a country to FDI or trade flows should reduce corruption through two different, but not mutually exclusive, channels (Sandholtz and Gray 2003): (1) increased competition brought by multinational corporations (MNCs) lowers monopoly rents and drives down bribe schedules (Rose-Ackerman 1978, 1999, Ades and Di Tella 1999 Larrain and Tavares 2004, Bohara, Mitchell, and Mittendorff 2004); or (2) the introduction of non-corrupt, Western business practices diffuse to domestic businesses in emerging markets (Sandholtz and Koetzle 2000, 40, Gerring and Thacker 2005, Kwok and Tadesse 2006).

We contest these findings on both empirical and theoretical grounds. Empirically, the observed correlations between FDI and corruption in the above studies could result from severe errors of measurement, aggregation, and, in many cases, endogeneity bias. More importantly, the extant literature, which predominantly employs cross-national data, has yet to definitively establish the causal logic of the firm-level behavior their theories depend upon. There is little systematic, firm-level evidence of firms responding to competition by limiting bribery or of domestic firms adopting Western modes of corporate governance. Although a large number of studies have observed the same negative correlations between FDI and corruption in cross-national datasets, others offer an alternative theoretical interpretation—foreign investors are attracted to less corrupt business environments (Lambsdorff 1999, Mauro 1995, Wei 2000, Smarynska and Wei 2000, Wei and Wu 2002; Gatti 2004). Moreover, work that does employ firm-level data concludes that foreign investors can also exacerbate corruption in host countries, by using bribes to substitute for the local business acumen and dense social networks of their domestic competitors (Hellman, Jones, and Kaufmann 2002, Søreide 2006, Tanzi and Davoodi 1997), especially in countries with weak institutions (Pinto and Zhu 2008).

In this paper, we narrow our analytical lens on an individual firm's decision to bribe, arguing that bribery is strongly determined by the expected profitability (or rents) in the sector a business wishes to enter. Although rent size is a function of multiple factors, including market structure and access to vital resources, we focus on the role of national policies and

investment regulations, as they have more generalizable implications.[1] Shleifer and Vishny (1993) have shown that politicians use such regulations to enrich themselves by offering relief from them in exchange for bribes. In the case of entry regulations, as we argue below, the restrictions on competition also serve to generate larger rents for firms lucky enough to be granted a license, increasing their motivation for bribery. Thus, we expect variation in bribe propensity across sectors. In sectors, where restrictions generate high rents, bribery has the greatest expected benefit and we should observe higher rates of corruption. Likewise, when domestic policies or international agreements remove restrictions that are associated with rents, we should anticipate a concomitant reduction in corruption in those newly liberalized sectors. Consequently, international integration may indeed reduce corruption, but at least a portion of the reduction actually precedes the entrance of new FDI into the domestic economy. And, as we argue in more detail below, reductions in corruption should be concentrated in sectors that are actually exposed to greater international competition.

Our emphasis on the relationship between corruption and entry restrictions builds on a literature that has, thus far, focused on how variation in levels of corruption can be explained by market competition (Krueger 1974, Ades and Di Tella 1999), how competition affects the functional character of corruption (Myrdal 1968, Lui 1985, Ross 2001), and most directly, how protectionist policies can increase the incidence of corruption (Dutt 2007, 2009; Broadman and Recanatini 2002). In these scenarios, the availability of rents is determined by access to highly profitable industries. However, profits in these industries, such as mining and extraction, do not vary much, absent fluctuations in global prices. Consequently, empirical analyses have been limited to formal modals (Bliss and Di Tella 1997).

We address this limitation in two ways. First, we conceptualize corruption as a two-way interaction between firms and host-country government agents. Rather than viewing bribes solely as an additional "tax" imposed on businesses engaging in activities such as obtaining business licenses, moving goods through ports, or passing regular (or irregular) business inspections (Wei 2000), we allow for the possibility that foreign firms may be complicit in using bribes to gain access to rents existing in the protected domestic sectors. We believe this is a more realistic model that better captures the nuances of business corruption.

Second, rather than relying on aggregate national data, we test our theory in an original, firm-level survey experiment conducted in Vietnam, where our dependent variables are designed to measure, as accurately as possible, the level of

[1] This approach follows the formal theoretical work of Harstad and Svensson (2011) question: this is not listed in the references, who model the relationship between regulatory procedures, bribery, and lobbying in developing countries.

corruption experienced by an individual firm when registering its business and entering the host country's market. We use an empirical strategy, drawn from research in experimental psychology, to test the linkage between openness and corruption hypothesized above. Instead of using traditional techniques for shielding respondents from admitting culpability in corrupt actions that are artificial and tend to inflate the estimates of corrupt behavior, we employ a specialized survey experiment (known as the Unmatched Count Technique (UCT) or list question) in surveys of 7,300 domestic, private enterprises (DPEs) and 1,155 MNCs conducted during the Summer of 2010. UCTs take advantage of basic rules of probability to extract sensitive information from responses to two different versions of a survey question collected from randomly selected sample pairs. The technique has been shown to provide the most accurate and confidential assessments of sensitive activity in repeated testing (Couts and Jann 2009).

These survey experiments were embedded in the most comprehensive annual assessment of the business environment in Vietnam, known as the Provincial Competitiveness Index (PCI), which is jointly administered by the Vietnamese Chamber of Commerce and Industry and the US Agency for International Development (USAID) funded Vietnam Competitiveness Initiative (VNCI) (See Malesky 2009 for methodological details). As we highlight in section 3, Vietnam offers a useful test for a link between openness and bribery due to the relatively common occurrence of corruption and because of recent changes in domestic laws: signing of several bilateral trade agreements, including one with the United States (USBTA) in 2000, and World Trade Organization (WTO) accession in 2006. These reforms allow us to track firms' experiences with corruption under different regulatory environments within the same national political institutions and under one sociocultural setting, while holding constant historical determinants of corruption that complicate many cross-national studies (Fisman and Miguel 2007).

Next, we test the impact of international integration, by taking advantage of two sources of variation in economic openness. First, we compare the individual behavior of domestic and foreign invested enterprises between 1990 and 2010 across both restricted and unrestricted sectors. Second, we study how corruption among foreign and domestic enterprises was influenced by the incremental lifting of restrictions on foreign investment entry. Vietnam provides a particularly useful test case, because the 1996 Foreign Investment Law and its subsequent iterations contained a provision requiring special licensing procedures for projects in sectors that were deemed to be vital to national security or of strategic economic interest (known as "Group A" projects), which can be measured at the International Standard Industrial Classification (ISIC) four-digit level. The generous interpretation by Vietnamese leaders of "strategic interest" allows for tremendous cross-sectional and longitudinal variation, which we exploit in our empirical analysis.

Focusing on the removal of Group A investment restrictions rather than other metrics of economic integration, such as exposure to trade and FDI, helps reduce the threat of reverse causality in our statistical analysis, as we can simply study whether a sector was restricted or unrestricted at the time an investor chose to enter the Vietnamese market. Although alternative measures gauge the magnitude of international exposure, they are highly prone to reverse causality and unobserved heterogeneity. For instance, large shares of FDI may have resulted from earlier and unrelated reductions in corruption. Furthermore, most countries do not move from pure autarky to free capital mobility overnight. Usually they liberalize incrementally, over time and based on domestic political and economic calculations. Scholars measuring openness in terms of aggregate FDI flows are forced to overlook this pattern. Because our theory is based on firm and sector-level variation in rents, we test for the possibility that levels of corruption vary, even within the same country and under the exact same domestic institutions over time. Measuring the investment restrictions at the ISIC four-digit level allows us to capture this variation. Of course, restrictions themselves can result from endogenous regulation demanded by entrenched interests and first movers (Rajan and Zingales 2003)—an issue that we address directly in section 4. Nevertheless, focusing on administrative restrictions as opposed to alternative measures of openness gets us much closer to the theoretical question we are trying to tackle: i.e., do policy-induced barriers affect corruption? This is a question of direct policy relevance to governments struggling with corruption.

Anticipating our results, we find that over the period of investigation, Group A projects were far more lucrative than projects in nonrestricted industries. After addressing endogeneity bias, in a given year, restricted sectors average 8.6 percent greater industrial concentration and 1.2 percent higher profit margins, meaning that entering a restricted sector assures extraordinary market power and economic rents. Further, we find that 22.9 percent of operations in Vietnam paid bribes during the registration period.[2] While foreign firms are no more likely than domestic firms to bribe overall, MNCs attempting to enter restricted sectors have a 31 percent predicted probability of engaging in bribery, 14 percent higher than their domestic competitors in restricted sectors and 19 percent more likely to bribe than foreign firms in nonrestricted sectors.

[2] A similar exercise for public procurement reveals that 34.7 percent of all operations paid bribes when seeking to acquire government contracts. Once again, foreign firms were less likely in general to bribe during procurement (11 percent versus 39 percent), but the difference is not statistically significant. The finding that bribing is more common during procurement than during registration is not surprising. Government contracts are extremely lucrative and rational investors may be willing to expend extra investment if they know procurement officers are willing. While corruption in procurement deals is undoubtedly endorsed and sustained by the politician, the firm is most likely an active and voluntary participant. Due to space considerations we focus on business entry, leaving procurement for a separate analysis.

1. The International Political Economy (IPE) of Corruption

The prevailing prediction in the IPE literature is that opening a country to FDI or trade flows should reduce corruption by lowering monopoly rents and bribe schedules (Rose-Ackerman 1978, Larrain and Tavares 2004, Sandholtz and Gray 2003, Bohara, Mitchell, and Mittendorff 2004). Treisman (2000) finds this relationship between corruption and openness (measured by imports/GDP), but concludes that the effect is substantively small. Dutt (2007) comes to a similar conclusion but goes a step further by using instrumental variables for trade policy rather than trade volumes. Others concur with the competition hypothesis, but also argue that the adoption of Western business practices and international preferences for transparency has an equally positive effect on how governments do business (Sandoholtz and Koetzle 2000, Gerring and Thacker 2005). Kwok and Tadesse (2006) describe the diffusion argument out in more detail by linking openness to reductions in corruption by way of: (1) regulatory pressure to reduce corruption from individual foreign-invested enterprises (FIEs) and their home governments, through legal frameworks like the Foreign Corrupt Practices Act or the Organization for Economic Cooperation and Development (OECD) Convention on the Bribery of Foreign Officials under which FIEs can be punished severely at home for engaging in corruption abroad; (2) demonstration of the fact that corruption is not a normal way of doing business and that it is possible to generate profits using Western practices without relying on traditional host country norms; and (3) professionalization as young workers leave FIEs to start their own businesses, carrying the positive business practices acquired from working in the FIEs with them.[3]

Although less prominent, some scholars have disputed the notion that openness reduces corruption, arguing that FIEs can actually augment corruption in some environments (Manzetti and Blake 1996). Interestingly, this set of scholars is more likely to rely on firm-level surveys rather than cross-national data. Hellman, Jones, and Kaufmann (2002), using survey data drawn from transition economies, find that foreign firms are just as likely to engage in corruption as their domestic counterparts, and significantly more likely to engage in corruption in economies where the policymaking process had been captured by large, domestic operations. Their findings were confirmed by Søreide (2006) study of Norwegian FIE transactions in transitional economies. Hellman, Jones, and Kaufmann (2002) conclude that foreign firms face a disadvantage when competing with domestic firms, because they lack the dense local social networks and local business acumen available to their native counterparts. Moreover, these operations are "sitting ducks for rapacious politicians to extract rents (13)" because their

[3] For an excellent review of the literature on globalization and corruption see Hopkin 2002.

exit opportunities are more constrained. Tanzi and Davoodi (1997) go further, arguing that FIEs face higher incentives to bribe, because relatively small transactions from their perspective have a sizable impact on the living standards of local officials, and therefore can be more persuasive. The effects of home country legal institutions, such as the Foreign Corrupt Practices Act (FCPA), do not fare well in these analyses, as the survey evidence indicates that FIEs have found innumerable ways to avoid these restrictions (Moran 2006). Indeed, Wei (2000) and Hellman, Jones, and Kaufmann (2002) find no evidence at all that foreign investors from home countries with such legal institutions behave differently than their unconstrained foreign and domestic counterparts.

A nuanced set of arguments offer conditional theories for the relationship between openness and corruption. Baksi, Bose, and Pandey (2009) argue that global integration will increase corruption in the short term by offering a larger set of targets from which corrupt agents can exact bribes. But as a particular host county attracts more FDI, corruption becomes more visible to the international community, which will eventually pressure those agents to reduce their rent-seeking activities. Pinto and Zhu (2008) devise a second conditional theory, which builds on the survey findings of Hellman, Jones, and Kaufmann (2002) to suggest that FDI reduces corruption in more democratic economies and with political institutions which encourage political participation and market competition. Blackburn and Forgues-Puccio (2006) find that corruption is exacerbated by protection, but that liberalization may not help once corruption is entrenched. Similarly, Tavares (2005) finds that countries that liberalize, but do not democratize, experience an increase in corruption.

International Trade and Investment Arrangements

A separate IPE literature offers fascinating results regarding economic openness, but has worked tangentially to direct empirical work on corruption. These scholars find that bilateral trade agreements (BTAs), bilateral investment treaties (BITs), and accession to the WTO significantly increase FDI inflows. The argument is that such agreements can serve as credible signals of good governance and market economics or to tie the hands of governments from reneging on contracts with investors (Büthe and Milner 2008, 2011, Elkins, Guzman, and Simmons 2006, Kerner 2009, Neumayer and Spress 2005, Vandevelde 1998, Tobin and Busch 2010). Overall, much debate exists in the literature about whether trade and investment agreements improve the quality of domestic governance, or substitute for it and allow states with problematic institutions or high corruption to still attract investment (Vandevelde 1998, Rosendorff 2010). Alternatively, other scholars argue that such

agreements only work in the presence of good institutions, and thus serve as a complement to high quality governance (Tobin and Rose-Ackerman 2005).

Despite this intriguing theoretical backdrop, we have yet to see a systematic empirical assessment of the effects of trade and investment agreements on actual levels of corruption. This appears to be a substantial omission, since many agreements insist upon changes in the country's legal provisions and normative documents, and may, by extension, affect the opportunities for corruption. Most modern trade agreements—in particular US trade agreements and WTO and EU accession or treaties—entail extensive requirements that go far beyond the traditional objective of reducing barriers to trade, such as tariff rates and import quotas, often calling for developing countries or transition economies to modernize their legal and institutional frameworks. To bring rules, regulations, and administrative procedures more in line with international best practices requires a commitment to legislative and regulatory transparency, due process, arms-length regulation applied equally to all firms, administrative review, and formal dispute settlement through arbitration and the courts (Crisp et al. 2010).

