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Mode of Entry and Expropriation

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First Draft

- Very Preliminary and Incomplete -

Abstract

We develop a politico-economic model to analyze the relationship between mode of entry into a new market and institutional quality of the host country. A foreign investor can either purchase a domestic firm, what we consider as FDI, or form a joint venture, in which the control right over the firm rests with the domestic entrepreneur. In an autocratic regime, the ruling elite uses its political power to implement expropriatory policies. In an integrated firm the risk of expropriation targets the foreign investor whereas in a joint venture the domestic agent bears this risk. We determine the equilibrium level of the probability of expropriation and show that the ruling elite, by choosing it, discriminates in favor of the foreign investor. This has implications for the form of invested capital, and thus for the organizational structure of active firms in the host country.

JEL classification: F21, L22, P48

Keywords: Foreign direct investments, joint ventures, property rights, expropriation

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1 Introduction

Recent literature has emphasized the role of the allocation of property rights in the international organization of firms (See particularly Antras 2005 and Antras and Helpman 2004). The key insight from the property-right approach is that in the presence of contractual incompleteness ownership structure matters for the mode of entry into a new market. Considering a production technology with two different input factors, one owned by a foreigner and the other by a domestic agent, theory has elaborated the following implication for the ownership decision: the foreign producer engages in an integrated production, i.e. obtains the residual right of control, if his/her input factor is relative intensively used compared to the input factor of the domestic supplier. Otherwise, the ownership is assigned to the domestic agent. Yet, the question how this organizational choice is affected by a weak institutional environment of a host country, has received far less attention. We employ this approach to model the possible forms of cooperation between foreign investors and domestic entrepreneurs and incorporate it into a framework with endogenous institutional quality which is characterized by the risk of expropriation.

In our model, each local entrepreneur owns a specific asset whose exogenous productivity differs among the agents. Output is produced in combination of the asset and foreign capital. Furthermore, we assume that fixed costs are required for production. Depending on the ownership structure, we distinguish two organizational forms between which the foreign investor and the local entrepreneur can choose: An integration, in which the foreign investor acquires the asset (we consider this case as a form of foreign direct investment); or a joint venture, in which the property right rests on the domestic entrepreneur and both partners share aggregate surplus according to a general Nash bargaining game. By allowing for heterogeneity of domestic agents, we can determine the respective threshold productivity levels which are necessary for both organizational forms. We thereby also determine the structure of active firms. However, in an autocratic regime, the organizational structure is also affected by the risk of expropriation which is imposed by the ruling elite. We assume that only the asset can be expropriated, but not foreign capital. As a consequence, with integration there is a risk for the foreign investor of being expropriated. On the contrary, under a joint venture the domestic agent bears this risk, while the foreign investor gets a riskless share from the expected payoff. By deciding on the optimal level of the risk of expropriation, which is the same for all asset owners, the elite therefore faces a clear trade-off: On the one hand, raising the probability of expropriation reduces the incentives of the foreigner to invest in an inte-

gration and thereby diminishes the expected payoffs for the elite from this organizational form.¹ On the other hand, a higher risk of expropriation is associated with higher aggregate rents for the elite since investments in joint ventures are not affected by expropriation. From this it follows, that a change in the equilibrium probability of expropriation also influences the organizational structure of firms. An increase in the risk of expropriation reduces the mass of the integrated firms, raising instead the mass of joint ventures. This result finds empirical support in the literature: Smarzynska-Javorcik and Wei (2009) and Straub (2008) show that a deterioration in institutional quality not only reduces the volume of FDI, but also shifts the ownership structure toward joint ventures. Building on these insights, we further derive the impact of an exogenous decline in the fixed costs of production - interpreting these changes as results of globalization - on the equilibrium level of the risk of expropriation. As a result, a decline in fixed costs in an integrated firm lowers the risk of expropriation whereas a decline in fixed costs in a joint venture raises it.

