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## Mode of international investment and endogenous risk of expropriation

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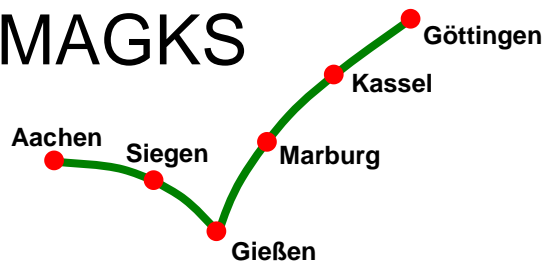
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# Mode of International Investment and Endogenous Risk of Expropriation

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## **Abstract**

In this paper, we develop a politico-economic model to analyze the relationship between the mode of international investment and institutional quality in a non-democratic capital importing country. Foreign investors from a capital-rich North can either purchase productive assets in a capital-poor South and transfer their capital within integrated multinational firms or they can form joint ventures with local asset owners. The South is ruled by an autocratic elite that may use its political power to expropriate productive assets. In a joint venture, the domestic asset owner bears the risk of expropriation, whereas in an integrated firm, this risk affects the foreign investor. This effect lowers the incentives for specific investments in an integrated firm and distorts the decision between joint ventures and integrated production. By setting the institutional framework in the host country, the elite influences the risk of expropriation. We determine the equilibrium risk of expropriation in this framework and the resulting pattern of international production. We also analyze as to how globalization, which is reflected in a decline in investment costs, influences institutional quality.

*JEL classification:* F21, L22, P48

*Keywords:* Foreign direct investment, joint venture, property rights, expropriation

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# 1 Introduction

Recent literature on the organization of international firms has emphasized the role of property rights in a world with incomplete contracts and opportunistic behavior. The key insight from the property rights approach is that ownership matters as it improves the incentives to undertake specific investments. In a joint relationship that is characterized by incomplete contracts and hold-up, ownership of a production asset entails a better outside option and thereby raises the bargaining power when it comes to surplus sharing.<sup>1</sup> Considering a property rights model with heterogeneous firms and two inputs, one owned by a firm in the North and one by a firm in the South, Antras and Helpman (2004) show that, depending on their productivity, firms choose different modes of international production. Low-productivity firms stay in the North, firms with an intermediate productivity outsource to the South, whereas high-productivity firms choose integrated production in the form of foreign direct investments. The mode of international production also depends on the relative importance of the specific inputs supplied by firms from the North.

The property rights mechanism can only work adequately if asset owners are protected against interventions by third parties, most notably the government of the host country. However, many countries in the South are plagued by insufficient institutions, poorly protected property rights, and sizable expropriation risks. For example, the average scores of Sub-Saharan Africa and Central Asia in the Legal and Political Environment Index of the International Property Rights Index Report stand out as lowest in comparison with other regions in the world.<sup>2</sup> Notably, a large part of the countries with weak economic institutions can be characterized as non-democratic. According to a study by Li (2010), more than four of five expropriatory acts towards foreign investors occur in autocratic regimes.<sup>3</sup>

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<sup>1</sup>The property rights literature builds on the seminal papers by Grossman and Hart (1986) and Hart and Moore (1990). For applications to the case of international firms, see, in particular, Antras (2003, 2005) and Antras and Helpman (2004, 2008). Levchenko (2007) and Acemoglu et al. (2007) employ the approach to explain how the quality of institutions may affect international trade patterns. Nunn (2007) and Nicolini (2007) find empirical evidence on the importance of the contractual environment for offshoring decisions of multinational firms.

<sup>2</sup>The Legal and Political Environment Index consists of four sub-components, namely judicial independence, rule of law, political stability, and control of corruption (see Strokova, 2010). A similar picture emerges from the Investment Profile Index of the International Country Risk Guide, which captures a broader measure of expropriation risks.

<sup>3</sup>In addition, Jensen (2008) shows that the political risk for multinational investors in

Ownership provides far weaker residual control rights and investment incentives in countries with weakly protected property rights compared to other locations with better institutions. Obviously, this has consequences for the organizational form of international production. The institutional quality in a country, in turn, is not exogenously given. Instead, as has been argued by Acemoglu and Robinson (2000, 2006) and Acemoglu et al. (2005), the quality of domestic institutions is the outcome of a political process. To elaborate the mutual relationship between institutional quality and the activities of international investors, we integrate the property rights approach into a politico-economic model that endogenizes institutional quality. In line with the prevalence of non-democratic regimes mentioned above, our model considers a setting in which the political power rests with a small elite in the society.<sup>4</sup>

Our model considers a small capital importing economy in the South with heterogeneous local producers. Each producer owns a specific asset whose exogenous productivity differs between agents. To start up production, a producer needs foreign capital that is provided by potential investors of the North. Producer and investor may choose between two organizational forms to transfer capital and to produce in the South: The first arrangement is integrated production or foreign direct investment, i.e., the investor purchases the asset in the South and transfers capital internally within the resulting multinational firm. Second, both partners may form a joint venture in which ownership of the local asset rests with the producer in the South.

The ruling elite in the capital importing country in the South determines the institutional framework under which production can take place. Specifically, we assume that the elite sets the institutional quality which in turn determines the expropriation risk, i.e., the degree to which property rights are protected in the country. We assume that only the local asset can be expropriated, but not foreign capital.<sup>5</sup> In a joint venture, the domestic agent bears the risk of expropriation, whereas this risk is directed towards the foreign investor in the case of an integrated firm. As a consequence, the risk of losing the local asset due to expropriation lowers the incentive to invest

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non-democratic regimes exceeds the risk in democratic countries. Autocracies are concentrated in Central Asia and Africa: More than half of the world's authoritarian regimes can be found there (see EIU, 2008).

<sup>4</sup>See Bourguignon and Verdier (2005); Albornoz et al. (2008); Myerson (2010); Rajan and Zingales (2003); Dadasov et al. (2010) for different approaches to analyze the interaction between financial integration and institutional quality.

