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Résumé de l'article

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Foreign Direct Investment and the Robustness of Host-Country Commitment

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This paper presents a model of a forward-looking government wooing foreign direct investment by enacting policies that reflect its commitment to the foreign enterprise. The ease with which the government is able to spend or carry out economic reform to complement the foreign venture evolves over time and influences the likelihood of its sustained commitment. The domestic and external strength of the government, the stability and not necessarily the level of returns from the project, venture-specificity of government spending or reform, and public and elite attitudes toward foreign commercial entry determine how invested the government remains in the long term success of the enterprise. More committed governments tend to be stronger and prefer robust investor-regime relationships. Reform that is not designed too narrowly to favor the investor is also less likely to be reversed later. Like pro-FDI public sentiment, a noisy policy environment induces deeper government commitment.

Keywords: foreign investment, policy reform, government strength

JEL Classification: F20, F21, O24

1 Introduction

Foreign direct investment has long been promoted as an effective vehicle for economic growth and development (World Bank, 2017). Understanding what determines the flow of foreign investment has been the focus of many scholars (Blonigen, 2005; Navaretti and Venables, 2006; Sekkat and Veganzones-Varoudakis, 2007; Aziz and Mishra, 2016) and has informed government policies designed to attract FDI in a fiercely competitive environment amongst countries seeking multinational investment. It is well understood that large and growing domestic markets, macroeconomic stability, liberalization policies, energy availability, ease of doing business, and low corruption and political stability all encourage FDI. From the viewpoint of investors scoping the global economy for opportunities to put their capital to use, it is also important to understand the conditions under which governments are more likely to

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court foreign firms. Having a better sense of factors that make governments more hospitable to foreign investment has the potential to empower investors to win host country support for their ventures.

By concentrating on the competing opportunities and risks faced by governments and the varying strength of the regimes in office over time, this paper highlights the conditions that are more conducive to foreign investment. The main building block of our framework is the opportunity cost of government spending, in the form of actual funds or reform efforts, to prepare the ground for foreign commercial entry into its economy. These costs are influenced by the economic and political conditions under which policymakers operate domestically. For example, the opportunity cost of spending is higher if building infrastructure to support foreign entry into the economy diverts funds away from the construction of public hospitals. But this cost could be more manageable if the same infrastructure also provides uplift to a local constituency. Several studies provide the empirical basis for this foundation. For example, Hauptmeier, et al (2012) study 1100 German municipalities from 1998-2004 to conclude that infrastructure spending to attract business investment goes up (down) when neighboring municipalities raise (lower) their spending on infrastructure. Such competing spending can therefore be interpreted as having a lower opportunity cost owing to the precedent being set by the neighboring municipality.

Hauptmeier et al (2012), along with Benassy-Querre et al (2005) and Redoano (2014), is representative of the large related literature on tax competition for foreign investment. These studies focus on the role of the cost of cross-border investment in determining investment levels, concluding that any such costs deter investment activity. Their results are applicable to any cost increasing measures such as taxes, but also to regulatory impediments that could be addressed via policy reform. Redoano (2014) treats EU membership as an indication of such costs being lower, which makes countries more sensitive to changes in the tax policy of other EU members. Benassy-Querra et al (2005) use 1994-2003 data on FDI flows from the US to 18 EU countries to confirm the importance of infrastructure and R&D by estimating that a one percent increase in road density increases FDI by 0.7 percent, and a one percent increase in R&D expenditures raises FDI by 1.1 percent. Together with their estimate that a one percent increase in taxes, a measure of the cost associated with investment, leads to a 3.5 percent decline in FDI, it suggests that countries with higher costs might still be able to attract significant FDI if they are able to offer robust infrastructure to support commercial activity. The results are consistent with the conclusion reached by Hauptmeier et al (2012). Similarly, while regulatory reform that is not broad based but that specifically benefits the foreign enterprise would be more costly to the government, it could reduce the need to ensure targeted infrastructure provision to a foreign firm, mitigating some of that cost. While physical infrastructure is important, it should not detract from the crucial role played by other forms such as the availability of an appropriately trained and healthy workforce. For example, Asiedu (2006),

Cleeve, et al (2015), Ghosh and Renna (2015), Kinda (2013), and Noorbakhsh et al (2001) provide evidence for human capital—classified by some of these studies as sophisticated, created assets—being one of the most important determinants of FDI inflows. Significance of this aspect may be gauged from the recent finding by Hou, et al (2021) that high labor quality mitigates the negative effect of high wages on inward FDI. The finding runs parallel to the empirical result obtained by Sanz-Cordoba (2020) based on data from 30 countries over 1999 - 2014 that government investment in enabling infrastructure or productivity-enhancing policies substitutes for low capital taxation. Availability of such assets can also be seen as reducing the cost to the foreign enterprise in the same way as a streamlined FDI policy framework or rationalized institutions. Benefits to the regime from foreign investment depend in part on its international strength and credibility and can mitigate the impact of these costs. Simply put, a government would be more likely to be favorably disposed toward foreign entry given a propitious policy environment and if investment-friendly spending and reform do not have to be too narrowly targeted.

The following sections formalize these ideas and enrich them with further details. To capture the evolving decision-making environment under which policymakers operate, we employ the notion of forward dynamic utility (Musiela and Zariphopoulou, 2007), a generalization of the traditional utility function. It allows us to model the regime's ability to withstand domestic economic and political pressure dynamically as it evolves over time following the dynamic programing principle. Given our interest in government decisions, we consider the case where the foreign investor sees the minimum threshold to proceed with the project being met and is prepared to invest a fixed amount in the country. A regime is then more likely to demonstrate a higher level of commitment to the foreign investor if the costs of overcoming opposition to the enterprise are low and the government has more bargaining power vis-à-vis the multinational.

One of the issues faced by foreign investors is the uncertainty surrounding the credibility of commitments made by the host government (Aisbett et al., 2010). In sectors such as mining where sunk costs are high, this becomes a significant roadblock to attracting FDI. Understanding the likelihood of phenomenon like the obsolescing bargain—that is when governments seek to renegotiate contracts with terms more favorable to themselves and often at the expense of the investor after the initial investment has been sunk, risk has declined, and the project has become profitable—could help firms devise a more surefooted investment strategy. The dynamic nature of our framework pinpoints the factors a foreign investor would do well to keep track of over time to better anticipate the changing attitude of the host government toward the project. These factors determine the willingness of the government to implement and sustain spending and reform policies and include the nature and structure of the regime, the degree of accountability and susceptibility to public opinion, the extent of patronage, and the state of the overall economy.

The results reiterate and enrich the conclusions of the literature on economic policy reform which suggests that reforms that are reputed to be zero-sum or the wrong response to ameliorate living standards are likely to arouse opposition. Without taking the maxim that "good economics does often turn out to be good politics, but only eventually" (Rodrik, 1996, p. 10) for granted, this paper offers some answers to when ostensibly good politics can sustain economic reform. Like Haggard and Webb (1993) and Rodrik (2002), it suggests that, in the case of foreign investment policy reform, a lot rests on the government's ability to create political support and overcome any opposition. The response and adjustment of government preferences to such exigencies in a dynamic setting allows our model to better account for their impact and bring forth their interactions with other relevant factors like expected returns and the scope of investments and reform.

In the remainder of the paper, we develop and present our model with a forward dynamic utility of the government and stochastic returns in the next section. Results are then derived from a preliminary analysis and compared to a more comprehensive investigation using simulations in the following section. The results are used to shed light on foreign investment across the developing world with particular emphasis on FDI in mining. The focus is mainly on policy and contract reform although the results may also be seen in the context of joint ventures between a foreign enterprise and the government or a publicly owned firm. The final section concludes with a summary and suggestions for future research.

