Takings of Land by Self-interested Governments
Economic Analysis of Eminent Domain Law

Ram Singh

Part 2

Benevolent Governments I

Proposition

When government is benevolent, generally a fixed compensation scheme, including zero-compensation, cannot guarantee the first best outcome

A benevolent government

- will go for takings iff the state of nature θ is such that the net social benefit from the best possible project is positive
- Therefore owner, given x^*_{-i}, owner i's problem is

$$\max_{x_i}\{F(\hat{\theta}(x_i, x^*_{-i}))v(x_i) + [1 - F(\hat{\theta}(x_i, x^*_{-i}))]\bar{c}_i - x_i\}$$

Benevolent Governments II

The corresponding FOC is given by

$$F(\hat{\theta}(x, \mathbf{x}^*_{-i}))v'(x_i) - 1 = -F'(\hat{\theta}(\cdot))[v(x_i) - \bar{c}_i]$$

(**??**) implies that x^* is a unique solution to the following

$$F(\hat{\theta}(x, \mathbf{x}^*_{-i}))v'(x) - 1 = 0 \tag{2.1}$$

Thus:

- Privately optimum investments can be greater or less than x^*, depending on the quantum of the fixed-compensation.
- The only exception is the case when $\bar{c}_i$ is fixed exactly at $v(x^*)$.

Benevolent Governments III

Proposition

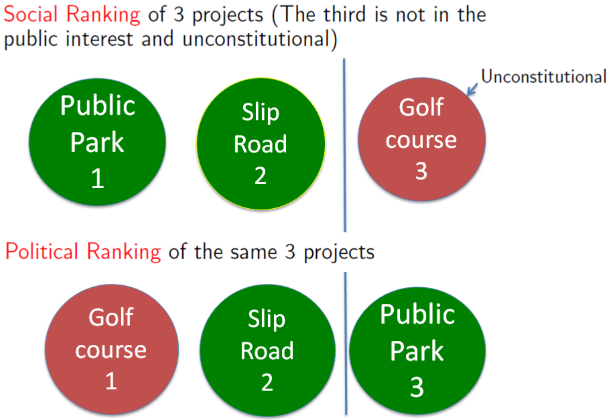
When the government is benevolent, the social welfare (common good) under restitution with under-compensation is higher than the outcome under full compensation (with or without the availability of restitution).

- Now the takings decision is as the first best
- Investment is less than full compensation levels but greater than the first best level
- Therefore first best cannot be achieved.

- As before, for appropriate values of γ, $x^* < x'(\gamma) < x^{FC}$
- The concavity of the SWF, in 4.1, ensures that social benefit is higher than under full compensation.

Social Vs Political Rankings I

Consider three public-goods: Public-park, Slip-road, Golf-course.



Government's Metric I

Let, β_p^G be the benefit to the government from project $p = 1, \ldots, P$.

$$\beta_p^G(\theta) = \alpha\beta_p^S(\theta) + \epsilon_p, \tag{2.2}$$

where

- α denotes the weight assigned by the government to the social interests,
- ϵ_p denotes the 'extraneous' considerations the government assigns to the project.

In general, $\alpha \neq 1$ and/or $\epsilon_p \neq 0$.
Let,

$$\pi_p^G(\theta, \mathbf{x}) = \beta_p^G(\theta) - \delta \sum_i^I c_i(x_i), \tag{2.3}$$

where

Government's Metric II

- $c_i(\cdot)$ is the compensation paid to the ith owner, and
- δ the discount rate for the Govt.

π_p^G denotes the net gains to the government from project $p = 1, 2, \ldots, P$. Let,

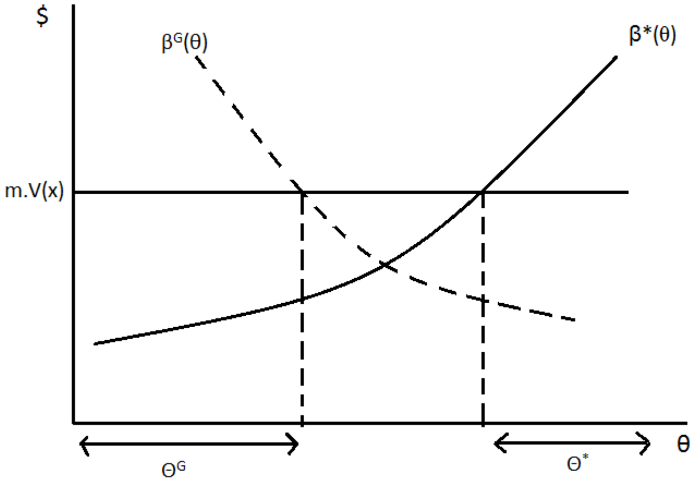
$$\pi^{G*}(\theta, \mathbf{x}) = \max\{\pi_{p'}^G(\theta) | p' \in \mathbb{P}^{G+}\}$$