2 The Model

We consider a small open economy that is populated by a homogeneous group of a ruling elite and a continuum of entrepreneurs. Each entrepreneur owns an asset whose exogenous productivity term (A) is drawn from a distribution function $G(A)$ over a subset $[0, \infty]$. The asset can only be used productively in combination with capital. We assume that the economy under consideration does not possess any own capital and, thus, foreign investments are necessary for production. Output is produced according to the Cobb-Douglas technology:

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

where the index $z \in [0, \infty]$ denotes the variety of different assets and corresponding types of output and K denotes foreign capital.² Moreover, we assume that to produce different types of good y different level of fixed costs (f) are required.

Following Grossman and Hart (1986) and Hart and Moore (1990), we argue that the cooperation decision between foreign investor and the domestic

¹This is in line with a vast empirical evidence which shows that the risk of expropriation crucially determines international capital inflows. See e.g. Alfaro et al. (2008) or Papaioannou (2009).

²We assume that output from different forms of production assets can be sold on the world market for a given price of one.

entrepreneur is subject to a contractual incompleteness.³ It arises due to the fact that the ownership - i.e. the control right over the asset - gives some bargaining advantage to the domestic entrepreneur in sharing the joint surplus *ex post*. Consequently, ownership affects the incentives of the foreign investor to supply capital. If the foreign investor does not own the asset, she will invest less relative to the situations in which the property right rests with her. Thus, potential partners are not able *ex ante* to write a contract which completely specifies the investment decision. Instead, they assign the ownership of the asset. Depending on the ownership structure we distinguish the following two organizational forms:

- joint venture: local entrepreneur holds the property right; aggregate revenue is shared according to the Nash bargaining solution
- integration: foreign investor acquires the asset paying an upfront fee to the local entrepreneur

Thus, within a joint venture, the foreign investor provides her capital and acquires a claim over the joint surplus. On the contrary, with integration, she purchases the ownership over the local asset. Hence, integration can be seen as an extreme form of *foreign direct investment* (FDI).⁴ The foreign investor and the domestic entrepreneur commonly choose one of these organizational forms in order to maximize aggregate profit. In the following, we will abstract from explicitly modeling the bargaining game. Instead, we will assume that the shares of the contract partners in each mode are exogenously given.

We consider a country with weak institutional environment in a sense that property rights are insecure. Due its political power, the ruling elite is able to expropriate the asset with a probability $\tau \in [0, 1[$.⁵ We assume that this is the only form of institutional distortion. Specifically, it is not possible for the elite to expropriate the foreign capital. This has an important implication for the organizational form which the foreign investor and the domestic entrepreneur choose. Whereas with integration there is a risk for the foreign investor of being expropriated, under a joint venture the domestic agent - as the owner of the asset - bears this risk. However, we assume that

³Antras (2005) uses this property right approach to analyze the international organization of firms.

⁴According to the *International Monetary Fund* a foreign investment is classified as FDI if at least 10% on jointly used enterprise is acquired.

⁵The elite chooses economic institutions in order to maximize its own utility. We assume that this choice perfectly determines the risk of expropriation. Therefore, a simple way to incorporate this mechanism into our framework is to directly model the elite's decision on the probability of expropriation.

expropriation is not discriminatory, i.e. each owner of the asset faces the same probability of expropriation.

Summarizing the structure of our model, we derive the following time sequence of events:

1. The elite decides on τ
2. The foreign investor and the domestic entrepreneur choose the organizational form that maximizes the aggregate expected payoff
3. The foreign investor decides how much K she invests
4. With the probability τ expropriation occurs
5. Revenue shares are realized

We assume that τ cannot be changed *ex post*, i.e. the elite can credibly commit to the value of τ set at the beginning of the game.

3 Mode of Entry

To solve the model, we first derive expected aggregate payoffs from both forms of organization. As mentioned above, the respective organizational form is chosen in order to have a maximal aggregate return. With a joint venture, the domestic entrepreneur is expropriated with a probability τ and sticks with zero revenues in this case. In case of the non-expropriation, she receives a share $1 - \beta_j$ from the joint surplus y_j . Expropriation does not target the foreign investor. She, therefore, receives a riskless share β_j from the aggregate return. Expected aggregate return from a joint venture is thus given by:

$$E[\pi_j] = (1 - \beta_j)(1 - \tau)y_j + \beta_j y_j - f_j = (1 - \tau + \beta_j \tau)y_j - f_j \quad (2)$$

