Prospectus: The effect of corruption on FDI technological spillover

Anh Le

October 15, 2015

1 Empirical Puzzle

In recent decades, foreign direct investment (FDI) global flow has steadily increased, rising to over $1.5 trillion dollars in 2014. For developing countries, FDI flow is also remarkably robust to global downturn, leading to enthusiastic endorsement by major international organizations as a key factor to economic development (Figure 1).[1] This assumption is also shared widely within political science, where much of the literature starts with the assumption that countries want to seek FDI for its many benefits. The question that these works focus on is *how* countries can attract FDI, not *whether* they want to do so (Jensen 2003; Li and Resnick 2003; Li 2006; Ahlquist 2006).[2]

Underlying this mode of thinking is the assumption that FDI brings various benefits to developing countries, including capital and employment. However, the most important promise that FDI holds to growth is the spillover of productivity between foreign firms and domestic firms. This can happen if local firms hire workers that were trained in a foreign firms, improve productivity through backward and forward linkages, or imitate foreign technology. According to growth theory, it is FDI's spillover, not capital or employment, that brings the technological innovation that is requisite for economic growth (Findlay 1978). In this view, FDI is also a public good, providing spillover benefits to the local firms in ways that foreign firms do not take into account in their private calculations. This provides the justification for countries' using investment incentives to rectify the undersupply of FDI, closing the gap between private and social returns.

Despite this prevailing view, there is little conclusive evidence of FDI having a positive effect on growth (Nair-Reichert and Weinhold 2001; Carkovic and Levine 2002) or poverty reduction (Guerra et al. 2009) (Figure 2). A substantial literature has developed to explain this puzzle, concluding that the growth-enhancing and spillover effect of FDI is conditional on the absorptive capacity of local firms. Cross-nationally, scholars find that FDI is more likely to have a positive growth effect when the technological gap between the local and foreign firms are small (Nunnenkamp and Spatz 2004) and when host countries have strong financial

[1] http://www.imf.org/external/pubs/ft/fandd/1999/03/mallampa.htm, http://www.weforum.org/reports/foreign-direct-investment-key-driver-trade-growth-and-prosperity-case-multilateral-agreement

[2] Two recent exceptions are Pinto (2013); Pandya (2013), which are the first to investigate the demand for FDI.

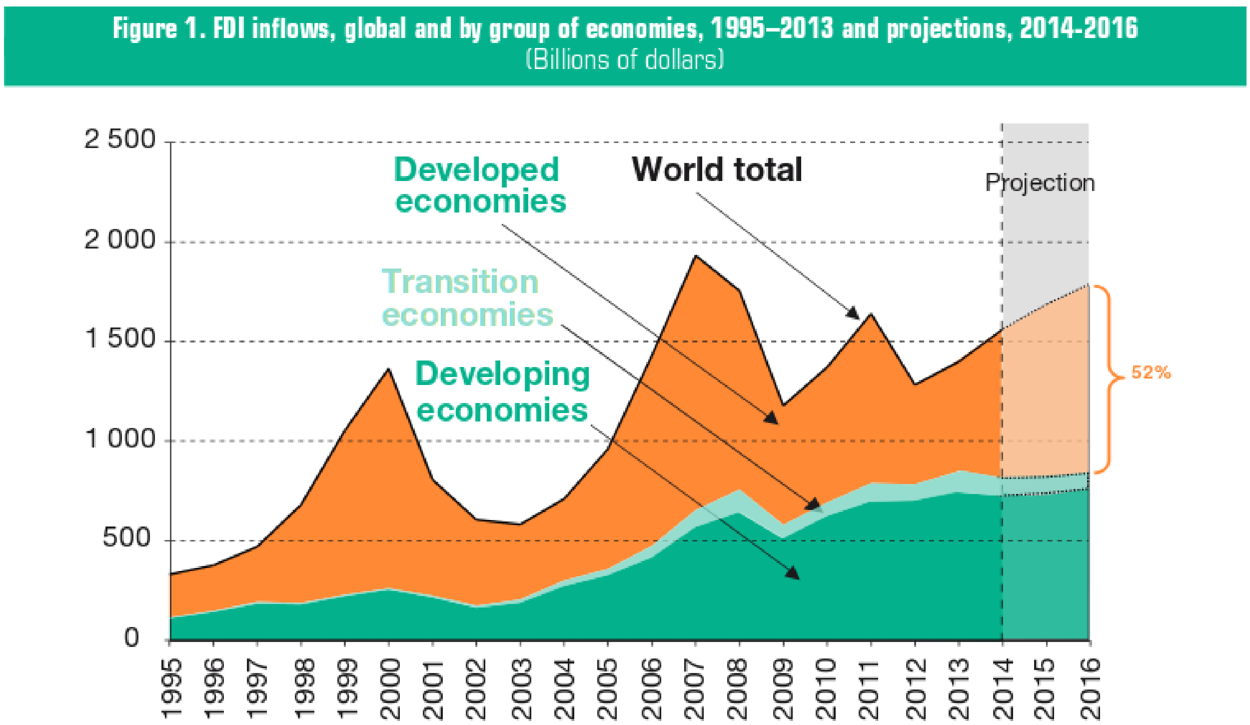
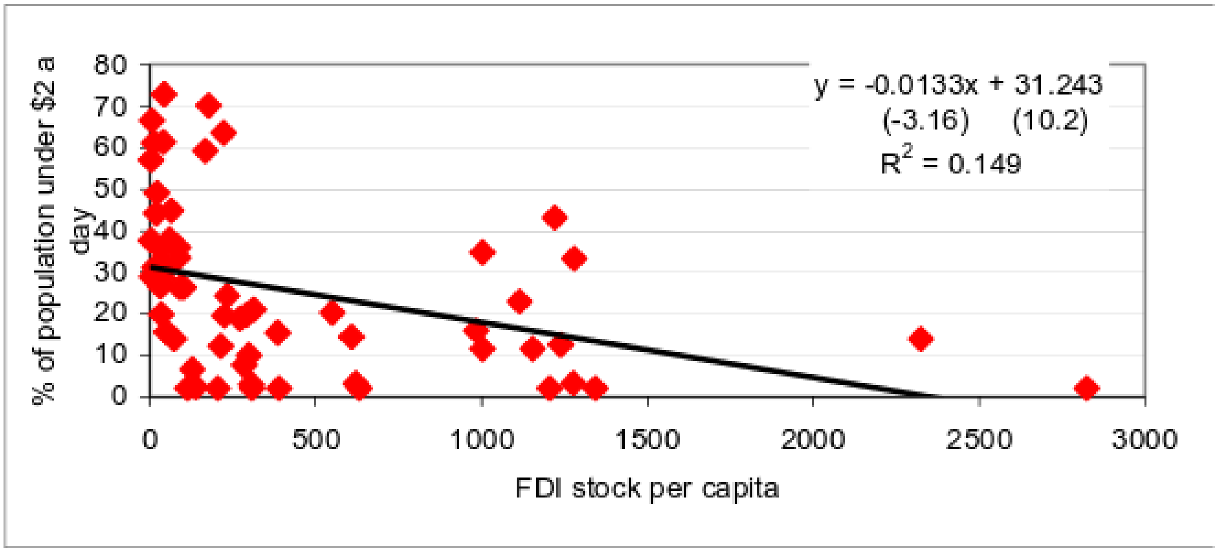


Figure 1: Source: World Investment Report, 2014

and institutional development (Durham 2004). Similarly, absorptive capacity, measured by the level of schooling in host economy, conditions the transfer of technology between foreign and local firms across regions in China (Fu 2008) and countries in Latin America (Willem 2004).