<sup>5</sup>Hajzler (2010) documents the distribution of expropriation acts between different sectors across countries. Between 1990 and 2006, 40 % of all expropriation acts occurred in the primary sector. These cases of expropriation in the primary sector may be seen as typical examples for an expropriation of local assets by the government.

capital in the integrated firm, which makes integration less attractive as an organizational form. As foreign investors provide less capital in a joint venture than in an integrated firm, the expropriation risk not only lowers capital transfers at the intensive margin (i.e., within a single integrated firm) but also at the extensive margin (by lowering the number of integrated firms) – even though foreign capital cannot be expropriated. These results find empirical support in the literature: According to Asiedu and Esfahani (2001), US multinationals are more likely to choose complete ownership for their foreign investment projects if the country risk of expropriation declines. Similarly, Henisz (2000) shows empirically that political hazards, which cover regulation policies as well as outright expropriation, decrease the probability of choosing majority-owned plants relative to minority owned joint ventures.<sup>6</sup> In addition, substantial empirical evidence shows that the risk of expropriation influences international capital inflows or the volume of FDI.<sup>7</sup>

By determining the quality of domestic institutions, the elite faces a trade-off: On the one hand, weakening the protection of property rights raises the expected output share that the elite can appropriate. On the other hand, it distorts international capital flows and thereby lowers the output level. From this trade-off, we can derive the equilibrium expropriation risk and its determinants. In particular, we are interested in the effects of economic integration on the institutional quality in the South. Interpreting globalization as a change in investments costs, we show that a decline in the fixed costs of setting up an integrated firm lowers the risk of expropriation, whereas a decline in the fixed costs of a joint venture raises it. A change in the marginal costs of capital investments, in turn, does not influence the equilibrium risk of expropriation. Here, two opposing effects exactly offset each other: On the one hand, the elite is induced to extract more rents, but on the other hand, the expropriation become more distortionary. Finally, we extend our analysis allowing additionally for the expropriation of foreign capital. In this case, the distortionary effects of the expropriation risk are stronger than in our baseline model, which amplifies the distortion of investment incentives.

Our paper is related to other contributions on the relationship between the mode of international investments and institutional quality. According

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<sup>6</sup>Building on these results, Henisz (2000) also analyzes the interplay between political and contractual hazards in determining the ownership structure. The findings of Javorcik and Wei (2009) and Straub (2008), who show that an increase in corruption shifts the ownership structure from FDI towards joint ventures, may also be interpreted as lending indirect support for our theoretical results. Bloom et al. (2009) show that trust and the rule of law promote a decentralization of firms.

<sup>7</sup>See, e.g., Alfaro et al. (2008); Asiedu et al. (2009); Busse and Hefeker (2007); Gas-tanaga et al. (1998); Papaioannou (2009).

to Che and Facchini (2009), a multinational company can choose between three different strategies to enter a market, depending on the allocation of authority within an organization: licensing agreements, joint ventures and wholly owned subsidiaries. The decision on the mode of entry depends on the multinational's knowledge of the local market and on the exogenous risk of being expropriated by the local partner. In this framework, the relationship between the optimal entry strategy and the institutional environment is non-monotonic. Straub (2008) considers a foreign firm that can either sell its superior technology to a developing country or make a greenfield investment. Expropriation may occur in the form of a default, i.e., the local government refuses to pay the price for the technology. In this setting, FDIs are preferred over debt financing in the presence of political risk. Asiedu and Esfahani (2001) develop a theoretical model that builds on the transaction cost approach to explain the determinants of ownership in international investments. The risk of expropriation, enters their model only indirectly, as it is assumed to influence the comparative advantage of the local partner in the joint project. Finally, several papers analyze expropriation of foreign investors in the resource extraction sector. For example, Guriev et al. (2009) set up a dynamic framework to explain the fact that expropriations in the oil industry are more likely to occur in periods with a high oil price. They also show empirically that the expropriation risk is higher in countries with weak political institutions.<sup>8</sup>

## 2 The Model

We consider a small open economy in the South that is populated by a ruling elite and a continuum of heterogeneous local producers with unit mass. Each producer owns a specific asset, for example, a production plant or access to natural resources. The utilization of this asset requires the fixed input of specific skills by the producer, such that asset and skills jointly produce a local intermediate input  $A$ . The productivity of this input differs between producers, which we model by assuming that  $A$  is distributed according to the cumulative distribution function  $G(A)$  over  $[0, \infty)$ . The local input can be used productively only in combination with capital  $K$  according to the

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<sup>8</sup>Similarly, Bohn and Deacon (2000) find a strong negative effect of the ownership risk on investments in resource extraction. Hajzler (2010) argues that a country with weak property rights protection may offset the expropriation risk for foreign investors by subsidizing the acquisition of exploitation rights for mineral resources.

Cobb-Douglas production function

$$y = \frac{1}{\theta} K^\theta A^{1-\theta} . \quad (1)$$

The economy under consideration does not own any domestic capital and therefore has to rely on foreign capital imports from the North for production. Output  $y$  is sold on the world market for a given price of one.

Building on Grossman and Hart (1986) and Hart and Moore (1990), we consider a relationship between foreign investor and domestic producer that is subject to a hold-up problem. Both potential partners are not able to contract upon the level of investments *ex ante* or on the returns for this investment. Instead, they bargain about revenue sharing *ex post* after the investment decision has been made. Anticipating that the marginal return on capital will not fully accrue to her, the international investor sets capital supply to a sub-optimally low level. To mitigate this inefficiency, both partners can transfer ownership of the specific asset from the local producer to the foreign investor. This improves the bargaining position of the international investor when it comes to sharing the joint surplus. Consequently, ownership affects the incentives of the foreign investor to provide capital. If the foreign investor does not own the asset, she will invest less relative to the situation in which the property right of the asset rests with her. Depending on the ownership structure, we distinguish the following two ideal organizational forms:

- Disintegrated production (joint venture), i.e., the local producer holds the property right of the asset
- Integrated production (foreign direct investment), i.e., the foreign investor acquires the asset from the local producer

In a joint venture, the foreign investor's claim over the joint surplus solely results from her ownership of the factor capital. With integration, the foreign investor purchases the local asset and thereby raises her claim. As mentioned in the introduction, we consider a country with a weak institutional environment in the sense that property rights are insecure. This lowers the value of owning the asset and therefore also influences the choice of the organizational form of international production.