Regulatory reform through trade agreements is top-down in structure; the national government negotiates with foreign countries to develop a trade treaty that is enacted into law for application throughout the economy. As an example, to meet its USBTA and WTO requirements, Vietnam revised or developed anew more than one hundred laws and regulations. According to Steve Parker (2005), the head of the USAID funded Support for Trade Acceleration (STAR) project in Vietnam, which provided technical assistance to Vietnam on implementing its international commitments, trade agreements may actually have an independent effect on corruption outside of their direct effect of increased capital flows. "Effectively employed, the increasingly transparent and legal representation of commercial, regulatory, and administrative rights and responsibilities benefits both domestic and foreign firms. It improves the business environment, strengthens the rule of law, and combats corruption (p10)."

Thus, we expect that implementation of regulatory reforms that are inspired by international agreements will reduce corruption. An important feature of such domestic reforms, however, is that they are rarely applied universally to the entire economy (Crisp et al. 2010). Rather, deep negotiations take place over particular sectors and phase-in periods are allowed in sectors where reform is most difficult. The divergence in regulatory barriers creates wide differences in the level of economic rents across sectors. As Weeke, Parker, and Malesky (2009), put it in regard to the service sector, "Critical service sectors are often subject to the most stringent government regulations because of social and public policy concerns, typically restricting the role of foreign providers" (p7). Because of these regulatory protections, services (such as insurance provision, healthcare,

and banking) create artificial monopolies and therefore provide the same types of opportunities for corruption as natural resource extraction and utilities, where true natural monopolies exist. Similar relationships exist in budding industries, such as has been the case in Vietnam's aquaculture sector or in China's cinemas, both of which are vehemently restricted without any obvious social or political concerns at stake. Other sectors, particularly those in manufacturing and retail, typically operate with much smaller profit margins and much greater competition.[4]

We are not the first to highlight how rents affect bribery. In the economics literature, excessively high profit margins have been thought to indicate insufficient competition. High profit margins also indicate opportunities for venal bureaucrats and officials with authority over the respective economic activity to demand bribes and kickbacks (Ades and Di Tella 1999; Svensson 2003; Clark and Xu 2004). This is especially true when the lack of competition is itself a consequence of state controls over an economic activity that deliberately raises costs to entry. Nevertheless, the attraction of high profits in noncompetitive economic activities can incentivize newcomer investors to offer entry bribes. In short, bribing one's way into a high-margin sector is a two way street. Businesses are motivated to invest a little more to increase their chances of entry, and gatekeeper bureaucrats are in turn motivated to demand bribes and keep access constrained (Shleifer and Vishny 1993). Ades and Di Tella (1999) attempt to test this relationship on a cross-national sample of countries and find that corruption is associated with high rents (which they operationalize indirectly as imports/GDP); where domestic firms are sheltered from foreign competition by natural or policy-induced barriers to trade; and in economies dominated by a small number of large firms.

Testable Hypotheses

The above discussion reveals a clear conditional empirical prediction that we analyze below. Foreign firms make a strategic decision to bribe when entering a market, based on the rents available in that sector. Thus, when aggregating across all industries, we should not expect a significant difference in the amount of bribery between foreign and domestic firms. Foreign firms faced with the prospect of paying a bribe in low-margin sector, such as garment manufacturing, will simply decide to produce in another country if the bribe price equals or exceeds the expected marginal profit. Moreover, bureaucrats serving as gatekeepers to business entry are savvy enough not to demand bribes in these sectors, for fear that they will end up being responsible for losing valuable FDI projects. In short, corruption taking the form of queue jumping ahead of the competition (Lui 1985) or endogenous harassment on the part of overzealous bureaucrats (Myrdal 1968) is parameterized by

[4] See Kalinova, Palerm, and Thomsen (2010) for a comparison of FDI restrictions across countries.

the rents available in a particular sector. Rents, however, are themselves sensitive to the underlying market conditions of a region which are defined in no small part by trade patterns and are in turn correlated with the overall patterns of foreign investment. In order to short-circuit this circular relationship, we proxy for expected rents by focusing on entry restrictions that were in place at the time a given firm chose to enter the Vietnamese market.

Foreign firms attempting to enter restricted sectors which offer higher economic rents are far more likely to bribe when seeking a valuable investment entry license. In markets restricted by statute, ensuring economic rents by obtaining first-mover advantages, or queue jumping, is a very attractive for incoming investors (Lui 1985). Ross (2001) calls this activity "rent creation," a process during which firms seek access to rents created by state policy. Likewise, gatekeeper bureaucrats evaluating licenses applications are equally aware of the value their approval holds for prospective entrepreneurs who cannot achieve similar rents by relocating to another country. Thus, we hypothesize that:

H1: The propensity of foreign firms to bribe increases with economic rents.

As countries sign investment arrangements as part of economic integration, restrictions to entry, and consequently the expected benefits of corruption, fall. We expect bribery rates to decrees as well.

H2: The removal of investment restrictions will:

a) reduce economic rents in a sector.

b) reduce the willingness of foreign firms to bribe.

The relationship between investment restrictions and domestic firms is more complicated. While restrictions on domestic entry will likely have the same effect, the impact of restrictions on foreign entry into strategic sectors is predominantly based on the existing economic competition in that sector. In most emerging markets, very few firms have the size and scale necessary to provide telecommunications, banking, or insurance services. As a result, existing theory suggests that the government does not need to limit domestic entry into these arenas. In these cases, foreign investment restrictions serve to protect these favored, domestic producers, and are likely unrelated to the decisions of domestic firms to bribe upon entry (see Grossman and Helpman (1994) on protection rationale). Removing these restrictions, however, could threaten the position of domestic monopolists and therefore generate additional corruption in the domestic sector (Prez-Batres and Eden 2008). We address the domestic protection theory more rigorously below.

2. Measurement Error and the Theoretical Relationship between FDI and Corruption

Contributors to the FDI-corruption literature come to the debate with strong theory and very poor data, which contributes to the confusing results. Each of the analysts surveyed above find empirical support for their arguments, whether pro, con, or conditional. The current approaches to studying openness and corruption faced by businesses are prone to four types of well-known biases: (1) normal perception biases of respondents in how they respond to Likert scales; (2) anchoring bias in the way corruption and bribes are understood (King et al. 2004); (3) biases caused by variation in respondents' confidence that the information they reveal will not be used to punish them (Coutts and Jann 2009); and (4) question wording which invites respondents to answer about others' experience with corruption and not their own, leading to exaggeration of the true bribe schedule (Ahart and Sackett 2004).

None of these biases would be problematic for a research endeavor if they affected responses randomly, so that the measurement error simply created noise around the estimated effects. They would be problematic but not fatal if the bias was systematic, so that all respondents were influenced to overestimate or underestimate the level of corruption by the same amount. But these scenarios are unlikely. The core problem faced by researchers is that all of the current approaches used to analyze the relationship between openness (particularly FDI flows) and corruption are prone to the statistical problem known as "systematic and variable measurement error in the dependent variable." This type of measurement error causes severe problems for causal inference, because the measurement error in the dependent variable is correlated with the independent variable, which the analyst intends to evaluate. As a result, the researcher will identify a relationship between the outcome and an independent variable that is in fact simply an artifact of errors in the data collection exercise.

To put a finer point on this critique: Variables, such as political institutions, socioeconomic factors, and social capital, are likely to influence the level of bias in a respondent's answer (Treisman 2007, Olken 2009). Indeed, Treisman (2007) finds that perceived corruption is thought to be lower in countries with democratic institutions, media freedom, and high economic development, while it is perceived to be worse in poor countries, with more intrusive regulations, and less democratic protection. These factors explain 90 percent of the variation of cross-national indices in perceived corruption. Nevertheless, actual corruption, measured by the proportion of respondents self-reporting bribe payments is not associated with any of these political and economic factors (Treisman 2007). Unfortunately, the factors that drive the measurement error in international indices of corruption will also be associated with the level of investment into and trade with a particular locality. As a result, the correlations between corruption and openness in the literature, especially the conditional correlations demonstrated in

respect to institutional quality, may result from the relationship between openness and its correlation with the errors in measurement of corruption—not from the causal relationship identified by the authors. Without correcting this problem, we can never be sure of the true implications of greater openness.

In addition to measurement error, current approaches fall prey to errors of aggregation. Systematic and objective measures of corruption are hard to come by, forcing researchers to rely on perceptions data drawn from surveys or country-level aggregations of several of these perception measures, such as such as *Transparency International's* "Corruption Perceptions Index" or the *World Bank Institute's* "Control of Corruption Index." In most cases, this approach is inappropriate because the aggregation confuses inference. For instance, *Transparency International* combines survey data from individuals, country experts, and businesses into a single measure. Corruption, however, comes in many different forms, many of which are not always closely related with one another (Tanzi 1998). Why, for instance, would greater competition from foreign investors or trade exposure reduce the bribe schedule for marriage or driver's licenses, indicators captured in both of the cross-national indices? Or shouldn't corruption have diverse effects on different types of corrupt actions. For instance, competition may drive up the price of land, increasing land-related misadventures while reducing kickbacks on government contracts, which can now be purchased from overseas suppliers.

Similarly, the aggregation of FDI into annual flows or stocks combines capital from vastly different "sender" nations, sectors, and business legal types—each with widely varying inhibitions, incentives, and grounds for engaging corruptly. It is becoming more and more inappropriate to assume that FDI flows from the highly transparent and institutionalized Western economies, rather than other emerging markets, will have the same impact on corruption. It is equally inappropriate to assume that FDI comes simply in the form of new greenfield foreign investment; indeed, most FDI comes in various shades, such as from private to public, from joint venture to acquisition, and from restricted to unrestricted sectors. A convincing assessment of the relationship between FDI and corruption should explore variation in FDI and identify the investors' relationships with specific form(s) of corruption. Even though testing on country-level data has the advantage of allowing variation on political institutions, it comes at great empirical cost because it is impossible to deal effectively with multiple unobserved factors (sociocultural, historical, leadership) that may be simultaneously increasing economic integration and reducing corruption (Fisman and Miguel 2007).

In our empirical strategy below, we attempt to correct for measurement error in perceptions of corruption by measuring corruption experience directly with respect to both foreign and domestic firms in one sociocultural setting but

across different entry environments. This approach allows us to offer the first unbiased assessment of the impact of economic openness on corruption. An additional feature of our strategy is to allow for the possibility that firms are culpable in the bribe activity, a dynamic that is captured by the objective measure of corruption we employ. Most importantly, our measures of corruption and liberalization facilitate direct longitudinal assessment that previous studies, due to data limitations, have been unable to produce.

3. FDI in Vietnam

Analysts of the Vietnamese economy have highlighted the important contributions of FDI to economic growth, trade, employment growth, and poverty alleviation throughout the country. One prominent economist surveying development in Vietnam in the twenty years since the first Foreign Investment Law (FIL) succinctly claimed, "Vietnam's economic growth can be described as being mainly brought by FDI" (Tran 2007, 223). Indeed, over the past two decades, Vietnam has benefited tremendously from Foreign Direct Investment (FDI) inflows. Since Vietnam first opened up to global capital flows in 1987, FDI flows have averaged about 5 percent of GDP, accounting for nearly $49 billion in implemented investment (World Bank 2010). Even before entry into the WTO, Vietnam was among the most attractive developing countries for FDI projects, but after WTO entry in 2006, FDI attraction exploded with inflows increasing to 10 percent of GDP (World Bank 2010). In 2010, Vietnam attracted $18.6 billion and 969 projects in licensed investment, which was actually down 20 percent from 2009, as investors held back on projects while awaiting Vietnam's new leadership (General Statistical Office 2010). More important than the size of the investment has been the contribution of FDI to the Vietnamese economy. In 2010, FIEs accounted for 54 percent ($38 billion) of Vietnamese exports, 39 percent of industrial output (including oil production), and 23 percent (1.8 million) of the nation's business sector employment, which excludes household enterprises and agricultural employment (General Statistical Office 2010).

In spite of FDI's enormous economic contributions many prominent Vietnamese observers have argued that Vietnam's greater exposure to global economic forces is exacerbating corruption, not restricting it. In the summer before the 2011 Communist Party Congress, Ngo Vinh Long, a leading historian of Vietnam, wondered whether the large inflows of foreign capital that followed the country's 2006 entry into the WTO was biasing national and local decision making: As he put it, "Huge concentrations of money, especially from foreign sources, have been at the roots of many arbitrary decisions of the Vietnamese state (6)." His speculations were echoed by Vu Quang Viet, a Vietnamese-American economist and close adviser

to leading Vietnamese reform figures in the 1980s and 1990s. Surveying the policies of economic openness and decentralization, he concluded, "This has helped make Vietnam more dynamic, capable of attracting more foreign direct investment (FDI), opening up the economy outwardly and generating much more wealth, and thus offering more spoils for abuse and bribery which have reached an unprecedented scale under the current regime (Viet 2010, 17). This realization has led Vietnamese leaders to identify the problem of business-government corruption as a key target for reform. However, negligible progress in reducing business-government corruption has led some analysts to conclude that the problems are systemic and cannot be resolved with short-term policy fixes (Gainsborough 2009).

Restrictions on FDI Entry

Similar to other emerging markets, market competiveness in Vietnam leaves much to be desired as a whole. Although labor markets are highly competitive, high import tariffs and excessive regulations continue to stifle competition. According to the most recent ranking published by the Global Competitiveness Report of the World Economic Forum (WEF 2011), Vietnam ranks 59th out of 133 countries on the overall competitiveness index, slightly worse than Brazil at 58th and better than Turkey at 61st. Government regulation in Vietnam continues to be perceived as excessively burdensome, placing Vietnam near the bottom of the index at the 120th position. Vietnam ranks 110th with regard to the number of procedures required to start a business (11), and 118th for time required to receive the appropriate licensing (50 days).