Despite the resounding conclusion that the effect of FDI is highly conditional and that investment incentives do not work, why do countries still fixate so much on bringing in FDI instead of developing local absorptive capacity (Blomström 2002)? For example, Ireland provided foreign investors with lower tax rate, lower land price, and cash grants for R&D that do not need to be repaid. China also used a tax holiday (two years of no tax and three year of half the normal tax rate) in special economic zones to attract more foreign firms (Telford and Ures 2001). We see the same widespread use of investment incentives in Southeast Asia (Fletcher 2002). In Vietnam, the race to offer incentives to foreign firms rages on even among sub-national units, as provincial governments defied the central government's directive and offered extra-legal incentives to FDI firms (Anh et al. 2007). Not only do these measures not work in attracting more FDI, they also deprive countries of revenues that could be spent on improving the local labor quality and investment climate, which are much more conducive to spillover effect and growth.

Thus, my dissertation project focuses on this empirical puzzle: if the positive effect of FDI is uncertain, why is there so much focus on attracting it? If developing absorptive capacity is so crucial to making FDI growth-enhancing, why is it often neglected? To understand this puzzle, I propose that we need to take into account the calculus of government officials,



Source: Own elaboration, from UNCTAD and UNDP data (data for the year 2000). T-statistics in brackets.

Figure 2: Relationship between FDI and poverty

who may be more interested in the potential rents from foreign firms than the spillover and growth-enhancing effect of FDI. This is a potential reason why we often see countries (i.e. government officials) being so enthusiastic about attracting FDI, yet not so passionate about developing the local capacity that enables FDI to actually have a positive effect on growth.

Starting with this empirical puzzle, my project also contributes to various literatures. First, it investigates the collusion of FDI firms and host countries' officials. This is a understudied phenomenon as the existing literature often assumes a foreign firm trying to fend off extortion and harassment from host countries. Second, it examines the political drivers behind private sector development, an issue whose welfare impact is well-known yet whose political determinants are ill-understood. Third, I engage with the decentralization literature in the case study of Vietnam, where I argue that the decision by provincial officials to seek rent from FDI instead of developing the domestic sectors depends on their interest in promotion.

2 Tentative Evidence

I present some evidences that motivate the puzzle and the hypothesized link between FDI and corruption:

- The spillover effect of FDI on growth is highly variable. For example, FDI is found to be growth-enhancing in East Asia, but not in Latin America (Zhang 2001). Similarly, the effect of FDI on domestic investment also varies across countries and regions. FDI is found to crowd in investment in some countries (e.g. Ghana, Senegal, South Korea, Pakistan, Thailand, etc.) but crowd out in others (Agosin and Machado 2005).

- Despite the prevalent concern with discrimination against foreign firms, the World Bank Enterprise Survey finds that foreign firms actually face fewer obstacles while doing business (Batra et al. 2003). The gap in the treatment of foreign and domestic firms also varies across countries (??).
- The correlation between corruption and FDI is negative. However, there is a lot of unexplained variance at the high end of FDI. Countries with high level of FDI run the gamut of corruption (Figure 3).

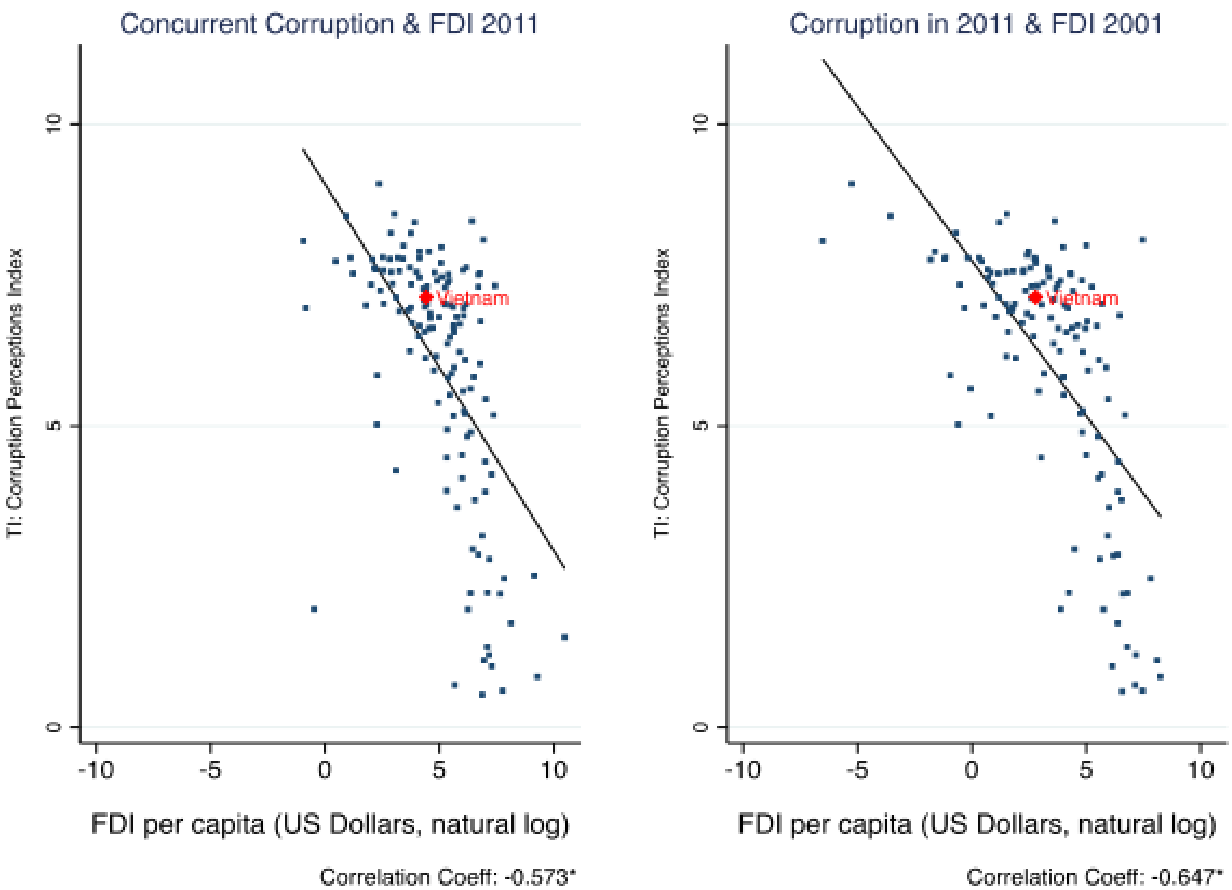


Figure 3: Source: (Malesky et al. 2015)

3 Generalized Theory

3.1 Actor and choice between spillover and private benefit

The model has one strategic actor: a government official. This official has control over a certain endowment (e.g. market size, cheap labor) that is attractive to foreign firms.[3]

[3] I define *foreign firms* as firms with over 50% ownership belonging to private foreign individuals, companies, or organizations

Foreign firms that invest in the official's territory turn this endowment into profit via their productive activities. Firms then share the value added with the official in exchange for access to the endowment.

Firms share the benefit with the official in the form of a two-good bundle: 1) technological spillover and, 2) private benefit (to the official). *Technological spillover* is the beneficial effects of foreign firms' technological knowledge on the productivity and innovative ability of private firms. The official cares about the technological spillover of FDI because it is a crucial ingredient in improving total factor productivity and generating long-term growth, which in turn, brings electoral or career benefits. *Private benefit* that firms offer to the official can come in many forms, both illegal (e.g. bribe, kickback) and legal (e.g. campaign finance contribution, informal network with foreign firms that leads to contracts for friends and families).

The essence of the dissertation project is to determinte how the official chooses the mix of these two goods, i.e. technological spillover and private benefit.

3.2 Government official faces a budget constraint

There are two reasons why there exists a budget constraint that prevents the official from getting as much spillover and private benefit as he wants.

First, since the endowment that the official commands is finite, it imposes a constraint on the amount of FDI that the official can attract.

