Prospectus: The effect of corruption on FDI technological spillover

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1 Generalized Theory

1.1 Government official faces a budget constraint over two goods, technological 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.[1] 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).

Since the endowment that the official commands is finite, it imposes a budget constraint on the amount of FDI that the official can attract, and consequently, the size of the bundle that he can afford.

Furthermore, since offering technological spillover and private benefit both reduces firms' profitability, firms cannot offer the official more of both goods in the bundle. Indeed, to encourage technological 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

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

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.

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

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.

1.2 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 1). 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).

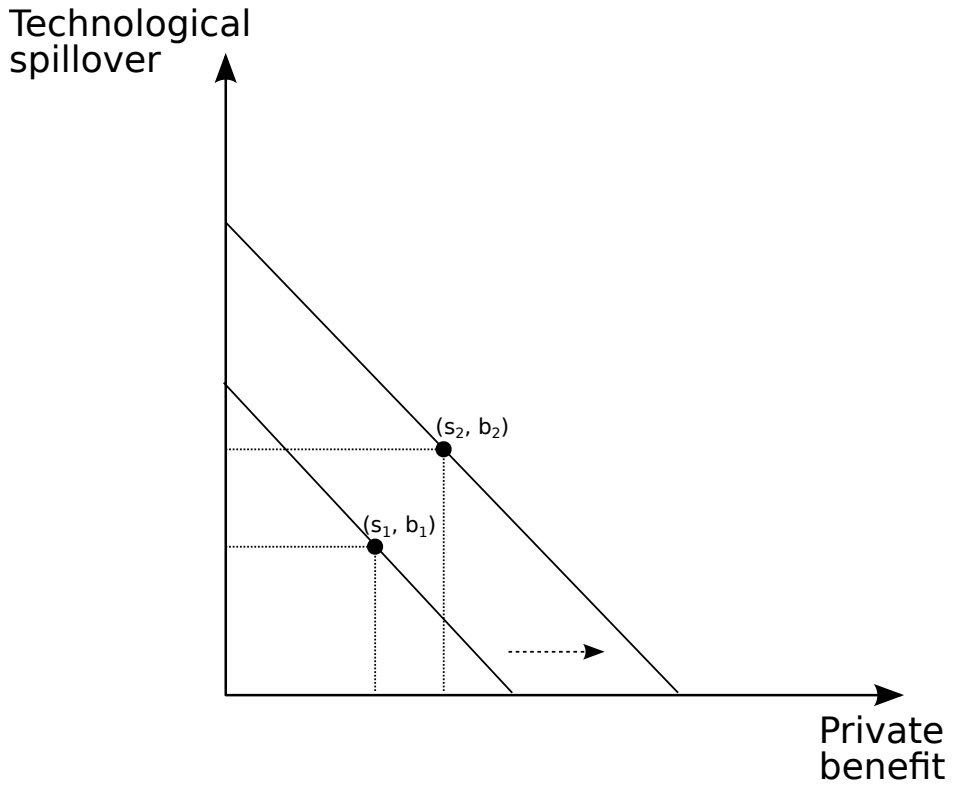

Figure 1: When an official has more endowment, his budget constraint shifts from left to right. He is now able to afford the (s_2, b_2) bundle, with $s_2 > s_1$ and $b_2 > b_1$.

1.3 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 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 2). Alternatively, we can think of the slope of the budget constraint as the relative price of the two goods.

The "price" of technological spillover substantively means 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.[2] This absorption can happen via two channels. 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. 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

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for this high quality labor from the foreign sector.