The institutional quality in the host country is characterized by the parameter  $\tau \in [0, 1]$  that measures the risk of expropriation. The elite of the host country sets the institutional environment and thereby influences the expropriation risk. For example, the elite may determine how clearly property rights are defined, under which conditions property may be confiscated,



or to which degree independent courts may review expropriation decisions. In the context of our paper, expropriation of an asset implies that the ruling elite, instead of the original owner, can claim a part of the revenue. The elite chooses the economic institutions to maximize its own income, and this choice determines the risk of expropriation. A convenient and straightforward way to incorporate this mechanism into our framework is to assume that the elite directly controls the probability of expropriation.<sup>9</sup> The risk of expropriation is the same for all asset owners, and it does not depend on the organizational form of production. We assume, for the time being, that this is the only form of institutional distortion. Particularly, it is not possible for the elite to expropriate foreign capital or the specific skills supplied by the local producer. The following sequence of events summarizes the structure of the model:

1. The elite determines  $\tau$  to maximize its own expected income
2. Foreign investors and domestic asset owners choose the organizational form that maximizes their expected joint payoff
3. Foreign investors decide how much  $K$  they invest
4. Expropriation of individual assets occurs with probability  $\tau$
5. Revenues are realized and shared

### 3 International Investment and Institutional Quality

To solve the model, we proceed by backward induction, beginning with the sharing of revenues in the final stage. Following the property rights approach, bargaining over dividing the joint surplus takes place both in a joint venture and under integration.<sup>10</sup> This is due to the fact that the foreign investor – though being the asset owner under integration – is still dependent on the specific skills of the local producer. To simplify the exposition, we refrain from explicitly modeling the bargaining game. Instead, we consider exogenous shares of the joint revenue that accrue from ownership of the respective

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<sup>9</sup>See, e.g., Besley and Ghatak (2009) for a similar approach.

<sup>10</sup>This distinguishes the current set-up from the transaction cost approach according to which integration completely solves the hold-up problem. For an application of transaction cost models in the context of the international organization of firms see, e.g., McLaren (2000) and Grossman and Helpman (2002).

factors of production. In particular, we apply following notation:  $\alpha$  denotes the expected share of the respective asset owner,  $\beta$  is the expected share of the local producer, which results from his specific skills, and finally  $\gamma$  is the expected share of the capital owner. Note that  $\alpha + \beta + \gamma = 1$ .<sup>11</sup>

Given this outcome of the revenue sharing stage, the international investor has to decide on the capital stock she will invest. This decision is characterized by the equality of the marginal return – either from a joint venture or from an integrated firm – with her opportunity costs. With a frictionless international capital market, the opportunity costs are given by the world interest rate  $R$ . As mentioned above, the investor expects a revenue share of  $\gamma$  under the joint venture. The investment level in this case can be derived from maximizing  $\gamma y_j - RK_j$ , where the subscript denotes the case of a joint venture. From the first order condition of this maximization, we can derive

$$K_j^* = \left(\frac{\gamma}{R}\right)^{\frac{1}{1-\theta}} A \equiv \delta_j A \quad (2)$$

as the investment level in a joint venture.

With integration, the international investor expects a revenue share of  $\gamma + \alpha - \alpha\tau$  and therefore chooses an investment level to maximize  $(\gamma + \alpha - \alpha\tau) y_i - RK_i$ , with  $i$  denoting the integrated firm. This yields

$$K_i^*(\tau) = \left(\frac{\gamma + \alpha - \alpha\tau}{R}\right)^{\frac{1}{1-\theta}} A \equiv \delta_i(\tau) A . \quad (3)$$

Describing the hold-up problem in the previous section, we have emphasized the relevance of ownership for the investment decision. The optimal investment level under integration is higher than in a joint venture since in the first case the foreign investor has the control rights over the asset and thereby receives a larger share of the revenue. This mitigates the hold-up problem which distorts the investment decision. According to the above equations,  $K_i^*(\tau) > K_j^*$  for all  $\tau \in [0, 1)$ . Taking the derivative of (3) with respect to  $\tau$ , we find  $\partial\delta_i/\partial\tau < 0$ . Thus, the investment level in an integrated firm decreases with the expropriation risk. Figure 1 depicts the investment levels under the two alternative organizational forms. In a perfect institutional environment – i.e., with no risk of expropriation – investments in an integrated firm are highest. As the institutional quality deteriorates ( $\tau$  increases), investments decline. Finally, in the limit case of a definite expropriation ( $\tau = 1$ ), ownership of the asset becomes worthless for the international investor, and she chooses the same investment level as in a joint venture. The investment level in a joint venture is not affected by  $\tau$ .

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<sup>11</sup>Such payoff shares can be derived from applying the Nash-Bargaining Solution in a two player context in which factor ownership influences disagreement payoffs.

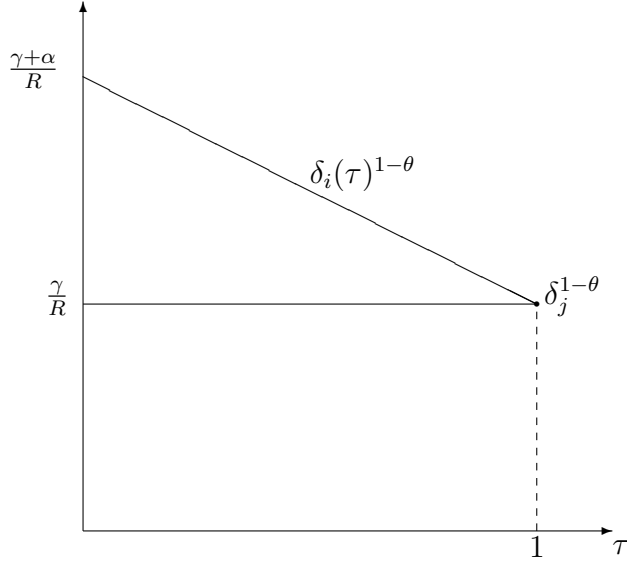


Figure 1: Institutional Quality and Investment Incentives

Inserting (3) and (2) into (1) yields the following output levels:

$$y_i(\tau) = \frac{\delta_i(\tau)^\theta}{\theta} A \quad \text{and} \quad y_j = \frac{\delta_j^\theta}{\theta} A . \quad (4)$$

