# Crime Induced Poverty Traps

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# Introduction

- Poverty makes thieves and thieves hamper economic growth.
- This paper studies precisely these linkages in a model of modern sector job creation.
- Crime, riots and social disruption may follow modernization which in turn can derail the development process.
- In standard models, modernization has NO disruptive social implications. Not borne out by the facts.
- A typical growth *loser* is a country where crime rates are increasing while growth *winners* tend to experience declining crime rates.

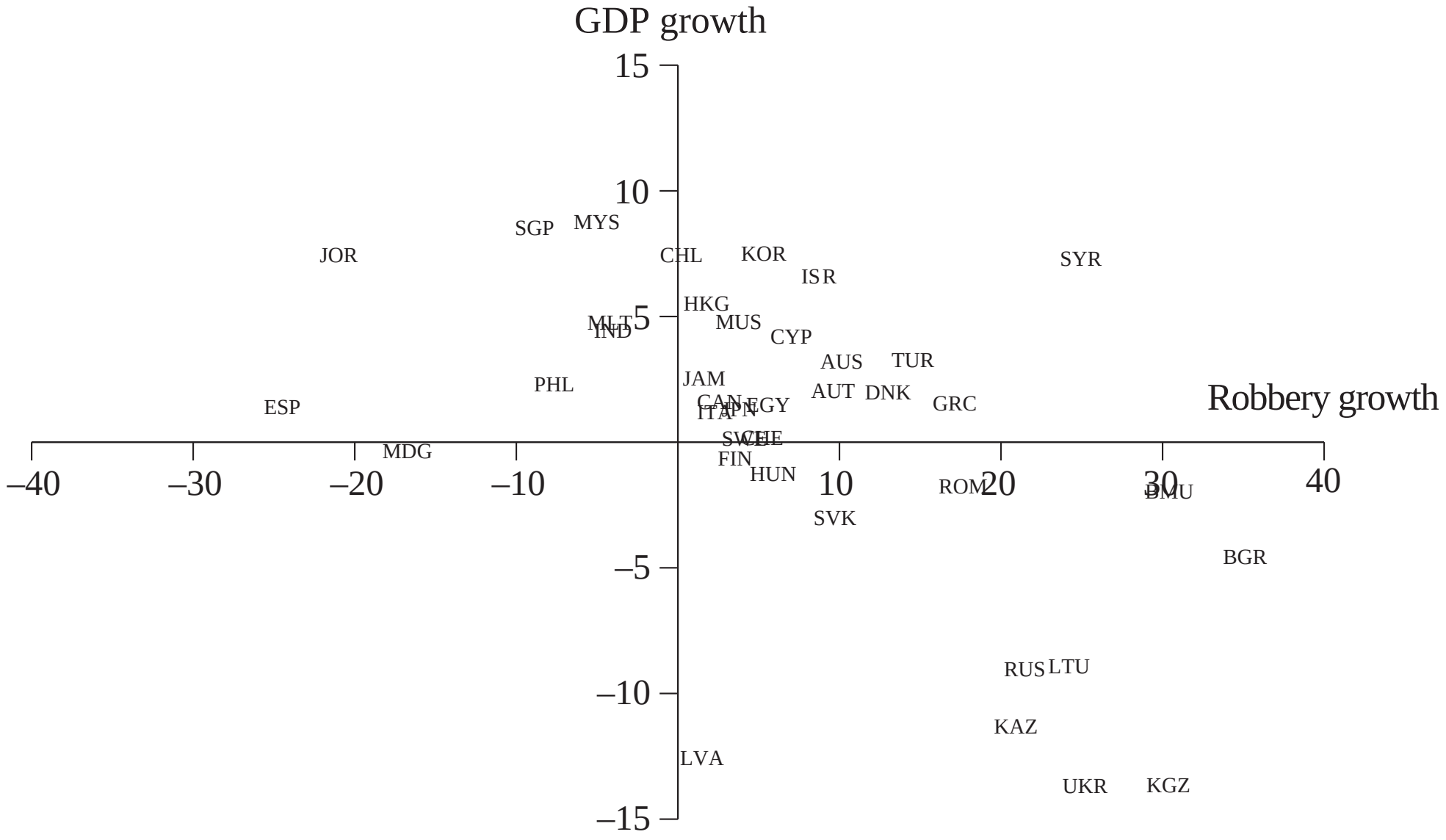


Fig. 1. Crime growth versus economic growth.