Second, given a fixed amount of FDI, there is a trade-off between spillover and private benefit. In other words, if the official wants more of one good, he has to give up some of the other. To induce spillover, governments frequently impose on foreign firms conditions such as forming a joint venture or local content requirement. These conditions constrain firms' options and their ability to optimally use their physical and management capital, reducing their revenue and profitability. Similarly, when firms are forced to offer private benefit to officials (e.g. bribes, contracts with officials' relatives), they suffer from both an upfront cost as well as the cost of uncertainty (as these private benefits are frequently informal, not transparently encoded, and thus abstruse to foreign firms). For this reason, offering officials private benefit increases firms' expenses and thus also reduces profitability. Given that firms are constrained have to maintain a minimum amount of profit (akin to reservation wage) that justifies investing in the country, if a firm offers more private benefit to the official it will have to bring less technological spillover, and vice versa.

One may argue that there are foreign firms that voluntarily produce spillover and this is not mutually exclusive from offering private benefit to the officials. However, this is rare because high-tech firms are wont to keep their technology proprietary. Due to scale and sophistication, foreign firms would also source from established international suppliers and only rely on local suppliers for standard commodity goods at arms-length, which doesn't generate as much spillover from personal contact (e.g. training, quality assurance assistance, financing assistance). By definition, FDI firms voluntarily source from local suppliers only when the availability and quality of local suppliers are not far from international quality, and in these cases there's less need and room for spillover. The only case that spillover happens is when the foreign firms specifically target the local market: in this case, the qualilty is not too stringent, quantity not too large, and there is a need for rapid local customization.

However, in this case, local-market-targeting FDI firms can displace local firms, and the benefit of spillover is offset and can lead to negative spillover (cite).

Combining the two facts that, 1) the size of the bundle is limited by the official's endowment, and 2) the official has to give up one good to get more of the other from firms, a budget constraint exists over this two-good bundle.

While FDI does bring other benefits, e.g. jobs and capital, the theory intentionally focuses on technological spillover and private benefit for both substantive and theoretical reasons. Substantively, technological spillover increases total factor productivity, which is key to sustaining long-term economic growth when capital has diminishing return. While the literature has mainly focused on the quantity of FDI attracted, development agencies and governments have paid much attention to the issue of technological spillover.

Furthermore, the implication of a spillover-vs-private-benefit trade-off is very different from that of a spillover-vs-capital/job trade-off. In the later case, one can count on the official to shift towards attracting FDI with high technological spillover as his country gradually grows and is in less immediate need of capital and job creation. The growth trajectory of a country is guaranteed to be positive in this scenario, fueled by FDI's capital injection in the earlier stage and sustained by FDI's technological transfer in the later stage. However, if the trade-off that the official considers is between spillover and private benefit as our project theorizes, then one cannot count on the official to take such benevolent action.

Theoretically, since technological spillover is key to growth, our theory about the official choosing the spillover-vs-private-benefit bundle speaks to the age-old research question: "Why are some governments corrupt, some growth-promoting, and yet others are both?" While such question is massive both in its importance and its difficulties, our project approach FDI's spillover effect as a mid-size problem with several mid-level theories, where the model of an official considering the mix of benefits brought by a FDI project is not too abstract from the real-world investment process as to be fictional. With the theory well delineated within the topic of FDI, we can pinpoint the parameters that affect the budget constraint and the official's preference over spillover and private benefit as follows.

3.3 Parameter 1: Official's endowment determines the size of the budget constraint

Since the official uses his endowment to attract FDI, with more endowment the official will be able to get both more technological spillover and more private benefits. In other words, his budget constraint will shift to the right (Figure 4). This feature of the model captures the fact that officials in a country with a lot of endowment have a much better bargaining leverage vis-a-vis the foreign firms and can extract both spillover and private benefit (e.g. China).

3.4 Parameter 2: price of spillover and private benefit determines the intercept and the slope of the budget constraint

Given a fixed amount of endowment, the two intercepts of the budget constraint are determined by the "price" of the two goods, i.e. how easily the official can obtain technological

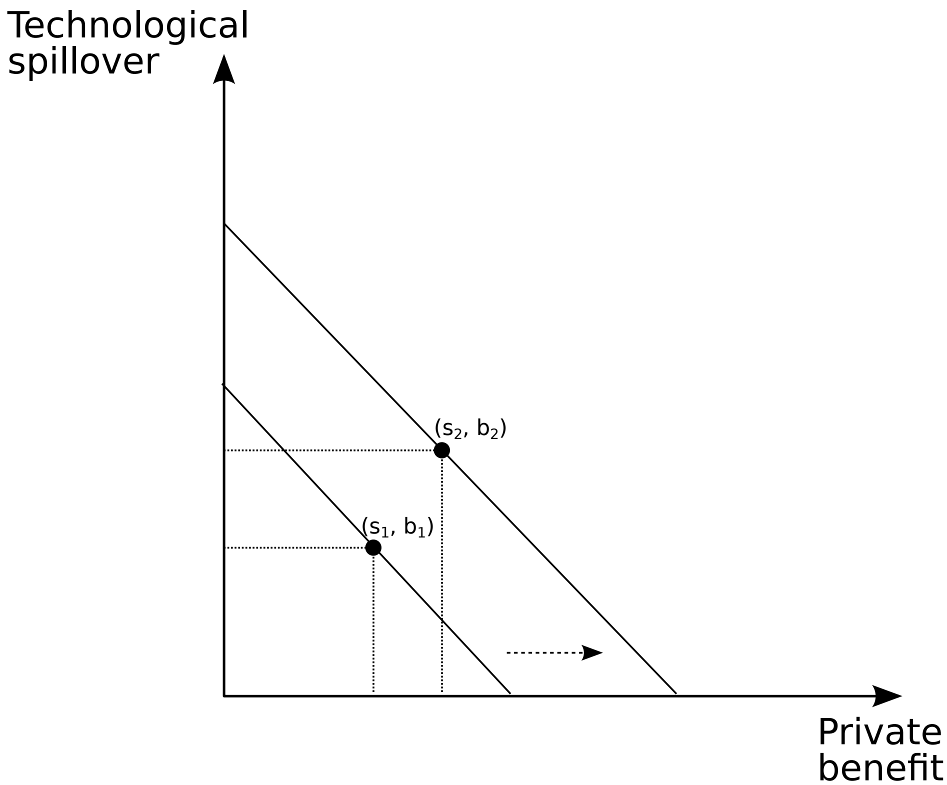


Figure 4: When an official has more endowment, his budget constraint shifts from left to right. He is now able to afford the (s_2, b_2) bundle, with $s_2 > s_1$ and $b_2 > b_1$.

spillover and private benefit from the foreign investors. If a good becomes harder to extract from foreign firms, the official can afford less of it and the corresponding intercept shifts inward (Figure 5). Alternatively, we can think of the slope of the budget constraint as the relative price of the two goods.

Substantively, the "price" of technological spillover depends on both the nature of the sector as well as the absorptive capacity of the local economy, which I argue to be the presence of private firms that are able to absorb technology from foreign firms.[4] Consider two channels through which technological spillover happens. First, private firms enter into the supply chain of foreign firms, improving their productivity by imitating the higher production standards or management techniques of foreign firms. For this to happen, it is necessary to have a wealth of private firms that are technologically capable to enter the supply chain. The feasibility of such outsourcing is also sector-specific, e.g. whether the production process is divisible into units, or whether the technology has matured enough for subcontracting. Second, local employees employed by foreign firms may learn from their experience and transfer that knowledge when they move to private firms. For this to happen, private firms must also be technically advanced enough to make use of and compete for this high quality labor from the foreign sector.

The "price" of private benefit substantively means how easily the government officials can

[4] I define *private firms* as firms with over 50% ownership belonging to private domestic individuals, companies, or organizations

extract these benefits from the foreign firms. One example of such parameter is the origin of the foreign firm. Firms that come from countries where corruption is more common or accepted would be more adept at providing private benefit to official and more willing to do. In contrast, firms from countries that have signed onto the OECD anti-bribery convention would be more hesitant to bribe given the punishment that they may face from their home governments.

Changing prices of the two goods will shift the budget constraint and, holding the indifference curve constant, have implications for the mix of two goods that the official chooses.