Turning to the choice of organizational form, we assume that the foreign investor and the domestic producer jointly choose the mode of foreign investment that maximizes the expected joint profit from the bilateral relationship.<sup>12</sup> With a joint venture, the domestic producer is expropriated with probability  $\tau$  and sticks with an output share of  $\beta$  in this case. In case of non-expropriation, he receives a share of  $\alpha + \beta$  of  $y_j$ . Expropriation does not target the foreign investor, who receives a share of  $\gamma$ . In an integrated firm, the domestic producer sticks to a share of  $\beta$ , whereas the international investor gets  $\alpha + \gamma$  in the case of non-expropriation and  $\gamma$  if the asset is expropriated. As in the work of Antras and Helpman (2004), we assume that international investments give rise to fixed costs that depend on the organizational form. We denote these fixed costs by  $f_i$  and  $f_j$ , respectively. The expected joint profits in a joint venture and in an integrated firm are respectively given by

$$E[\pi_j] = (1 - \alpha\tau)y_j - RK_j^* - f_j \quad \text{and} \quad (5)$$

$$E[\pi_i] = (1 - \alpha\tau)y_i(\tau) - RK_i^*(\tau) - f_i . \quad (6)$$

<sup>12</sup>That is, we allow for side payments between the foreign investor and the domestic producer.

Because of the fixed costs, minimum supply levels of the local input are required for the different modes of production. We now determine these critical values and thereby obtain the organizational pattern of firms in equilibrium. The minimum level of  $A$  that is needed to establish a joint venture is obtained from the zero profit condition  $E[\pi_j] = 0$ . Using (2), (3), and (4) yields

$$A_j^*(\tau) = \frac{\theta f_j}{\delta_j^\theta (1 - \theta\gamma - \alpha\tau)}. \quad (7)$$

Accordingly, for an integrated firm to be at least as profitable as a joint venture, the following inequality has to hold:  $E[\pi_i] \geq E[\pi_j]$ . This inequality determines a second critical input level:

$$A_i^*(\tau) = \frac{\theta(f_i - f_j)}{(1 - \theta\gamma - \alpha\tau)(\delta_i(\tau)^\theta - \delta_j^\theta) - \alpha\theta\delta_i(\tau)^\theta(1 - \tau)}. \quad (8)$$

Note that for  $\tau \rightarrow 1$ , the denominator in (8) approaches zero. Since this denominator is strictly decreasing in  $\tau$ , it is positive for all  $\tau \in [0, 1)$ , which implies  $A_i^* > 0$ . In what follows, we make a parametric assumption that guarantees  $A_i^*(\tau) > A_j^*(\tau)$ :<sup>13</sup>

$$f_i > \left(\frac{\alpha + \gamma}{\gamma}\right)^{\frac{\theta}{1-\theta}} f_j. \quad (9)$$

Figure 2 illustrates the cut-off levels, depicting the expected profit levels (5) and (6) for a given value of  $\tau$ . Note that  $E[\pi_i]$  is steeper in  $A$  than  $E[\pi_j]$ . The intersection of  $E[\pi_j]$  with the abscissa determines the minimum input level  $A_j^*$ . All domestic asset owners, who can provide a lower input level than  $A_j^*$ , do not take up production and are, therefore, inactive on the market. The intersection between  $E[\pi_j]$  and  $E[\pi_i]$  determines the threshold input level required for a FDI,  $A_i^*$ . In the range between  $A_j^*$  and  $A_i^*$  it is not profitable to form an integrated firm due to the higher fixed costs. Therefore, this range corresponds to the firms that form joint ventures in the economy. Finally, expected profits from integration exceed profits from a joint venture for all productivity values higher than  $A_i^*$ .

The institutional quality of the host country affects the critical cut-off levels between the different organizational forms, as shown by the following

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<sup>13</sup> $A_i^*(\tau) > A_j^*(\tau)$  if  $(1 - \theta\gamma - \alpha\tau)\delta_j^\theta f_i > [1 - \alpha\tau - \theta(\gamma + \alpha - \alpha\tau)]\delta_i(\tau)^\theta f_j$ . Since  $1 - \theta\gamma - \alpha\tau \geq 1 - \alpha\tau - \theta(\gamma + \alpha - \alpha\tau)$  for all  $\tau \in [0, 1]$ , we need an assumption that ensures  $\delta_j^\theta f_i > \delta_i(\tau)^\theta f_j$ . Using (3) and (2) and taking into account that  $\delta_i(\tau)$  takes the highest values for  $\tau = 0$  yields inequality (9).

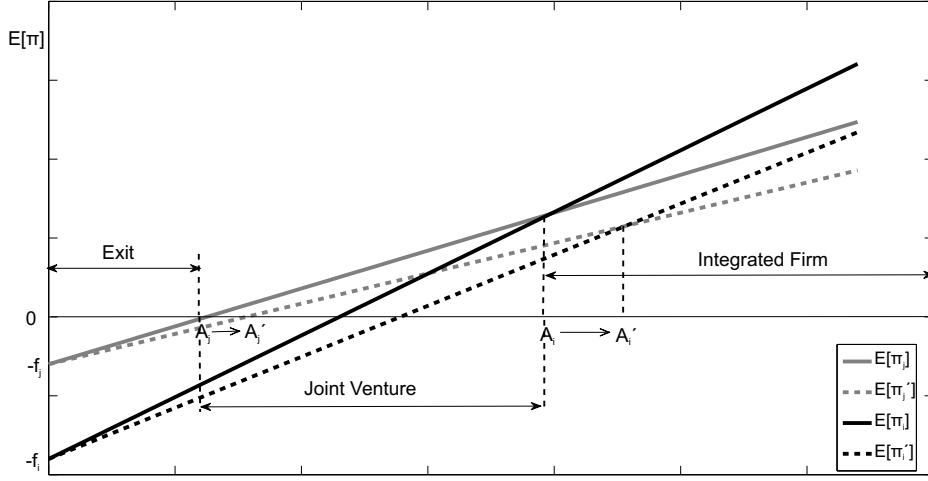


Figure 2: Organizational Structure and Expropriation

derivatives of (7) and (8):

$$\frac{\partial A_j^*}{\partial \tau} = \frac{\alpha}{1 - \theta\gamma - \alpha\tau} A_j^*(\tau) \quad \text{and} \quad (10)$$