# Economic & Social conditions: Linkage I

**Linkage I:** Economic stagnation and poverty leads individuals into crime.

- Sociologists and criminologists have emphasized how poverty and idleness explain high crime rates (Allan and Steffensmeier, 1989; Currie, 1997).
- The connection between crime and poverty has also caught renewed attention among economists.
- Applying panel data for 45 developed and developing countries over the period 1965 –1995, Fajnzylber et al. (2001) find that violent crime rates decline when economic growth improves (see also Fajnzylber et al., 2002; Miguel, 2002).

# Economic & Social conditions: Linkage II

**Linkage II:** Crime and violence lower business profitability, reduce the effectiveness of the economy and therefore reduce economic growth.

- In Latin America, the costs of crime are in several cases above 7% of GDP (Londono and Guerrero, 2000).
- Russia has also experienced escalating crime and violence spirals in the 1990s with bad economic consequences (Ledeneva and Kurkchiyan, 2000).
- The negative impact of crime on economic performance is also evident from cross-country regressions (Barro and Sala-I-Martin, 1995, chap. 12).

# The Model

- In this model, growth stems from modern sector job creation.
- In the modern sector there is a unit mass of firms that employ $L$ workers to produce the modern sector output $X$.
- Each worker has a constant productivity $\beta$, hence $X = \beta L$.
- New jobs are created by entrepreneurs. The speed of job creation $\dot{L}$ depends on the profitability $\pi$ in the modern sector.
- $\dot{L} = h(\pi)$ where $h(0) = 0$ and $h' > 0$.
- So jobs are created when profits are positive while jobs are destroyed when the profits are negative.

# The case *without* crime

- Here modern sector workers are recruited from the subsistence sector that has $F$ workers all earning a fixed income $q$.
- When $F > 0$ the wage in the formal sector is equal to $q$ and the net return to job creation is the constant $\pi = \beta - q$.
- Modernization takes off provided that modern jobs are sufficiently productive; that is $\beta \geq q$.
- Modernization goes on with constant growth $\dot{L}$ as long as there is labor in the subsistence sector ($F > 0$).
- Thus, in the case without crime, the model generates an uninterrupted transition to full modernization once it gets started.

# The case *with* crime

- For simplicity, assume that all workers are equal and that when they choose between crime and other employment they *only* consider the expected income.
- The main results are robust to some modifications...discussed later.
- $L$ workers are employed in the formal sector earning $w$; $F$ workers in the subsistence sector earn $q$; $C$ workers become thieves earning $p$.
- With available labor normalized to unity, $L + F + C = 1$.
- Let $z$ capture the total cost of crime as a share of production then the net return of job creation is $\pi = (1 - z)\beta - w$.

# Crime: Costs and Returns

- The cost of crime $z$ is made up of two components.
  1. Firms spend resources on protection measures such as guards, fences, alarm systems, and supervision.
  2. Protection reduces the stealing in each attack. The scaring-off effect for one particular firm is determined by the firm's protection level compared to the average level of guarding in the other firms.
- $\gamma$: the fraction of each job that is in the form of guarding services.
- In each criminal attack a share $A - a\gamma$ of production is stolen, where $0 < a \leq A \leq 1$.
- The scaring-off effect: when the firm's own protection, $\gamma$, is low relative to the average level of protection, $\overline{\gamma}$, the firm attracts a large fraction of the criminals.
- Total cost $zX$ is $[\gamma + (A - a\gamma)\frac{\overline{\gamma}}{\gamma}C]X$.

# Crime: Costs and Returns (cont'd.)

- Each firm chooses the level of protection that minimizes its total cost of crime.
- The first order condition for minimum costs is simply $\gamma^2 = AC\overline{\gamma}$.
- Combining this with the requirement that in equilibrium all firms choose the same level of protection yields:
  - $\gamma = AC$
  - $z = A(2 - aC)C$.
- The return from being a criminal p is the share that each criminal steals $(A - a\gamma)X$. Hence, $p = A(1 - aC)X$.
- This completes the description of the micro level.