2 Model

Assume revenue depends on two activities. Let x be government investment in the activity in which it enjoys an advantage over the foreign firm—such as the provision of infrastructure or the development of a favorable regulatory and policy regime—and y be foreign investment in the project. We may think of y as input in production or mining. Revenue is given by the increasing function $R(x, y)$.

The government's return from the undertaking can be written in a way similar to Navaretti and Venables (2006) as follows:

$$\pi^F = \theta\varphi R(x,y) + xr - cx = \theta S + xr - cx, \quad 0 < \theta, \varphi < 1 \tag{1}$$

The surplus $\varphi R(x, y) = S$, which is the revenue in excess of what is earned when an outside option has to be invoked, is stochastic and depends on demand (or price). We model it as a Brownian motion (detailed in the next paragraph) because demand (or price) experiences continuous stochastic perturbation. A relatively strong outside option is therefore consistent with a low value of φ. The government's share of the surplus is a fraction θ while the rest goes to the foreign firm. In this way, we are able to model the regime's international standing and credibility as θ proxies its bargaining power. Other than complementing foreign production,

government spending has alternate uses and this outside option is represented by *r*, while *c* is the per-unit cost of *x*. The return on alternate spending may be thought of as pecuniary—thus providing the government with an additional income stream to manage the risk associated with entering the project—or public support garnered through that spending or resulting redistribution through economic reform. We rewrite (1) more simply as:

$$\pi^F = \theta S + (r - c)x = \theta S + \delta x, \tag{2}$$

where $\delta = (r - c)$.

Demand perturbations generally have many sources making the market outcome unpredictable. Generally, the random setting is described by letting $(\Omega, \mathcal{F}, \{\mathcal{F}_t\}_{t\geq 0}, P)$ be a filtered complete probability space and $\boldsymbol{W} = (W^1, \ldots, W^n)$ be an *n*-dimensional standard Brownian motion (Bass, 2011). The motivation for modeling perturbations in this manner is based on the everywhere-pervasive influence of the underlying factors present at any moment in time. Also, by the Central Limit Theorem, the statistical behavior of these factors, as well as that of the Brownian motion, is normal which again makes our modeling approach suitable. The specific context in this paper will make the setting more straightforward.

To incorporate the idea that the government's preferences over risk might evolve over the course of the venture, we use the notion of *forward utility*. Risk preferences could change with the changing economic and political environment or simply because of a change in the political regime. The forward dynamic utility for the government is given by:

$$U(t, \pi) = -\exp(\gamma_t - m(t)\pi), \tag{3}$$

where γ_t satisfies the stochastic differential equation $d\gamma_t = A(t, \gamma_t)dt + B(t, \gamma_t)dW_t$, $\gamma_0 > 0$, and $m(t) > 0$ is a deterministic function. The standard role of *m* in exponential utility functions is as a measure of the aversion to risk of the economic agent. We will argue in the next section that this risk aversion may be interpreted as the government's domestic strength. The distinction made between the government's internal and foreign strength in the model will allow for richer institutional analysis to be presented in the next section.

If the government does not enter into the project with the foreign firm, it still gets a constant return, $\bar{\pi}$. In this case, the sector remains underexplored or underprovided as the status-quo prevails.

The dynamics of x_t are given by:

$$dx_t = \delta x_t dt, \quad x_0 = 1. \tag{4}$$

The surplus, S_t, satisfies the following stochastic differential equation:

$$dS_t = \mu S_{t-} dt + \sigma S_{t-} dW_t, \quad S_0 > 0. \tag{5}$$

Here, W_t is a one-dimensional Weiner process. We assume that δ in (4) and the mean surplus, μ, and volatility, σ, in (5) are all constant, which makes writing down the time subscript unnecessary.

Without loss of generality, we assume positive initial government investment at time $t = 0$ with its value at $t > 0$ given by:

$$\pi_t^F = V_t^S + V_t^O, \tag{6}$$

where $V_t^S = \theta S_t$ and V_t^O are the accumulated values at time $t > 0$ of the commitment to the project and the outside option respectively. Then, given any allocation of spending between investment in the joint project and the outside option, the dynamics of these accumulated gains for the government are described by:

$$d\pi_t^F = \delta \pi_t^F dt + (\mu - \delta)\theta S_t dt + \sigma \theta S_t dW_t, \quad \pi_0^F > 0. \tag{7}$$

The government's forward dynamic utility, $U(t, \pi)$, in (3) is a continuous, random, (strictly) increasing concave function. For any initial $\pi > 0$, forward utility satisfies:

$$E[U(t, \pi_t^F) | \mathcal{F}_s] \leq U(s, \pi_s), \tag{8}$$

for any s, t, $0 \leq s \leq t$. Also, for any $\pi > 0$, there is optimal return π^* such that:

$$E[U(t, \pi^{F*}) | \mathcal{F}_s] = U(s, \pi_s^{F*}), \tag{9}$$

for any $0 \leq s \leq t$. We assume $U(t, \pi_t)$ to be a supermartingale for any π and a martingale for some π^* which allows us to invoke the dynamic programing principle (Musiela and Zariphopoulou, 2007).

We specify a conventional (static) utility function $u(\pi)$ as an initial condition such that $U(0, \pi^F) = u_0(\pi^F)$, which evolves following the dynamic programing principle. In addition, we locally characterize $U(t, \pi^F)$ as:

$$dU(t, \pi^F) = \alpha(t, \pi^F) dt + \beta(t, \pi^F) dW_t. \tag{10}$$

Then, by Ito's formula (Kunita, 1997), utility dynamics can be written as:

$$\begin{aligned} dU(t,\pi^F) &= \alpha(t,\pi^F)dt + \beta(t,\pi^F)dW_t \\ &\quad + U_\pi(t,\pi^F_{t-})[\delta\pi^F_t dt + (\mu-\delta)\theta S_{t-}st \\ &\quad + \sigma\theta S_{t-}dW_t] + \tfrac{1}{2}U_{\pi\pi}(t,\pi^F_{t-})\sigma^2\theta^2 S^2_{t-}dt \\ &\quad + \beta_\pi(t,\pi^F_{t-})\sigma\theta_t S_{t-}dt \\ &= [\alpha(t,\pi^F_{t-}) + \delta U_\pi(t,\pi^F_{t-})\pi^F_{t-} + (\mu-\delta)U_\pi(t,\pi^F_{t-})\theta S_t \\ &\quad + \sigma\beta_\pi(t,\pi^F_{t-})\theta S_t + \tfrac{1}{2}U_{\pi\pi}(t,\pi^F_{t-})\sigma^2\theta^2 S^2_t]dt \\ &\quad + [\beta(t,\pi^F_t) + U_\pi(t,\pi^F_{t-})\sigma S_t]dW_t. \end{aligned} \tag{11}$$

For notational convenience, we denote the terms in the first set of square brackets after the last equality in (11) above as follows:

$$\begin{aligned} f(t,\pi^F,S) &= \alpha(t,\pi^F_{t-}) + \delta U_\pi(t,\pi^F_{t-})\pi^F_{t-} \\ &\quad + (\mu-\delta)U_\pi(t,\pi^F_{t-})\theta S_t + \sigma\beta_\pi(t,\pi^F_{t-})\theta S_t \\ &\quad + \tfrac{1}{2}U_{\pi\pi}(t,\pi^F_{t-})\sigma^2\theta^2 S^2_t. \end{aligned} \tag{12}$$