With integrated production, the foreign investor owns both input factors - the asset and the capital - and therewith, naturally, the total return. However, the foreigner faces now the risk of expropriation. Yet, she still has a claim on a share of the total output even in case the asset has been expropriated by the elite. This claim and therewith the bargaining power toward the elite result from the assumption that foreign capital, which is necessary for production, cannot be expropriated. Denoting with $\beta_i < 1$ the share of the foreign investor in case of an expropriation, the expected aggregate return from integration takes the following form:

$$E[\pi_i] = (1 - \tau + \beta_i \tau)y_i - f_i \quad (3)$$

We assume that production in an integrated structure requires higher level of fixed costs than producing within a joint venture. Thus, the following inequality holds:

Assumption 1 $f_j < f_i$.

The investment decision for the foreign investor is characterized by the equality of the marginal return - either from a joint venture or from an integration - with her opportunity costs. With a frictionless international capital market, these opportunity costs are assumed to be given by the world net interest rate R . The optimal investments level with integration - i.e. the optimal volume of FDI - is then given by:

$$K_i^* = \left(\frac{1 + \tau(\beta_i - 1)}{R} \right)^{\frac{1}{1-\theta}} A \equiv \delta_i(\tau)A, \quad \text{where} \quad \frac{\partial \delta_i}{\partial \tau} < 0 \quad (4)$$

Accordingly, the optimal level of K in a joint venture is:

$$K_j^* = \left(\frac{\beta_j}{R} \right)^{\frac{1}{1-\theta}} A \equiv \delta_j A \quad (5)$$

Describing the hold-up problem in the previous section, we have also emphasized the relevance of ownership for the investment decision. Specifically, the optimal investment level under integration tends to be higher than under a joint venture since in the first case foreign investor is the sole owner of the firm. In what follows, we make an assumption which is sufficient for $K_i^* > K_j^*$ for all $\tau \in [0, 1[$.

Assumption 2 $\beta_i = \beta_j$

This condition implies that the revenue share of the foreign investor - and therewith her bargaining power - is the same in bargaining with the local entrepreneur (in a joint venture) as with the elite (in an integrated firm).

Inserting (4) and (5) into (1) yields the following aggregate returns:

$$y_i = \frac{\delta_i(\tau)^\theta}{\theta} A \quad \text{and} \quad y_j = \frac{\delta_j^\theta}{\theta} A \quad (6)$$

The difference between the two investment levels has an important implication with respect to the institutional environment. Though we have assumed that the risk of expropriation is the same for all asset owners, there is a potential source of indirect discrimination by the elite resulting from the effect of τ on capital invested. An exogenous increase in the probability of the

expropriation would reduce the volume of FDI and thereby the output (K_i^* decreases in τ). On contrary, the optimal level of the investment in a joint venture (K_j^*) is not affected by τ .

As fixed costs are needed to start up a firm, minimum productivity levels of the asset are required for different forms of production. We now determine these critical productivity values and obtain thereby the organizational structure of firms in equilibrium.⁶

A minimum productivity level, which is needed to establish a joint venture, is obtained from the zero profit condition $E[\pi_j] = 0$:

$$A_j^* = \frac{\theta f_j}{\delta_j^\theta (1 - \tau + \beta\tau)} \quad (7)$$

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

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

In what follows, we make a parametric assumption that guarantees $A_i^* > A_j^*$ for all $\tau \in [0, 1[$.

Assumption 3 $\delta_j^\theta f_i > \delta_i^\theta(\tau) f_j$ ⁷

Figure 1 illustrates these productivity cut-off levels, depicting the profit functions (3) and (2) for a given value of τ .⁸ Note that $E[\pi_i]$ is steeper than $E[\pi_j]$. The intersection of $E[\pi_j]$ with the $E[\pi] = 0$ - line determines the minimum productivity level A_j . All domestic entrepreneurs, whose assets are less productive than A_j , do not receive any investments from abroad and are, therefore, inactive on the market. The intersection between $E[\pi_j]$ and $E[\pi_i]$ in turn determines the threshold productivity level required for a FDI, A_i . In the range $[A_j, A_i]$ it is not profitable to form an integrated firm due to the higher fixed costs. Therefore, this range corresponds to the mass of joint ventures in the economy. Finally, expected profits from integration exceed profits from a joint venture for all productivity values higher than A_i .