Table 1
The labor market regimes

| Regime | Labor market condition | Wage condition |
|---|---|---|
| 1. Subsistence | $C=0$, $F>0$ | $w=q>p$ |
| 2. Low income | $C>0$, $F>0$ | $w=q=p$ |
| 3. Medium income | $C>0$, $F=0$ | $w=p>q$ |
| 4. High income | $C=F=0$ | $w>p>q$ |

- The economy goes through the four regimes as modern sector employment increases in tandem with modern sector production.
- The poorest and richest regimes have no crime, while the low income and medium income regimes both have crime. A transition through the regimes shows that there is a hump-shaped relationship between modern sector employment and crime.
- At the early stage of modernization (regime 2) crime becomes a tempting opportunity for some of the poor. At a later stage of modernization (regime 3) labor becomes scarce and crime decreases as the modern sector employs more workers.

- The profits from modern sector job creation is given by $\pi = \beta - \beta AC(2 - aC) - w$.
- The return $\pi$ goes down when either the wage goes up or the number of criminals increases. The wage and crime levels are in turn both determined by the modern sector employment.

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Table 2
The return to job creation

| Regime | $\pi$ |
|---|---|
| 1. Subsistence | $\pi_1 = \beta - q$ |
| 2. Low income | $\pi_2 = \beta - q - \beta A/a + q^2/(aAL^2\beta)$ |
| 3. Medium income | $\pi_3 = \beta - 2A\beta + aA\beta + (1-a)AL\beta$ |
| 4. High income | $\pi_4 = 0$ |