The government's utility in the case with foreign participation satisfies the following stochastic differential equation:

$$\begin{aligned} dU(t,\pi^F) = -\exp(\gamma_t - m(t)\pi^F)\Big[\Big(A(t,\gamma_t) + \tfrac{1}{2}B^2(t,\gamma_t) \\ - m'(t)\pi^F\Big)dt + B(t,\gamma_t)dW_t\Big], \end{aligned} \tag{13}$$

and so, from (10),

$$\begin{aligned} \alpha(t,\pi^F) = -\exp(\gamma_t - m(t)\pi^F)\Big[A(t,\gamma_t) + \tfrac{1}{2}B^2(t,\gamma_t) \\ - m'(t)\pi^F\Big], \end{aligned} \tag{14}$$

and

$$\beta(t,\pi^F) = -\exp(\gamma_t - m(t)\pi^F)\,B(t,\gamma_t). \tag{15}$$

Differentiating (14) with respect to π^F yields:

$$\beta_\pi(t,\pi^F) = m(t)\exp(\gamma_t - m(t)\pi^F)B(t,\gamma_t). \tag{16}$$

The first and second derivatives of the government's utility are:

$$U_\pi(t,\pi^F) = m(t)\exp(\gamma_t - m(t)\pi^F), \tag{17}$$

and

$$U_{\pi\pi}(t,\pi^F) = -m^2(t)\exp(\gamma_t - m(t)\pi^F). \tag{18}$$

Using (16)-(18), we can rewrite (12) as follows:

$$\begin{aligned} f(t,\pi^F,S) = & -\exp(\gamma_t - m(t)\pi^F)\Big[-\Big(A(t,\gamma_t) + \tfrac{1}{2}B^2(t,\gamma_t)\Big) \\ & + \Big(m'(t) \\ & + m(t)\Big(\delta\pi^F + (\mu-\delta)\theta S + \sigma B(t,\gamma_t)\theta S \\ & - \tfrac{1}{2}\sigma^2 m(t)\theta^2 S^2\Big)\Big)\Big]. \end{aligned} \tag{19}$$

To analyze $f(t, \pi^F, S)$ further, we first solve:

$$dm(t) = -\delta m(t)dt, \;\; m(0) = m_0 > 0,$$

to get:

$$m(t) = m_0\exp(-\delta t). \tag{20}$$

The right-hand side in (20) implies that $m(t)$ is always positive. Substituting (20) into (19) then yields:

$$\begin{aligned} f(t,\pi^F,S) = \exp(\gamma_t - m(t)\pi^F)\Big[-\tfrac{1}{2}\sigma^2 m^2(t)\theta^2 S^2 + (\mu-\delta \\ + \sigma B(t,\gamma_t)m(t)\theta S - (A(t,\gamma_t) + \tfrac{1}{2}B^2(t,\gamma_t))\Big]. \end{aligned} \tag{21}$$

Note that the term in the square brackets in (21) is concave with respect to S. As usual, we differentiate with respect to S and set it equal to zero to derive the optimal solution. This gives:

$$S^* = \frac{1}{\theta}\Big(\frac{\mu - \delta + \sigma B(t,\gamma_t)}{\sigma^2 m^2(t)}\Big). \tag{22}$$

Further, if $U(t, \pi)$ is a forward utility, then the following relationship must constrain A and B in order to put the requisite constraint on γ_t:

$$A(t,\gamma) = -\frac{1}{2}\sigma^2 m^2(t)(S^*)^2 + \big(\mu - \delta + \sigma B(t,\gamma)\big)m(t)S^* - \frac{1}{2}B^2(t,\gamma). \tag{23}$$

Our analysis is now going to be based on the main result in (22) and its associated constraint in (23) above. The expression for S^* in (22) gives the accumulated value from the project at any point in time and is critical to understanding the government's optimal strategy dynamically. The condition in (23) adds richness to our analysis by ensuring the forward nature of preferences that may be interpreted as resulting from the evolving decision-making environment over time.

3 Results and Analysis

Before using simulations to conduct the main analysis, it is useful to get an intuitive feel for the results by exploiting simple algebra. Equations (22) and (23) allow us to write:

$$S^* \geq 2\left(\frac{\mu - \delta}{\theta\sigma^2 m^2}\right) \tag{24}$$

From (24) and the optimal surplus condition in (22), it is clear that the rents from the joint project depend on several factors. The government's share of the surplus, θ, inversely affects the optimal surplus. As indicated before, it is useful to think of this parameter as a reflection of the relative bargaining power of the two parties. A higher θ is consistent with the government having a stronger bargaining position, enabling it to claim a larger share of the resulting surplus. As expected, our result suggests that the foreign firm's weaker bargaining position leads to underinvestment in the project, provision of few investment incentives, and a lack of government commitment to reform.

The condition also confirms the intuition that a strong economic environment that supports robust demand for the product, reflected in a higher value of μ, would encourage the parties to undertake the project. The condition further underscores that turbulence in the market, captured by a higher value of σ, reduces the proclivity to invest. Rents also have a negative relationship with $\delta = (r - c)$, which can be thought of as the net return on the outside option, likely because a higher net return would undermine the likelihood of the joint project moving forward. A higher cost to the government of investing in the project also reduces the chance of running into the hold-up problem in the future. One way to consider this cost is to think of it as the cost of remaining in power. For example, in the case of democratic regimes, the cost of investment could be the opportunity cost of public spending in other sectors of the economy. The cost may also be thought of as the political capital expended or the effort required to overcome organizational inertia, resource constraints, or other opposition to affect institutional

and policy reform that is more favorable to foreign investment. A government would then be expected to escalate its commitment to the joint project if diverting funds to the project and away from alternate uses—such as social sector spending on health and education, or legislative work in other areas—requires overcoming considerable opposition and creates high political costs. Democratic governments with strong checks and balances are therefore more likely to skirt the hold-up problem and would have more at stake in the success of the project. Fledgling democracies and other regimes with weaker institutions and endemic corruption are likely to be unenthusiastic and less reliable partners for the foreign investor. In particular, authoritarian regimes are likely to enter into such projects only to the extent that these benefit the powerholders and their enablers with the possibility that the project is abandoned before takeoff. Kleptocratic institutions that are strong enough to ensure ongoing and adequate returns for the regime to fund a system of patronage would raise the possibility that an authoritarian government stays in the partnership.

The model also predicts that a regime with higher a tolerance for uncertainty is likely to invest more in the project for any given level of international investment as m is inversely related to the surplus. Weaker regimes, i.e., regimes, whether democratic or authoritarian, that face meaningful domestic opposition, have underdeveloped or crisis-ridden economies, are saddled with a heavy debt burden, or are experiencing bouts of resource nationalism would be more averse to the risk of failure. The possibility of accountability in any form would then contribute to the policymaker being more risk averse in a manner analogous to that discussed in Bozeman and Kingsley (1998) for public organizations. Such resistance would be lower in times of crises when payoffs to different economic agents are altered and make policy reform more likely (Sturzenegger and Tomassi, 1998). Allowing m to vary over time also admits the outcomes of similar past endeavors as determinants of how willing policymakers are to entertain the possibility of failure. Impacts of previous attempts on, for example, the distribution of gains could reasonably affect current support for attracting foreign investment and driving reform forward. Domestically strong regimes would be characterized by an absence of sclerotic policymaking institutions, display firmer policy commitment, and be avid supporters of the project because they would be better able to negotiate failure of the enterprise or, in the case of being signatories to international trade and investment treaties, increase their immunity to domestic pressure to expropriate foreign assets outright (Büthe and Milner, 2008).