The role of FDI in Vietnam's development story has been well documented. Less discussed however are the various restrictions on foreign investment; some of which have remained in place since the very first iteration of the foreign investment law in 1987. Beginning with the FIL in 1996, Vietnam liberalized FDI entry dramatically in most areas. A few sectors, however, were only partially liberalized according to the law. These sectors, known as "Group A" projects, require special approval from the Prime Minister's Office to receive an investment entry license. The stark difference between Group A and other projects became clearer after Vietnam decentralized FDI registration to the provincial level in the late 1990s. While provinces could register any FDI investment up to a specified amount locally, Group A projects still required central approval and a Prime Ministerial signature (Malesky 2008). Even in the lead up to the USBTA in 2000, over 30 different economic sectors were protected by restrictive conditions on foreign investment. In addition to the restrictions typical of any non-democratic economy, such as those of the press and national defense, Vietnamese restrictions also extended to finance sectors, retail distribution, and even some cash crops like sugar and tobacco. Although, the motivation for some of these

restrictions was and continues to be ostensibly political, others may be strategically aimed at repelling foreign competition. Several sectors remain restricted throughout our period of observation, but Vietnam's 2007 WTO entry did result in the liberalization of a large number of these conditional sectors (See table 1).

As a result of both the reduction in restrictions and increased trade opportunities brought by the WTO, FDI inflows quickly doubled and soon quadrupled by 2009. Much of this investment, due to tax breaks on profit for reinvestors, came in the form of license augmentation on existing projects, but FDI was quickly finding its way into the previously protected sectors as well. For example, whereas foreign enterprises engaging in retail distribution were required to form joint ventures with local partners and were limited to a 49 percent stake prior to accession, both investment caps and any need for partners was abolished thereafter. Similarly, following WTO accession, 100 percent foreign-owned banks, insurance providers, and foreign securities service suppliers were permitted to establish representative offices and joint ventures with Vietnamese partners. Along with the categorical removal of several previously restricted sectors, such as those in finance and retail, WTO commitments deepened domestic investment licensing reforms introduced in the Common Investment Law (CIL) and Unified Enterprise Law (UEL), which were promulgated in mid-2006. Under the new rules, licensing authority became much more decentralized and a single corporate framework and licensing mechanism was established for both foreign and domestic entities. Other sectors that have seen an easing on foreign investment restrictions include: business management and accounting, education, health services, telecom, and transportation.

This is not to say that foreign capital did not find its way into sectors while they were restricted. Our data shows foreign entry into almost all restricted sectors over this time frame. Nevertheless, the additional restrictions served to dampen competition and generate high rents for those lucky enough to enter them. To demonstrate this point we gathered triennial-level information on sectoral restrictions from revisions to Vietnam's Law on Foreign Investment and other legal documents related to foreign investment. Although restrictions exist within multiple dimensions ,which at times vary depending on location and license size, the most apparent is the blanket sector-level restriction which we code as a dichotomous variable during each three year period the sector was classified as a "Group A" restricted sector.

Analyzing the Impact of Restrictions on Market Concentration and Rents

To analyze the effect of these restrictions, we created a measure of competition and rents available at the ISIC four-digit level, based on revenue taken from Vietnam's annual Enterprise Census, where all firms in the country are required to submit

financial data (General Statistical Office 2009). The first measure is the Herfindahl-Hirschman Index ($HHI = \sum_{i=1}^{N} S_i^2$), where S represents a particular firm's share of sector-level revenue. Commonly used in antitrust analysis as a measure of market power, HHIs range from 0 to 100. A sector with concentration above 25 represents a highly concentrated sector, where firms have the ability to distort competition and charge monopoly rents.

Figure 1 studies the median HHI experienced in Vietnam in a given time period (biannual averages) in both restricted and unrestricted sectors. Clearly, Group A sectors are significantly more concentrated than nonrestricted sectors. For most of the time period under observation, restricted sectors averaged well above the 25-point HHI that signifies severe market concentration, the potential for anticompetitive behavior, as well as the availability of monopoly rents. By contrast, nonrestricted sectors rarely slip above an HHI of 10. Also evident is that the average HHIs in the restricted sectors have declined over time from a high of 40 at the time of the 1996 Foreign Investment Law to 22 after the first series of Vietnam's WTO accession reforms were phased in.

While not perfectly correlated with HHI, the proportion of economic sectors subject to Group A investment restrictions has declined radically as well from about 36 percent of all four-digit sectors, observed in our sample, to 23 percent today. Although the correlations appear strong, there is reason to be suspicious that the apparent relationship could be spurious, caused by declines in both HHI and restrictions over time, or by omitted firm-level features driving both variables. We test the robustness of the relationship using HHI and the average profit margin of firms (Profit/Revenue) at the ISIC four-digit level, another measure of rents, as our dependent variables and regress them on a dichotomous measure of whether a particular sector is listed as being Group A. These results are presented in table 2, where the unit of analysis is the sector (four-digit)-year, between 1996 and 2010 for all sectors operating in Vietnam during that time. Models 1 and 6 display the simple bivariate regressions and models 2 and 7 add controls for the capital/labor ratio of the industry, allowing us to separate the impact of restrictions from the cost structure of the industry. Models 3 and 8 add year dummies to make sure that our results are not simply capturing over-time trending in both the dependent and independent variable. With year-fixed effects, this model essentially provides the HHI observed by survey respondents in the year they chose to invest in a given sector in Vietnam.

The final models for each dependent variable (models 4, 5, 9, and 10) address the possible threat that endogenous regulation poses to our analysis. There is a first-mover benefit to early investors, who may lobby for regulations to protect their market share (Rajan and Zingales 2003, Benmelech and Moskowitz 2010, Weymouth 2011). According to this theory, MNCs may be complicit in establishing the regulatory framework, using corruption to influence host-country officials. If this

is the case, the causal relationship could be reversed, meaning corruption might pre-date investment restrictions and available rents (Bandyopadhyay and Roy 2007). Thankfully, the registry of Group A restrictions has only moved in one direction over time; restrictions have been removed and never added, limiting the threat that new restrictions emerged to protect early investors. Nevertheless, there remains a legitimate concern that the removal of restrictions and the length that restrictions are in place, especially those that result from international agreements, may have been negotiated with an eye to entry by particular MNCs.

To account for these concerns, we employ a two-stage instrumental variables model, where we instrument for restrictions by the share of State-Owned Enterprises (SOEs) in the particular four-digit sector.[5] This variable is lagged one year to account for the state share at the time policymakers were negotiating restrictions. SOE investment share picks up the legacy effect of Vietnam's former command economy. As Vietnam is still transitioning from a centrally planned system and has not undergone full-scale privatization, many sectors are still dominated by large, state-owned conglomerates. As we noted above, there is strong reason to suspect that Group A restrictions were aimed predominantly at protecting their market share (See Stigler 1971; Grossman & Helpman 1994). Indeed, Abuza (2002) points out that SOEs were the primary opponents of the USBTA, specifically fearing the loss of their market position. Even after USBTA entry, the trade and investment regime still favored SOEs, allowing cheap entry of inputs that SOEs relied upon, while maintaining formal and informal barriers to entry in the sectors SOEs dominated. As Auffret (2003, 5) put it, describing the bifurcated nature of Vietnam's commitment to international openness, "Vietnam has been so far able to liberalize the trade regime while maintaining a policy bias in favor of domestic-market-oriented industries, particularly those dominated by state-owned enterprises (SOEs)".

The IV strategy confirms this. Each 10 percent increase in SOE share, increases the probability of Group A restrictions by 2 percent in the first stage (model 12). Moreover, the size of the coefficients on restrictions and the R^2 in both the HHI and profit models fall dramatically, indicating that our approach has removed a portion of the endogeneity bias. Finally, the Cragg-Donaldson F-Statistic is large and statistically significant, indicating that the strength of the identification in the first-stage model is sufficient to proceed with IV-2SLS. Thus, by instrumenting with SOE share, our estimates should be interpreted as the impact of regulations that are determined by the legacy of central planning, after the regulations possibly demanded by early MNC entrants have been removed.

[5] Although it is possible that some sectors may be protected for reasons other than SOE resistance, it is nevertheless the case that restricted sectors are the most likely to have heavy SOE concentrations.

After ensuring exogenous regulation, accounting for market structure, and controlling for time effects in models 5 and 10, we find that restricted sectors have a tremendous 8.7 percent greater industrial concentration and a 1.3 percent larger median profit margin. The less pronounced difference in profit margins likely results from the fact that removing restrictions simultaneously lowers the costs of firms in nonrestricted sectors, leading to higher profits there as well. In short, exogenous barriers to investment have dramatic effects on a firm's expected profitably. An enterprise lucky enough to enter a restricted sector can be assured of extraordinary market power and economic rents. Given our theory, we expect that firms attempting to start Group A projects are far more likely to pay more for this privilege.

Foreign Direct Investors in the PCI Survey

The Provincial Competitiveness Index (PCI) survey is a highly representative selection of 7,300 domestic firms and 1,155 FIEs which are located throughout country's 63 provinces, although many of the provinces have only one or two active FDI projects. The sample frame for selection was the list of registered domestic firms and FIEs in the General Tax Authority database of registered operations. Excluding businesses that had incorrect telephone numbers and addresses, and therefore could not be reached, the response rate was about 30 percent for domestic operations and 20 percent for FIEs. While these response rates are actually much higher than the rates commonly received in the international business literature (White and Luo 2006), they are still large enough to create concerns about reliability (Dillman et al. 2002). As a result, it is reasonable to ask whether nonresponse creates selection bias that might affect our conclusions (Jensen et al. 2010). In Online Appendix 2, we compare the PCI data to available information from the General Statistical Office's Enterprise Census and Tax Authority Databases. The table shows that PCI data reflects observable characteristics of the national population and therefore offers a highly accurate depiction of foreign and domestic investors in Vietnam. Consequently, the conclusions we draw can be trusted and generalized to the underlying population.

There are currently 5,620 active MNCs in Vietnam, which includes 4,609 100 percent FDI, and 1,011 joint ventures (JVs).[6] By this metric, the PCI accounts for 20 percent of the entire population of foreign investors found in the country! We find that investors from East Asia dominate the sample. Investors from South Korea, Taiwan, Japan, and mainland China alone account for 67 percent of the active businesses surveyed. When we add investors from neighbors in Southeast Asia, the

[6] General Statistical Office Enterprise Census (2009).

figure approaches 75 percent. These numbers correspond closely to universe of firms in Vietnam. Although it is important to remember that a great deal of US investment is listed as originating in Hong Kong and Singapore for a variety of logistical and tax-based reasons, so US investment is probably understated (Parker et al. 2005). Respectable numbers exist for Western investors as well. The PCI-FDI sample contains 30 investors from France, 28 from the United States (including Guam and US Virgin Islands), 23 from Australia, and 12 from Germany, in addition to a host of others from Western Europe, Russia and Eastern Europe, and Latin America.

Re-weighting the sample to reflect national proportions,[7] we find that 84 percent of the FIEs in Vietnam are 100 percent foreign owned. This figure, which is in agreement with GSO Enterprise Census data is remarkable, because early in the Vietnamese investment history (1987–1991), 100 percent foreign owned investment was not allowed and investors were obligated to enter into joint venture with SOEs. While 100 percent FDI was possible under the 1991 revision to the Foreign Investment Law (FIL), it was still difficult, as access to land hinged heavily on finding a state-owned local partner. Thus until 1996, FDI came primarily in the form of joint ventures with state-owned enterprises, accounting for over 70 percent of approved projects and 75 percent of total registered capital between 1988 and 1996. The 1996 revisions of the FIL facilitated 100 percent direct investment and led to the trend we observe today. Very few foreign firms have taken advantage of the 2005 Enterprise Law's invitation to register as a domestic operation with foreign capital (Tran 2007).

Figure 2 illustrates the entry year of firms in our sample. We track the entry dates over the iterations of the FIL, the 2005 Unified Enterprise Law, as well as the 2001 Bilateral Trade Agreement with the United States (USBTA), and 2006 WTO Entry. Most of the firms in our sample are relatively young operations in Vietnam. Over 77 percent were established and licensed after the USBTA, although we cannot say for certain that the USBTA was the primary stimulant for their entry, because other important changes were also taking place in the Vietnamese economy at the time.

4. Our Empirical Strategy

To address the problems discussed in measuring corruption above, the 2010 PCI survey instrument exploits an approach known as the Unmatched Count Technique (UCT). Informally known as the LIST question (Couts and Jann 2009, Ahart and Sackett 2004), the technique has been used widely by researchers across many disciplines to explore many different

[7] Re-weighting is necessary because the sampling strategy is designed to reflect provincial populations. Thus, an unweighted sample overvalues the contributions of provinces with small business populations.

kinds of sensitive topics but has only recently started gaining popularity as a method for studying corruption. List questions are extremely easy to administer, as a respondent is simply presented with a list of activities and must only answer *how many* of the activities they engaged in. They are not obligated to admit to engaging in a sensitive activity in any way. As a result, the respondent can reveal critical information without fear. Couts and Jann (2009) have shown in a series of experimental trials that UCT out performs all other techniques at eliciting sensitive information and maintaining the comfort level of respondents. The trick to the UCT approach is that the sample of respondents is randomly divided into two groups that are equal on all observable characteristics. One group of respondents is provided with a list of relatively infrequent, but not impossible activities, which are not sensitive in any way. The second group, however, receives an additional item, randomly placed in the list. This additional item is the sensitive activity.

Below is the UCT question included in the 2010 PCI survey regarding bribery during business registration and licensing. An important feature of the question is that it is highly targeted and context specific. All of the activities listed are well known to businesses operating in Vietnam and would not be perceived as impossible or artificial, which might damage their confidence in the question. Other UCTs which employ highly abstract activities often fall prey to this problem. Moreover, the UCTs in this survey were specifically designed to differentiate participation in petty corruption from grand corruption.