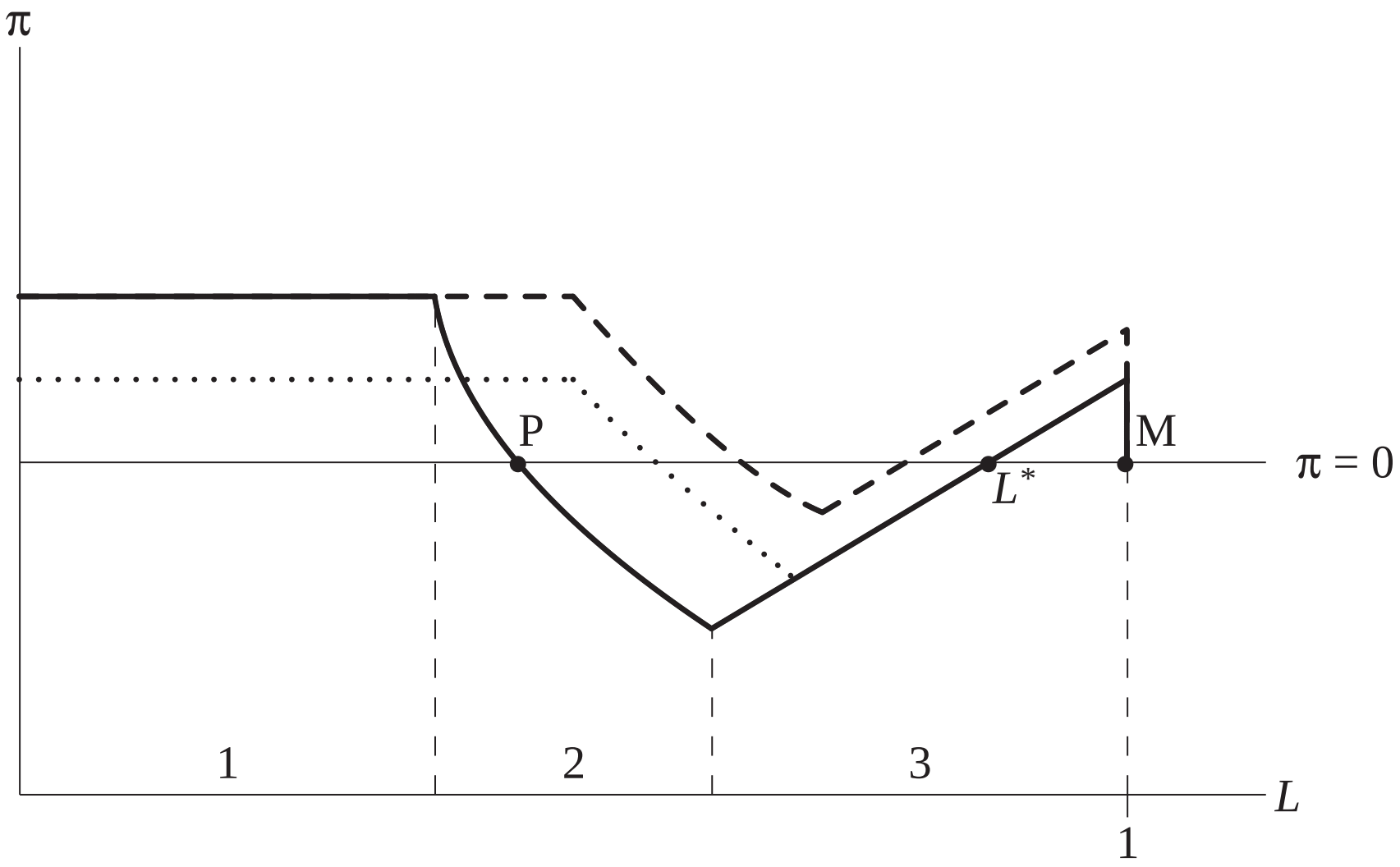


Fig. 3. The return to job creation.

**Proposition 1.** Due to crime, the return to modern sector job creation is a V-shaped function of employment. This may produce a crime generated poverty trap.

- In Fig. 3 there are three equilibria: M, P, and L*.
- Here M and P are stable equilibria while L* is an unstable equilibrium.
- L* is the threshold level of modernization that determines whether the economy ends up in the poverty trap P or ends with complete modernization in M.
- With a sufficiently high productivity $\beta$ in the modern sector, the economy would grow continuously without being trapped at intermediate levels of modernization.
- In the model, the overall shape of the return to job creation follows the movement in crime levels. In regime 3 the condition for this to happen is that the positive social externality through crime reduction outweighs the increase in wages.

# Moral scruples

- Suppose there is an aversion/moral cost of committing crime that is the same for all individuals (also captures the effect of more efficient law enforcement/harsher punishment).
- The effect in the model is illustrated by the dashed curve in Fig. 3.
- When the aversion is sufficiently high, the poverty trap disappears.
- Aversion against committing crimes varies across individuals: those with the lowest aversion are the first to enter into crime and the marginal aversion against committing crimes increases with the number of criminals.
- Taking this heterogeneity into account, as exemplified in Fig. 3, reduces the steepness of the $\pi$-curve in regimes 2 and 3. Hence, qualitative effects are similar.

# Policies: Foreign Aid

- Foreign aid: Rural development program that increases the subsistence pay $q$.
- The shift in the return of job creation $\pi$, from the higher $q$, is illustrated by the dotted curve in Fig. 3.
- Formally the effect in regime 2 is seen by differentiating $\pi_2$ in Table 2 w.r.t. $q$.

$$\frac{\partial \pi_2}{\partial q} = \frac{aL+2(1+aF-a)}{aL} > 0.$$

**Proposition 2.** Foreign aid that improves living conditions in the subsistence sector lowers crime and may remove the crime induced poverty trap.

# Policies: Public employment programs

- Consider the case where a number of workers $L_g$ are employed by the government. Hence, in regime 3, crime is lower, as $C = 1 - L - L_g$.
- Will the private sector would be willing to finance such a program?
- Extreme case: Suppose the public workers are completely unproductive. Then the net return to job creation in regime 3 is

$$\pi^*(L, L_g) = \pi_3 - wL_g / L.$$

- Some substitution and re-arrangement of terms yield

$$\pi^*(L, L_g) = \beta(1 - A) - (1 - a)A\beta(1 - L - L_g).$$

$$\frac{\partial \pi^*}{\partial L_g} = A\beta(1 - a) > 0.$$

**Proposition 3.** In regime three unproductive employment implies higher returns to private firms even when the program is financed by a tax on production.

# The optimal public employment program

- The program that maximizes the return to job creation is one where all potential criminals are in public employment.
- Let $C \to 0$ (in regime 3). Then $\pi^*(1 - L_g, L_g) = \beta(1 - A) \equiv \pi^{**}$.
- A public employment program is a cure against crime as long as there is excess supply of labor. It hampers growth, however, if labor is in short supply.
- If the economy is in regime 4 a public employment program reduces the pool of workers that can be recruited to modern sector jobs and therefore limits the scope for growth.
- Downscaling: Gradual versus Big Bang.

