"Political Losers as a Barrier to Economic Development"

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Why do societies fail to adopt the best available technologies?

- Example: large diffusion lags in adoption of railways during 19th century
- known to be key technology driving industrial revolution
- some countries (UK, US and Germany) adopted very quickly
- other European (Russia, Austria-Hungary) countries did so much more slowly

- Some kind of institutional failure?
Economic losers hypothesis

- Existing powerful “interest groups” block new technologies to protect their rents
  - monopoly producers
  - trade unions (e.g. the Luddites)
  - land owners

- Problems with this story
  - few instances where major economic change was blocked by economic losers
  - assumes that certain groups have the political power to block innovation
  - why not simply tax the returns?
Political losers hypothesis

- It is groups whose political power is eroded by progress that will block technological advance.
- If agents are economic losers but lack political power they cannot impede progress.
- If they have and maintain political power, they have no incentive to block progress.
- It is those who have political power and fear losing it that have the ability and incentives to block.

- Related to the endogeneity of political institutions (North, 1981).
- Powerful groups block change if there is no credible commitment to compensate them afterwards.
A Simple Static Model

- Three groups of agents
  - a group of consumers
  - an incumbent monopolist
  - a potential rival

- Two goods
  - capital, $x$: produced competitively with price normalized to 1
  - manufactured good, $y$: produced by incumbent or rival, with price $p$
• Citizens have an exogenous initial endowment of capital $m$ and utility function

$$u = x + \frac{y^\alpha}{\alpha}.$$ 

• Manufacturing production technology:

$$y = zx$$

where

$$\pi = \begin{cases} 
  z_0 & \text{if incumbent produces} \\
  z_1 & \text{if rival produces: } z_1 > z_0 
\end{cases}$$

• Producers face a sales tax, $\tau$
Citizen’s optimization problem

• Choose $x$ and $y$ to maximize

$$x + \frac{y^\alpha}{\alpha} \text{ subject to } py + x \leq m$$

← can be written as

$$\max_y \ m - py + \frac{y^\alpha}{\alpha}$$

• FOC is

$$-p + y^{\alpha-1} = 0$$

← implied demand function is then

$$y(p) = p^{-\frac{1}{1-\alpha}}$$
Monopolists profit maximization problem

- Choose $p$ to maximize profits:

$$py(p)(1 - \tau) - x = py(p)(1 - \tau) - \frac{y(p)}{\pi} = (1 - \tau)p^{1 - \frac{1}{1-\alpha}} - p^{-\frac{1}{1-\alpha}}$$

- FOC is

$$\left(1 - \frac{1}{1-\alpha}\right)(1 - \tau)p^{-\frac{1}{1-\alpha}} + \left(\frac{1}{1-\alpha}\right)\frac{1}{z}p^{-\frac{1}{1-\alpha}-1} = 0$$

→ optimal price is a constant mark-up over marginal cost

$$p^* = \frac{1}{\alpha(1 - \tau)z}$$

- Implied monopoly profits:

$$\Pi(z, \tau) = (1 - \alpha)(\alpha z)^{\frac{\alpha}{1-\alpha}} (1 - \tau)^{\frac{1}{1-\alpha}}$$
Incumbent monopoly owners initially control political system

\[ T \in [0, \bar{T}] \rightarrow \text{value of } \bar{T} \]

reflects political power

\[ \text{can set sales tax } \tau \Rightarrow \text{possible to allow rival to enter and tax it} \]

\[ \text{can block new technology by incurring cost } C \]

Political power depends on economic position

Probability of retaining power = \( \begin{cases} q & \text{if new technology is not introduced} \\ s & \text{if new technology is introduced, } s \leq q \end{cases} \)
Payoffs

- If the monopolist does not block and loses power
  \[ V(NB, NP) = 0 \]

- If monopoly owner blocks new technology, \( B \), and retains power, \( P \), it will choose \( \tau = 0 \) and \( T = \bar{T} \):
  \[
  V(B, P) = \bar{T} + \Pi(z_0, 0) \\
  = \bar{T} + (1 - \alpha)(\alpha z_0)^{\frac{\alpha}{1-\alpha}}
  \]

- If the monopoly owner blocks the technology, but loses power, \( NP \), it can no longer levy taxes:
  \[
  V(B, NP) = \Pi(z_0, 0) = (1 - \alpha)(\alpha z_0)^{\frac{\alpha}{1-\alpha}}
  \]
If the monoplist retains political power, but does not block, \( NB \), it can still tax the rival and earn revenue

\[
R = \tau py
= \tau [\alpha (1 - \tau)z_1]^{\frac{\alpha}{1-\alpha}}
\]

Choosing \( \tau \) to maximize this revenue yields

\[
\tau^* = 1 - \alpha
\]

and so the maximum sales tax revenue is

\[
R^* = (1 - \alpha) [\alpha^2 z_1]^{\frac{\alpha}{1-\alpha}}
\]

It follows that

\[
V(NB, P) = \bar{T} + (1 - \alpha) [\alpha^2 z_1]^{\frac{\alpha}{1-\alpha}}
\]
Expected Returns

- **Expected value of blocking technology:**

\[
EV(B) = qV(B, P) + (1 - q)V(B, NP) - C \\
= q\left[\bar{T} + (1 - \alpha)(\alpha z_0)^{\frac{\alpha}{1-\alpha}}\right] + (1 - q)\left[(1 - \alpha)(\alpha z_0)^{\frac{\alpha}{1-\alpha}}\right] - C \\
= q\bar{T} + (1 - \alpha)(\alpha z_0)^{\frac{\alpha}{1-\alpha}} - C
\]

- **Expected value of not blocking technology:**

\[
EV(NB) = sV(NB, P) + (1 - s)V(NB, NP) \\
= s\left[\bar{T} + (1 - \alpha)\left[\alpha^2 z_1\right]^{\frac{\alpha}{1-\alpha}}\right]
\]

- It follows that monopoly owner will block if and only if

\[
(q - s)\bar{T} + (1 - \alpha)(\alpha z_0)^{\frac{\alpha}{1-\alpha}} - s(1 - \alpha)\left[\alpha^2 z_1\right]^{\frac{\alpha}{1-\alpha}} > C
\]
Implications

- Suppose $\alpha z_1 > z_0 \Rightarrow R^* > \Pi(z_0)$.

  $\iff$ if $q = s = 1$, incumbent owners would never want to block progress

  $\iff$ would allow introduction of technology and collect taxes from citizens and rival

  $\iff$ if $s < 1$, then blocking may occur because political power is threatened by innovation

- More generally, incumbents will block progress when:

  (1) $q - s$ is high: likelihood of staying in power when it blocks is relatively high

  (2) $\bar{T}$ is high: political rents from staying in power are large

  (3) $z_0$ is high: profits from blocking are greater

  (4) $z_1$ is low: sales tax revenue from rival is small
Application to Industrial Revolution in Europe (1800)

- Initially land owners had political power, but would be economic losers from industrialization
  - migration to urban centres eventually drove up wages
  - increased and freer trade led to falling land values and rents

- Why didn’t the landed elites block progress in Britain and Germany?
  - no longer feudal systems ⇒ political rents, $\bar{T}$, relatively small
  - landed groups anticipated security of political power ⇒ $q - s$ small

- Why did the landed elites block progress in Russia and Austria-Hungary?
  - more to lose due to their almost feudal (monarchist) system
    ⇒ $\bar{T}$ large
  - existing political institutions could not adapt to “social forces” unleashed by industrialization ⇒ $q - s$ large