⁶This approach is similar to Helpman et al. (2004), who argue that different productivity levels of firms in combination with different levels of fixed costs are crucial in explaining the decision of firms to export and/or to make foreign direct investments.

⁷ $A_i^* > A_j^*$ if $\frac{\theta(f_i - f_j)}{(1 - \tau + \beta\tau)(\delta_i^\theta - \delta_j^\theta)} > \frac{\theta f_j}{\delta_j^\theta (1 - \tau + \beta\tau)} \Leftrightarrow \delta_j^\theta (f_i - f_j) > f_j (\delta_i^\theta - \delta_j^\theta) \Leftrightarrow \delta_j^\theta f_i > \delta_i^\theta f_j$

⁸The parameters that are chosen for this figure take the following values: $\beta = 0.5$, $\theta = 0.5$, $R = 0.1$, $f_j = 3$, $f_i = 9$, $A = [1, 100]$.

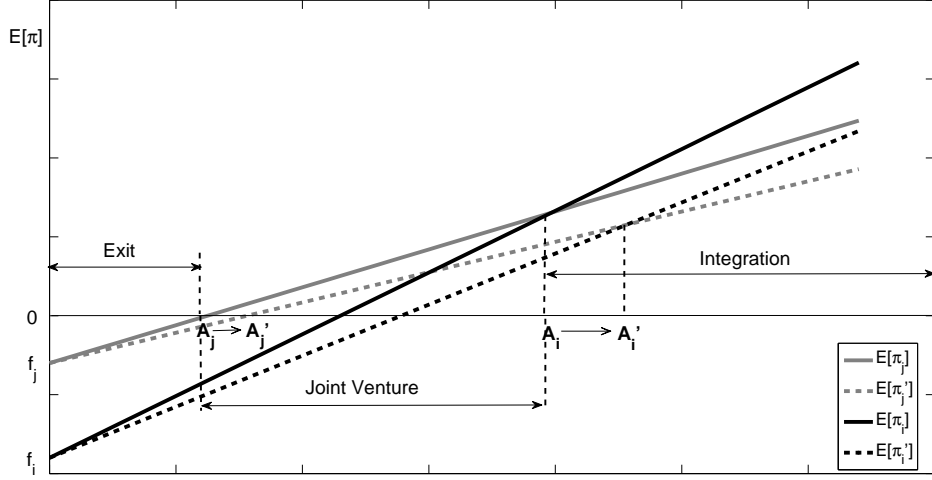


Figure 1: Mode of Entry and Expropriation

Before we turn to the first stage of the game and derive the equilibrium risk of expropriation, we first analyze how an exogenous change in the probability of expropriation affects the cut-off levels and thereby the organizational structure of firms. Taking derivatives of (7) and (8) yields:

$$\frac{\partial A_j^*}{\partial \tau} = \frac{1 - \beta}{1 - \tau + \beta\tau} A_j^* > 0 \quad \text{and} \quad (9)$$

$$\frac{\partial A_i^*}{\partial \tau} = \frac{(1 - \beta) \left(\frac{\theta}{(1-\theta)R} \delta_i(\tau)^{2\theta-1} (1 - \tau + \beta\tau) + \delta_i(\tau)^\theta - \delta_j^\theta \right)}{(\delta_i(\tau)^\theta - \delta_j^\theta)(1 - \tau + \beta\tau)} A_i^* > 0 \quad (10)$$

An increase in τ shifts both cut-off levels to the right. Moreover, Assumption 3 is sufficient to show that $\frac{\partial A_i^*}{\partial \tau} > \frac{\partial A_j^*}{\partial \tau}$.⁹ That is, an increase in τ has a stronger effect on the value of A_i^* (critical productivity level for an integrated firm) than in A_j^* (critical productivity level for production within a joint venture). As a result, the mass of the integrated firms declines whereas the mass of joint ventures increases. The intuition behind this result is that an increase in τ has two effects on A_i^* : First, it directly reduces expected profit from an integration, as given by (3). Second, according to (4), an increase in τ reduces the optimal level of capital invested by the foreign investor