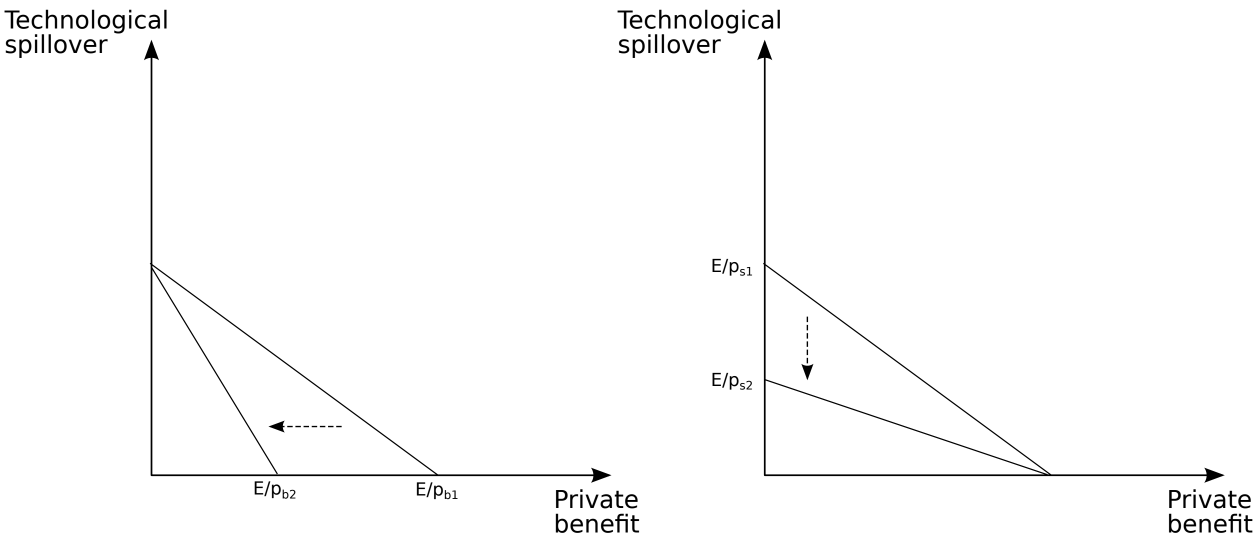


Figure 5: In the left panel, the intercept for private benefit moves from the right to the left as its price increases. In other words, $\frac{E}{p_{b2}} < \frac{E}{p_{b1}}$ because $p_{b2} > p_{b1}$. Similarly, in the right panel, as it becomes more difficult to extract spillover from foreign firms, the intercept moves down.

3.5 Parameter 3: The official's time horizon determines the shape of his indifference curve

The official has a convex indifference curve, meaning that there is decreasing marginal utility to both spillover and private benefit. This assumption is standard and makes intuitive sense. As the official accumulates more private benefit, there are fewer things worth spending on as his consumption is satiated and produces less utility. Similarly, when more technological spillover happens, it becomes less of a bottleneck to the economy. Thus, voters (or the official's higher-ups) become less concerned with the issue and it brings less electoral (or career) benefits.

The shape of the indifference curve denotes the relative weight the official assigns to the two goods, spillover and private benefit. When the curve is steep, it means that the official is willing to trade a lot of spillover for a small increase in private benefit. Vice versa, a flatter curve indicates that the official values spillover more (Figure 6).

Politically, the steepness of the indifference curve depends on the time horizon of the official. This is because technological spillover takes time to happen and to increase economic growth whereas private benefit is immediate. The longer the time horizon, the more heavily does he weigh technological spillover effect. For example, in Figure 6, the blue indifference curve is flatter and signifies more weight assigned to spillover. In that case, the official does choose a bundle that has more spillover and less private benefit (i.e. $s_1 > s_2$ and $b_1 < b_2$). Political factors that influence the official's time horizon may include term limit, the stability of the regime, or the probability of electoral success.

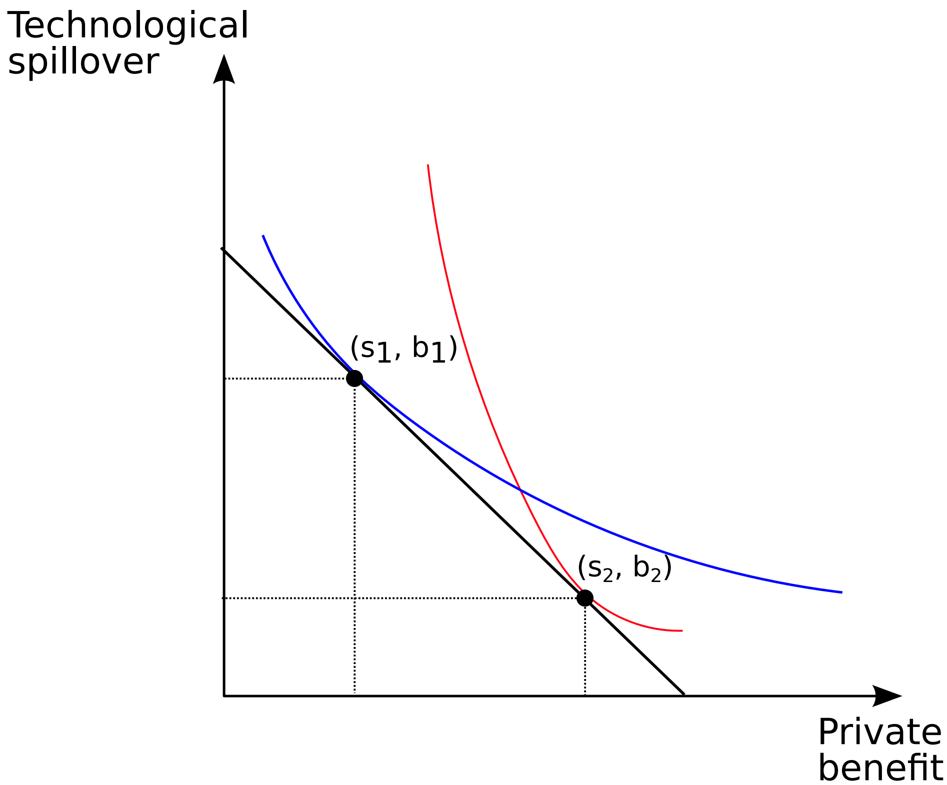


Figure 6: The blue indifference curve shows that the longer the official's time horizon, the flatter his indifference curve, and he will choose more spillover and less private benefit.

3.6 Literature on corruption and FDI

Regarding private benefit for the officials, I focus on corruption, i.e. bribe and informal fees, given the ubiquity of the practice in developing markets and wealth of data collected on this issue from cross-national business surveys. The majority of literature on the relationship between corruption and FDI focuses on showing that a high level of corruption deters FDI (Wei 2000; Hakkala et al. 2008; Al-Sadig 2009). (Summarize a bit here)

But what about foreign firms that choose to invest in a highly corrupt environment nonetheless? One strain of the literature argues that foreign firms can help reduce corruption in host country via regulatory pressure effect, demonstration effect, and professionalization effect (Kwok and Tadesse 2006); or via competing away the rents of the domestic firms, reducing the supply of bribes (Sandholtz and Gray 2003). In these works, corruption between the host government and the foreign firm has been conceptualized as *predatory*.

My research offers a new perspective, recognizing that, compared to domestic firms, foreign firms always have the freedom to move out of the country or at least stop bringing in capital. Therefore, the exchange between the government and foreign firms are always more voluntary compared to private firms.[5] In this angle, corruption between the government and the foreign firm can be *collusive*, with government officials getting bribe and foreign firms getting advantages over domestic firms (e.g. an expedited bureaucracy or privileged use of public resources) (Hellman et al. 2002). Indeed, there are evidence of foreign firms bribing to get an upper hand in the local market[6] or to pursue rent in protected industries (Malesky et al. 2015).