In general, for any given θ and $\mathbf{x}$, we will have

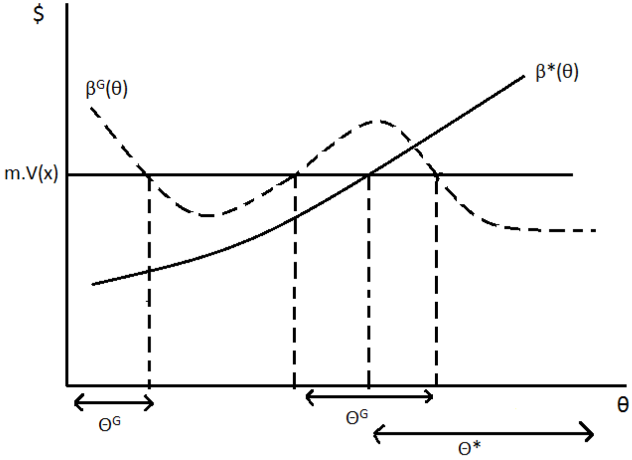
$$\mathbb{P}^{G+}(\theta, \mathbf{x}) \neq \mathbb{P}^{S+}(\theta, \mathbf{x}),$$

For instance,

Social Vs Political Rankings



Social Vs Political Rankings



Full Compensation: Cash-in the illegality

An owner i will choose x_i to maximize:

$$\max_{x_i} \{v(x_i) - x_i\}.$$

The first order condition:

$$v'(x_i) - 1 = 0. \tag{3.1}$$

That is, will choose x^{FC}, where $x^{FC} > x^*$.

Proposition

Under 'full compensation'

- *there will be excessive investment by the owners*
- *the government realizes a project whenever it interests it.*
- *Provision of judicial review does not change the outcome*

The owners

- $x^{FC} > x^*$. and will not challenge the takings decisions.

Budget Constraints and Takings I

Proposition

Under 'full compensation', the proportion of inefficient takings can increase with Budget Constraints.

- Suppose there are $N \geq 3$ neighborhoods
- At each Nbd any ONE of the projects can be taken up $\mathbb{P}^{G+} = \{$ Golf-course, slip-road and public-park$\}$
- Under full compensation, the owners will not litigate.
- Suppose $\mathbb{P}^{G+} = \{$ Golf-course, slip-road and public-park$\}$
- But recall $\mathbb{P}^{S+} = \{$public-park, slip-road$\}$.

- Without budget constraints, the proportion of inefficient takings is 1/3
- With budget constraints, the proportion of inefficient takings can be 1/2 or even 1

Restitution/Injunction I

We assume that

- courts can issue injunction or restitute the condemned land, if the taking is not in public interest.
- the assumption is somewhat optimistic.

However, we consider it a reasonable assumption on the following grounds:

In several countries,

- Eminent Domain law requires (including Germany and India)
  - clear definition of public purpose
  - Cost and benefit analysis by the authorities
- courts check whether infringement of a right is ‘proportional’
  - Germany, Poland, Portugal, Spain, Israel and the European Court of Justice, the New eminent domain law in India

Restitution/Injunction II

- Proportionality requires that the condemned land is the mildest infringement of property for realization of the project.
- That is, it rules out condemnation of parcels which are not necessary for realizing the project.
- If the taking passes these two tests, courts still check whether the project is ‘necessary’ in view of the totality of social benefits as well as the costs

Restitution with Less-than-full Compensation I

With less than full compensation,

- Owners lose out if takings happen
- owners will seek injunction against inefficient/illegal takings
- Taking happens iff there common ground between Political and Social preferences

Scenario 1:

- Whenever socially preferred projects exist, at least one of them is of interest to the government. Formally,

Restitution with Less-than-full Compensation II

Scenario 1:

$$\mathbb{P}^{G+}(\theta, \mathbf{x}) \cap \mathbb{P}^{S+}(\theta, \mathbf{x}) \neq \emptyset, \text{ whenever } \mathbb{P}^{S+}(\theta, \mathbf{x}) \neq \emptyset$$

Proposition

Suppose, Scenario 1 holds. Under restitution and 'less-than-full compensation', the following outcome is achieved:

- *taking happen iff it enhances the social welfare*
- *investment levels of the owners are less than under full compensation, but still greater than the first best*
- *First best is not achieved*

Suppose compensation is $\gamma v(x_i)$, $\gamma < 1$. The optimisation problem of the ith owner is

$$\max_{x_i} \{\pi^i \equiv F(\hat{\theta}(x_i, x_{-i}))v(x_i) + [1 - F(\hat{\theta}(x_i, x_{-i}))]\gamma v(\cdot) - x_i\}$$

Restitution with Less-than-full Compensation III

When $\frac{\partial^2 F(\hat{\theta}(x_i, x_{-i}))}{\partial x_i \partial x_j} \geq 0$, we have $\frac{\partial^2 \pi^i}{\partial x_i \partial x_j} \geq 0$ for all $i, j = 1, \ldots, I$. So

- The game is thus *super-modular*
- It also satisfies the single-crossing property over $[0, x^{FC}]$
- an interior equilibrium exists and is identified by the FOC's,

$$v'(x_i) - 1 = (1 - \gamma)[(1 - F(\hat{\theta}(x_i, x_{-i})))v'(x_i) - F'(\hat{\theta}(x_i, x_{-i}))v(x_i)]$$

Moreover, *Single Crossing Condition* holds, i.e.,

$$\frac{\partial^2 \pi^i}{\partial \gamma \partial x_i} = (1 - F(\hat{\theta}(x_i, x_{-i})))v'(x_i) - F'(\hat{\theta}(x_i, x_{-i}))v(x_i) > 0$$

when

- $F'(\hat{\theta}(x_i, x_{-i}))$ is small or
- $(1 - F(\hat{\theta}(x_i^{FC}, x_{-i}^{FC})))v'(x_i^{FC}) - F'(\hat{\theta}(x_i^{FC}, x_{-i}^{FC}))v(x_i^{FC}) \geq 0$

Restitution with Less-than-full Compensation IV

The assumptions are especially plausible when

- land is agricultural or
- project is large - many properties are taken

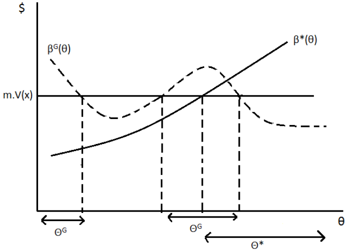
From the above,

- The unique equilibrium investment levels are an increasing and continuous function of γ
- At $\gamma = 1$, $\mathbf{x}^{FC}$ is an equilibrium.
- So at a suitable range of $\gamma < 1$, we have an equilibrium $\in [x^*, x^{FC}]$.

Restitution with Less-than-full Compensation V

Scenario 2:

- There are states of nature such that while there are socailly desirable projects, none of them are politically desirable.
- However, in other states of nature, the two coexist.



Restitution with Less-than-full Compensation VI

Formally: For any given $\mathbf{x}$,
$\exists\ \theta' \in \Theta$ such that $\mathbb{P}^{S+}(\theta', \mathbf{x}) \neq \emptyset$ but $\mathbb{P}^{G+}(\theta', \mathbf{x}) \cap \mathbb{P}^{S+}(\theta', \mathbf{x}) = \emptyset$, and
$\exists\ \theta^{''} \in \Theta$ such that $\mathbb{P}^{G+}(\theta^{''}, \mathbf{x}) \cap \mathbb{P}^{S+}(\theta^{''}, \mathbf{x}) \neq \emptyset$

Proposition

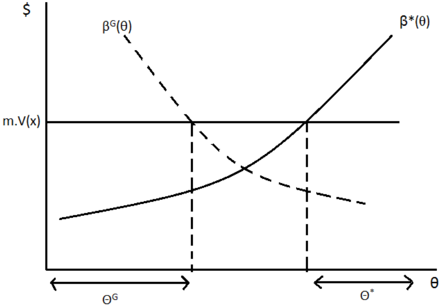
Suppose, Scenario 2 holds. Under restitution and 'less-than-full compensation', the following outcome is achieved:

- *taking happen only it enhances the social welfare*
- *investment levels of the owners are less than under full compensation, but still greater than the first best*
- *First best is not achieved*

Restitution with Less-than-full Compensation VII

Scenario 3: Regardless of the state of nature, no politically interesting project is socially desirable. Formally,

$$\mathbb{P}^{G+}(\theta, \mathbf{x}) \cap \mathbb{P}^{S+}(\theta, \mathbf{x}) = \emptyset, \text{ for all } \mathbf{x} \text{ and all } \theta \in \Theta$$



Restitution with Less-than-full Compensation VIII

Under such unusual conditions,

- No project will be realized
- The uniquely best investment choice for each owner will be to choose x to maximize $\{v(x) - x\}$, i.e., to choose x^{FC} , as defined above.

Restitution with Less-than-full Compensation IX

Scenario 4: There exists a certain profile of investments that regardless of the state of nature, politically and socially desirable projects cannot coexist. Formally,

$$\exists\ \mathbf{x}, \text{ such that: } \mathbb{P}^{G+}(\theta, \mathbf{x}) \cap \mathbb{P}^{S+}(\theta, \mathbf{x}) = \emptyset, \text{ for all } \theta \in \Theta$$

In principle, such a situation might arise if due to (excessively) high investments the opportunity cost of a taking is always greater than the social benefit, since

- $p \in \mathbb{P}^{S+}(\theta, \mathbf{x}) \Leftrightarrow \beta_p^S(\theta) - \sum_{i=1}^{I} v_i(x_i) \geq 0$
- So increasing $\mathbf{x}$ high enough would ensure that for all $p \in \mathbb{P}$ and for all $\theta \in \Theta$, $\mathbb{P}^{S+}(\theta, \mathbf{x}) = \emptyset$

Restitution with Less-than-full Compensation X

If this occurs at the full compensation levels of investment, $\mathbf{x}^{FC}$, we have the following result:

Proposition

Suppose $\mathbb{P}^{G+}(\theta, \mathbf{x}^{FC}) \cap \mathbb{P}^{S+}(\theta, \mathbf{x}^{FC}) = \emptyset$ *for all* $\theta \in \Theta$ *holds. Under restitution with full compensation, each owner will invest* x^{FC} *and there will be no takings.*

- Owners, being under-compensated, want to reduce the probability of takings
- x^{FC} reduces the probability to zero while also being privately optimal

Social Welfare I

Proposition

Under Scenarios 1 and 2, the social welfare (common good) under restitution with under-compensation is higher than the outcome under full compensation (with and without the availability of restitution).

For any given profile of investments $\mathbf{x}$, the expected social benefit is given by:

$$\int_{\tilde{\Theta}^*(\mathbf{x})} \sum_{i=1}^{I} v(x_i)\ f(\theta)d\theta + \int_{\Theta^*(\mathbf{x})} \beta^{S}_{S\cap G}(\theta)\ f(\theta)d\theta - \sum_{i=1}^{I} x_i \tag{4.1}$$

- The result hold if we assume this is concave
- Since equilibrium we have $x^{**} < x'(\gamma) < x^{FC}$.

Social Welfare II

Proposition

Suppose Scenario 1 holds and the judiciary allows takings iff $\beta_p^S(\theta) \geq \sum_{i=1}^{I} v_i(x_i^*)$.

- *There is an equilibrium such that the investments are first best efficient,*
- *and the takings happens only if it improves the social welfare.*
- *There is no litigation.*

Let compensation be fixed at $c^{**} < v(x^*)$. First, look at the Government's decision.

- Assume each owner opts x^*. Then $\mathbb{P}^{S+}(\cdot) \neq \emptyset \Leftrightarrow \beta_p^S(\theta) > I v_i(x^*)$
- The owner's problem is then

$$\max_x \left\{ F(\hat{\theta}(x^*))v(x) + (1 - F(\hat{\theta}(x^*)))c^{**} - x \right\}$$

x^* is a Nash Equilibrium by all the players.