⁹ $\frac{\partial A_i^*}{\partial \tau} > \frac{\partial A_j^*}{\partial \tau}$ if $\frac{(1-\beta) \left(\frac{\theta}{(1-\theta)R} \delta_i(\tau)^{2\theta-1} (1 - \tau + \beta\tau) + \delta_i(\tau)^\theta - \delta_j^\theta \right)}{(\delta_i(\tau)^\theta - \delta_j^\theta)(1 - \tau + \beta\tau)} A_i^* > \frac{1-\beta}{1 - \tau + \beta\tau} A_j^*$. Given Assumption 3, $A_i^* > A_j^*$. Since $\frac{\theta}{(1-\theta)R} \delta_i(\tau)^{2\theta-1} (1 - \tau + \beta\tau) > 0$, such that $\frac{\partial A_i^*}{\partial \tau} > \frac{\partial A_j^*}{\partial \tau}$ definitively holds.

which in turn lowers aggregate output and expected profit. Due to a stronger decrease in expected payoff, A_i increases higher than A_j . Furthermore, since the minimum productivity level rises, the total mass of active firms declines and, thus, the average productivity decreases. That is, a deterioration in the institutional quality, in form of an increased risk of expropriation, harms the aggregate economy.

The impact of a higher τ is also demonstrated in Figure 1. According to (3) and (2), an exogenous increase in τ makes the profit functions flatter, with a larger absolute change in the slope of $E[\pi_i]$ (as illustrated by the dashed lines).¹⁰ As a consequence, there is a stronger shift in A_i^* than in A_j^* . Hence, a reallocation of the organizational structure of firms takes place shifting the ownership structure toward joint ventures. This result verifies the empirical evidence, presented in the introduction, that a deterioration in institutional quality shapes the mode of entry of foreign investors reducing the volume of FDI.

4 Endogenizing Expropriation

The insights obtained above will be helpful in analyzing the choice of the institutional environment, which is characterized here by the risk of expropriation τ , by the ruling elite. To determine the equilibrium level of τ , we maximize the elite's expected rent income, which is given by:

$$U(\tau) = \tau(1 - \beta) \frac{\delta_j^\theta}{\theta} \int_{A_j^*}^{A_i^*} g(A) dA + \tau(1 - \beta) \left[1 + \frac{\delta_i(\tau)^\theta}{\theta} \right] \int_{A_i^*}^{\infty} g(A) dA \quad (11)$$

With $g(A)$ as the density function of a Pareto-Distribution $G(A) = 1 - \left(\frac{b}{A}\right)^k$, (11) simplifies to:¹¹

$$U(\tau) = \frac{(1 - \beta)b^k}{\theta} \tau \left[\delta_j^\theta A_j^*(\tau)^{-k} + (\delta_i(\tau)^\theta - \delta_j^\theta) A_i^*(\tau)^{-k} \right] \quad (12)$$

Note that we have not introduced explicit costs of expropriation.¹² Yet, there are implicit costs which result from the negative impact of expropriation on the level of capital investments, and which are captured by $\delta_i(\tau)^\theta$. These

¹⁰Taking partial derivatives of (3) and (2) with respect to τ yields: $\frac{\partial E[\pi_i]}{\partial \tau} = \frac{(\beta-1)}{\theta} \left(1 + \frac{\theta}{1-\theta} \right) \delta_i^\theta A < \frac{\partial E[\pi_j]}{\partial \tau} = \frac{(\beta-1)}{\theta} \delta_j^\theta A$.

¹¹Since the work by Helpman et al. (2004) Pareto-Distribution has been frequently employed in literature. To ensure finite variance, we assume $k \geq 2$.