Such collusive corruption between the government and foreign firm can be the key to explain the puzzle why governments may want to attract a lot of FDI despite the lack of developmental impact. One may say that (corrupt) institutions matter, but not only to *how much* FDI a country can attract as the literature has studied, but also *which kind*.

3.7 Empirical Implications

In the sections that follow, I contextualize the general theory presented above, building three mid-level theories that map each of the three parameters to a specific empirical context. Specifically,

- *"price" of spillover*: sectoral variation (primary, manufacturing, and service) in the level of potential absorptive capacity.
- *"price" of private benefit*: Phase 3 enforcement of OECD's anti-bribery convention makes firms from member countries more hesitant to bribe
- *time horizon*: term limit reduces the time horizon of Vietnamese provincial officials that are close to retirement

4 Contextualized theory

4.1 "Price of spillover" sectoral variation

As implied in the theory section, when the "price" of spillover is high (i.e. it is difficult to obtain spillover given the country's absorptive capacity or sector-specific characteristics), the government official would choose a bundle that has more private benefit than spillover.

PICTURE

Here I focus on industry-specific characteristics that either facilitate or hinder spillover. Due to its divisible process, manufacturing firms tend to engage more local suppliers and

[5]There is an argument about FDI being harder to relocate, and thus subject to creeping expropriation. However, corruption doesn't tend to change that quickly, and a foreign investor looks into a country knows relatively well the level of corruption that they are getting involved with.

[6]http://www.nytimes.com/2012/04/22/business/at-wal-mart-in-mexico-a-bribe-inquiry-silenced.html?pagewanted=all

generate more spillover effect than primary and tertiary sectors. In addition, there is a wide variation across industries within a sector to be exploited as well. For example, in manufacturing, food processing can have a high amount of spillover due the sourcing of raw materials and packaging, whereas in textile and automotive industries (which require high level of technological sophistication), it is harder for foreign firms to work with local suppliers. Similarly, in tertiary sectors, finance, trading, tourisms and utilities are is generally not divisible into discrete stages to subcontract. Yet service industries such as retailing and construction have more opportunities for input suppliers (cite).

This leads us to the following hypothesis:

> Hypothesis: Government official will pursue less private benefits from firms in industries where it is easier to generate spillover

While such variation across industry is clear conceptually, measurement is thorny given the many factors that can affect the potential for spillover. In addition, there is an endogeneity problem as the potential for spillover may itself be affected by the level of rent-seeking of that industry. For example, an industry plagued by collusive relationship between the official and the foreign firms does not offer an enabling environment that allows private firms to develop their absorptive capacity. The endogeneity problem is compounded if the official strategically invests to improve absorptive capacity, in which case it is not even clear which direction is our estimate biased.

To address both of these measurement and endogeneity issues, I will use the variation in technological spillover across industries in the United States as the instrumental variable.[7] The assumption is that the level of technological spillover in a US industry only correlates with the level of bribe in another country's industry through the latent factor that is the industry-specific potential for spillover.

4.2 "Price of private benefit" firms ability to bribe

As implied from the theory, when the "price" of private benefit is high (i.e. it is costly for the firm to offer the official private benefit), the official would choose a bundle that has less private benefit.

This theoretical claim generates many substantive predictions that we can test, each involving a factor that affect the cost of bribing for firms. For example, foreign firms that come from a corrupt home countries may have more experience with bribing and thus would incur less information cost if they bribe.

Here I focus on the Phase 3 (Enforcement) of the OECD Anti-Bribery Convention (ABC) as an exogenous increase in the cost of bribing for foreign firms in Vietnam. In December 1997, all members of OECD and an additional five non-members, accounting for nearly 61% of world trade, signed the ABC. The ABC criminalizes the bribery of foreign public officials and upholds its principles with a peer-monitoring system, in which member countries visit and review one another's legislation and implementation. According to legal experts, these

[7] The United States is considered due to its high quality economic data. Alternatively, for each country, I can use a comparable country in the same region or the same developmental stage to formulate the instrument

reports are often quite harsh and effective in shaming countries into improving their practices (Tyler 2011).

Important for my research design, in December 2009 the OECD's Working Group on Bribery (WGB) annouced that following Phase 1 and 2 (Evaluation and Assessment) there would be a Phase 3 (Enforcement). The goal of Phase 3 is to continually monitor countries' anti-bribery practices and to exhort inactive enforcers. Noticeably, Phase 3 also removed a previous exception that allowed firms to make "small facilitation payment" (Strauss 2013). Researchers have argued that following the announcement of Phase 3, member countries ramped up enforcement to avoid a negative review, and causing their firms to reduce bribery abroad (Malesky and Jensen 2015).

Given that FDI to Vietnam only accounts for a small fraction of OECD countries' total foreign investment, it is plausible that Vietnam is not a major factor driving the initiation of Phase 3. Therefore, the announcement of Phase 3 serves as an exogenous shock to the cost of bribery for firms from ABC member countries. With OECD firms being reluctant to offer bribes, we expect corrupt officials to become uninterested in OECD firms. Post 2009, OECD firms would be attractive only to non-corrupt officials for their developmental impact, and we should observe them having more spillover effect.[8]

With 2009 as an exogenous shock we have a difference-in-difference design. First, we estimate the difference in spillover between OECD and non-OECD firms, pre-2009. We then find the same difference in spillover post-2009. Subtracting these two differences, we can estimate the effect of corruption on the level of spillover.

I sum, I have the following hypothesis:

> Hypothesis: The Phase 3 (Enforcement) of OECD's Anti-Bribery Convention causes firms from member countries to have more spillover and pay less bribe.

4.3 Time horizon of officials

As implied by the theory above, an official with a longer time horizon would choose a bundle with more spillover, whereas an official with a short time horizon would choose a bundle with more private benefit.

To get a handle on the time horizon of the official, we need to know the options provided to the official within the country's political economic system. Such is a big and difficult question to study with a cross-national design due to an insurmountable degree of endogeneity stemming from unobservable and unmeasurable differences across political systems. Therefore, at this step, I focus on the case of Vietnam, whose sub-national variation in FDI flow and private sector development serve as an excellent testing ground. Again, here I focus on bribe and informal fees as the main form of private benefit for officials. Such constraint is not problematic for the case of Vietnam, where the authoritarian system means that officials are not offered campaign contribution and where revolving door jobs are non-existent.

[8] An alternative design looks at the difference between OECD and non-OECD firms that *enter* Vietnam pre- and post-2009. This design will have fewer firms in the sample but could be more appropriate if we think that the spillover-bribe bundle is negotiated at the time firms enter Vietnam and is hard to change later, even with the ABC coming into effect. If so, the change in level of spillover and bribe is caused by the change in the official's selection of firms instead of the adjustment in behaviors of existing firms after 2009.

4.3.1 The effect of time horizon on the choice of Vietnamese provincial officials

The relative weight assigned to spillover versus bribe by the Vietnamese provincial officials is determined by the principal-agent relationship between Vietnam's central and the provincial governments. On the one hand, the central government (i.e. the principal) cares more about the spillover effect of FDI and uses promotion to reward local officials that attract high-spillover FDI. On the other hand, local officials (i.e. the agent) have more opportunities to engage in corruption with foreign firms, and should they decide that the private benefit of corruption is greater than that of promotion, they will prioritize foreign firms that bring bribes over those that have high spillover effects.

The reason behind such difference in the preference of central and local governments is the fact that FDI projects are approved and managed at the provincial level. While the central law may be uniform in the book, its implementation varies widely across sub-national units in Vietnam (Meyer and Nguyen 2005).[9] Therefore, the provincial government holds valuable services for sale to foreign firms. In contrast, the central government is more removed from direct contact with FDI firms and thus less likely to benefit from corruption than provincial leaders.

In addition, the central government is much more concerned with overall economic growth, which is central to the longevity of the regime (Malesky 2008). It wants to attract high-spillover FDI and uses promotion to reward local officials that accomplish this goal. On the other hand, each provincial leader is incentivized to free-ride on the developmental effort of other provinces and of the central to keep the entire regime stable. Therefore, local officials value the spillover effect of FDI only insofar as the opportunities for promotion that it brings.