> **UCT Question 1**: Please take a look at the following list of common activities that firms engage in to expedite the steps needed to receive their investment license/registration certificate. How many of the activities did you engage in when fulfilling any of the business registration activities listed previously?
>
> 1. Followed procedures for business license on website.
> 2. Hired a local consulting/law firm to obtain the license the firm for you.
> 3. *Paid informal charge to expedite procedures* **(Only Available on Form B of the Survey)**
> 4. Looked for a domestic partner who was already registered

The question was asked to representatives of domestic as well as foreign owned firms. Whether a firm received A or B was determined by random sampling, so the two groups of respondents are balanced on all important observable characteristics. Table 3 shows the results of individual t-tests for each covariate of interest (column 3) and results from a Probit model which regresses treatment on all covariates at the same time (column 4) to address imbalances caused by joint effects of the variables. On key firm characteristics and operational environments there are no statistically significant differences between treatment and control groups. Only firms with owners who previously operated a state-owned enterprise and foreign firms which used the one-stop-shop (OSS) registration procedures were more likely to fall within the treatment group. Imbalances across the two groups may indicate systematic nonresponse by firms receiving the treatment list. Table 3

however, shows that this is not the case. In fact, treatment groups in both the domestic and foreign samples exhibited higher rates of completion than the control group. As a result, we can safely interpret the differences between treatment and control groups as being determined entirely by the additional item in the list question and not by features of firms or provincial setting.

Respondents are only asked to tell the interviewer how many of the listed items they have either engaged in or believe in, and are specifically instructed NOT to identify which items they specifically engaged in. Respondent anonymity is provided because neither the interviewer nor the researcher can interpret whether or not a treated respondent's answer included a sensitive item. One concern is that respondents may feel trapped by the set of nonsensitive items. If the activities are too frequent, a respondent in treatment may feel forced to answer the maximum number of activities (including the sensitive item), thereby revealing their complicity directly. Alternatively, nonsensitive items that are too rare would have the opposite effect, allowing the respondent to believe that the sensitive item was the only reasonable option. In either case, the UCT would have failed and respondents would still be obligated to conceal their behavior. Our data did not appear to demonstrate such a tendency. Less than 15 percent of the respondents in the control group answered the maximum number of nonsensitive questions, and less than 2 percent answered zero items.[8] In addition, pilot testing demonstrated low correlation between nonsensitive items. Such rare instances for extreme values and a lack of correlation between nonsensitive item responses, gives us great confidence that respondents were able to answer honestly

It is important to keep in mind that our survey question relies on the ability of the respondent to recall the activities they engaged during the last time they completed registration procedures, for some firms this took place over 15 years ago. Although we could have chosen more proximate events for our survey experiment, the year a firm entered is critically important for our results, as we aim to take advantage of the changes in investment restrictions over time, paying special attention to the restrictions that were in place at the time a firm chose to enter the Vietnamese market. To mitigate, we chose our activity items carefully, so that each represented an obvious action and was easy to remember. Nevertheless, such questions in firm-level surveys pose two dangers. First, data is likely to be noisier at early years of registration, which tends to reduce significance of results. Second, changes in firm management over time may mean that the respondent is different from the owner or manager who actually completed the procedures.[9] Indeed follow-up interviews with respondents revealed that

[8] See appendix 3 for histograms of the share of responses to each value in the respective questions.
[9] The PCI requires general managers or owners to complete the survey, although there is no way to formally guarantee that the task was not delegated to a subordinate. The name and position of the respondent are maintained in the dataset, giving us confidence that delegation is not a major threat to our analysis.

some of the item nonresponse to the question comes from new managers unable to answer the question. Once again, this problem most likely will lead to noise and insignificant findings rather than biased coefficients.

Once a survey is completed, a simple difference-in-means test between the treatment and control groups can reveal a population proportion equal to the prevalence of the sensitive behavior or belief. These results are shown in figure 3. Triangles depict the average number of activities that the treated group participates in, while diamonds illustrate the average activities of the control group. The range bars around the mean scores are 95 percent confidence intervals. The first thing to notice is that the range bars do not overlap in either the foreign or domestic cases, indicating the differences in means are statistically significant and therefore that the treatment was effective. To calculate the percentage, we must now only subtract the treatment average from the control average (1.879 and 1.652 respectively in the case of business registration for all investors). These difference between these means is .229 (when rounded to the nearest thousandth), indicating that 22.9 percent of businesses pay bribes at registration.

Disaggregating by foreign and domestic operations, as we do in figure 3, reveals that foreign firms are slightly less likely to pay bribes than domestic firms overall (18 percent versus 21 percent), but the difference is not statistically significant. The disaggregated averages are lower than the overall average, because disaggregating and calculating separate means, removes the direct comparison between treated domestic firms and foreign control firms—a problem that we deal with below using a multiple regression estimation strategy.

5. Firm-Level Empirical Analysis

Although the difference-in-means interpretation provides a very powerful illustration of how prevalent corruption is, it is nevertheless a crude analysis that ignores a wealth of information within and outside the survey that may help differentiate between the types of firms or settings conducive to corruption and the factors that might reduce it. Using an ordinary least squares (OLS) analysis is possible but cumbersome, as it requires interacting each possible determinant of corruption with the treatment variable. This quickly leads to unwieldy models that are difficult to interpret.

We address this issue by adapting a two-stage non-linear least squares (NLS) estimation model developed by Imai (2011) which extends the difference in means approach used above to multivariate estimation.[10] This process allows for more complex evaluation and theory testing which makes use of the rich descriptive information available in the survey. The Imai

[10] Imai also develops a maximum likelihood estimator, which is more efficient, but we prefer the NLS estimation, because it is able to recover the difference-in-means estimate when no controls are added.

process involves fitting a model to describe the control group, then using the estimated coefficients to predict new values for the treated group, and finally fitting the imputed values over the observed in the treated group through an expectation algorithm to produce estimators for each variable included in the following model:

$$Y_i = f(X_i\gamma) + T_i(X_i\delta) + \varepsilon_i, \textit{where}:$$

- Y_i : response variable (total number of activities)
- T_i : treatment variable (received survey with sensitive item)
- X_i : matrix of covariates
- $f(X_i\gamma)$: model for non-sensitive items (negative binomal regression)
- $g(X_i\delta)$: model for sensitive items (non-linear least squares)

In the first stage of the adapted procedure, we fit the $f(X_i, \gamma)$ model to the control group via negative binomial estimation (to account for count nature of the data and the over-dispersion caused by zero answers) and obtain $\hat{\gamma}$, which is the relationship between participating in the nonsensitive behavior and each independent variable. In the second stage, we fit the $g(X_i, \delta)$ model to treatment group via non-linear least squares (NLS), after subtracting $f(X_i, \hat{\gamma})$ from Y_i and obtained $\hat{\delta}$, the relationship between participating in the sensitive behavior and each independent variable. Because the dependent variable in the second stage is an estimate, standard errors are calculated using bootstrapping with 1,000 replications. When there are no covariates (independent variables) introduced in the model, the estimator reduces to the difference-in-means estimator. This can be seen in model 1 of table 4, which replicates the difference-in-means estimator from above. Note that the constant is .229, indicating 22.9 percent of respondents engage in the activity. Also note that the number of observations (4,544) is about half of the true sample of firms, as the second stage is only performed on the treatment group.[11]

One of the core assumptions required for implementing the Imai method is that there is a finite set of respondent types based on the number of nonsensitive choices within the experiment (the independence of irrelevant alternatives assumption). This means that missing observations for the variable of interest (resulting in an undefined respondent type) necessitates either list-wise deletion of the observation or imputation. Beyond the statistical demands, there is a theoretical reason to impute missing data. Missing responses to sensitive questions, such as the ones evaluated here, are unlikely to be missing completely at random. Respondents do not simply flip coins and choose not to answer specific queries; rather, respondents do not answer questions that they do not understand or questions that make them uncomfortable, fear

[11] Due to space considerations first stage estimations of nonsensitive items are not reported in the paper, but are available upon request and are documented in our replication materials.

retribution, or believe that their answers may not remain confidential. The factors behind these choices are likely to be correlated with other features of the respondents' backgrounds (Jensen et al. 2010). As a result, dropping these nonresponses leads to bias. In our case, respondents' attempts to hide culpability will likely lead to an underestimation of the overall level of bribery.

To resolve this problem, we employ multiple imputation using the AMELIA software program (Honaker et al. 2009, 3). Multiple imputation allows us to predict the missing observations, using the observed information we possess from the answers of other respondents and the questions that all respondents answered. As the authors of AMELIA put it, "Multiple imputation involves imputing *m* values for each missing cell in your data matrix and creating *m* "completed" data sets. Across these completed data sets, the observed values are the same, but the missing values are filled in with a distribution of imputations that reflect the uncertainty about the missing data". Thus, if we learn that former state-owned enterprises are statistically more likely to report corruption among the firms that answered our question, AMELIA will likely impute a higher probability of corruption among former state-owned enterprises that did respond. Because we have predicted the corruption five times and created five datasets, our estimates will allow us to include the estimation of the uncertainty of the predicted values in our future analyses. AMELIA also has the benefit of being able to predict count variables, so that our dependent variable remains simply a count of how many activities a respondent engaged in. The imputed and aggregated dataset, (both domestic and foreign) includes 8,455 (7,300 domestic versus 1,155 foreign) observations for the question concerning corruption during registration and licensing. While our analysis primarily relies on the imputed data, we re-ran our core specifications to ensure that our results are not an artifact of the choice to impute.[12]

Model Specification

Our first theoretical expectation is that bribery is likely to be higher when foreign firms seek to enter sectors that are designated as Group A projects. Thus, we expect that *g*, the predicted proportion of firms paying bribes is determined by the following equation, where C represents a matrix of control variables:

$$\mathrm{g} = \hat{\delta}_0 + \hat{\delta}_1 FDI + \beta\hat{\delta}_2 Restricted + \beta\hat{\delta}_3 FDI * Restricted + C + \varepsilon.$$

[12] See table 4 models 11 and 12 for robustness results.

We begin our analysis in model 2 of table 4 by assessing the component effects of FDI and Restricted Sectors, whether an entry sector is restricted in the year a firm entered the Vietnamese market.[13] Model 3 then adds the interaction between FDI and restrictions. Omitted variable bias is a possibility, as particular types of firms may be both more likely to engage in more registration activities and be clustered in high-rent industries. This is particularly important for our comparison of foreign and domestic firms. While they are very similar within the same four-digit code, foreign firms do tend to be larger and more optimistic. To address this, we add a series of control variables for firm and provincial level characteristics in model 4. *Labor Size,* a categorical variable illustrating the employment size of the firm at the time they applied for registration, ranges from 1 to8, where 1 equals less than five employees and 8 equals greater than 1000. *Capital Size*, similarly, is an eight-point categorical variable representing the amount of registered capital for domestic firms or the operating license size for foreign firms at the time of entry (1: <$25,0000 to 8: >$25 million). Harstad and Svensson (2011) argue that large and important firms are less likely to bribe, as they can rely on lobbying to circumvent difficult regulations. About 6 percent of the domestic firms in the sample are formerly state-owned enterprises that have been privatized according to Vietnamese law. Because shares of privatized firms are offered first to employees in the enterprise, Vietnamese authorities have termed this equitization. In many cases, these formally state-owned firms have maintained the same directors and top managers and therefore have a far different relationship with bureaucrats, especially with local registration officers, than greenfield private investment. Finally, bribery may be a function of general optimism on the part of an entrepreneur, rather than the rents associated with a particular sector. Because we want to isolate the generalizable aspects of corruption, we control for firm-level optimism, by including a variable called *expand*, which measures whether the business has plans to expand its production, investment, labor force, or add to its product lines over the next two years. Model 5 adds a dummy variable for whether a province is considered to be one of Vietnam's five national-level cities (Ha Noi, Ho Chi Minh City, Hai Phong, Da Nang, and Can Tho), which are urban centers that have the same political authority as provinces. These cities face unique problems of urbanization and are also granted special administrative and regulatory privileges. Model 6, the fully specified model, adds a quadratic time trend to ensure that the relationship is not a function of trending in both corruption and restrictions over time.

Results

The results offer strong evidence for H1. In the fully specified model 6, when competing in nonrestricted sectors, MNCs are not significantly more likely than domestic firms to pay bribes during business entry. The coefficient on restricted

[13] Due to space constraints, only the results of the second-stage estimation for nonsensitive items are displayed in the table. First-stage results are presented in our appendix.

sectors, however, is significant and negative, indicating that domestic firms in restricted sectors are actually about 8 percent less likely to pay bribes than domestic firms in nonrestricted sectors. This result strongly indicates that Group A restrictions have a protectionist element (see Tanzi and Coelho 1993), raising the costs for foreign firms to enter the market, while allowing domestic firms entry without extortion. Finally, the coefficient on the interactions is substantively large and highly significant (0.27). This means that, when all variables are held constant at their mean, foreign firms attempting to enter restricted sectors have a 31 percent predicted probability of engaging in bribery, 14 percent higher than their domestic competitors in restricted sectors and 19 percent more likely to bribe than foreign firms in nonrestricted sectors.

These differences can be observed graphically in figure 4. In the first panel, we compare the difference in coefficients between foreign firms in restricted and nonrestricted sectors. In the second panel, we compare coefficients between foreign and domestic firms within the same Group A categories. The results of table 4 (model 6) are shown by the first range bar in each panel. In both cases, the differences are significantly above zero (marked with a dashed lines), providing strong confirmation for our first hypothesis.

Looking at the control variables we learn that, all else equal, large employers are less likely to pay bribes. A one unit shift in the eight-point scale leads to a 3.5 percent reduction in bribery. Although we can only speculate, it may be that they are economically important and can lobby instead of bribe or because local gatekeepers may implicitly favor firms that can help create jobs for Vietnam's young labor force, which grows by about 1.5 million individuals annually. Highly capitalized firms, by contrast, are marginally more likely to pay a bribe. This provides further evidence for the role of investment restrictions, as all projects over $10 million before the 2000 amendment to the Foreign Investment Law and $40 million after are subject to the same additional licensing step as Group A sectors. It also contrasts the sociopolitical appeal of large employers who reduce unemployment to that of large capital holders who have deeper pockets. Finally, a one-unit shift in optimism increases the chances of bribery by 4.8 percent, further demonstrating that firms with expectations of success are willing to pay more.

Robustness Tests

Imai's two-stage NLS estimator is a major empirical breakthrough, but other alternatives exist. To ensure that our results are not an artifact of modeling choices, we developed several sensitivity tests. First, model 7 replaces the quadratic time trend with year fixed effects, knocking out all over-time variation and allowing us to simply compare restricted and unrestricted sectors within a given year. Model 8 addresses the fact that most business registration takes place at Departments

of Planning and Investment (DPIs) located in Vietnam's 63 provinces. Because it is possible that corruption may be associated with specific provincial activities that are correlated with firm-level features, such as size or industry type, we add provincial-fixed effects in model 8 to ensure that our results survive a within-province comparison. Both of these fixed-effect estimators are calculated using ordinary least squares (OLS), because of the well-known biases associated with fixed effects in maximum-likelihood estimations. In both cases, the substantive effects of FDI, restrictions, and the interaction are nearly identical to the fully specified model 7.