To do the analysis more comprehensively, we revisit (22) and (23) and the terms $A(t, \gamma)$ and $B(t, \gamma)$. This more completely (and correctly) reintroduces the relevant dynamic elements into our analysis. Recall that $d\gamma_t = A(t,\gamma_t)dt + B(t,\gamma_t)dW_t$. We explicitly define these terms as $A(t,\gamma) = \omega\gamma$ and $B(t,\gamma) = \rho\gamma$, where ω and ρ are the mean and noise coefficients respectively. We begin by simulating the solution obtained in the previous section by varying the bargaining power parameter θ. This is presented in Figure 1. Owing to the form of (23) and (24), the curves in Figure 1 as well as the subsequent figures are bifurcated but this does not

affect the trends identified in our results or our conclusions in any way. The domestic strength of the governing regime is captured by its tolerance for uncertainty and its ability to navigate project failure as indicated earlier and is measured on the horizontal axis. At any point in time and for a given level of foreign investment, the government's commitment or investment to maintain optimal value in the project is tracked on the vertical axis. The model allows us to interpret the dependent variable on the vertical axis as either the government's level of effort and commitment to economic reform—such as legislation or policies that incentivize investment—or actual funds invested by the government to complement FDI—for example, in the form of infrastructure provision. The figure supports the preliminary analysis and shows that weaker regimes (corresponding to a higher *m*) invest less in the project than stronger ones. Our framework allows us to distinguish between the strength of the regime at home and the strength it is able to project abroad in, for example, its negotiations with foreign entities. While domestic strength could be reflected in policy resoluteness and the lack of opposition the government faces at home to its legislative efforts, its ability to maneuver talks with a foreign partner is a separate and distinct capability. It is possible and even likely that regimes facing strong domestic opposition are also weak international negotiators or that governments firmly in control at home lack international credibility.

Figure 1

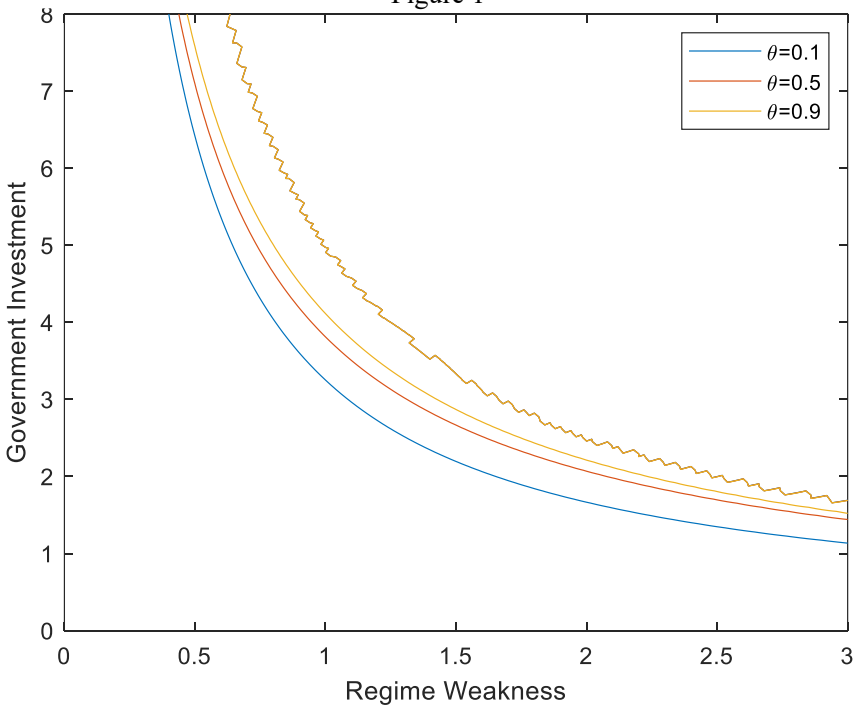


Figure 1 captures these possibilities as well and shows that governments with strong bargaining power, regardless of their domestic strength, drive reform forward or invest more than those that lack negotiating capacity or international credibility with the commitment to reform or the level of investment falling along with the domestic strength of the regime. The figure also suggests that bargaining power matters little for domestically very weak regimes as their commitment to the venture effectively reaches the same levels whether or not they are internationally strong.

The stability of returns from the project, which mainly depend on global market conditions, promotes higher government commitment with the domestically weaker regimes investing less than the stronger ones. Figure 2 further suggests that highly uncertain global market conditions lead to a precipitous drop in government commitment. Large idiosyncratic volatility due to global political risks could explain this decline as in Boutchkova, et al. (2012). Any government, weak or strong, is likely to have only a marginal commitment to the joint project when future success cannot be predicted with confidence. Given a certain level of volatility in returns, Figures 3a and 3b vary the mean return to present differences in government commitment at different degrees of attractiveness of the outside option. The mean return represents the inherent value of the project where larger values could be returns specific to certain high-value industries. Both figures show that domestically weak regimes show weaker commitment to reform and invest less in the project irrespective of the mean return, indicating that even high-return projects may not find sufficient government support if the regime is domestically weak. Limited alternate use of the reform or investment outside of the joint project, i.e., a weak outside option, also discourages government reform efforts and investment, highlighting the forward-looking nature of the policymaker's decisions. In that way, the return on the outside option fills the role of insurance against the risk of entering the project with the foreign partner. Better prospects of alternate use of the reform or investment would then improve the likelihood of a government undertaking efforts to support the project. In fact, as the outside option becomes stronger, disparities between reform and investment levels in projects with different mean returns become imperceptible as seen in Figure 3b, highlighting the complementary role to project-specific reform or investment played by alternate uses. The forward utility approach dynamically captures this link between partnering with the foreign firm and directing government efforts to reform or spending toward alternate uses, and highlights the possibility that the relationship might not be based on a tradeoff over time but be mutually supportive instead.

