Expropriations and Foreign Direct Investment in a Positive Economic Theory of Foreign Aid

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Expropriation Example 1

- In the early 1990s, Venezuela liberalized its oil industry and signed service agreements with 22 foreign oil companies. Under these contracts, foreign companies managed the oil fields, and Petrleos de Venezuela S.A. (PDVSA), a state-owned firm, purchased the produced oil from the foreign firms at the market rate.

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- However, in February 2006, the government signed a decree that beginning May 2006, PDVSA will have at least 60 per cent ownership in the oil production projects managed by foreign oil firms. The government also retroactively raised corporate income tax on foreign oil companies from 30 per cent to 50 per cent and increased royalties from as low as 1 per cent to 33 per cent.

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- Two European firms (Total of France and Eni S.p.A of Italy) refused to operate as a joint venture and hence were expelled.

Expropriation Example 2

- **Argentina Seizes Oil Producer YPF, as Repsol Gets Ousted**
  (*Bloomberg*, April 17, 2012)
  Argentine President Cristina Fernandez de Kirchner seized control of
  YPF (YPF) SA, the nations largest crude producer, ousting Spanish
  owner Repsol YPF SA (YPFD) after a dispute over slumping oil
  output and investments. Argentina took over management of YPF
  with immediate effect.

- **Argentina Congress Backs Takeover of YPF From Repsol**
  (*Bloomberg*, May 5, 2012)
  The lower house voted 207 to 32 yesterday to back Fernandezs bill
  empowering the government to take 51 percent of YPF. The Senate
  had approved the legislation on April 26.

Motivations

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    - Conditionality of aid
    - Altrustic motive versus geopolitical motive

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  - Bilateral Investment Treaties (BITS) not enough
- Foreign aid
  - Conditionality of aid
  - Altrustic motive versus geopolitical motive
- This paper:
  - Aid is considered as an alternative to BITS
  - Donor's economic interest

Outline and Summary of Results

- A theoretical model of bilateral aid, risk and FDI
- Part I: No commitment technology
  - Existence of expropriation risk leads to under-investment
  - Optimal level of FDI decreases as expropriation risk increases
  - Bilateral aid facilitates capital flows by reducing risk
  - Aid benefits both recipient and donor countries
  - Aid provision condition
  - Optimal quantity of aid and aid Kuznets curve

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- Part II: no-expropriation commitment technology (NECT) available
  - Endogenous institutional reform to adopt NECT
  - Expropriation trap

Model Environment

- The model builds on two papers:
  - Eaton and Gersovitz (1984): expropriation risk negatively affects FDI
  - Asiedu and Villamil (2002): foreign aid reduces default risk in sovereign lending

- Infinite time horizon, stationary equilibrium

- Three agents: a host country, a foreign donor country, and a private foreign firm

  - Firm operates a project in the host country: $f\left(k^M\right) = \left(k^M\right)^\theta$
  - Host country imposes a tax on FDI output, $\tau f\left(k^M\right)$
  - Foreign donor country provides A units of capital as aid to augment poor country's capital

- If expropriation occurs, the country takes the entire FDI output, loses access to aid and FDI in subsequent periods

- Timing: aid decision, tax decision, and FDI decision

Foreign Firm's Problem

- Depend on anticipation of host country's expropriation action

$$\max_{k^M} (1 - \tau) f\left(k^M\right) - rk^M$$

- The optimal FDI, k^{M*}, satisfies

$$(1 - \tau) f'\left(k^{M*}\right) = r$$

and

$$\frac{dk^{M*}(\tau)}{d\tau} < 0$$

Host Country's Problem

- Expropriating

$$H^E = f\left(k^M\right) + h\left(K^H + A\right) + \frac{\beta}{1-\beta}h\left(K^H\right)$$

- Not expropriating

$$H^N = \tau f\left(k^M\right) + h\left(K^H + A\right) + \beta \max\left\langle H^N, H^E\right\rangle$$

- No-expropriation constraint (NEC)

$$H^N \geq H^E$$

Host Country's Problem

- Unconstrained optimal tax rate

$$\tau^* = \arg\max H^N = 1 - \theta$$

- Constrained optimal tax rate $\hat{\tau}$ satisfies $H^N(\hat{\tau}) = H^E(\hat{\tau})$, and

$$\hat{\tau}(A = 0) = 1 - \beta$$

$$\frac{d\hat{\tau}(A)}{dA} < 0$$

- τ^* satisfies NEC $\iff \tau^* \geq \hat{\tau}$
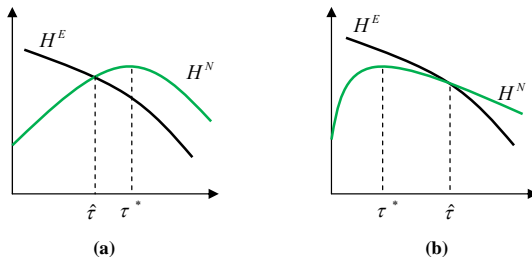
Host Country's Tax Decision