Model 8 offers a truncated estimation of bribery in the second stage, where negative values in the dependent variable are rounded to zero. This test is necessary, because the Imai (2011) approach of subtracting the predicted number of predicted nonsensitive items (*f*), from each the total number of activities (*g*), for treatment firms can lead to a predicted number of activities for treatment firms that is less than zero (Glynn 2010). That is, the number of nonsensitive activities for predicted firms is greater than the total number of activities (including bribery) that it actually reported. Clearly, this is nonsensical. On the other hand, as Glynn (2010) notes, the truncated estimator is positively biased. Without control variables, the estimated total bribery during registration using the truncated estimator is 38 percent, sixteen points higher than the difference-in-means estimator. Thus, the marginal effect of the core interaction term is significantly smaller, but this is simply a function of the biased truncation. Most importantly, we find that the truncated estimator delivers the same substantive conclusions; bribery for MNCs in restricted sectors is significantly higher than for their domestic competitors and other MNCs.

Model 10 applies the algorithm piecewise estimator suggested as an alternative specification by Glynn (2010: 13). In this approach, we run separate *logit* models predicting the probability of a firm answering a specific number of items (k) in both the control and treatment group. For instance, a model is run for the probability of a firm answering one item. Afterwards, we calculate the curve formed by the differences in the probability estimations for treatment and control firms. This process is repeated for all possible values in the question. Finally, the difference curves are added to form a final K curve, which summarizes the overall prediction of bribery for each observation. Standard errors are calculated through bootstrapping. Using this approach yields almost the exact results as for the core variables with two exceptions. Bribery by MNCs in nonrestricted sectors appears to be 3 percent smaller and standard errors are uncomfortably small, leading to nearly universal statistical significance of the covariates.

Finally, models 11 and 12 replicate the difference-in-means estimation and fully specified model using non-imputed data. Here, once again, our overall substantive conclusions are confirmed. Without imputation, however, we appear to underestimate the proportion of MNCs participating in bribery in nonrestricted sectors.[14]

Hypothesis 2: The Impact of Removing Restrictions Over Time

Table 5 picks up the above analysis, but focuses on the over-time effect of reducing bribery in two ways. First in models 1 through 3, we look at the difference in results by re-running our analysis before and after WTO admission. Model 1 includes the full set of firms which registered before WTO admission, while model 2 compares only the first three years prior to WTO entry (2004–06) to eliminate firms which registered in the early years of Vietnam's reform era and allow for a more balanced comparison. Next, in model 4, we introduce four-digit ISIC fixed effects, so that we are only comparing firms within the most highly disaggregated sector. Controlling for all conceivable structural features that might differentiate firms in that sector, the measure of restrictions will pick up the average effect of removing restrictions over time. Ideally, we would compare the exact same firms over time using panel data, but the UCT questions were only asked in the most recent version of the survey. Models 5, 6, and 7 offer robustness tests, employing truncated, piecewise, and non-imputed estimations.

First in models 1 through 3, we find that the key results discovered in table 4—a lower probability of bribery by FIEs in nonrestricted sectors; and a higher probability of bribery in restricted sectors—are most pronounced before WTO accession. As figure 4 shows, the predicted probability of bribery for foreign firms was 37 percent in restricted sectors before WTO entry, 29 percent in the years just before WTO entry, and only 13 percent afterwards. In the years after WTO entry (2007–10), the impact of domestic treatment for MNCs seems to have led to a convergence between domestic and foreign firms. This can be seen clearly by the lack of significant differences in the fourth range bar of figure 4. The coefficients retain the same signs, but the magnitude of the effects is much smaller and not significantly different from zero.

For H2, the effect of the WTO is troubling, as it appears that WTO accession influenced bribery in ways beyond simply the removal of restricted sectors. After all, the bribery within the sectors that remain restricted declined as well, which

[14] One concern with our analysis is our blunt treatment of foreign investors. Foreign firms differ in their country of origin, the legal form of their mode of entry into Vietnam, and whether they chose to avail themselves of special legal mechanisms meant to facilitate investment and reduce corruption, such as licensing within investment zones. If these features are correlated with the probability of investing in restricted sectors, we could be confusing the effect of high rents with investor type. Although space considerations prohibit reporting the results, appendix 4 disaggregates the results by investor type. Our findings confirm that bribe propensity increases for foreign investors in restricted sectors is not an artifact of a particular investor type or policy choice being correlated with restricted sectors. We find that firms from OECD countries are 3 percent less likely to bribe than other home countries in aggregate. This effect is entirely driven by reduced bribery in restricted sectors (-40 percent), as OECD origin actually has a slight positive effect in nonrestricted sectors.

is not what our theory anticipated. The most likely explanation is that bribery from previous time periods increased entry into those sectors and reduced the rents available in restricted sectors. The WTO results do not offer a clear-cut finding on the effect of removing restrictions. Although intriguing, we should be cautious about these conclusions, as the choice to enter WTO was not exogenous and cannot be separated satisfactorily from domestic reforms taking place in the economy during the exact same time period.

To address H2 more directly, we turn to a fixed-effects analysis in model 4, where we study the removal of restrictions within a particular four-digit ISIC code. Here, we find significant support for H2—removing restrictions does have a significant impact on the propensity of MNCs to pay bribes. In years where a product or service faced restrictions, MNCs were more likely to pay bribes. The 0.125 coefficient indicates that foreign firms facing Group A restrictions pay 12.5 percent more than firms in the same sector after those restrictions were lifted. Since the only variation in Group A restrictions is longitudinal, and because restrictions are always removed but never newly created, we can interpret the inverse of the coefficient (-0.125) as the effect of removing restrictions. Interestingly, reducing the protections for domestic firms had the opposite effect. The rate of bribery among domestic firms, now suddenly subject to increased foreign competition, actually increased by an average of 14.7 percent. This may explain why the Vietnamese analysts, who primarily cite domestic incidents, have observed an uptick in corruption. While reforms have changed the way foreign firms gain access to the Vietnamese market they have not changed local bureaucrats who depend on bribe extortions. As in other countries, like China, which bias policy decisions to benefit foreign investors (Huang 2008), emerging domestic entrepreneurs may in fact be becoming more attractive targets for extortion.

In short, the results of table 5 offer mixed conclusions for Hypothesis 2. While opening up to foreign competition does reduce the propensity for MNCs to bribe, it compels their domestic competitors within the same sectors to increase their potential to bribe. Certainly more research is necessary to understand this unanticipated finding.

7. Concluding thoughts on FDI and Corruption

In this paper, we have sought to enhance the literature linking foreign capital flows to changes in corruption by addressing the major methodological shortcoming in the literature: measurement error in corruption, which is significantly correlated with the independent variables under investigation. We suggest that previous findings linking openness to less corruption are hard to interpret, as the merits often attributed to openness may simply result from the fact that FDI and trade

are attracted to the same types of institutions that produce lower levels of perceived corruption. Using the UCT technique, we present the first empirical findings of this relationship that are divorced of such spurious correlation. In addition, our empirical design employs both foreign and domestic firms to address whether openness has an independent effect on corruption or simply adjusts to local norms and bribe schedules. We find over the entire period of investigation 22.9 percent of operations in Vietnam pay bribes during the registration period, and that corruption appears to have declined over time in general, as those hypothesizing positive effects of foreign capital inflows on corruption might expect.

Our within-country firm-level design allows us to eliminate sociocultural factors and institutional differences as the source of corruption, as these factors did not vary dramatically over the period and changed very little upon Vietnam's WTO accession. Our focus on actual firm behavior further removes the possibility that results are derived from inaccurate perceptions. Consequently, this study demonstrates in a limited way that corruption is a nuanced activity that, like other business activities, is a two-way street where behavior is dictated by the expected gains from the activity for both parties. It is not simply an additional tax on doing business. Understanding this feature can help us devise more targeted policy interventions for reducing corruption in Vietnam and other emerging markets. We contribute to this discussion by using a dynamic measure of competition which is specifically associated with entry into a market rather than a subjective measure sensitive to all sorts and stages of malfeasance. By doing so, we offer a more complete account of how changes in the market influence corrupt activities. Similarly, by focusing on market entry we can make more confident conclusions about how competition affects the corruption rate among new entrants, such as foreign-invested enterprises. Most importantly, we demonstrate the nefarious impact of entry restrictions on corruption, providing clear evidence that entry barriers provide strong incentives for investors to buy entry and for government officials to sell access to these sectors.

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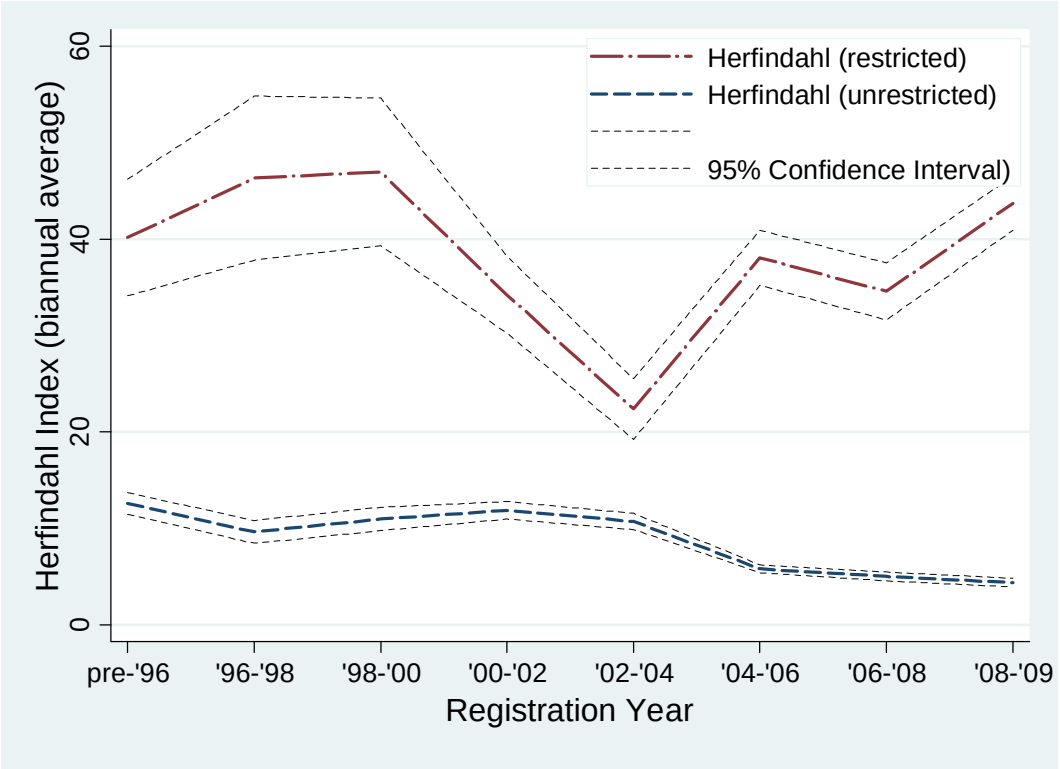
Figure 1 Herfindahl Indices for Restricted and Nonrestricted Sectors



Note: Herfindahl-Hirschman Index ($HHI = \sum_{i=1}^{N} S_i^2$), where S represents a particular firm's share of sector-level revenue. Commonly used in antitrust analysis as a measure of market power, HHIs range from 0 to 100. A sector with concentration above 25 represents a highly concentrated sector, where firms have the ability to distort competition and charge monopoly rents. Restricted sectors are those listed as Group A projects in Vietnam's Foreign Investment Laws, Common Investment Law, US Bilateral Trade Agreement, and World Trade Organization Accession Agreement. Group A projects require special approval from the Prime Minister's Office (See table 1 for a complete listing).