Figure 2

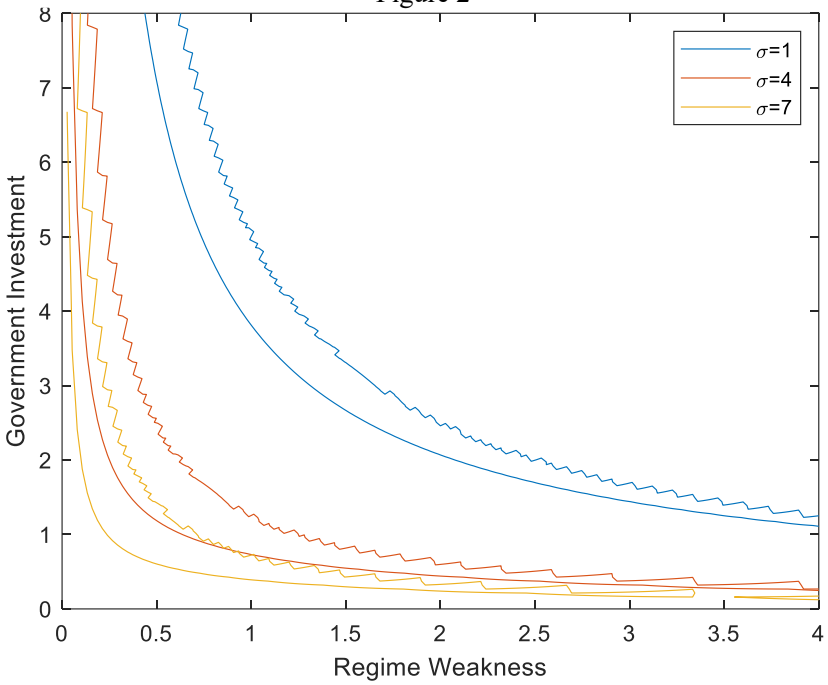


Figure 3a

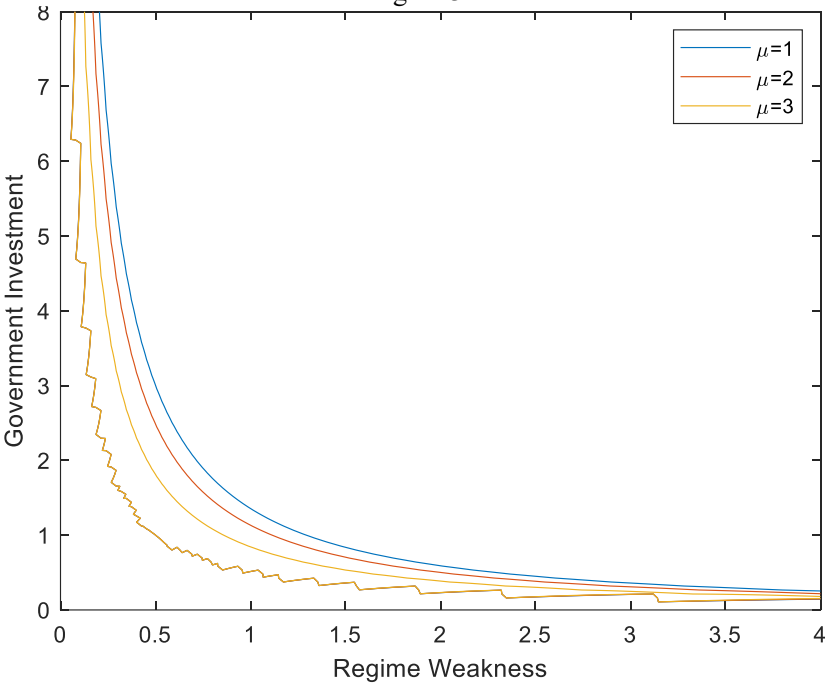
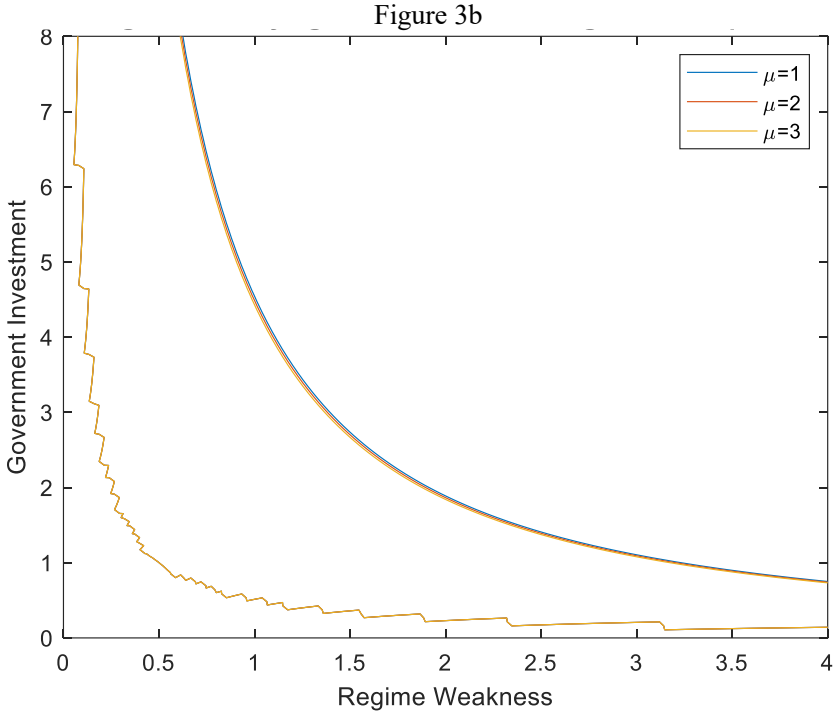


Figure 3b



The observation that government reform effort (or investment) approaches similar levels with sufficiently strong outside options points to the relative insignificance of the intrinsic value of the project to the government's decision and suggests that government commitment would be higher as long as it has the flexibility to adapt the reform to other parts of the economy or allocate its investment to other uses if needed. This puts our simulation results in Figures 3a and 3b at odds with our preliminary analysis in a crucial respect. Figure 3a shows that government commitment would not only be much lower with a weaker outside option but might even be more sluggish if the mean return on the project is higher. This outcome appears less puzzling when we observe that the expected return on the project depends not just on the government's commitment but also on foreign investment, which itself is in part determined by the prospects of the project (Blonigen, 2005; Navaretti and Venables, 2006). Foreign investment is likely to be higher with a healthier mean return on investment which could weaken the imperative to pursue policies that are highly accommodative of the foreign investor. The result is consistent with the empirical findings of Ahlquist and Prakash (2010) demonstrating a higher likelihood of accommodative institutional and policy reform by host countries when FDI is an exigent requirement for the host country. Government commitment would also be lower if the relative attractiveness of the project, φ, is low. The behavior can be seen as yet another reflection of the crucial role of the outside option and how it interacts with

other variables in the decision process. With potent outside alternatives, the government is more open to the idea of committing to the foreign investor since it would be able to shift to the alternate use if needed and be able to avail the benefits created in the interim. But weaker options erode its fidelity to the project with an escalation of investment from the foreign partner further diminishing government commitment. How relationally specific and therefore less prone to adaptation to outside use the government's reform or investment is, is more relevant to its project commitment than the intrinsic value of the project itself. This implies that kickbacks to government officials might not necessarily be a feature of high-value projects as commonly thought but a consequence of the jitters that policymakers feel at the prospect of committing funds and effort to an undertaking that has few other uses. As the simulations demonstrate, this is exacerbated if the regime is domestically weaker. It also means that foreign investors have a better chance of getting a government that is favorably disposed to their project if the government can be reassured of the flexibility of use of its investments. In fact, this could be a superior approach to securing government commitment than extravagant spending on the project by the foreign firm especially in relatively low-value industries.

Figures 4a and 4b reinforce the previous point. The figures show how government commitment varies with the allure of the outside option. Weaker outside options leave the government less inclined toward the project. The simulations also bring to the fore how investment levels are affected by the government's bargaining power vis-a-vis the foreign firm. Given the outside alternative, higher bargaining power enables a regime of any domestic strength to legislate and implement deeper reform or to invest more in the project suggesting that weak opposition and better domestic organization together with a strong international position induce vigorous government engagement, and a robust outside option further intensifies that participation. A strong bargaining position dampens the effect of the outside option as seen in Figure 4b where, notwithstanding the strength of the outside alternative, the differences in commitment levels are relatively small. This result becomes starker as regimes become domestically weaker—commitments in Figure 4b converge to the same level as domestic regime strength goes down.

Government engagement is low if the regime's own philosophy or public sentiment are hostile toward foreign investment. This is captured by a higher value of ω, the mean coefficient in the evolution of $d\gamma_t$. But the volatility of this intrinsic cost also affects government participation. Figure 5 highlights the link between commitment by regimes of varying domestic strength and the stability of their preference for foreign ventures. While domestically weaker regimes still affect less pro-investment reform than stronger ones, more unpredictable intrinsic costs—which may be interpreted as a measure of the regime's uncertain political or policy environment—result in higher levels of government commitment to the project.