$$\frac{\partial A_i^*}{\partial \tau} = \frac{\alpha}{1 - \theta\gamma - \alpha\tau} A_i^*(\tau) + \alpha\Psi(\tau)A_i^*(\tau), \quad (11)$$

where  $\Psi(\tau) > 0$ .<sup>14</sup>

An increase in  $\tau$  shifts both cut-off levels to the right, with  $\partial A_i^*/\partial \tau > \partial A_j^*/\partial \tau > 0$ . That is, an increase in  $\tau$  has a stronger effect on the value of  $A_i^*(\tau)$  than on  $A_j^*(\tau)$ . As a result, the mass of integrated firms declines in  $\tau$  whereas that of joint ventures increases. Furthermore, since the minimum input level that is necessary for market entry rises, the total mass of active firms in the host country declines, which raises the average  $A$  of the remaining firms. The intuition behind this result is that an increase in  $\tau$  has two effects: First, it directly lowers expected joint profits in both organizational forms. As the size of this effect is proportional to the supplied quantity of the local input, it has a stronger influence on  $A_i^*(\tau)$  than on  $A_j^*(\tau)$ . Second, in an integrated firm, an increase in  $\tau$  reduces the quantity of capital supplied

<sup>14</sup>This term is defined as

$$\Psi(\tau) \equiv \left[ \frac{\alpha(1-\tau)}{1-\theta\gamma-\alpha\tau} + \frac{\beta}{(1-\theta)(\gamma+\alpha-\alpha\tau)} \right] \frac{A_i^*(\tau)\delta_i(\tau)^\theta}{f_i - f_j}.$$

by the foreign investor, which additionally lowers output and expected joint profits. The term  $\Psi(\tau)$  in (11) captures this effect. To illustrate the distortion in capital allocation more clearly, we may also examine the effect of a change in expropriation risk on joint profits. By differentiating (5) and (6) with respect to  $\tau$ , we obtain

$$\frac{\partial E[\pi_j]}{\partial \tau} = -\alpha y_j < 0 \quad \text{and} \quad (12)$$

$$\frac{\partial E[\pi_i]}{\partial \tau} = - \left( 1 + \frac{\beta\theta}{(1-\theta)(\gamma + \alpha - \alpha\tau)} \right) \alpha y_i(\tau) < 0 . \quad (13)$$

Comparing (12) with (13) shows that an increase in the risk of expropriation reduces joint profits in an integrated firm to a larger extent than in a joint venture. In addition to a higher direct effect of the expropriation risk, joint profits in an integrated firm are also lowered by a decline in the capital supply.

Figure 2 demonstrates the influence of  $\tau$  on the cut-off input levels. An exogenous increase in  $\tau$  makes the expected income lines flatter (illustrated by the dashed lines), with a larger absolute change in the slope of  $E[\pi_i]$ . As a consequence,  $A_i^*(\tau)$  increases more strongly than  $A_j^*(\tau)$ . Hence, a reallocation of the organizational structure of firms takes place shifting ownership toward joint ventures.

The influence of the expropriation risk on the critical productivities suggests that a deterioration of the institutional quality harms the economy in the host country. By deriving the effect of a change in  $\tau$  on domestic production (GDP), we analyze this effect more systematically. GDP – denoted by  $Y^G$  – is composed of the aggregate production by joint ventures and integrated firms

$$Y^G(\tau) = \frac{\delta_j^\theta}{\theta} \int_{A_j^*(\tau)}^{A_i^*(\tau)} Ag(A) dA + \frac{\delta_i(\tau)^\theta}{\theta} \int_{A_i^*(\tau)}^{\infty} Ag(A) dA , \quad (14)$$

where  $g(A)$  denotes the density of the corresponding distribution function  $G(A)$ . From now on, we assume that  $G(A)$  follows a Pareto distribution:  $G(A) = 1 - (b/A)^k$ , where  $b$  denotes the minimum possible value for  $A$ , and  $k > 2$ .<sup>15</sup> With this specification, GDP can be written as follows:

$$Y^G(\tau) = \frac{kb^k}{\theta(k-1)} \left[ \delta_j^\theta A_j^*(\tau)^{1-k} + (\delta_i(\tau)^\theta - \delta_j^\theta) A_i^*(\tau)^{1-k} \right] . \quad (15)$$

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<sup>15</sup>Since the work by Helpman et al. (2004), the Pareto distribution has been frequently employed in the literature on trade with heterogeneous firms. The assumption  $k > 2$  ensures a finite variance of  $A$ .

Differentiating (15) with respect to  $\tau$  yields

$$\begin{aligned} \frac{\partial Y^G}{\partial \tau} &= \frac{\alpha(1-k)}{1-\theta\gamma-\alpha\tau} Y^G(\tau) - \\ &\frac{\alpha k b^k A_i^*(\tau)^{1-k}}{\theta(k-1)} \left[ \frac{\theta \delta_i(\tau)^\theta}{(1-\theta)(\gamma+\alpha-\alpha\tau)} + (k-1)(\delta_i(\tau)^\theta - \delta_j^\theta) \Psi(\tau) \right] < 0. \end{aligned} \quad (16)$$

Hence, an increase in the risk of expropriation lowers domestic production.

We now turn to the first stage of the game and analyze the choice of the institutional environment by the ruling elite. That is, we determine the level of  $\tau$  that maximizes the elite's expected income from expropriating the asset owners. The expected income of the elite can be written as

$$Y^E(\tau) = \tau \alpha Y^G(\tau). \quad (17)$$

The following first order condition determines the optimal institutional quality  $\tau$  from the view of the elite:

$$\alpha Y^G(\tau) + \alpha \tau \frac{\partial Y^G(\tau)}{\partial \tau} = 0, \quad (18)$$

where  $\partial Y^G(\tau)/\partial \tau$  is given by equation (16). Determining the optimal institutional quality, the elite faces a trade-off: On the one hand, a higher  $\tau$  delivers a higher expected share of aggregate output for the elite. On the other hand, it lowers output because of the distortions (*i*) with respect to the capital transfer within integrated firms and (*ii*) with respect to the decision between a joint venture and an integrated firm.