Figure 1: The host country's optimal decision
(a) $\tau = \tau^* = 1 - \theta$; (b) $\tau = \hat{\tau} > 1 - \theta$

Optimal Tax Rate

> ## Lemma 1: **Optimal Tax Rate**
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- When $\beta \geq \theta$, the unconstrained optimal tax rate τ^* is chosen and the amount of FDI is $k^{M*}(\tau^*)$, regardless of the value of A.
- When $\beta < \theta$ and $A = 0$, the constrained optimal tax rate $\hat{\tau}$ is chosen and the amount of FDI is $k^{M*}(\hat{\tau}) < k^{M*}(\tau^*)$.

Foreign Donor's Problem

- Expropriating

$$F^E = r\left(K^F - k^M - A\right) + \frac{\beta}{1-\beta}rK^F$$

- Not expropriating

$$F^N = \frac{1}{1-\beta}\left[(1-\tau)f\left(k^M\right) + r\left(K^F - k^M - A\right)\right]$$

- Maximize F^N. Zero optimal aid when $\beta \geq \theta$.

Foreign Donor's Problem

- $A^* \equiv \arg\max F^N$.
  - $A^* > 0$ iff $K^H < h'^{-1}(r/\beta)$
  - If $\hat{\tau}(A^*) \geq \tau^*$, it is the optimal aid
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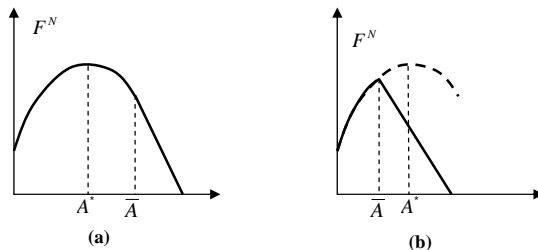- Define $\bar{A}$ such that $\hat{\tau}(\bar{A}) = \tau^*$, $\bar{A} > 0$

Figure 2: The foreign country's optimal aid
(a) $A = A^*$; (b) $A = \overline{A}$

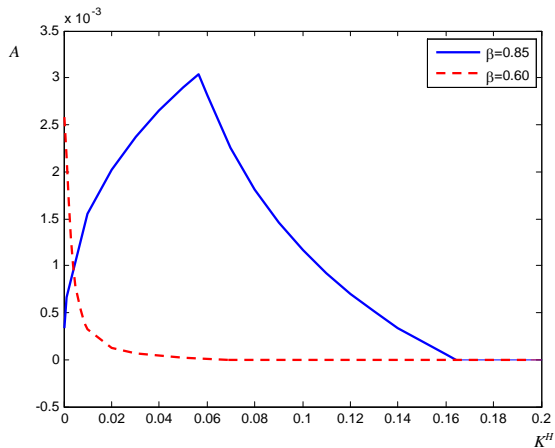# Theory of Aid

Proposition 1: **Aid Provision**

There will be positive amounts of aid provided by the foreign donor if and only if all the following conditions are satisfied:

- The host country is sufficiently impatient: $\beta < \theta$,
- There is no commitment technology to prevent the host country from expropriating, and
- The host country is sufficiently poor: $K^H < \bar{K}^H \equiv h'^{-1}(r/\beta)$.

Proposition 2: **Optimal Quantity of Aid**

The optimal amount of aid equals $\min \langle A^*, \bar{A} \rangle$. Whenever the optimal aid is positive, both the host country and the foreign donor are better off relative to no aid.

Optimal Aid and K^H

Aid Kuznets Curve

Proposition 3

Suppose that the three conditions specified in Proposition 1 are all satisfied. Let $\bar{K}^H \equiv h'^{-1}(r/\beta)$.

- If $\bar{A} \geq A^*$ at $K^H = 0$, then the optimal aid is positive and monotonically decreasing in K^H until it reaches $\bar{K}^H$.

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- If $\bar{A} \geq A^*$ at $K^H = 0$, then the optimal aid is positive and monotonically decreasing in K^H until it reaches $\bar{K}^H$.
- If $\bar{A} < A^*$ at $K^H = 0$, then there exists an aid Kuznets curve. The optimal aid equals $\bar{A}$ and increases with K^H for $K^H \in (0, K_1^H]$; it equals A^* and decreases with K^H for $K^H \in \left(K_1^H, \bar{K}^H\right)$.

- $K_1^H \equiv h^{-1}\left[h\left(h'^{-1}\left(\frac{1-\beta}{1-\theta}\frac{r}{\beta}\right)\right) - \frac{\theta-\beta}{\beta}\left(\frac{r}{\theta^2}\right)^{\frac{\theta}{\theta-1}}\right]$.