Figure 4a

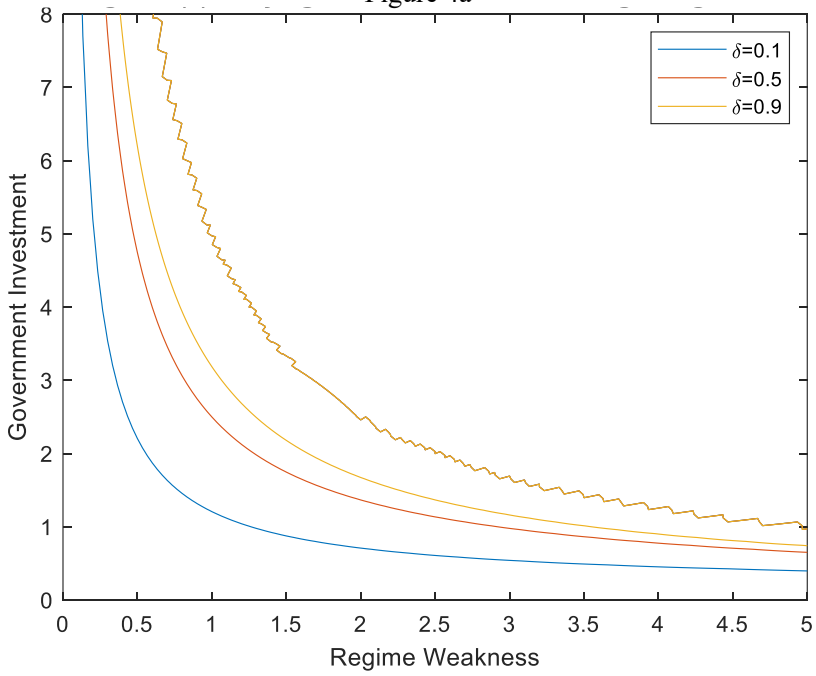


Figure 4b

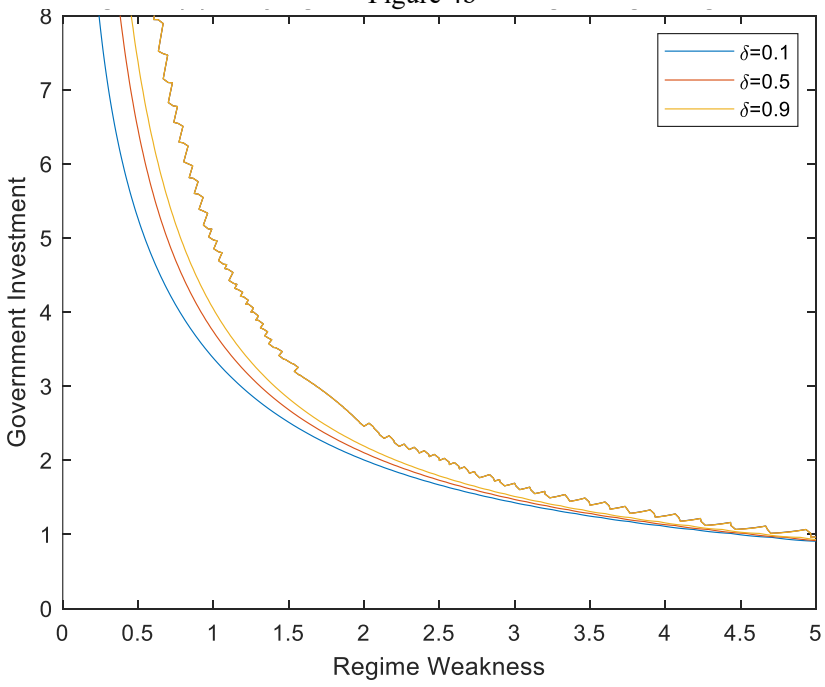
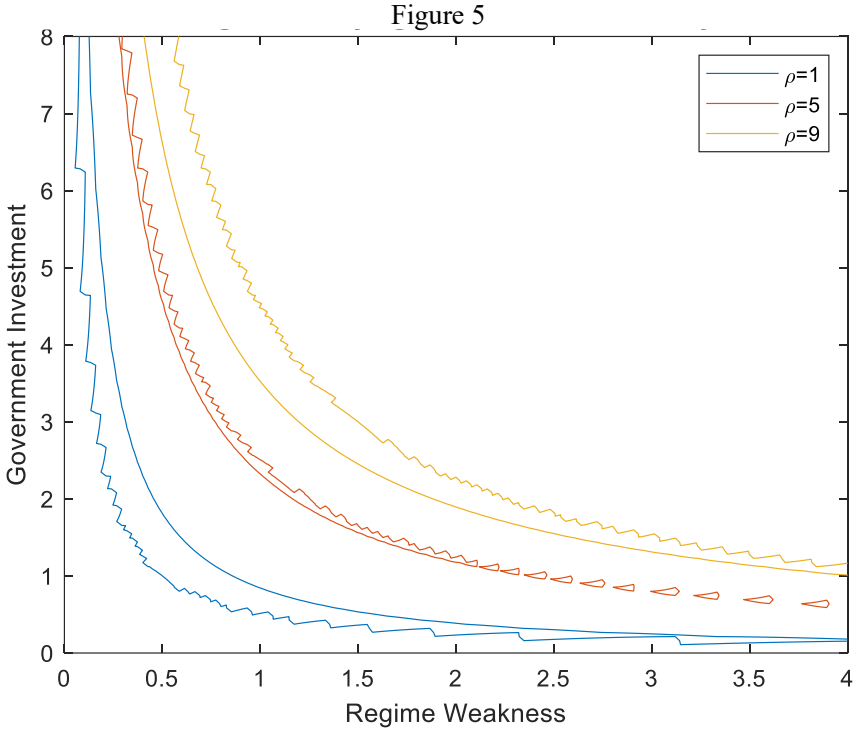


Figure 5



A regime that faces a chaotic policy environment characterized by competing forces impinging on the policy process or vacillating, not necessarily positive, public perception of foreign investment commits more to the project. The result suggests that government cooperation with the foreign investor might be higher not just when the regime and the public are predisposed toward foreign investment but also when there is ambiguity regarding broader public support for such projects, such as when the government is unable to form an accurate picture of public or elite opinion. This result is analogous to the one obtained by Albertus and Gay (2019) that provides an explanation for higher investment under authoritarian regimes when the informational environment is noisy and the type of future regimes are difficult to ascertain.

Considerable empirical support is available for many of the preceding analytical results. The foundational result in Figures 1 - 5 that weak regimes and institutions are tied with lower levels of commitment and investment has a long history in the literature (Knack and Keefer, 1995; Mauro, 2002). More recently, Heimberger (2021) uses meta-analysis of 33 primary studies to conclude that partisan politics, an indication of domestic weakness of the regime, moderates the impact on corporate tax rates, a measure of regime commitment, of lower tax rates in competitor jurisdictions. This basic relationship also conforms with recent empirical findings that establish the link between institutional quality, particularly institutional distance and regulatory quality, and FDI (Aleksynska and Havrylchyk, 2013; Benassy-Quere, et al, 2007;

Buchanan, et al, 2012; Olney, 2013). For instance, Benassy-Quere, et al (2007) find that a country with superior banks regulation, on average, receives 2.2 times higher inward FDI than a country where this aspect of control is lacking. A strong host-country institutional environment manifested, for example, in institutional governance, and fiscal and budgetary transparency is consistent with higher levels of inward FDI (Barry and DiGiuseppe, 2019; Cicatiello, et al, 2021; Fazio, et al, 2008; Kingsley and Graham, 2017) even in the absence of other reforms, confirming the insight captured by our simulation results in Figures 3 and 4 which suggest that the need for vigorous government commitment becomes less imperative if other offsetting variables are in place. For example, Suliman and Mollick (2009) find evidence of such an offsetting relationship between literacy and political rights on the one hand and war and domestic unrest on the other, while Kinda (2013) detects this link between human capital and infrastructure constraints, particularly in the case of horizontal FDI.

The link between government commitment in the form of investment promotion and FDI is explored by Loewendahl (2001) using case studies and empirically by Anyanwu (2006), Harding and Javorcik (2011), and Heilbron and Kronfol (2020). These studies affirm our result delineated in Figure 2 that government commitment in the form of investment promotion and regulatory reform is lacking in times of global market uncertainty. Their stressing of the importance of an intensive commitment to such policies in uncertain times further lends support to our results in Figures 3 - 4 of the substitutability of government commitment and an intrinsically favorable landscape for FDI. For example, Harding and Javorcik (2011) specifically find that investment promotion is more effective in countries with weak institutions that are less able to formulate efficient policies. That government commitment encourages FDI inflows is also confirmed by Dixon and Haslam (2016), who show that ratified treaties, a sign of government commitment, that offer investment protection encourage FDI while merely signed treaties do not.