Inserting (16) into (18) and rearranging yields

$$\begin{aligned} \frac{\alpha(1-\theta\gamma-\alpha\tau k)}{1-\theta\gamma-\alpha\tau} Y^G(\tau) - \frac{\alpha^2 \tau k b^k A_i^*(\tau)^{1-k}}{\theta(k-1)} \\ \left[ \frac{\theta \delta_i(\tau)^\theta}{(1-\theta)(\gamma+\alpha-\alpha\tau)} + (k-1)(\delta_i(\tau)^\theta - \delta_j^\theta) \Psi(\tau) \right] = 0. \end{aligned} \quad (19)$$

The equilibrium probability of expropriation  $\tau^*$  solves (19). We assume that the second order condition  $\partial^2 Y^E(\tau^*)/\partial \tau^2 < 0$  is satisfied. Inspecting (19) reveals that  $\tau^*$  has to satisfy the following necessary condition:  $1 - \theta\gamma - \alpha k \tau^* > 0$ . This implies that  $\alpha k \geq 1$  is a sufficient condition to rule out a confiscatory risk of expropriation (where  $\tau^* = 1$ ). Note further that assuming  $\tau = 0$  yields  $\partial Y^E(\tau)/\partial \tau > 0$ , such that a zero probability of expropriation can also be ruled out.

## 4 Globalization and Institutional Quality

Given the equilibrium probability of expropriation, we now analyze the elite's reaction to changes in exogenous parameters. In particular, we focus on the influence of a better integration of the small country into the world economy. In this respect, we begin with the effects of a decline in the fixed costs of foreign production on  $\tau^*$ . Taking total derivatives of (19) yields the following results (see Appendix):

$$\frac{d\tau^*}{df_i} > 0 \quad \text{and} \quad \frac{d\tau^*}{df_j} < 0.$$

Whereas a decline in  $f_i$  results in a lower probability of expropriation, a decline in  $f_j$  raises  $\tau^*$ . We can intuitively explain these different effects as follows: For a given institutional quality, a decline in  $f_j$  lowers the critical productivity for joint ventures  $A_j^*$  and raises the critical productivity for an integrated firm  $A_i^*$ . This results in a higher mass of joint ventures. Since expropriating joint ventures does not distort foreign capital supply, the elite raises the risk of expropriation such that the institutional environment changes for the worse. On the contrary, with a decline in  $f_i$  and therewith a drop in  $A_i^*$ , the mass of integrated firms increases, such that  $\tau^*$  declines. In this case, economic integration improves the institutional quality of the host country. Moreover, we know from the previous section that a change in  $\tau$  has a stronger effect on  $A_i^*$  than on  $A_j^*$ . Hence, the decline in the risk of expropriation results in more integrated firms (i.e., a higher volume of FDI) and fewer joint ventures. The total mass of active firms increases.

With regard to a simultaneous decline in  $f_i$  and  $f_j$ , we can show the following (see Appendix):

$$d\tau^* \begin{cases} < \\ = \\ > \end{cases} 0 \quad \text{if} \quad \frac{df_i}{f_i} \begin{cases} < \\ = \\ > \end{cases} \frac{df_j}{f_j}. \quad (20)$$

A better integration of the country into the world economy improves institutional quality in the South only if the fixed costs of setting up an integrated firm decline more strongly (in percentage terms) than the fixed costs of a joint venture. In the opposite case, the countries' institutions change for the worse, and the risk of expropriation increases. According to (7) and (8), a simultaneous change in  $f_i$  and  $f_j$  yields for a given  $\tau^*$

$$\frac{dA_i^*}{A_i^*} = \frac{df_i}{f_i} + \left( \frac{df_i}{f_i} - \frac{df_j}{f_j} \right) \frac{f_j}{f_i - f_j} \quad \text{and} \quad \frac{dA_j^*}{A_j^*} = \frac{df_j}{f_j}.$$



Hence, for  $df_i/f_i = df_j/f_j$ , the relative decline in both cut-offs  $A_i^*$  and  $A_j$  is the same, and, according to (20), the elite does not change institutional quality. If the relative decline in  $f_i$  is higher than in  $f_j$ , however, the mass of integrated firms increases, and this results in a lower equilibrium expropriation risk.

Globalization may also be reflected in a decline in the cost of capital  $R$ . This, however, does not affect the equilibrium expropriation risk, i.e.,  $d\tau^*/dR = 0$  (see Appendix). Both threshold productivity levels –  $A_j^*$  and  $A_i^*$  – decrease by the same relative amount in this case:

$$\frac{dA_i^*}{A_i^*} = \frac{dA_j^*}{A_j^*} = \frac{\theta}{1-\theta} \frac{dR}{R}.$$

Similar to the previous case of a symmetric change in fixed costs, the elite does not adjust the expropriation risk to the new constellation. Its motivation to extract more rents on the one hand and the larger distortion caused by the expropriation risk on the other hand balance out, such that  $\tau^*$  remains unchanged.

## 5 Extension: Expropriation of Capital

In our baseline model, expropriation targets only the local asset, such that an international investor engaged in a joint venture does not bear any political risk. In this section, we extend our analysis to a setting in which the factor capital may also be expropriated. For this, we assume that the measure of institutional quality  $\tau$  describes the expropriation risk for the asset as well as for capital.

Following the structure of the baseline model, we first determine the optimal investment levels under both organizational forms. In a joint venture, the international investor expects a revenue share  $\gamma$  with the probability  $1-\tau$ . In case of expropriation, she is left with a revenue share of zero. The optimal capital stock invested in a joint venture is therefore given by

$$K_j^*(\tau) = \left( \frac{(1-\tau)\gamma}{R} \right)^{\frac{1}{1-\theta}} A \equiv \tilde{\delta}_j(\tau)A. \quad (21)$$

Accordingly, the expected revenue share of the investor in an integrated firm is  $(1-\tau)(\alpha+\gamma)$ . Hence,

$$K_i^*(\tau) = \left( \frac{(1-\tau)(\alpha+\gamma)}{R} \right)^{\frac{1}{1-\theta}} A \equiv \tilde{\delta}_i(\tau)A \quad (22)$$

determines the capital input in an integrated firm. As before, the optimal level of investment under integration is higher than in a joint venture. A deterioration of the institutional quality now also affects investments in a joint venture, i.e.,  $\partial \tilde{\delta}_j / \partial \tau < 0$ . However, since  $\partial \tilde{\delta}_j / \partial \tau > \partial \tilde{\delta}_i / \partial \tau$ , the distortion in  $K_i^*$  is larger than in  $K_j^*$  for a given  $A$ , similar to the baseline model. Figure 3 illustrates as to how investment incentives are influenced by the new institutional environment. As in Figure 1,  $\tilde{\delta}_i$  exceeds  $\tilde{\delta}_j$  for all  $\tau < 1$ .