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

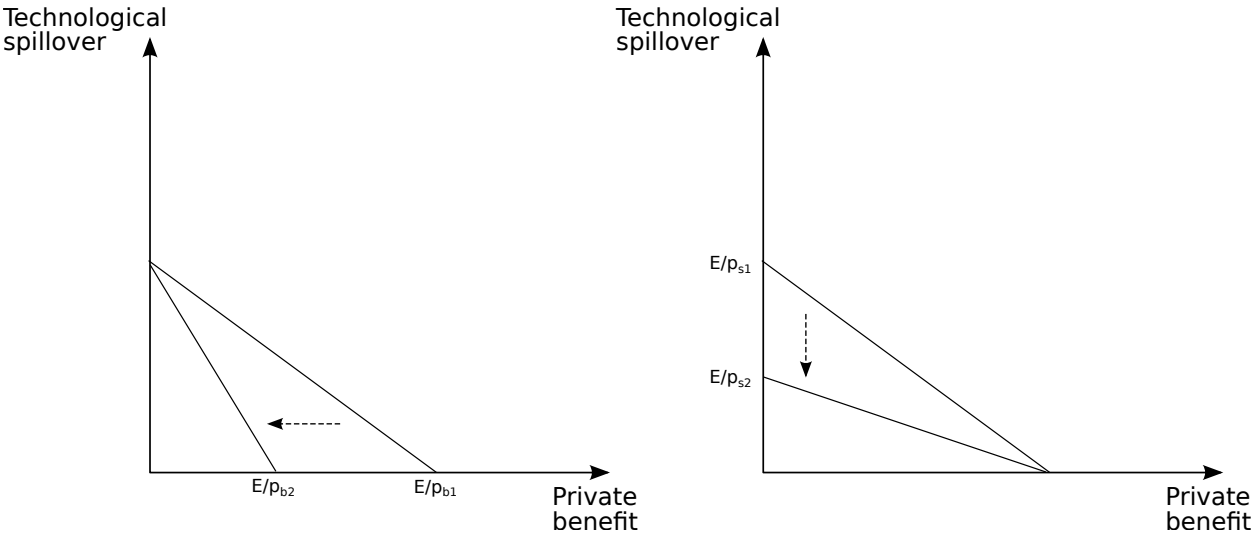

Figure 2: In the left panel, the intercept for private benefit moves from the right to the left as its price increases. In other words, $\frac{E}{p_{b2}} < \frac{E}{p_{b1}}$ because $p_{b2} > p_{b1}$. Similarly, in the right panel, as it becomes more difficult to extract spillover from foreign firms, the intercept moves down.

1.4 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 3).

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 3, 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.

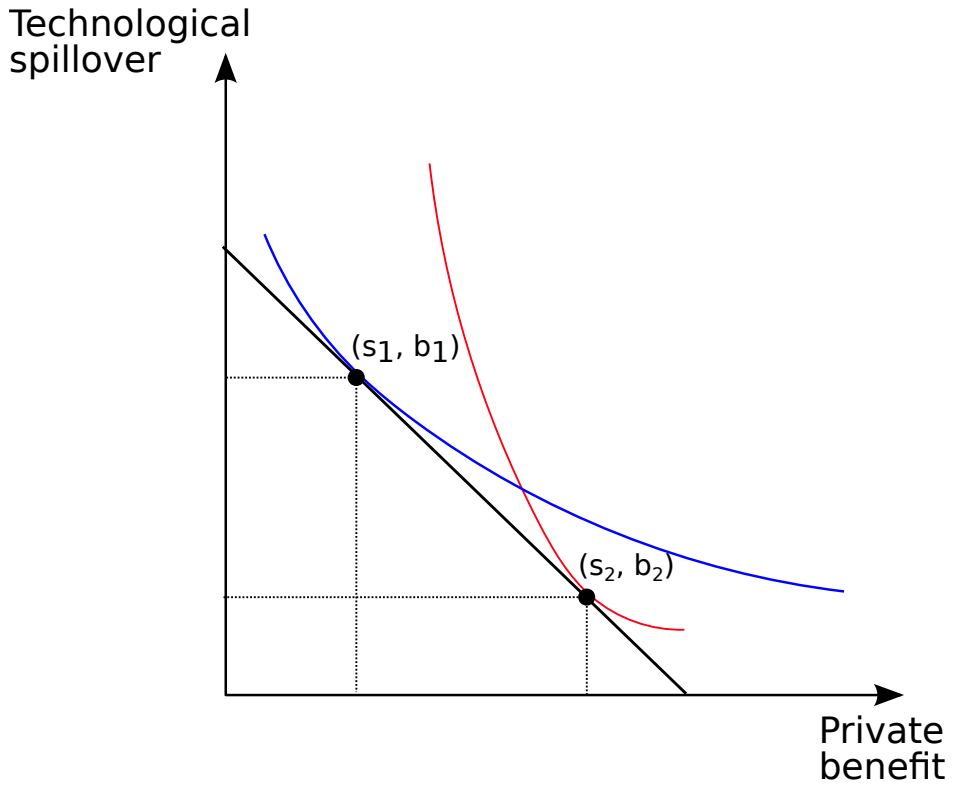

Figure 3: The blue indifference curve shows that the longer the official's time horizon, the flatter his indifference curve, and he will choose more spillover and less private benefit.

1.5 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