Our results on the link between public sentiment and government commitment depicted in Figure 5 also find empirical validation when considered along with earlier conclusions arrived at in Figures 3 and 4. For example, Kunčič and Jaklič (2014), Li, et al (2019), and Yiu, et al (2021), all conclude that a negative view of foreign investment and asset acquisition deters FDI inflow. This means that maintaining an optimal level of investment from abroad would require compensating measures, such as the provision of enabling infrastructure or other forms of government commitment, to be taken by the host government.

The foregoing discussion of empirical evidence that is consistent with the conclusions of our model strengthens the case for its applicability. To further highlight the relevance of our analytical framework, we consider case studies from the mining industry and provide exploratory evidence in the next section.

4 Illustrations from the Mining Industry

To illustrate the main mechanisms proposed in the model, we provide some case study evidence from the mining industry. The discussion establishes the following claims which are consistent with the assertions of our framework: (i) domestically weaker governments show lower levels of commitment; (ii) internationally stronger regimes display higher levels of commitment; (iii) the promise of stable returns from a project promotes government engagement; (iv) project specificity of the reform effort or government investment deters regime commitment but being the stronger partner can help the government make up for a lack of enthusiasm; and (v) positive and even equivocal public opinion or elite sentiment toward foreign investment leads to stronger government commitment.

The risks associated with FDI tend to be high because of the various information asymmetries with which the investor has to contend. These risks are generally considered to be more acute if the host nation is a developing country where unstable governments, corruption, and poor socioeconomic conditions and bureaucracy are prevalent (Kasatuka and Minnitt, 2006; Tole and Koop, 2011). The mining industry is additionally characterized by large sunk costs, high capital intensity, volatile markets, and late payback. While the intrinsic value of the project is a crucial determinant of foreign investment, government commitment in the form of supportive policies also plays a significantly complementary role. Transparency, regulatory reform, and the manageability of investment risks including the risk of expropriation are all critical requisites for successfully attracting FDI. In trade focused sectors such as mining, trade policy reform is also a sign of the seriousness the government is affording to the task of attracting foreign investment. To improve the likelihood of these reforms, host countries have to invest in building a supportive political, legal, and institutional environment which, in turn, promotes FDI inflows (Globerman and Shapiro, 2002). The groundwork that a government must do to attract investment in this sector is substantial with myriad infrastructure, security, and regulatory requirements needing to be fulfilled. In an intertemporal setting, even rents generated by the project in its early stages can be ploughed back into the economy to build roads, seaports, and airports, develop human capital through expenditure on education and health, and train and expand the civil service. Together with direct investment, regulatory reforms can be seen as inputs that are imperative to the production of output and ultimately to the success of the project. While liberalization of trade and the modernization of investment codes help at a general level, industry-specific legislative and policy reform is what is ultimately needed. These parochial steps, such as ensuring security of tenure, can be seen as a reflection of a government's commitment to a project.

Governments whose ability to carry out their policy commitments is limited are considered to be domestically weak in this paper. That internally weaker regimes have lower levels of commitment to foreign investment can be seen in the examples of Indonesia and the Philippines,

countries where a substantial devolution of power to local governments has resulted in lower levels of investment in mining (O'Callaghan 2009, 2010). Nigeria presents another example of inconsistent federal and state level reforms and the will to implement them. This has hindered the effective use of rents generated by its resource boom resulting in often wayward spending and mismanagement (Ajakaiye, 2008). Often, this is due to the divergence between national policy and local sentiment toward foreign investment in the sector or a preference for domestic over foreign investment. Government effort and investment to achieve transparency and certainty in policies toward foreign investment are as important as commitments to build and upgrade complementary infrastructure. The discrepancy in national and local government attitudes or between different branches of government—like the legislative and the judicial—also creates ambiguity and has adverse effects on investor confidence. For example, Pakistan has lately struggled to recover investor confidence after the recent case of a denial of a mining lease needed to continue operations in its Reko Diq area and the subsequent ruling in favor of the investor by a World Bank panel. But Pakistan's willingness to submit to the international tribunal's ruling is an example of steps countries can take to signal their commitment to foreign investors and to transparency.

The cases of Zambia's copper industry and Argentina's relationship with its oil are illuminating examples of the highs and lows of government commitment with a changing political and economic backdrop. We next consider these examples to further support our analytical results.

Zambia

Copper permeates the history and economy of Zambia. But the global market is large by comparison and keeps Zambia in the role of a price taker having to contend with high price volatility. Production costs in the country are also significant owing to its complex geology and reduce potential rents. Following peak production in 1969, Zambia began its process of state ownership and by 1982 held a majority stake in copper mining. But the period that followed was hardly a triumph with rampant corruption fueling enormously costly rent-seeking activities (Bates and Collier, 1995). With declining prices and output growth and rising expenditures, Zambia's debt increased and ensuing adjustments led to falling investment which was barely high enough to maintain the capital-labor ratio in the sector. This was accompanied by falling consumption and deteriorating social indicators (Dinh, et al., 2002). With little room left for the government to maneuver and institute requisite changes to deal with the crisis, it embarked on an effort to shepherd foreign investment into mining through the privatization of the by now loss-making national mining company.

Given the feeble financial condition of the company, the government was in a weak negotiating position and had to not only piece apart the conglomerate for sale but also hold on to pension and other contingent liabilities. The task force charged with overseeing the

privatization process was staffed with ex-senior managers from the firm and, according to the World Bank, was in direct conflict with the goal of privatization. Bargaining power, too, resided asymmetrically with the investors and the dim industry outlook at the time meant that sales were achieved, after some initial breakdowns in negotiations, at uninspired prices. While the government retained some equity interest, this mostly hovered around 15 percent in most of the components sold and was mainly to assist in the funding of the aforementioned liabilities. The resulting tax regime was highly favorable to the investors with below average royalty rates, an effective rate of 25 percent on taxable profits, fully deductible interest costs and repatriated profits, and capital input free from import duties (Adam and Simpasa, 2011). The extremely favorable outcome for investors occurred with a backdrop of historically low global copper prices and a nebulous public stance toward foreign engagement, underscoring the government's elevated level of commitment to foreign investment as predicted by our framework. Prodigious proportions of rents were remitted to overseas headquarters of the foreign mining companies as a result. That all this happened when the government significantly lacked bargaining power reveals the tremendous pressure it was under to accomplish the goal of privatization during this period.

The public perception that the mining boom was almost entirely bypassing the domestic economy translated into a sharp shift away of support from the ruling regime and a jump in popularity of the opposition parties. The rising tide of anti-foreign investment sentiment in the country increased the political cost to the government of courting foreign partners and prompted it to revise the overly investor-friendly mining tax law. This was seen by the foreign mining investors as a reduction in the government's commitment to the sector but, with an upsurge in global copper prices, the perception reverted to being favorable after only modest changes to the tax code as initially proposed. This underscored the government's ability to sustain foreign participation even as its policies became less conducive to rent appropriation by the firms in times of higher mean returns on investment due to better copper prices in world markets. The subsequent rise in government expenditure on broad-based infrastructure and increase in non-traditional exports serve as demonstration of the regime choosing to put more emphasis on its outside options over unbridled commitment to the mining sector.

Argentina

Issues surrounding the prospecting for oil and resource ownership have been an abiding feature of Argentina's modern economic history. Policy has swung between being highly accommodating of foreign investment and actively discouraging it. However, public sentiment toward the oil sector is generally nationalistic and averse to foreign participation in the sector (Gadano, 2010). Two episodes in this history are particularly illustrative. Consistent with public sentiment were President Peron's pro-nationalization policies toward oil in his first term in 1946. But policy orientation turned toward attracting foreign participation by the second term

to maintain elevated levels of domestic spending. In a deteriorating political environment rendering it increasingly weaker, the government entered into an agreement with a subsidiary of Standard Oil, a suboptimal strategy based on the foregoing analysis. The highly unpopular agreement was terminated soon after the regime was overthrown and the new government subsequently quickly nationalized much of the sector.