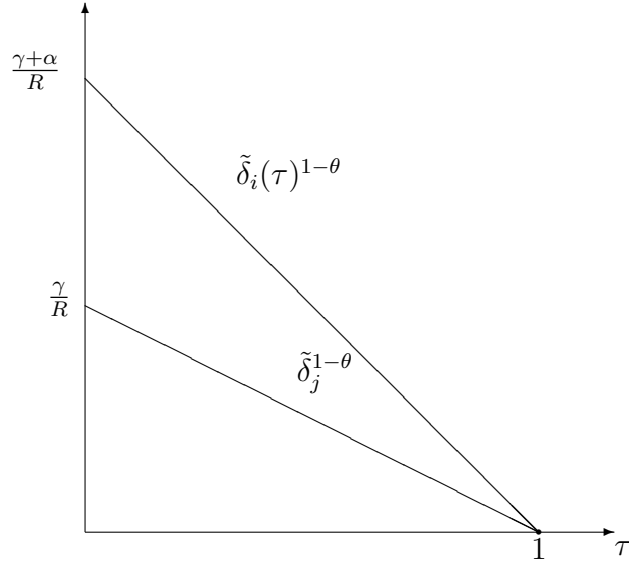


Figure 3: Expropriation of Capital and Adjusted Investment Incentives

The risk of expropriation now causes a larger distortion than in the baseline model, as the remaining expected revenue share of the international investor decreases. In the baseline model, the investor still supplies some capital in the limit case in which property rights are completely insecure ( $\tau = 1$ ). In the extended framework, however, for the same case, there is no investment made. Output levels, which are given by

$$y_i(\tau) = \frac{\tilde{\delta}_i(\tau)^\theta}{\theta} A \quad \text{and} \quad y_j(\tau) = \frac{\tilde{\delta}_j(\tau)^\theta}{\theta} A, \quad (23)$$

are also lower than in the baseline specification.

To determine the organizational structure of firms, we again formulate the respective expected joint profits. Naturally, incorporating the risk of capital expropriation does not influence the expected output share of the domestic producer. Taking into account the change in output shares of the

international investor, the expected joint profits are now given by

$$E[\pi_j] = [1 - \tau(\alpha + \gamma)]y_j(\tau) - RK_j^*(\tau) - f_j \quad \text{and} \quad (24)$$

$$E[\pi_i] = [1 - \tau(\alpha + \gamma)]y_i(\tau) - RK_i^*(\tau) - f_i . \quad (25)$$

As before, the respective threshold levels of  $A$  are obtained by the following two equations:  $E[\pi_j] = 0$  and  $E[\pi_j] = E[\pi_i]$ . Inserting (24) and (25) yields

$$A_j^*(\tau) = \frac{\theta f_j}{\delta_j(\tau)^\theta [1 - \tau(\alpha + \gamma) - \theta\gamma(1 - \tau)]} \quad \text{and} \quad (26)$$

$$A_i^*(\tau) = \frac{\theta(f_i - f_j)}{[1 - \tau(\alpha + \gamma) - \theta\gamma(1 - \tau)](\delta_i(\tau)^\theta - \delta_j(\tau)^\theta) - \alpha\theta\delta_i(\tau)^\theta(1 - \tau)} . \quad (27)$$

Given our parametric assumption in (9),  $A_i^*(\tau) > A_j^*(\tau)$  still holds for all  $\tau \in [0, 1]$ . Comparing (7) and (26) reveals that the minimum input level for taking up production in a joint venture is now higher than in the case without expropriation of capital. Due to the additional negative impact on the capital invested in a joint venture, the expected joint profit from this organizational mode is lower than before. Whether the cut-off for integrated production  $A_i^*$  in (27) is also higher than its counterpart in (8) is not as clear. A sufficient condition for this to be the case is  $\theta \leq 1/2$ .<sup>16</sup>

The influence of the risk of expropriation on the critical levels of  $A$  can be inferred from the influence of  $\tau$  on the expected joint profits. Differentiating (24) and (25) yields

$$\frac{\partial E[\pi_j]}{\partial \tau} = - \left( \alpha + \gamma + \frac{\theta[\beta + \alpha(1 - \tau)]}{(1 - \tau)(1 - \theta)} \right) y_j \quad \text{and} \quad (28)$$

$$\frac{\partial E[\pi_i]}{\partial \tau} = - \left( \alpha + \gamma + \frac{\beta\theta}{(1 - \tau)(1 - \theta)} \right) y_i . \quad (29)$$

As in the baseline model, a higher risk of expropriation lowers expected joint profits in both organizational forms. As a consequence, both threshold levels  $A_i(\tau)$  and  $A_j(\tau)$  increase in  $\tau$ , leading to a lower mass of active firms. In contrast to our previous results, however, it is now not obvious whether  $E[\pi_i]$  declines more strongly than  $E[\pi_j]$  if the risk of expropriation  $\tau$  increases. That is, the mass of joint ventures not necessary increases with a rise in the expropriation rate. On the one hand, the multiplier in (29) is smaller than the one in (28), but on the other hand, the output level  $y_i$  exceeds  $y_j$ . This

<sup>16</sup>For  $\theta \leq 1/2$  the difference  $\tilde{\delta}_i(\tau)^\theta - \tilde{\delta}_j(\tau)^\theta$  in (27) is not lower than the respective term in (8).