Figure 2 FDI Attraction Over Time

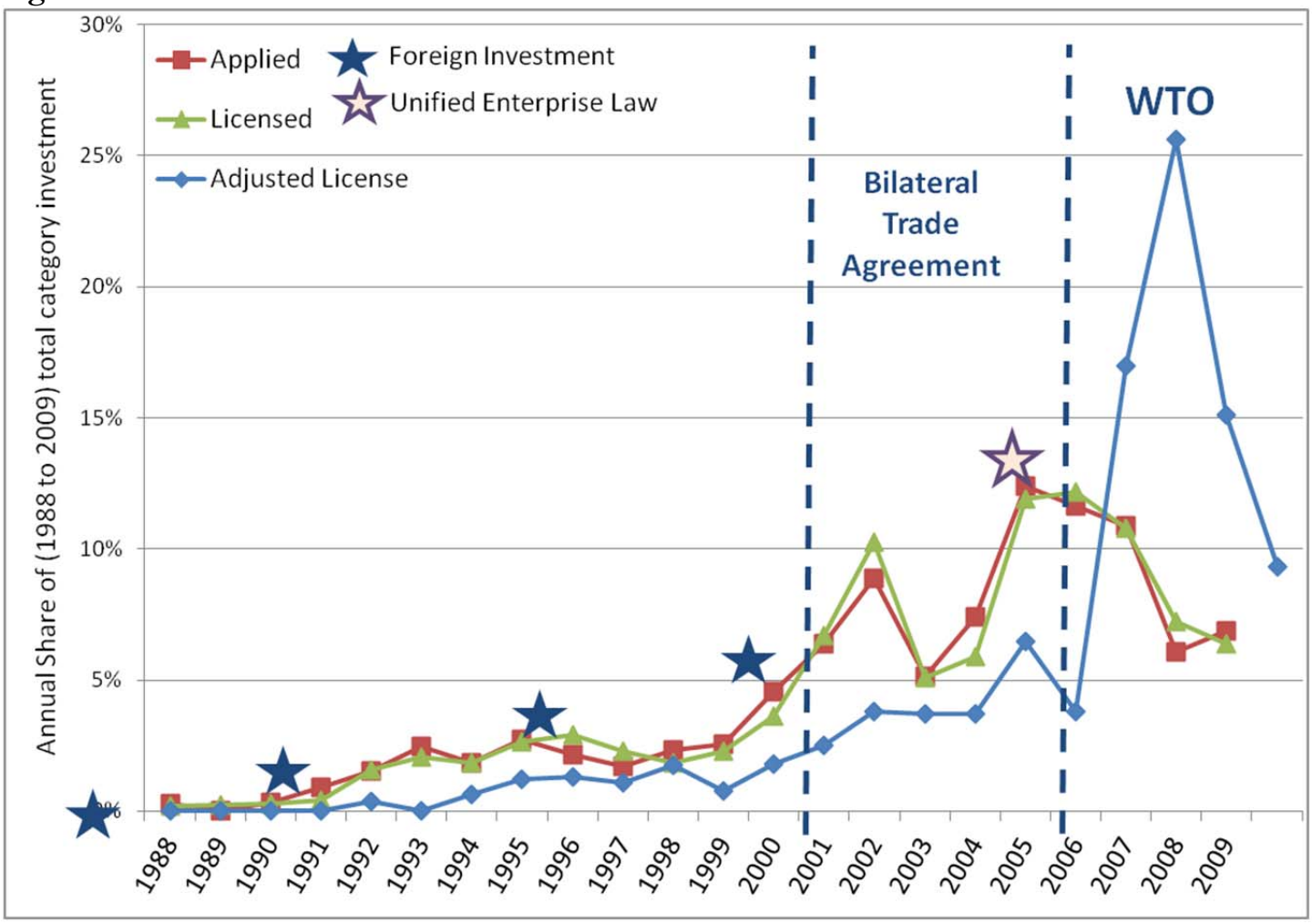
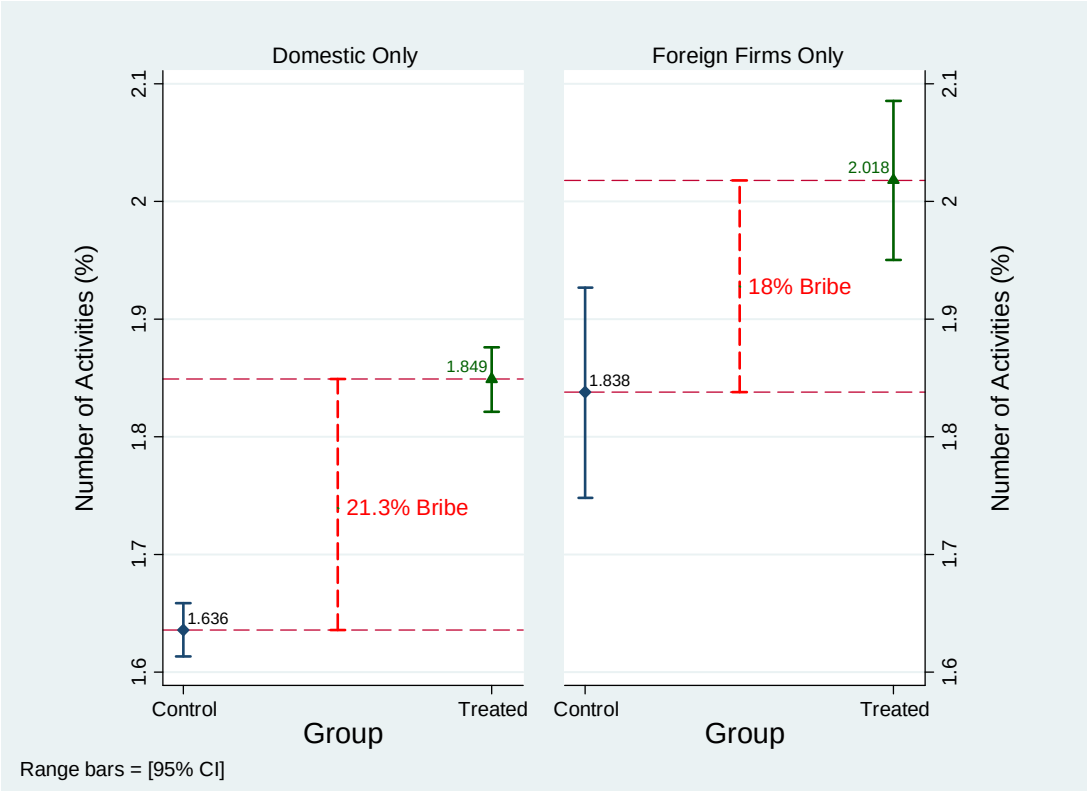
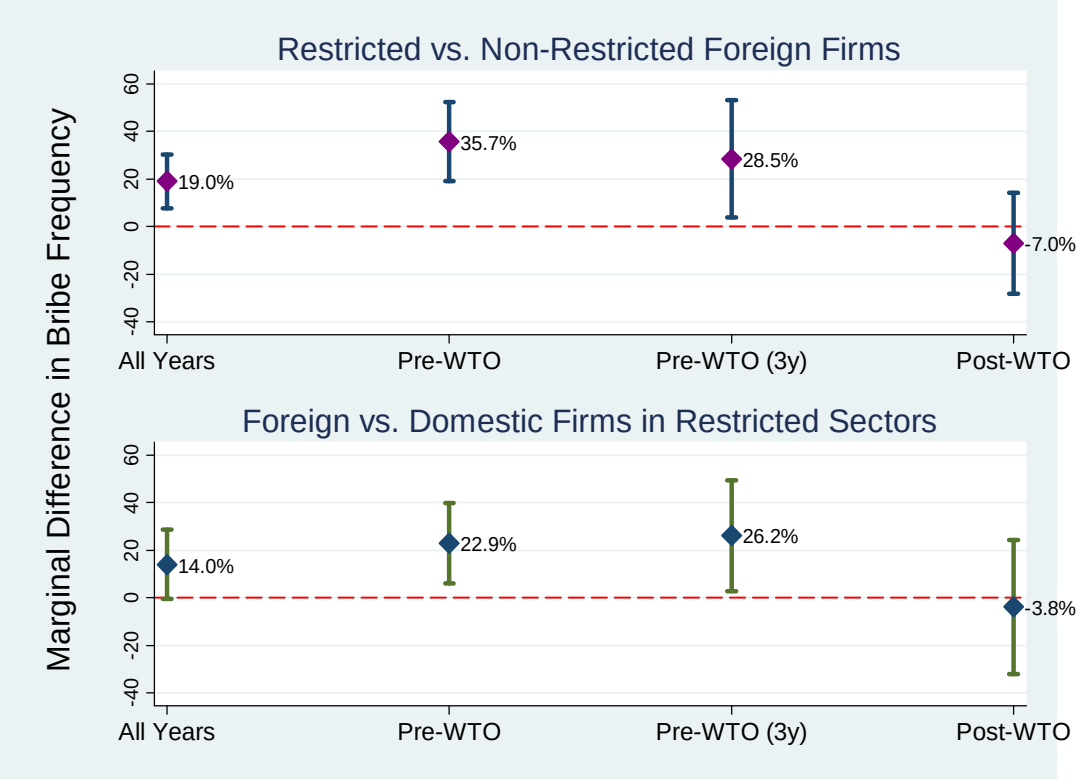


Figure 3 Propensity to Bribe During Registration



Note: Diamonds represent the mean score for the control group, triangles depict the mean score for the treatment group, and range bars depict confidence intervals. The difference-in-means in a list question depicts the proportion of respondents engaging in the sensitive activity.

Figure 4 Differences in Bribe Frequency
(By foreign firms, restricted sectors, and WTO entry)



Note: Diamonds represent the mean difference in coefficients between the two groups and range bars depict confidence intervals. Zero is shown by the dashed line. Thus, a range bar above zero indicates a statistically significant difference. Panel 1 shows the marginal difference between foreign firms in Group A restricted sectors and foreign firms in unrestricted sectors. Panel 2 shows the marginal difference between foreign and domestic firms operating in the same four-digit sector. The first set of range bars, labeled "All years" is derived from table 4 (model 6). It includes all respondents between 1990 and 2009. The second set of range bars ("Pre-WTO") are taken from table 5 (model 1) and includes all respondents that entered Vietnam before 2007. "Pre-WTO (3y)" limits the pre-WTO period to firms which entered after 2004 and before 2007 (table 5, Model 2), so that the time period studied is comparable to the three years after WTO entry shown by the "Post-WTO" range bar (table 5, model 3). The figure demonstrates that foreign firms in restricted sectors are significantly more likely to bribe than their nonrestricted foreign counterparts and domestic firms in the same sectors. Nevertheless, this tendency has declined since 2007.

Table 1 Group A Sectors Allowing Investment but Requiring Special Licensing Procedures

ISIC Revision 3 Code	As of 1996 Restricted sectors	Pre-2000	2000-2005 (USBTA era)	2005-2007 (Common investment law)	2007-2009 (WTO era)	After 2009 (WTO phase-in period)
501	Catching aquaculture	YES	YES	YES	X	X
1110	Extraction of crude and gas	YES	YES	YES	YES	YES
1020	Mining coal and ignite	YES	YES	YES	YES	YES
1320	Mining of metal ores	YES	YES	YES	YES	YES
1400	Mining and quarrying	YES	YES	YES	YES	X
1542	Manufacture of sugar and alcohol	YES	YES	YES	YES	YES
1600	Manufacture of tobacco	YES	YES	YES	YES	YES
2220	Publishing of newspapers, journals	YES	YES	YES	YES	YES
2330	Manufacture of chemicals	YES	YES	YES	YES	YES
2423	Manufacture of pharmaceuticals	YES	YES	YES	YES	X
2695	Manufacture of cement	YES	YES	X	X	X
2429	Manufacture of refined petroleum	YES	YES	YES	YES	YES
4010	Production of electricity	YES	YES	X	X	X
4520	Infrastructure construction	YES	YES	YES	X	X
5000	Sale of motor vehicles	YES	YES	YES	YES	X
5100	Wholesale and commission trade	YES	YES	YES	YES	X
5219	Retail trade	YES	YES	YES	YES	X
5510	Hotels	YES	YES	YES	X	X
6021	Land transport and railways	YES	YES	YES	YES	YES
6120	Sea and inland water transport	YES	YES	YES	YES	YES
6200	Air transport	YES	YES	YES	YES	YES
6302	Transport and travel activities	YES	YES	YES	YES	YES
6420	Post and telecomm	YES	YES	YES	YES	X
6500	Financial intermediation	YES	YES	YES	X	X
6600	Insurance and pension funding	YES	YES	YES	X	X
6700	Auxiliary financial activities	YES	YES	YES	X	X
7000	Real estate activities	YES	YES	YES	X	X
7290	Computer related activities	YES	YES	YES	YES	YES
7300	Research and development	YES	YES	YES	X	X
7412	Legal, accounting, and auditing	YES	YES	YES	YES	X
7510	Public security and defense	YES	YES	YES	YES	YES
8090	Adult and other education	YES	YES	YES	YES	X
8500	Health services	YES	YES	YES	X	X
9000	Sewage and refuse disposal	YES	YES	YES	YES	X
9249	Motion picture, TV, entertainment	YES	YES	YES	YES	YES

USBTA = United States Bilateral Trade Agreement
ISIC = International Standard Industrial Classification
WTO = World Trade Organization
Source: Various years of Vietnamese Foreign Investment Law available at <http://www.vietnamlaws.com/>

Table 2 Restrictions on Investment Entry and Monopoly Rents

Dependent Variables/	Herfindahl-Hirschman Index					Profit Margin					1st Stages	
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Restricted Sector	11.190***	10.338***	10.672***	6.894***	8.632***	2.167***	2.817***	2.873***	0.749	1.214*		
	(1.519)	(1.467)	(1.425)	(2.381)	(2.315)	(0.482)	(0.526)	(0.529)	(0.727)	(0.735)		
Capital/Labor (ln)		-2.047***	1.523	-0.343	0.567		1.352***	1.257***	1.510***	1.563**	-0.078***	-0.085***
		(0.618)	(1.061)	(0.672)	(1.009)		(0.268)	(0.475)	(0.339)	(0.625)	(0.019)	(0.029)
State Owned Investment Share (lag)											0.002***	0.002***
											(0.001)	(0.001)
Constant	8.561***	9.930***	18.082***	8.666***	2.931	4.272***	3.302***	1.827**	3.365***	3.256***	0.196***	0.135**
	(0.379)	(0.533)	(2.159)	(0.732)	(2.065)	(0.187)	(0.241)	(0.731)	(0.345)	(1.000)	(0.032)	(0.063)
Year FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes	No	Yes
Observations	1,126	1,125	1,125	699	699	1,310	1,108	1,108	694	694	699	699
R-squared	0.087	0.093	0.147	0.034	0.091	0.021	0.047	0.054	0.028	0.036	0.039	0.053
RMSE	15.81	15.58	15.16	13.98	13.63	6.482	6.433	6.429	6.040	6.046	0.403	0.402
Cragg Donald F-Statistic											10.94	9.876
Cragg Donald p-value											0.0158	0.0144

Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). The two dependnet variables are average Herfindal score and average profit margin reported in a four-digit sector year. Models 1 & 6 report the bivariate correlation; Models 2 & 7 add a time variant control for market structure; Models 3 & 8 add registration year dummies; and Models 4, 5, 9, and 10 emply two-stage least squares where restrictions are instruments by state owned investment share. Models 11 and 12 display the first stage models