Transformative but controversial policies were in play in the 1990s with Argentina experiencing hyperinflation at the start of the period. Macroeconomic stabilization policies were pursued by a government with a preference for an orthodox approach, and augmented by privatization and deregulation of the economy, including that of the oil sector (Pastor Jr and Wise, 1999). Consistent with the emphasis of our model, agreements that were highly favorable to private firms were reached by a weak regime with little bargaining power and a predilection for private investment. The contracts granted the firms exploitation concessions and limited the government to simply collecting income taxes. The policies went further to facilitate production and export by allowing firms to build and operate oil refineries and gas stations, making the transport of crude and byproducts easier, and guaranteeing the availability of foreign exchange.

The crisis of 2001 led to a major devaluation of the currency and default on public debt. The impact of the downturn on the oil sector was yet another reversal of the policies set in motion in the 1990s. Firms could no longer take foreign exchange availability for granted and significant export taxes on crude were imposed leading to the exit of many foreign investors. The general mood in the aftermath of the crisis also turned sour toward foreign corporations, including oil giants Shell and Exxon (Shever, 2012). This swing between accommodative and restrictive policies under changing circumstances, which included shifting political attitudes and public sentiment toward foreign participation as well as fluctuating economic fortunes of the country that fed into the regime's domestic strength and international credibility, ably depict the mechanisms of our framework. The dance between pro- and anti-foreign investment positions has continued with the President (until 2019) Macri's administration yet again wooing foreign investment in oil.

There are many examples of different types of regimes in developing countries courting foreign investment. It is also true that the enthusiasm with which foreign investment is pursued varies significantly. In the mining sector, these differences appear to be correlated with the strength of the government both internally and externally, the stability of the economy, and alternate avenues to fruitfully expend government efforts, all of which is consistent with the emphasis of our model.

5 Conclusions

For multinational firms that have identified investment opportunities across the globe, it is critical to understand the factors that contribute to a host government inviting investment in to the sector being targeted by the firm. Once in, it is also imperative to appreciate the elements

of a mutually beneficial ongoing relationship. This paper introduces a dynamic framework to examine a government's decisions and the processes that give rise to them. Focusing on the cross-relevance of government spending or reform efforts as proxies for government commitment to foreign investment, we have proposed that the adaptability of spending or reform efforts to uses other than investor support is a major determinant of the durability of the project's success. The adaptability of spending or reform efforts to other parts of the economy over time provides an insurance mechanism to the government against the failure of the project. To ensure access to a resource that the firm aims to reach, it could then be helpful for the investor to directly assist in politically high-value projects like infrastructure development and even capacity building for reform. The financing of schools, hospitals, and roads by oil majors in the Niger Delta region of Nigeria and Chinese investment in Africa, Latin America, and in countries along the Belt-and-Road Initiative can be seen in this light. It should quickly be added, however, that the extreme turmoil and violence in the case of Nigeria alerts us to a multitude of other factors at play which are not accounted for by our framework.

Earlier discussion in this paper has already highlighted the potential influence of many factors such as institutions and human capital that encourage inward FDI and enhance the robustness of government commitment. More nuance can be added to this discussion by further disaggregating factors like institutions. For instance, there is reason to believe that the political structure of the host country and associated political environment would exert influence on government policy. Our model incorporates this insight by deploying the idea of a forward utility function of the government, which allows for evolving preferences due to factors like a changing political environment and institutional backdrop. This suits our purpose of focusing on the stability of policy choices, but correlating this stability with exact political structures could be a fruitful direction for future research.

Empirical research could serve as a guide in this endeavor. In addition to the many studies cited earlier, Bailey (2018) and Sabir, et al (2019) are comprehensive recent analyses of how institutional quality affects FDI inflows in both developing and developed countries and identify political stability, democracy, rule of law, and institutional reform, among others, as important determinants, particularly in developed countries. Bougharriou, et al, (2021) confirm these findings for Arab countries. These various aspects of institutional quality appear to be complementary to corporate tax and regulatory policy in empirical research and lend further support to the implications of our model, particularly those captured in Figures 1 - 4. It is reasonable to expect that political and civil liberties would also exert influence on inward FDI. While Busse (2004) finds evidence of a negative relationship between repression and FDI inflows in the 1990s, the link appears to be positive in the 1970s and 1980s. The nonlinearity of the relationship that is hinted at is addressed by Harms and Ursprung (2002) and Filippaios, et al (2019) who find evidence contradicting the hypothesis that political and civil repression boost FDI by accounting for other relevant variables like country risk and oil exports, as well

as human capital. In fact, the negative impact on inward FDI is amplified by media reporting of human rights abuse and public shaming by UN human rights bodies (Vadlamannati, et al, 2018). Anwar and Cooray (2102) provide further support by showing that political and civil liberties contribute positively to financial development, which in turn attracts more FDI in South Asia. A more direct link between political and civil liberties and FDI inflows is established by Dutta and Osei-Yeboah (2013). Incorporating the many manifestations of institutional strength and quality into an analytical framework could enrich our understanding of the interlinkages that are insisted upon by our model in its emphasis on the complementarity between the various determinants of FDI inflows.

Another important point is the robustness of policy reform brought about during a crisis. The popularity of such reforms often erodes quickly once the crisis is staunched and growth recovers. Our model accounts for this lack of policy legitimacy with repercussions that the government would have to deal with in later periods. With a changing public sentiment toward reforms once the crisis has abated, our model points toward an increasing likelihood of policy reversal. In that sense, our framework brings to the foreground the conditions under which reform is likely to be sustained.

The paper also suggests several directions for future research. For example, the analysis assumes no endogenous possibility of renegotiating the terms along which the gains are shared between the firm and the host government. The notion of dynamic utility employed here is an efficient way to acknowledge changing government preferences over time in a continuous time framework given that our goal was to identify enabling factors that foreign investors should look for at any point in time. But it is conceivable that bargaining power would evolve over time or that circumstances, such as the world price, would change, necessitating a redesign of the agreement between the two parties. It is likely that investment agreements would impact the distribution of the resulting gains and consequently in income and wealth distribution. Incorporating the implications of these changes on government bargaining power is hence a crucial element in the story. Modeling renegotiation as a strategic interaction and incorporating sectoral peculiarities and country specifics in that process could shed light on determinants unique to certain industries. Also, depending on the sector in which investment is made, prices and revenues are susceptible to abrupt step changes. These sudden changes could have far-reaching implications for the political arrangements that underpin policymaking and could remain in the system due to long-term memory. Including these features in the model, while a considerable challenge, would be an insightful extension. While modeling strategic interaction in continuous time has the drawback of producing elusive or intractable solutions, the methods introduced by Sannikov (2007, 2008) to address difficulties such as finding equilibrium solutions could prove to be effective in this regard.

The structure of the model benefits from assumptions that simplify our analysis. This has both advantages and drawbacks. The framework exploits stochasticity to incorporate a change

in variables that directly impinge upon the government's decision-making process. While this forgoes the strategic interaction between the policymakers and domestic players at one level and between the government and the investor at another, it has the advantage of putting the spotlight on factors directly relevant to a government's commitment to FDI. Future research could additionally delve deeper into the mechanisms that bring about those changes. We also treat opportunities to direct legislative effort toward narrowly benefiting the regime and its supporters or to syphon off funds at par with bona fide uses like development-focused spending or reform based on the assumption that both make the regime better off. We speculate that incorporating a change to distinguish between these development-focused and predatory uses is unlikely to alter our results regarding government commitment and would likely only strengthen them. But it is reasonable to expect that the exact nature of the opportunity costs involved would still have implications for the broader development picture and as such presents another promising avenue for subsequent research.

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