Fortunately for the central government, the principal-agent problem in this context is partially solved because monitoring is not too difficult. Indeed, the central government can observe the economic performance of the provinces and use personnel management to punish and reward provincial officials (Sheng 2007; Li and Zhou 2005).[10] Therefore, the principal-agent problem is only severe when provincial officials are not interested in further promotion to the central government, i.e. when the local official's time horizon is short. This suggests that there will be a variation in the level of FDI's spillover effect across provinces according to provincial officials' interest in promotion. In the research design, I use fuzzy regression discontinuity (RD) exploiting the mandated retirement age of Vietnamese officials, arguing that those that are in their last term have shorter time horizon and less interest in promotion.

By looking at this variation in the career interest of provincial officials, my theory contributes a fresh angle to the current literature on the relationship between decentralization and corruption. So far, scholars have only postulated a one-way relationship: either decentralization increases bribery (Fan et al. 2009) or reduces it (Guerra et al. 2009). In my model, how decentralization affects corruption is conditional on the local officials' interest in

[9] Vietnam's sub-national variation in implementation generalizes well to other cases, such as China (Thun 2006)

[10] Shih et al. (2012) recently argue that economic performance does not matter to cadre promotion. However, they investigate all members of the Chinese Central Committee, including the central party apparatus, the army, and the central economic bureaucracy. These actors are not the important decision-makers in our theory.

the promotions offered by the central as carrots.

Three key assumptions in the theory above deserve further examination:

1. Why wouldn't Vietnam's central government worry that a developed private sector may lead to social change that ultimately undermines its rule?

   First, there is a large scholarship showing that authoritarian regimes are very adept at using institutions to manage regime outsiders in general and business in particular (Gandhi and Przeworski 2006; Gandhi 2008; Wright 2008; Le 2015). Second, if the legitimacy of the regime rests heavily on delivering economic growth, then the short-term risk of an economic downturn creating instability features much more prominently than the long-term concern with social changes. Third, it is possible to foster economic growth while restricting political freedom (e.g. Singapore). Indeed, growth can make a regime, both democratic and authoritarian, more stable, and creates room for political control (Przeworski et al. 1997).

2. Why don't provincial leaders seek rent from the domestic sector?

   First, Vietnam's private sector was very small when FDI was first allowed into Vietnam. The size and the profitability of the average domestic firm is still smaller than those of foreign firms today. Therefore, there are both fewer rents and more coordination problems if provincial officials want to seek rents from domestic firms. Second, ironically, if officials want to grow the private sector for future rent-seeking, they must promote an enabling business environment that are free from rent-seeking. In contrast, engaging in corruption with large and existing FDI firms is much more convenient. Essentially, corrupt provincial officials have shifted the cost of building a thriving domestic sectors to the home countries of FDI firms and now extract rents from the high productivity and high profitability of these firms.

In sum, I propose a hypothesis about variation across Vietnam's provinces:

> Hypothesis: In provinces whose leaders are in their last term before the mandated retirement age, there are more spillover and less bribe from the foreign firms.

5 Research Design

5.1 Measuring the main dependent variable: spillover effect

Measuring spillover indirectly

Similar to how growth economists start endogenizing technological change, FDI researchers investigate how technology spillover from FDI may happen instead of assuming its inevitability (Romer 1994). Several channels for spillovers have been proposed, some of which suggest an indirect measure of technology spillover.

These channels are:

- imitation: private firms may reverse engineer a production or management technique (Wang and Blomstrom 1992), which is facilitated by backward linkage between local and foreign firms (Javorcik 2004). This motivates my first measure of spillover effect: % of private firms that participate in contracts with foreign firms.

- competition: similar to the effect of competition from arm's length trade on productivity, the presence of foreign firms in the domestic market put pressure on local firms to reduce inefficiency (Glass and Saggi 2002). (Doing Business has firm-level data on the number of private/state/foreign competitors in the last year)

- export demonstration: foreign firms are more knowledgeable about exporting, which involves high fixed cost to set up a distribution and transport infrastructure, or learning about foreign taste and regulatory environment. Domestic firms can learn this "export know-how" from foreign firms (Aitken et al. 1997). This motivates my third measure of spillover effect: % of private firms that export.

- skills acquisition: workers trained in foreign firms bring along their human capital when they move to domestic firms (Djankov and Hoekman 2000). This presumes a healthy domestic sector that can offer competitive wages to workers.

Among these channels, *imitation* and *export demonstration* forms the theoretical basis of my two proxy measurements of spillover:

1. frequent business contacts between foreign and domestic firms,

2. percentage of domestic firms engaging in export

Measuring spillover directly

As standard in the economic literature that studies whether there is a spillover effect for FDI, we can also measure spillover directly. This is done in two steps.

- First, measure the level of technology or productivity of a firm.

  Level of technology: R&D spending

  Level of productivity: Consider the familiar Cobb-Douglas production function:

  $$Y = AL^{\alpha}K^{\beta} \tag{1}$$

  where Y is value added, A is total-factor productivity (TFP), L is labor, and K is capital. y, L, and K are observable, while A is not. Log transform both sides of the equation, we attain a linear form:

  $$y = a + \alpha l + \beta k \tag{2}$$

  where the lowercase variables are the log-form of the uppercase variables (e.g. $y = \log(Y)$ and so on). Equation 2 can then be estimated with OLS:

$$y_i = \beta_0 + \beta_1 l_i + \beta_2 k_i + \epsilon_i \tag{3}$$

where β_0 is the average total-factor productivity of all firms and ϵ is the firm-specific deviation from that mean. From the estimated coefficients of Equation 3, we can estimate firm-level TFP as follows:

$$a_i = \hat{\beta}_0 + \hat{\epsilon}_i \tag{4}$$

$$A = \exp^{\hat{\beta}_0 + \hat{\epsilon}_i} \tag{5}$$

- Having estimated firm-level TFP (or technology), we then regress TFP (or technology) on the presence of FDI in a country / sector. FDI presence can be measured as:
  - amount of FDI or number of foreign firms in a country (sector). This measure focuses on the horizontal, or intra-sector, linkage of FDI
  - number of foreign firms that the domestic firms are in contact with. This measure focuses on the vertical, or inter-sector, linkage of FDI

5.2 Hierarchical model using cross-national, cross-sectoral data

To measure corruption, presence of FDI, and treatment of firms across countries, I utilize the World Bank's Enterprise Survey (ES), which includes a wealth of firm-level data across 125 countries, spanning various topics from investment, labor, to business-government relation (World Bank 2015). The Enterprise Survey uses stratified random sampling (using three strata: firm size, business sector, and region) in order to ensure representativeness. The survey data comes from face-to-face interviews with upper management and is anonymized to ensure confidentiality at all times.[11] This dataset has a wealth of firm-level data that helps us operationalize key concepts as detailed below.

Recall our hypothesis:

> Hypothesis: The presence of large FDI firms in corrupt countries is associated with a low level of spillover effect in those countries.
>
> Hypothesis: The presence of large FDI firms in corrupt sectors is associated with a low level of spillover effect in those sectors.

Operationalization of independent variables:

- FDI in countries: available via UNCTAD data on FDI flows and stocks to countries.

[11] For more on the methodology of the Enterprise Survey, visit http://www.enterprisesurveys.org/methodology

- FDI in sectors: available via the Enterprises Survey dataset. The "largeness" of FDI firms can be measured by constructing a Herfindahl-Hirschman Index based on the size of sale, labor, or capital of firms. This allows us to calibrate the "largeness" of FDI firms according to the size of the host country's market.

- Corruption: can be measured in two ways. 1) Firms' perception about corruption as an obstacle. This measure is frequently used but not accurate since firms' perception of corruption depends not only on the level of corruption but also the characteristics of firms. 2) Hard measure of prevalence and depth of bribes, e.g. "Was an informal payment expected or request (when applying for a license)?", "How much do establishments like this one give in informal payments?"