¹²See Dadasov et al. (2010) for a way of modeling these costs.

costs together with the assumption that the risk of expropriation is identical for all asset owners rules out the possibility of $\tau = 1$. Deriving the first order condition for the ruling elite, we obtain:

$$\frac{\partial U}{\partial \tau} = \frac{(1 - \beta)b^k}{\theta(1 - \theta)(1 - \tau + \beta\tau)} [(1 - \theta)(1 - (1 - \beta)(1 + k)\tau) \delta_j^\theta A_j(\tau)^{-k} +$$

$$[(\delta_i(\tau)^\theta - \delta_j^\theta)(1 - (1 - \beta)(1 + k)\tau) - \theta\delta_i(\tau)^\theta] A_i(\tau)^{-k}] = 0 \quad (13)$$

The equilibrium probability of expropriation τ^* solves (13).¹³

5 Impact of Globalization

Given the equilibrium probability of expropriation, we want next to analyze the elite's reaction to changes of the exogenous parameters. The impact of an exogenous decline in the fixed costs of production on τ^* is especially interesting for us, because we interpret these changes as resulting from globalization. Taking total derivatives of (13), 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 level of the equilibrium probability of expropriation, a decline in f_j raises τ^* . We can intuitively explain these different effects as follows: A decline in f_j lowers the critical productivity level for joint ventures A_j^* and raises the critical productivity level for an integrated firm A_i^* . Both result in a higher mass of joint ventures. Since expropriating joint ventures is not associated with costs, the elite raises the risk of the expropriation. Consequently, institutional environment changes for the worse. On contrary, with a decline in f_i and therewith a drop in A_i^* , there are potentially more integrated firms. Since there is a negative relationship between the volume on FDI and the risk of the expropriation, the elite reduces the optimal level of the expropriation. Moreover, we know from the previous section that a change in τ affects A_i^* more strongly than A_j^* . Hence, a decline in the risk of expropriation results in a higher mass of the integrated firms (i.e. higher volume of FDI) and a lower mass of the joint ventures. The total mass of active firms increases.

¹³See Appendix for the calculation of the second order condition.

6 Extension: Incorporating Domestic Production

t.b. added

7 Conclusion

t.b. added

A Appendix

In this appendix, we first analyze under which conditions an interior solution $\tau^* \in]0, 1[$ exists and then prove the comparative static results presented in section 5.

Inspecting the first order condition (13) suggests that following condition has to be satisfied: $1 - (1 - \beta)(1 + k)\tau > 0$. Otherwise, $\partial U / \partial \tau < 0$ for all τ . This implies that $\Psi \equiv (\delta_i(\tau)^\theta - \delta_j^\theta) (1 - (1 - \beta)(1 + k)\tau) - \theta \delta_i(\tau)^\theta < 0$. Otherwise, $\partial U / \partial \tau > 0$ for all τ .

Deriving the second order condition (S.O.C.), we obtain:

$$\begin{aligned} \frac{\partial^2 U}{\partial \tau^2} = & \frac{(1 - \beta)^2 b^k}{\theta(1 - \theta)(1 - \tau + \beta\tau)} \frac{-k(1 - \theta)(2 - (1 - \beta)(1 + k)\tau)}{1 - \tau + \beta\tau} \delta_j^\theta A_j^{-k} + \\ & \left[\left(\frac{1 - k}{1 - \tau + \beta\tau} - \frac{k\theta \delta_i^{2\theta-1}}{(1 - \theta)(\delta_i^\theta - \delta_j^\theta)} \right) \Psi - \right. \\ & \left. \frac{\theta \delta_i^{2\theta-1}}{(1 - \theta)R} (1 - (1 - \beta)(1 + k)\tau - \theta) - (1 + k)(\delta_i^\theta - \delta_j^\theta) \right] A_i^{-k} \end{aligned}$$

Taking now total derivatives of (13) yields following results:

- (i) The effect of a change in f_i on τ^* :

$$d\tau^* / df_i = \frac{k\theta(1 - \beta)b^k}{(1 - \theta)(\delta_i^\theta - \delta_j^\theta)(1 - \tau + \beta\tau)^2} \Psi A_i^{-k-1} / S.O.C. > 0.$$

- (ii) The effect of a change in f_j on τ^* :

$$d\tau^* / df_j = \Omega / S.O.C. < 0, \text{ where}$$

$$\Omega = \frac{k(1 - \beta)b^k}{1 - \tau + \beta\tau} \left(\frac{1 - (1 - \beta)(1 + k)\tau}{1 - \tau + \beta\tau} A_j^{-k-1} - \frac{\Psi}{(1 - \theta)(\delta_i^\theta - \delta_j^\theta)} A_i^{-k-1} \right) > 0.$$

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