Endogenous Adoption of Commitment Technology

Host country's loss function

$$L(A) \equiv H^N(\hat{\tau}(A), A) - H^N(\tau^*, 0)$$

Foreign donor's gain function

$$G(A) \equiv F^N(\tau^*, 0) - F^N(\hat{\tau}(A), A)$$

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- Will foreign donor provide host country incentives to adopt it?
  Yes if $L(A) > 0$, and $G(A) \geq L(A)$

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- Will host country adopt it voluntarily? Yes if $L(A) < 0$
- Will foreign donor provide host country incentives to adopt it? Yes if $L(A) > 0$, and $G(A) \geq L(A)$
- Expropriation trap occurs if neither happens. $G(A) < L(A)$
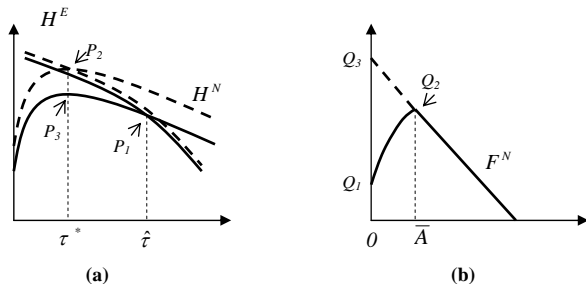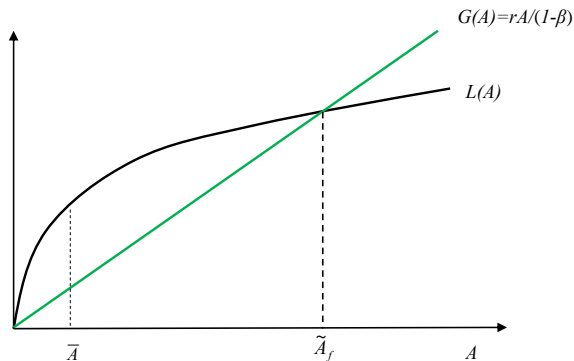
Case 1: Optimal aid is $\bar{A}$

Figure 4: Effects of institutional reform
(a) The host country is worse off ($P2 \rightarrow P3$)
(b) The foreign country is better off ($Q2 \rightarrow Q3$)

Case 1: Optimal aid is $\bar{A}$

Figure 5: Gain function $G(A)$ and loss function $L(A)$
In equilibrium with $\bar{A}$

Case 1: Optimal aid is $\bar{A}$

Lemma 2

Suppose that the three conditions specified in Proposition 1 are satisfied, that $K_1^H > 0$ exists, and that $K^H \in \left(0, K_1^H\right)$. Then the host country will not adopt the NECT voluntarily. Furthermore, the foreign donor has no incentive to induce such an adoption by providing a one-time stimulus to the host country.
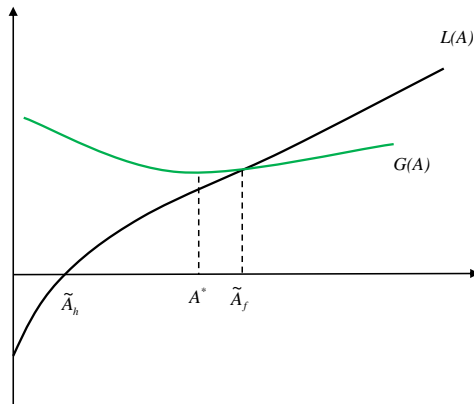
Case 2: Optimal aid is A^*

Figure 6: Gain function $G(A)$ and loss function $L(A)$
In equilibrium with A^*

Case 2: Optimal aid is A^*

Lemma 3

Suppose that the three conditions specified in Proposition 1 are satisfied and the optimal aid equals A^*. Define $\tilde{A}_h$ such that $L\left(\tilde{A}_h\right) = 0$ and $\tilde{A}_f$ such that $L\left(\tilde{A}_f\right) = G\left(\tilde{A}_f\right)$.

- If $A^* \leq \tilde{A}_h$, then the host country will adopt the NECT voluntarily.
- If $\tilde{A}_h < A^* \leq \tilde{A}_f$, then the host country will not adopt the NECT voluntarily but the foreign donor is willing to provide the one-time stimulus to the host country to induce such an adoption.
- If $A^* > \tilde{A}_f$, then neither will host country adopt the NECT voluntarily nor will the foreign donor provide the one-time stimulus to induce adoption.

Expropriation Traps

Proposition 4

Suppose the host country is sufficiently impatient: $\beta < \theta$.

- If $0 < K^H < K_f^H$, then the host country will not adopt the NECT voluntarily. Furthermore, the foreign donor has no incentive to induce such an adoption by providing a one-time stimulus to the host country. The world economy is in an expropriation trap.
- If $K_f^H \leq K^H < K_h^H$, then the host country will not adopt the NECT voluntarily but the foreign donor is willing to provide the stimulus.
- If $K_h^H \leq K^H < \bar{K}^H$, then the host country will adopt the NECT voluntarily.

Conclusions

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- Future research: dynamic capital accumulation and aid provision