5.3 OECD ABC and List experiment to better measure corruption

As mentioned earlier, despite the wealth of firm-level, cross-national data in the ES dataset, its measure of corruption is still plagued by a host of measurement issues.

Asking directly about firms' experience with corruption is unlikely to get an accurate answer due to sensitivity bias (Coutts and Jann 2011). Researchers, including the ES team, often address this problem by framing the question about the experience with corruption of "firms like yours." However, with this technique, firms may not read between the lines and actually answer about the experience of others (Ahart and Sackett 2004).

I remedy these problems with a research design focusing on the case of Vietnam, taking advantage by a survey list experiment by Malesky et al. (2015), which uses unmatched count technique to accurately measure the experience of firms with corruption while avoiding sensitivity bias.

Recall the hypothesis:

> Hypothesis: The presence of large FDI firms in provinces whose leaders are not interested in promotion is associated with a low level of spillover effect.

Operationalization of independent variables:

- FDI in province: provincial statistics of FDI flow (government website)

- FDI in sectors: government website

- Corruption: list experiment (Malesky et al. 2015)

- Interest in promotion:
  - base chance of promotion: years until retirement (retirement age is 60 for male, 55 for female)
  - appearance in centrally controlled newspapers as a proxy for the decision to pursue promotion

5.4 Vietnam case study: addressing issues of endogeneity and measurement error of corruption

In the cross national design, the corruption variable is problematic for two reasons. First, corruption, due to its complex institutional causes, is likely to be endogenous to a host of unobserved factors that also affect spillover. Second, a direct measure of corruption tends to suffer from sensitivity bias. In this section, I address both of these issues in turn, using 1) an exogenous shock to the level of corruption in Vietnam following the Phase 3 (Enforcement) of the OECD's anti-bribery convention in 2009, and 2) data from a list experiment by Malesky et al. (2015) to measure corruption.

5.5 Conjoint analysis of Vietnamese officials' preference

A crucial causal mechanism in my theory is the utility calculation of provincial officials, which weighs between the developmental impact and the potential for bribes of FDI. It is difficult to fully examine this key step with only observational data because what officials truly want may not be fulfilled due to external factors and thus cannot be observed. Furthermore, what an official wants from a FDI firm is often hard to tease out completely. A big FDI firm is an attractive source of rent, but it also brings job and technology. Indeed, perhaps this high correlation is precisely why it is so easy for officials to extract rent from FDI under the guise of promoting economic development.

To truly get at the utility calculation of provincial officials, I plan to conduct a survey experiment using conjoint analysis to ask provincial officials about their preference between two hypothetical FDI firms (Hainmueller et al. 2014). The characteristics of these firms will be randomly varied across several dimensions: size of labor force, capital, technology age, and most importantly, need for land, which proxies for corruption opportunities.

5.5.1 Why choose land as a proxy for corruption?

To discern provincial officials' preference for corruption opportunity versus developmental impact, one must vary the hypothetical FDI projects along a characteristic that can only be attractive to officials because of its potential for corruption and not because of any other reasons. In this regard, the amount of land a project requires is the best proxy for corruption. Since land is such a scarce resource with rapidly rising value in Vietnam, acquiring land from current tenants and farmers is a difficult, sometimes violent, process. Therefore, there is neither good developmental nor political reason for local officials to prefer a project that needs a large amount of land.

In contrast, other characteristics of a FDI project can be preferred by officials for many different reasons. For example, a well capitalized project may signify a large pot of money to dip in, but it may also be attractive for the labor productivity enhancing effect of its capital. Similarly, a FDI firm with a large labor force may need to curry favor with officials to suppress their workers, but it may also be appealing for the jobs it creates. Unlike those factors, land is unambiguously an indication of corruption opportunities. With a high level of *monopoly* and *discretion*, local officials are able to sell land access, something that investors are eager to buy.

1) Monopolistic control over land supply: At the start of Vietnam's liberalization (under Land Law 1993), any exchange of land between land users and investors must go through the local government. Investors had to negotiate with all levels of local governments (i.e. commune, district, and province level people's committees) to acquire land—a complex process that encouraged investors to use informal procedures and fees to expedite. Importantly, the price of land was solely determined by the local government, which was usually 10-30% of the market price. Therefore, officials were able to extract bribes with both their gate-keeping and price-setting powers over land.

Subsequent land law reforms (2003 and 2013) attempted to bring the land acquisition process closer to a market approach and lessen the monopolistic control of the local government over land. For example, Land Law 2003 specified two methods for investors to acquire lands: voluntary and compulsory. Under compulsory land acquisition (akin to eminent domain), local governments retain the power to acquire land with compensation then allocate to approved investors. Under the newly-introduced voluntary land acquisition, investors negotiate with and buy from land users in a private market transaction. Despite the option of buying lands from private users, in practice most investment projects tellingly opted for compulsory land acquisition by the state. With the local government's coercive power and legal ability to set compensation value on their side, investors find compulsory land acquisition both faster and cheaper, and thus worth paying for.

Similarly, despite many calls for removing the state's control over land, Land Law 2013 disappointed with its insistence on "people's ownership" of land instead of adopting a fully private ownership system. Furthermore, the law preserves the state's right to acquire land for the vaguely defined "socioeconomic development" and "national interest," which expansively includes the development of industrial zones.

2) Discretionary allocation of land to selected investors: Opportunities for corruption also arise from two discretionary powers of the local governments. First, land acquired by the government is allocated directly to approved investors instead of through public auction, an option allowed by law but rarely practiced by local governments. Second, in many cases, local officials even modify the existing land use plans according to the suggestions of investors, making available land that was previously not zoned for business development. Without any standard guideline for investor approval, this process relies heavily on personal contacts and is prone to bribery and kickback.

An important symptom of this corrupt practice is the lack of transparency in the land allocation process and decision. Key information, such as the criteria of project approval, the shortlist of investors, the profile of the selected projects and investors, and the (dictated) price of land, are kept among selected investors and a few state officials involved. Even a straightforward compliance with transparency regulation, i.e. the public posting of investment site maps, is not fulfilled. In a 2010 study, DEPOCEN researchers could only access the investment site maps in 2 of the 12 visited provinces (Anderson and Davidsen 2011).[12]

[12] But Land law 2013 does remove the direct allocation of land to approved project, instead try to increase the number of land auctions. Does this have an effect?

5.5.2 Conjoint analysis design

Two FDI projects want to enter your province. Please carefully read the following description of the projects. Then, please indicate which project you prefer.

	Project 1 (Du an 1)	Project 2 (Du an 1)
Industry		
Labor force		
Capital		
Land		
Technology age		

If you have to choose, which project do you prefer to grant investment license?
Project 1 / Project 2

The five dimensions will be given random values as follows.

- Industry: textile, electronics, automobile, consumer product
- Labor force: 5, 50, 100, 200, 500 employees
- Capital:
- Land:
- Technology age:

If desired, it is possible to:

- adjust the design so that implausible hypotheticals will not appear (i.e. there should not be a high-tech company with very small capital).
- randomize the ordering of the characteristics between respondents to test for the ordering effect (i.e. knowing a firm's industry first changes how the respondent thinks about the other characteristics)

I am mainly interested in the "average marginal component effect" (AMCE) of *land*, which is the marginal effect of *land* on the likelihood of a project being preferred, averaged over the distribution of all the other components. This allows us to back-out what provincial officials truly want from a FDI project.

References

Agosin, M. R. and R. Machado (2005). Foreign Investment in Developing Countries: Does it Crowd in Domestic Investment? *Oxford Development Studies 33*(2), 149–162.

Ahart, A. M. and P. R. Sackett (2004). A New Method of Examining Relationships between Individual Difference Measures and Sensitive Behavior Criteria: Evaluating the Unmatched Count Technique. *Organizational Research Methods 7*(1), 101–114.

Ahlquist, J. (2006). Economic policy, institutions, and capital flows: portfolio and direct investment flows in developing countries. *International Studies Quarterly 50*(3), 681–704.

