Property rights and investment

From The failure of one market to The success of another
Outline

• The tragedy of the commons (review)
• Social and private returns
• Property rights
• Combining assets (joint ownership)
• Investment
• Property rights and Investment
From last lecture

• Solutions to public goods problems are rather diverse
• Mandates
• Taxes
• Markets.
  – Economists like markets because they lead to efficient mitigation of problems.
  – Here we explore how to set up the market in more detail
The Tragedy of the Commons

• Suppose there is a forest F. There are n lumberjacks. They each cut f trees a year.

• The size of the forest is a function of its current number of trees $F_{t+1} = G(F_t)$.
  – We want to know how many trees will be cut—what will be the steady state size of the forest. That occurs when $G(F)-F=nf$
  – Assume that a tree not cut this year can be cut next year.

• If there are n lumberjacks
  – Max= $f+(\delta/n)G(F-f)$
  – FOC = $1+(\delta/n) G'=0 \Leftrightarrow G'=n/\delta$. => F goes to zero
Conflicts between Social and private returns

- Each lumber jack gets a tree when he cuts one
  But only gets 1/n of the benefit of leaving it standing.
- To restore efficiency we have to align private incentive to social ones.
- The problem lies with the unrestricted claims each lumberjack can make on the forest
- Property rights are not set up efficiently
The property rights view

• To understand these issues move from a one period world to a multi-period world

• What is a property right?
  – Claim on an Asset

• What is an Asset?
  – A durable object or a person that can produce an income stream.
  – Land, building, machines, tools, people
  – A property right on an asset
    • An income claim
    • Authority over the disposition of the asset
Property right on an asset

- An income claim
  - E.g. a share of a firm’s profit is a property right
  - The right of the lender to interest and principal
  - The right of the master over his slave
- Authority over the disposition of the asset
  - Right to decide how to use
    - What firm the worker work for
    - Whether to rent a piece of land to a farmer
    - Whether to continue or dissolve a business venture
  - Right to dispose of the asset
    - Sell it
- Income and authority claims are often (but no always) bundled
Private property

• 1793 declaration of the rights of man:
  – art 16. The right of property is that which belongs to every citizen to enjoy, and to dispose at his pleasure of his goods, income, and of the fruits of his labor and his skill.
  – Art 19 No one can be deprived of the least portion of his property without his consent, unless a legally established public necessity requires it, and upon condition of a just and prior compensation.

• Economists
  – An individual has the private property to an asset if:
  – The individual has complete authority over how the asset is used, the exclusive right to the services of the asset, and the right to delegate, rent or sell the asset in whole or part

• How often is there private property?
Private property and the law

• In fact private property rarely exists
• (DRoM Art 18.)
  – Every man can contract his services and his time, but he cannot sell himself nor be sold: his person is not an alienable property.
• Regulation over real estate, waste, speed on roads, noise by airplane, safety.
• Joint ownership
The problem combining assets

• Suppose a farmer (who owns her labor and capital) and a landowner (who owns his land and improvements) combine their inputs to produce some output.

• How to do this combination
  – (1) the farmer rents the land from the landowner
  – (2) the landowner hire the farmer
  – (3) they form a partnership and divide the profits

• Which is best?
The problem combining assets

• Does ownership matter?
• Here what matters is what is contractible.
  – Farmer has discretion on how hard he work
  – Landowner has discretion on capital improvement
• If all this matters are contractible, then all arrangements are equivalent.
  – Why?
  – Because you can specify in the contract what each person must do in each circumstance and then levy penalties if they fail to do so
What if not contractible

• Then each makes his own decision
• Let the production function be $F(L,K)$ where $L$ is discretionary labor input and $K$ is discretionary capital input.
• What happens if there is a fixed rent for the land (and the farmer gets the net profit)
  ‒ Landowner’s return is just the rent, he will make 0 discretionary capital investment.
  ‒ Farmer $\max F(L,K)-L$ $\text{FOC } F'_l = 1$ Efficient investment on discretionary labor
• What happens if the farmer is hired for the year?
  ‒ Farmer’s return is just the wage, she will make 0 discretionary investment
  ‒ Landowner $\max F(L,K)-K$ $\text{FOC } F'_k = 1$ Efficient investment on discretionary capital
• What happens if they own the asset jointly?
Joint ownership

• Each is going to set their investment taking the other as give

• Farmer: Max $\alpha F(L,K) - L$  FOC $\alpha F_L' = 1$

• Landowner: Max $(1-\alpha) F(L,K) - K$  FOC $(1-\alpha) F_k' = 1$

• Efficient would have been $F_L' = 1$ and $F_k' = 1$

• So what is best?
  – $F_L' = 1; K=0$
  – $L=0; F_k' = 1$
  – $\alpha F_L' = (1-\alpha) F_k' = 1$

• If one discretionary input is really valuable....
Investment--Discounted present value

• Investment K leads to return k to society for T periods then vanishes
  – Could make things more complicated by building in residual value and depreciation

• What is value of project?
  – Cost of capital (interest rate, market rate of return) borrow X dollars today return (1+r)X dollars tomorrow
  – Value of stuff tomorrow relative to today (rate of discount) \( d \Leftrightarrow X \text{ dollars next period is worth } dX \text{ dollars today} \)
  – In equilibrium \( d=1/(1+r) \)
Social and private value

• The social present value of the project is

\[ V = \sum_{t=1}^{T} k d^t - K \]

• Society wants to undertake if \( V > 0 \)

• But what will the private market do?
  – Entrepreneur has to pay \( K \) but if there is a difference between social and private returns gets only part \( k \).

\[ V = \sum_{t=1}^{T} k d^t - K > \sum_{t=1}^{T} \alpha k d^t - K \]
Who bears this problem

Property rights and project selection

Present value

Period return

-100 0 100 200 300 400 500

5 15 25 35 45 55 65

α=0.1
α=0.2
α=0.3
α=0.4
α=0.5
α=0.6
α=0.7
α=0.8
α=1
Property rights and investment

• If you want investment and it is discretionary
• You have to allow the investor earn a sufficient return
• Four possible policies
  – Cut taxes
  – Subsidies
  – Privatization
    • Both improve capacity to exclude others
    • Move assets from public sector to private sector
  – Nationalization
    • Move assets from private sector to public
Investment and tax rates

• Simple:
  \[ V_g = \sum_{t=1}^{T} kd^t - K > \sum_{t=1}^{T} (1 - t)kd^t - K = V_g \]

• But things not as simple as that because there is a buried assumption in that model
• Opportunity cost of tax cuts is zero
• Social rate of return to public spending is zero
Subsidies

• So let’s have the state pay part of the cost of the investment

\[ V_s = \sum_{t=1}^{T} kd^t - K \geq \sum_{t=1}^{T} \alpha kd^t - (K - S) = V_a \geq \sum_{t=1}^{T} \alpha kd^t - K \]

• Problem is that one might get too much investment.

• Forms of subsidies
  – Very varied (direct for specific tasks) indirect in support of business
Privatization

• Either regulated or unregulated businesses
  – Public utilities vs private firms
• Was a major solution in the 1980s and 1990s
• Roads to turnpikes or toll roads
• Breaking up common land
• Sale of water supply systems
• Sale of railroads
• Telephone companies
Nationalization

• Schooling
• Health care
• Water delivery
• Amtrack and public transport

• In each an argument can be made that the change is made for efficiency grounds.
  – And it usually involved increasing investment
Rents and efficiency

• Important to remember that private incentives to change property rights regime involved BOTH efficiency and rents