ambiguity arises due to the additional distortion in capital supply caused by the expropriation risk, which now also affects joint ventures. In section 3, we have pointed out that a rise in  $\tau$  lowers joint profits in an integrated firm through two different channels: It directly reduces the expected joint share of the output, and it diminishes the level of invested capital. As the wedge between the marginal productivity and the cost of capital is higher for a joint venture than for an integrated firm, the latter effect has a relatively stronger negative impact in a joint venture. In the following, we derive a sufficient condition that guarantees  $\partial E[\pi_j]/\partial\tau > \partial E[\pi_i]/\partial\tau \forall \tau \in [0, 1]$ . Using (21), (22), and (23), the inequality  $\partial E[\pi_j]/\partial\tau > \partial E[\pi_i]/\partial\tau$  holds if

$$1 + \frac{\theta\alpha(1-\tau)}{(1-\tau)(1-\theta)(1-\beta) + \beta\theta} < \left(\frac{\gamma + \alpha}{\gamma}\right)^{\frac{\theta}{1-\theta}}. \quad (30)$$

The left hand side of the this inequality is strictly decreasing in  $\tau$ , such that a sufficient condition for  $\partial E[\pi_j]/\partial\tau > \partial E[\pi_i]/\partial\tau$  can be obtained by setting  $\tau = 0$ :

$$1 + \frac{\theta\alpha}{(1-\theta)(1-\beta) + \beta\theta} < \left(\frac{\gamma + \alpha}{\gamma}\right)^{\frac{\theta}{1-\theta}}. \quad (31)$$

Summarizing, we obtain the following two insights from this extension: First, the fundamental mechanisms of our baseline model are not affected by incorporating an additional risk of capital expropriation. Investments in integrated firms are higher than in joint ventures, and they react more sensitive to a change in institutional quality. Consequently, an increase in  $\tau$  results in a lower mass of integrated firms. Second, introducing capital expropriation also affects investments in joint ventures and amplifies the distortion in investments incentives. Hence, the level of investments and aggregate payoffs are lower than that in our baseline specification.

## 6 Concluding Remarks

This paper has taken the property rights view of the firm as a starting point to analyze the relationship between international investments and the institutional environment in a non-democratic host country. We have considered a small open economy in which local producers own specific assets and foreign investors provide capital for the production of a final good. In line with the property rights approach, integration mitigates the hold-up problem that distorts the incentives to invest capital for production. Political risks of expropriation, however, distort this mechanism, such that less capital is invested in each integrated firm and fewer integrated firms are active

in the country. To determine the expropriation risk in equilibrium, we have assumed that a ruling elite shapes national institutions to maximize its own expected income. The institutional quality in this setting results from a trade-off for the elite: On the one hand, weak institutions provide the elite with better opportunities to seize productive assets from the private sector and, thereby, raise the expected share of output that the elite can capture. On the other hand, an increase in the risk of expropriation lowers the volume of capital invested in the country and thereby reduces output.

In our model, a better integration of the capital importing country into the world economy can be reflected by a decline in fixed investment costs. We have shown that the impact of such a development on the institutional quality critically depends on which type of fixed costs decreases. If the barriers for setting up an integrated firm in the host country decline, the elite improves the institutional quality in the host country and more investors choose the mode of integrated production. If, however, the specific costs of setting up a joint venture decline, for example, because contracting with local firms becomes easier, the institutional quality in the country deteriorates. This asymmetric effect of a change in investment costs offers an interesting hypothesis for an empirical analysis. It is also important from a policy point of view: Measures to improve the institutional quality in certain countries should therefore focus on supporting FDI instead of joint ventures.

## A Appendix

In this appendix, we prove the comparative static results presented in section 4. The first order condition, given by (19), can also be written as

$$\mu(\tau^*)\delta_j^\theta A_j^*(\tau^*)^{1-k} + \Phi(\tau^*)A_i^*(\tau^*)^{1-k} = 0, \quad (32)$$

where

$$\mu(\tau^*) \equiv \frac{1 - \theta\gamma - \alpha\tau^*k}{1 - \theta\gamma - \alpha\tau^*} \quad \text{and}$$

$$\Phi(\tau^*) \equiv [\mu(\tau^*) - \alpha\tau^*(k-1)\Psi(\tau^*)] (\delta_i(\tau^*)^\theta - \delta_j^\theta) - \frac{\alpha\theta\tau^*\delta_i(\tau^*)^\theta}{(1-\theta)(\gamma + \alpha - \alpha\tau^*)} < 0.$$

Taking total total derivatives of (32), and provided that the second order condition ( $SOC < 0$ ) is satisfied, we obtain the following results:

- (i) The effect of a change in  $f_i$  on  $\tau^*$ :

$$\frac{d\tau^*}{df_i} = \frac{(k-1)\Phi(\tau^*)A_i^*(\tau^*)^{1-k}}{(f_i - f_j)SOC} > 0.$$

(ii) The effect of a change in  $f_j$  on  $\tau^*$ :

$$\frac{d\tau^*}{df_j} = \frac{k-1}{SOC} \left[ \frac{\mu(\tau^*)\delta_j^\theta A_j^*(\tau^*)^{1-k}}{f_j} - \frac{\Phi(\tau^*)A_i^*(\tau^*)^{1-k}}{f_i - f_j} \right] < 0.$$

(iii) The effect of a simultaneous change in  $f_i$  and  $f_j$  on  $\tau^*$ :

$$d\tau^* = \frac{k-1}{SOC} \left[ \frac{\Phi(\tau^*)A_i^*(\tau^*)^{1-k}}{f_i - f_j} (df_i - df_j) + \frac{\mu(\tau^*)\delta_j^\theta A_j^*(\tau^*)^{1-k}}{f_j} df_j \right].$$

Defining  $\hat{f}_i \equiv df_i/f_i$  and  $\hat{f}_j \equiv df_j/f_j$  and inserting the first order condition (32), we can write

$$d\tau^* = \frac{(k-1)\Phi(\tau^*)A_i^*(\tau^*)^{1-k}f_i}{SOC(f_i - f_j)} (\hat{f}_i - \hat{f}_j).$$

The expropriation risk  $\tau^*$  therefore decreases if and only if  $\hat{f}_i < \hat{f}_j$ .

(iv) The effect of a change in  $R$  on  $\tau^*$ :

$$\frac{d\tau^*}{dR} = \frac{\theta k}{R(1-\theta)SOC} [\mu(\tau^*)\delta_j^\theta A_j^*(\tau^*)^{1-k} + \Phi(\tau^*)A_i^*(\tau^*)^{1-k}] = 0,$$

since the term in squared brackets is equivalent to the first order condition (32).

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