Table 3 Balance Tests of Key Indicators of Control and Treatment Group

A. Domestic Private Entrprises (N = 7138)									
Covariates	**1. Control (N = 3622)**		**2. Treatment (N = 3731)**		**3. Difference in Means**		**4. Treatment Correlation (N= 6074)**		
Firm-Level Attributes	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**P-Value**	**T-Score**	**Cofficient**	**Std. Err.**	**P-Value > |z|**
Labor Size Category (1 - 8)	1.029	0.168	1.029	0.168	0.991	0.011	0.003	(0.043)	0.938
Capital_Size Category (1 - 8)	2.334	1.219	2.350	1.176	0.568	-0.571	0.003	(0.006)	0.665
SOE History (0 - 1)	0.062	0.241	0.069	0.254	0.224	-1.217	0.044	(0.032)	0.171
Household Hisotry (0 - 1)	0.642	0.479	0.646	0.479	0.701	-0.384	0.009	(0.015)	0.561
Owner History with State (0 - 1)	0.099	0.298	0.093	0.290	0.396	0.850	-0.018	(0.022)	0.420
Owner History with SOE (0 - 1)	0.266	0.442	0.293	0.455	0.010	-2.586	0.042	(0.015)	0.005
Sole Proprietorship	0.332	0.471	0.331	0.471	0.978	0.028			
JointStock Company	0.189	0.391	0.191	0.393	0.257	0.872	-0.011	(0.022)	0.618
Limited Liability Company	0.467	0.499	0.464	0.499	0.801	0.252	-0.006	(0.016)	0.721
Other Domestic Company	0.004	0.064	0.007	0.083	0.104	-1.628	0.133	(0.080)	0.113
Sector-Level Attributes									
Sectoral Profit Margin	4.710	7.969	4.946	8.263	0.257	-1.134	0.001	(0.001)	0.425
Agriculture (0 - 1)	0.033	0.178	0.043	0.204	0.015	-2.429			
Mining (0 - 1)	0.017	0.128	0.016	0.124	0.728	0.348	-0.084	(0.059)	0.159
Manufacturing (0 - 1)	0.174	0.379	0.162	0.368	0.149	1.445	-0.112	(0.038)	0.004
Construction (0 - 1)	0.092	0.289	0.096	0.294	0.554	-0.592	-0.064	(0.041)	0.118
Services and Trade (0 - 1)	0.685	0.465	0.684	0.465	0.908	0.115	-0.088	(0.035)	0.013
Spatial and Infrastructure Controls									
Telephones Per Capita	0.277	0.350	0.276	0.354	0.935	0.082	0.002	(0.025)	0.945
Logged Distance from Hanoi and HCMC	4.780	1.647	4.685	1.741	0.017	2.392	-0.013	(0.005)	0.012
Regional Position (1 - 5)	3.289	1.773	3.272	1.794	0.668	0.429	0.001	(0.004)	0.801
Industrial Zone (0 - 1)	0.096	0.295	0.090	0.286	0.374	0.889	-0.006	(0.023)	0.792
1StopShop (0 - 1)	0.620	0.485	0.607	0.489	0.223	1.218	-0.022	(0.013)	0.106
National Cities (0 - 1)	0.150	0.357	0.159	0.366	0.270	-1.103	-0.008	(0.029)	0.788
B. Foreign Invested Enterprises (N = 1124)									
Covariates	**1. Control (N = 320)**		**2. Treatment (N = 841)**		**3. Difference in Means**		**4. Treatment Correlation (N= 6074)**		
Firm-Level Attributes	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**P-Value**	**T-Score**	**Cofficient**	**Std. Err.**	**P-Value > |z|**
Labor Size Category (1 - 8)	3.909	2.286	3.697	2.129	0.137	1.489	-0.003	(0.008)	0.678
Capital_Size Category (1 - 8)	5.293	1.412	5.316	1.496	0.830	-0.215	0.003	(0.012)	0.816
100% Foreign Invested	0.819	0.386	0.829	0.377	0.688	-0.402			
Joint Venture	0.106	0.309	0.108	0.311	0.924	-0.096	0.076	(0.058)	0.175
Other Foreign Invested Company	0.075	0.264	0.063	0.243	0.464	0.733	0.070	(0.073)	0.376
Sector-Level Attributes									
Sectoral Profit Margin	4.419	7.591	4.384	7.250	0.948	0.065	-0.001	(0.002)	0.832
Agriculture (0 - 1)	0.047	0.212	0.029	0.167	0.122	1.550			
Mining (0 - 1)	0.003	0.056	0.011	0.103	0.212	-1.248	0.207	(0.089)	0.169
Manufacturing (0 - 1)	0.222	0.416	0.197	0.398	0.355	0.925	0.009	(0.090)	0.925
Construction (0 - 1)	0.063	0.242	0.073	0.260	0.549	-0.599	0.071	(0.091)	0.465
Services and Trade (0 - 1)	0.666	0.473	0.691	0.462	0.409	-0.825	0.085	(0.090)	0.336
Spatial and Infrastructure Controls									
Telephones Per Capita	0.214	0.208	0.264	0.321	0.010	-2.569	0.127	(0.100)	0.203
Logged Distance from Hanoi and HCMC	3.132	2.133	3.104	2.171	0.845	0.196	-0.003	(0.015)	0.835
Regional Position (1 - 5)	3.247	1.893	3.247	1.899	0.258	1.132	-0.005	(0.009)	0.582
Industrial Zone (0 - 1)	0.497	0.501	0.482	0.500	0.641	0.466	-0.047	(0.035)	0.176
1StopShop (0 - 1)	0.825	0.381	0.891	0.312	0.003	-3.004	0.168	(0.054)	0.001
National Cities (0 - 1)	0.334	0.473	0.385	0.487	0.109	-1.604	0.035	(0.072)	0.632

Panel A asseses the balance of domestic enterprises, Panel B the balance of foreign firms. The first column depicts descriptive statistics of the control group, the second column depicts the treatment group. Column 3 tests whether there are significant difference in means on key covariates. Finally, the fourth column results from a probit regression of treatment on all covariates at once to assess the joint probability of selection.

Table 4Correlates of Corruption during Business Entry

Dependent Variable: Difference between the activities reported by treatment group and predicted number of non-sensitive activities of control group.	Main Models						Robustness Tests					
	Diff-in-Means	Baseline	Interaction	Controls	City	Time Trend	Year FE	Province FE	Truncated	Piecewise	No Impute	No Impute
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Foreign Enterprise		-0.044	-0.080*	-0.090	-0.079	-0.128	-0.139*	-0.051	-0.031	-0.151***		-0.206**
		(0.035)	(0.042)	(0.064)	(0.068)	(0.082)	(0.083)	(0.067)	(0.057)	(0.045)		(0.103)
Restricted Industry		-0.053**	-0.067**	-0.070***	-0.071***	-0.078***	-0.070***	-0.079***	-0.060***	-0.068***		-0.062*
		(0.025)	(0.027)	(0.025)	(0.027)	(0.027)	(0.026)	(0.027)	(0.019)	(0.014)		(0.035)
FDI*Restricted			0.199***	0.257***	0.275***	0.269***	0.264***	0.279***	0.147**	0.223***		0.198*
			(0.074)	(0.061)	(0.065)	(0.080)	(0.083)	(0.060)	(0.072)	(0.059)		(0.106)
Labor Size				-0.030**	-0.033**	-0.035**	-0.030	-0.032**	-0.032***	-0.026**		0.004
				(0.014)	(0.014)	(0.018)	(0.019)	(0.014)	(0.012)	(0.010)		(0.025)
Capital Size				0.024**	0.024**	0.022*	0.021	0.024**	0.021**	0.021***		0.016
				(0.010)	(0.010)	(0.012)	(0.014)	(0.010)	(0.009)	(0.006)		(0.016)
Equitized Company				0.157**	0.157**	0.096	0.100	0.166**	0.110*	0.028		0.100
				(0.069)	(0.071)	(0.077)	(0.087)	(0.071)	(0.059)	(0.036)		(0.086)
Plan to Expand Business				0.018	0.020	0.048*	0.049	0.015	0.030	0.039**		0.067*
				(0.023)	(0.023)	(0.027)	(0.031)	(0.024)	(0.021)	(0.015)		(0.040)
National-Level City					-0.050**	-0.031			-0.002	-0.051**		0.086*
					(0.025)	(0.028)			(0.031)	(0.028)		(0.046)
Time Since Registration						0.038			0.032*	0.029**		0.041
						(0.025)			(0.018)	(0.013)		(0.033)
Time Squared						-0.004			-0.003*	-0.004**		-0.005
						(0.003)			(0.002)	(0.001)		(0.004)
Constant	0.228***	0.233***	0.238***	0.191***	0.200***	0.125*	0.174***	0.193***	0.382***		0.223***	0.045
	(0.016)	(0.020)	(0.020)	(0.030)	(0.031)	(0.069)	(0.044)	(0.030)	(0.046)		(0.022)	(0.432)
Provincial FE	No	No	No	No	No	No	No	Yes	No	No	No	No
Registration Year FE	No	No	No	No	No	No	Yes	No	No	No	No	No
N	4,544	4,544	4,544	4,544	4,371	3,627	3,627	4,371	3,627	3,627	2,836	2,293
R2	-0.000	0.001	0.001	0.001	0.008	0.009	0.015	0.037	0.009		-0.000	0.010
RMSE	0.880	0.877	0.877	0.877	0.868	0.861	0.860	0.867	0.619		0.850	0.828
Log Likelihood	-5864	-5851	-5851	-5851	-5581	-4597	-4593	-5543	-3401		-3564	-2815

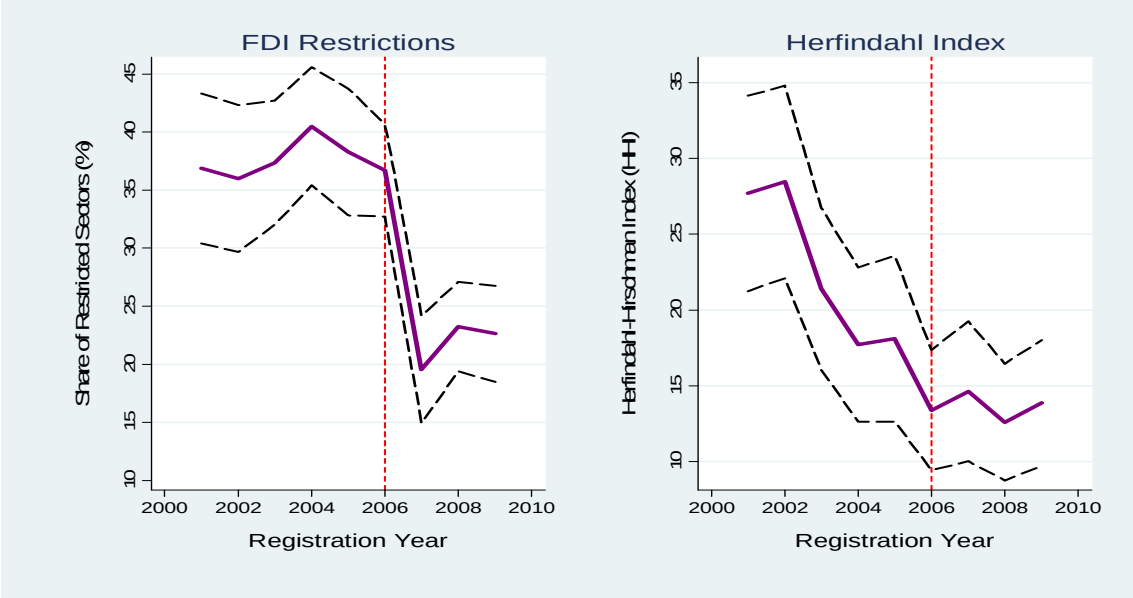
These results are derived from a two-stage model. In the first stage, the number of non-sensitive activities is regressed on the covariates for the control group using a negative binomial specification. The predicted number of non-sensitive activities is then subtracted from the total number of registration activities for the treatment group. The difference becomes the dependent variable in the second stage, which is analyzed using a Non-Linear Least Squares (NL) specification in this model. The fixed effect estimations in Models 7 and 8, however, employ OLS. Note that the number of observations (N) is the number of respondents in the treatment group. As Model 1 shows the process correctly delivers the difference-in-means estimator, indicating that the two-stage procedures yields unbiased estimates. Because the dependent variable is an estimate, standard errors are calculated are through bootstrapping procedure with 1000 repetitions (*** p<0.01, ** p<0.05, * p<0.1). Model 9 rounds all negative differences in the dependent variable to 0. Model 10 calculates the predicted bribery using the Glynn (2010) piecewise estimator. Models 11 & 12 replicate the average corruption and fully-specified models using non-imputed data.

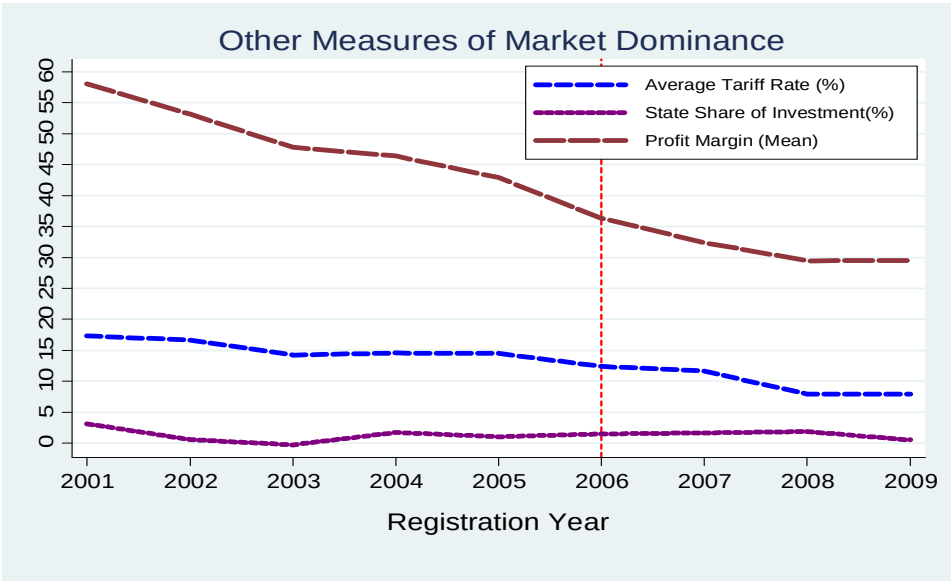
Table 5Effect of Removing FDI Restrictions over Time