Aitken, B., G. H. Hanson, and A. E. Harrison (1997). Spillovers, foreign investment, and export behavior. *Journal of International Economics 43*(1-2), 103–132.

Al-Sadig, A. (2009). The effects of corruption on FDI inflows. *Cato Journal 29*(2), 267–294.

Anderson, J. and S. Davidsen (2011). Recognizing and reducing corruption risks in land management in Vietnam. *Hanoi: National Political Publishing House (Su That).*

Anh, V. T. T., L. V. Thai, and V. T. Thang (2007). Provincial Extralegal Investment Incentives in the Context of Decentralisation in Viet Nam : Mutually Beneficial or a Race to the Bottom ? *Forum American Bar Association* (November).

Batra, G., D. Kaufmann, and A. Stone (2003). The firms speak: What the world business environment survey tells us about constraints on private sector development.

Blomström, M. (2002). The economics of international investment incentives. *International Investment Incentives*, 165–183.

Carkovic, M. V. and R. Levine (2002). Does foreign direct investment accelerate economic growth? *U of Minnesota Department of Finance Working Paper*.

Coutts, E. and B. Jann (2011). Sensitive Questions in Online Surveys: Experimental Results for the Randomized Response Technique (RRT) and the Unmatched Count Technique (UCT). *Sociological Methods & Research 40*(1), 169–193.

Djankov, S. and B. Hoekman (2000). Foreign Investment and Productivity Growth in Czech Enterprises. *The World Bank Economic Review 14*(1), 49–64.

Durham, J. B. (2004). Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth. *European Economic Review 48*(2), 285–306.

Fan, C. S., C. Lin, and D. Treisman (2009). Political decentralization and corruption: Evidence from around the world. *Journal of Public Economics 93*(1-2), 14–34.

Findlay, R. (1978). Relative Backwardness, Direct Foreign Investment, and the Transfer of Technology: A Simple Dynamic Model. *Quarterly Journal of Economics 92*(1), 1–16.

Fletcher, K. (2002). Tax Incentives in Cambodia, Lao PDR, and Vietnam. Technical report.

Fu, X. (2008). Foreign Direct Investment, Absorptive Capacity and Regional Innovation Capabilities: Evidence from China. *Oxford Development Studies 36*(1), 89–110.

Gandhi, J. (2008). *Political Institutions under Dictatorship*, Volume 3. Cambridge: Cambridge University Press.

Gandhi, J. and A. Przeworski (2006). Cooperation, Cooperation and Rebellion under dictatoship. *Economics & Politics 18*(1), 1–26.

Glass, A. J. and K. Saggi (2002). Multinational Firms and Technology Transfer. *Scandinawian Journal of Economics 104*(4), 495–513.

Guerra, E., J. de Lara, A. Malizia, and P. Díaz (2009). Supporting user-oriented analysis for multi-view domain-specific visual languages.

Hainmueller, J., D. J. Hopkins, and T. Yamamoto (2014). Causal inference in conjoint analysis: Understanding multidimensional choices via stated preference experiments. *Political Analysis 22*(1), 1–30.

Hakkala, K. N., P.-J. Norbäck, and H. Svaleryd (2008). ASYMMETRIC EFFECTS OF CORRUPTION ON FDI : EVIDENCE FROM Swedish multinational firms. *Review of Economics and Statistics 90*(4), 627–642.

Hellman, J., G. Jones, and D. Kaufmann (2002). Far from home: Do foreign investors import higher standards of governance in transition economies? *Available at SSRN 386900*.

Javorcik, B. S. (2004). Does Foreign Direct Investment Increase the Productivity of Domestic Firms ? In Search of Spillovers through Backward Linkages Does Foreign Direct lnvestment Increase the Productivity of Domestic Firms ? In Search of Spillovers Through Backward Linkages. *American Economic Review 94*(3), 605–627.

Jensen, N. M. (2003, July). Democratic Governance and Multinational Corporations: Political Regimes and Inflows of Foreign Direct Investment. *International Organization 57*(03).

Kwok, C. C. Y. and S. Tadesse (2006). The MNC as an agent of change for host-country institutions: FDI and corruption. *Journal of International Business Studies 37*(6), 767–785.

Le, A. (2015). The effect of authoritarian legislature on business behavior.

Li, H. and L. A. Zhou (2005). Political turnover and economic performance: The incentive role of personnel control in China. *Journal of Public Economics 89*(9-10), 1743–1762.

Li, Q. (2006). Democracy, autocracy, and tax incentives to foreign direct investors: A cross-national analysis. *Journal of Politics 68*(1), 62–74.

Li, Q. and A. Resnick (2003). Reversal of fortunes: Democratic institutions and foreign direct investment inflows to developing countries. *International organization*.

Malesky, E. J. (2008, January). Straight Ahead on Red: How Foreign Direct Investment Empowers Subnational Leaders. *The Journal of Politics 70*(01), 97–119.

Malesky, E. J., D. D. Gueorguiev, and N. M. Jensen (2015). Monopoly Money: Foreign Investment and Bribery in Vietnam. *American Journal of Political Science 59*(2), 419–439.

Malesky, E. J. and N. M. Jensen (2015). Does the OECD Anti-Bribery Convention Affect Bribery ? An Empirical Analysis Using the Unmatched Count Technique.

Meyer, K. and H. Nguyen (2005). Foreign Investment Strategies and Sub-national Institutions in Emerging Markets: Evidence from Vietnam. *Journal of Management Studies* (January).

Nair-Reichert, U. and D. Weinhold (2001). Causality tests for cross-country panels: a new look at FDI and economic growth in developing countries. *2*, 153–171.

Nunnenkamp, P. and J. Spatz (2004). FDI and economic growth in developing economies: how relevant are host-economy and industry characteristics. *Transnational Corporations 13*(3).

Pandya, S. (2013). *Trading Spaces.*

Pinto, P. (2013). Partisan Investment in the Global Economy.

Przeworski, A., F. Limongi, and F. L. Neto (1997). Modernization: Theories and facts. *World politics 49*(2), 155–183.

Romer, P. M. (1994). The Origins of Endogenous Growth. *Journal of Economic Perspectives 8*(1), 3–22.

Sandholtz, W. and M. M. Gray (2003). International Integration and National Corruption. *International Organization 57*(04), 761–800.

Sheng, Y. (2007). Global Market Integration and Central Political Control: Foreign Trade and Intergovernmental Relations in China.

Shih, V., C. Adolph, and M. Liu (2012, March). Getting Ahead in the Communist Party: Explaining the Advancement of Central Committee Members in China. *American Political Science Review 106*(01), 166–187.

Strauss, E. N. (2013). Easing Out the FCPA Facilitation Payment Exception. *Boston University Law Review 93*.

Telford, T. G. and H. A. Ures (2001). The Role of Incentives in Foreign Direct Investment. *Loyola of Los Angeles International and Comparative Law Review 23*(4).

Thun, E. (2006). *Changing lanes in China: Foreign direct investment, local governments, and auto sector development.*

Tyler, A. (2011). Enforcing Enforcement: Is the OECD Anti-Bribery Convention's Peer Review Effective? *George Washington International Law Review 43*(2007), 137–173.

Wang, J.-Y. and M. Blomstrom (1992). Foreign Investment and technology transfer. A simple model. *European Economic Review 36*, 135–175.

Wei, S.-J. (2000). How Taxing is Corruption on International Investors?

Willem, D. (2004). Foreign Direct Investment and Income Inequality in Latin America by and Income Inequality in Latin America. *ODI Research Papers*.

World Bank (2015). Enterprise Surveys Core 2.

Wright, J. (2008). Do authoritarian institutions constrain? How legislatures affect economic growth and investment. *American Journal of Political Science 52*(2), 322–343.

Zhang, K. H. (2001). Does foreign direct investment promote economic growth ? Evidence from East Asia and Latin America. *Contemporary Economic Policy 19*(2), 175.