Dependent Variable: Difference between the activities reported by treatment group and predicted number of non-sensitive activities	Main Models				Robustness Tests		
	Pre-WTO (All)	Pre-WTO (3y)	Post-WTO	ISIC FE	Truncated	Piecewise	No Impute
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Foreign Enterprise	-0.170*	-0.035	-0.103	-0.113	-0.046	-0.167***	-0.175
	(0.095)	(0.151)	(0.149)	(0.082)	(0.059)	(0.052)	(0.133)
Restricted Industry	-0.042	-0.012	-0.135***	-0.147**	-0.096**	-0.14***	-0.159**
	(0.042)	(0.054)	(0.050)	(0.059)	(0.046)	(0.035)	(0.073)
FDI*Restricted	0.399***	0.297**	0.065	0.125*	0.105	0.081	0.054
	(0.109)	(0.149)	(0.146)	(0.078)	(0.069)	(0.0553)	(0.122)
Labor Size	-0.045**	0.002	0.005	-0.025	-0.024	-0.02	0.010
	(0.021)	(0.042)	(0.031)	(0.027)	(0.015)	(0.0123)	(0.030)
Capital Size	0.008	0.004	0.041*	0.027*	0.025**	0.025***	0.024
	(0.015)	(0.019)	(0.023)	(0.014)	(0.011)	(0.007)	(0.024)
Equitized Company	0.089	0.048	0.091	0.111	0.128*	0.046	0.122
	(0.096)	(0.123)	(0.134)	(0.086)	(0.066)	(0.0372)	(0.095)
Plan to Expand Business	0.047	0.152***	0.041	0.064*	0.045*	0.054***	0.076
	(0.041)	(0.047)	(0.053)	(0.032)	(0.026)	(0.017)	(0.049)
National-Level City	0.085	-0.020	0.373**	0.053*	0.036	-0.051***	0.076*
	(0.097)	(0.057)	(0.166)	(0.030)	(0.023)	(0.024)	(0.040)
Time since registration	-0.007	-1.465**	-0.076*	-0.005	-0.003	0.046***	-0.007
	(0.007)	(0.597)	(0.043)	(0.003)	(0.002)	(0.0148)	(0.004)
Time squared	-0.049	0.149**	-0.007	-0.025	0.007	(-0.004)***	-0.015
	(0.043)	(0.060)	(0.042)	(0.049)	(0.046)	0.0015	(0.084)
Constant	-0.039	3.561**	-0.271**	0.067	0.356***		-0.025
	(0.317)	(1.426)	(0.135)	(0.082)	(0.060)		(0.124)
ISIS 4-Digit FE	No	No	No	Yes	Yes	Yes	Yes
N	2,059	1,251	1,568	3,587	3,587	3,587	2,281
R2	0.016	0.017	0.016	0.112	0.093		0.164
RMSE	0.866	0.885	0.853	0.859	0.624		0.828
Log Likelihood	-2620	-1616	-1970	-4429	-3282		-2698

These results are derived from a two-stage model. In the first stage, the number of non-sensitive activities is regressed on the covariates for the control group using a negative binomial specification. The predicted number of non-sensitive activities is then subtracted from the total number of registration activities for the treatment group. The difference becomes the dependent variable in the second stage, which is analyzed using a Non-Linear Least Squares (NL) specification in this model. Because the dependent variable is an estimate, standard errors are calculated through bootstrapping procedure with 1000 repetitions (*** p<0.01, ** p<0.05, * p<0.1). Model 1 & Model 2 re-run Model 7 of Table 5, but limiting the sample to before and after WTO accession. Model 3 replicates Model 7 (Table 5) but employs ISIC-4 Digit FE to analyze changes in sectors over time. Model 4 rounds all negative differences in the dependent variable to 0. Model 5 calculates the predicted bribery using the Glynn (2010) piecewise estimator. Model 6 replicates the fully-specified model (3) using non-imputed data.

Appendix 1 Changes in Market Dominance Over Time in Vietnam



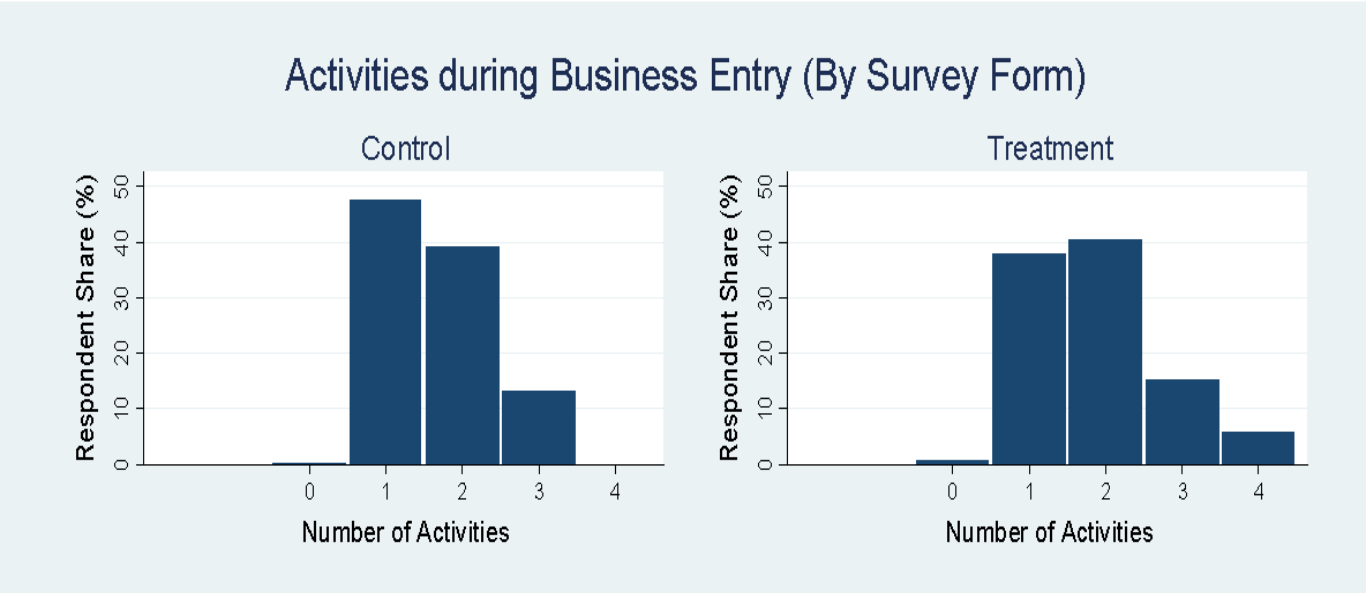


Appendix 2 Characteristics of Provincial Competitiveness Index Sample

Foreign Invested (1,155)			Domestic Enterprises (7,300)		
Legal Form of Investment	**Weighted PCI**	**GSO**	**Legal Form of Investment**	**Weighted PCI**	**Tax**
100% Foreign Directed Enterprise	84.35%	82.95%	Sole Proprietorship	16.2%	19.4%
Joint-Venture with a Vietnamese Private	4.84%	16.36%	Limited Liability	54.5%	59.1%
Joint-Venture with a Vietnamese SOE	4.55%		Joint Stock	27.6%	21.4%
Registered as a domestic company	2.52%	0.46%	Joint Stock with Shared Listed on Stock Exchange	1.1%	NA
Domestic company w/overseas VN capital	0.61%		Partnership and Other	0.7%	0.0%
Other	3.13%	0.23%			
Sector	**Weighted PCI**	**GSO**	**Sector**	**Weighted PCI**	**Tax**
Industry/Manufacturing	64.59%	59.44%	Industry/Manufacturing	30.2%	34.5%
Construction/Infrastructure Investment	4.09%	4.72%	Construction/Infrastructure Investment*		
Service/Commerce/Finance	29.33%	28.94%	Service/Commerce/Finance	64.6%	62.2%
Agriculture/Forestry/Aquaculture	2.36%	5.87%	Agriculture/Forestry/Aquaculture	4.0%	1.9%
Mining/Natural Resource Exploitation	0.86%	1.03%	Mining/Natural Resource Exploitation	1.2%	1.4%
Size of Labor Force	**Weighted PCI**	**GSO**	**Size of Labor Force**	**Weighted PCI**	**GSO**
Less than 5	2.92%	4.18%	Under 5	12.1%	23.36%
5 to 9	5.99%	6.79%	5 to 9	24.1%	35.63%
10 to 49	31.79%	29.67%	10 to 49	41.9%	33.22%
50 to 299	31.35%	30.95%	50-200	14.9%	6.11%
300 to 399	6.38%	7.64%	Over 200	7.1%	1.7%
400 to 499	7.26%	7.09%			
500 to 999	7.17%	6.88%			
1000 and over	7.13%	7.81%			
Licensed Investment Size	**Weighted PCI**	**GSO**	**Licensed Investment Size (Total Assets, BVND)**	**Weighted PCI**	**GSO**
Under 0.5 BVND ($25,000 USD)	2.52%	2.25%	Under 0.5 BVND ($25,000 USD)	10.9%	8.9%
From 0.5 to under 1 BVND ($50,000 USD)	1.39%	2.17%	From 0.5 to under 1 BVND ($50,000 USD)	17.0%	13.5%
From 1 to under 5 BVND ($250,000 USD)	15.85%	12.75%	From 1 to under 5 BVND ($250,000 USD)	42.8%	49.6%
From 5 to under 10 BVND ($500,000 USD)	8.75%	11.71%	From 5 to under 10 BVND ($500,000 USD)	12.7%	13.4%
From 10 to under 50 BVND ($2.5 Million USD)	35.14%	36.04%	From 10 to under 50 BVND ($2.5 Million USD)	11.9%	11.5%
From 50 to under 200 BVND ($10 Million USD)	23.13%	22.83%	From 50 to under 200 BVND ($10 Million USD)	4.8%	3.2%
From 200 to under 500 BVND ($25 Million USD)	7.62%	7.29%	From 200 to under 500 BVND ($25 Million USD)		
Above 500 BVND ($25 Million USD)	5.61%	4.97%	Above 500 BVND ($25 Million USD)		
Major Customer	**Weighted PCI**	**GSO**	**Major Customer**	**Weighted PCI**	**GSO**
Export Directly or Indirectly	55.00%	66.8%	Export Directly or Indirectly	11.7%	NA
Foreign Individuals or Companies in Vietnam	24.51%	16.2%	Foreign Individuals or Companies in Vietnam	9.9%	NA
Sold domestically to SOE	3.52%	2.8%	Sold domestically to SOE	14.8%	NA
Sold domestically to state agency	1.42%	0.9%	Sold domestically to state agency	20.3%	NA
Sold domestically to private individuals	15.55%	13.0%	Sold domestically to private individuals	43.4%	NA

This table compares data on the nationally weighted sample of domestic and foreign firms from the PCI to the data collected from the National Tax Authority (Tax) and General Statistical Office (GSO) Enterprise Census. Weighted PCI is the PCI survey sample, but weighted by provincial share of enterprises to create a nationally representative sample. General Statistical Office (GSO) Data available at (www.gso.gov.vn) and GSO Enterprise Census (2009) available at (http://www.gso.gov.vn/default_en.aspx?tabid=515&idmid=5&ItemID=9775). NA = Not Available for 2010. *Tax Authority data does not disaggregate construction firm from manufacturing. The PCI data records 15% construction.

Appendix 3 Frequency of Responses to Experimental Questions



Appendix 4 Type of FDI and Bribe Propensity

Dependent Variable: Difference between the activities reported by treatment group and predicted number of non-sensitive activities of control group.	Main Models				Robustness Tests		
	Wholly Owned	OECD	IZ	All	Truncated	Piecewise	No Impute
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Restricted Industry	0.265	0.331***	-0.046	0.373	0.284	0.357	0.213
	(0.235)	(0.117)	(0.123)	(0.276)	(0.201)	(0.78)	(0.198)
Wholly Owned FIE	-0.264**			-0.185	-0.109	-0.130	-0.392**
	(0.119)			(0.117)	(0.087)	(0.206)	(0.171)
Wholly*Restricted	-0.305			-0.265	-0.206	-0.391	-0.139
	(0.262)			(0.259)	(0.174)	(0.708)	(0.227)
OECD Origin		0.106		0.119*	0.052	0.077	0.126
		(0.067)		(0.070)	(0.046)	(0.053)	(0.104)
OECD*Restricted		-0.381*		-0.405*	-0.201	-0.224	-0.424*
		(0.223)		(0.226)	(0.157)	(0.616)	(0.261)
Industrial Zone			-0.244***	-0.254***	-0.091	-0.218***	-0.300***
			(0.087)	(0.089)	(0.065)	(0.079)	(0.094)
IZ*Restricted			0.413	0.126	-0.105	0.33	0.481
			(0.318)	(0.328)	(0.187)	(0.776)	(0.357)
Labor Size	0.014	0.017	0.014	0.009	0.002	0.004	0.017
	(0.017)	(0.018)	(0.018)	(0.018)	(0.012)	(0.014)	(0.022)
Capital Size	-0.002	0.001	0.025	0.023	0.018	0.015	0.014
	(0.033)	(0.033)	(0.031)	(0.033)	(0.023)	(0.02)	(0.035)
Plan to Expand Business	-0.128	-0.086	-0.090	-0.112	-0.020	-0.194**	-0.037
	(0.084)	(0.084)	(0.087)	(0.093)	(0.054)	(0.058)	(0.107)
National-Level City	0.168	0.136	0.120	0.096	0.091	0.098	0.055
	(0.133)	(0.143)	(0.144)	(0.143)	(0.092)	(0.154)	(0.166)
Time since registration	0.117	0.104	0.109	0.102	0.088	0.15**	0.104
	(0.103)	(0.107)	(0.107)	(0.111)	(0.074)	(0.07)	(0.113)
Time Squared	-0.024**	-0.023**	-0.023**	-0.023**	-0.015**	-0.026***	-0.020*
	(0.010)	(0.011)	(0.011)	(0.011)	(0.007)	(0.007)	(0.012)
Constant	0.420	0.091	0.176	0.365	0.454*		0.651
	(0.406)	(0.400)	(0.403)	(0.439)	(0.268)		(0.432)
N	523	523	523	523	523	523	414
R2	0.105	0.095	0.099	0.118	0.077		0.103
RMSE	0.975	0.978	0.978	0.976	0.656		0.976
Log Likelihood	-723.7	-725.5	-725.2	-722.2	-514.8		-570.1

These results are derived from a two-stage model. In the first stage, the number of non-sensitive activities is regressed on the covariates for the control group using a negative binomial specification. The predicted number of non-sensitive activities is then subtracted from the total number of registration activities for the treatment group. The difference becomes the dependent variable in the second stage, which is analyzed using a Non-Linear Least Squares (NL) specification in this model. Because the dependent variable is an estimate, standard errors are calculated through bootstrapping procedure with 1000 repetitions. (*** p<0.01, ** p<0.05, * p<0.1). Model 5 rounds all negative differences in the dependent variable to 0. Model 6 calculates the predicted bribery using the Glynn (2010) piecewise estimator. Model 7 replicates the fully-specified model using non-imputed data.