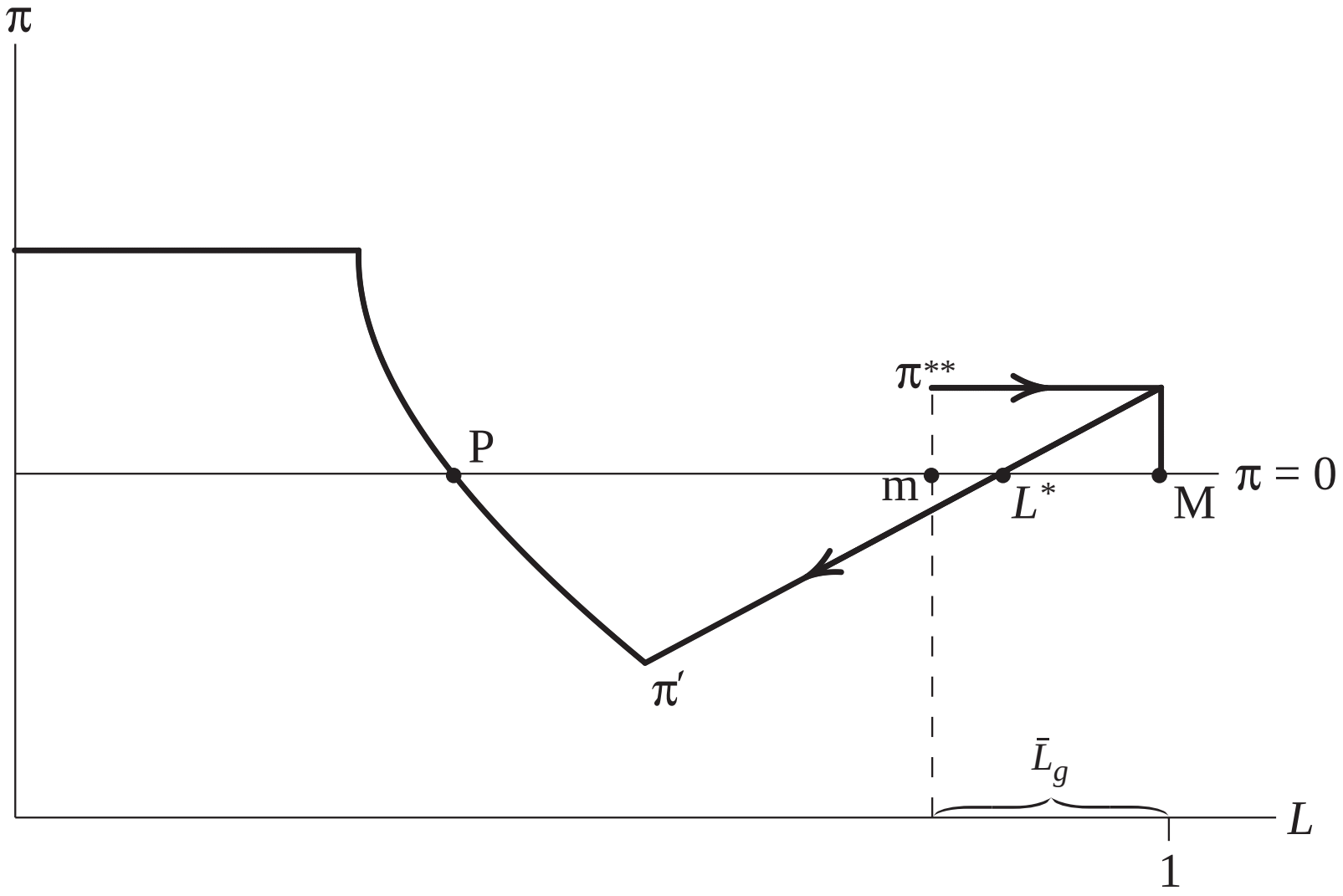


Fig. 4. Gradual versus big bang reform.

# Public sector downsizing

**Proposition 4.** A big bang reduction of public sector surplus labor may throw the economy into a crime induced poverty trap. A gradual reduction of public sector surplus labor, that prevents the crime rates from becoming excessive, avoids the poverty trap.

- Social repercussions which follow an abrupt downsizing are damaging.
- Resembles the tragic development in some eastern European countries after their reforms.
- Another abrupt reduction in public employment is the scaling down of armies after the end of the Cold War.
- In Africa alone more than 750000 troops were demobilized (Kingma, 2000). Demobilized personnel and low paid officers found new sources of income as violent entrepreneurs and criminals (Lock, 1998).

# Conclusion

- Depending on the level of modernization, job creation may have negative or positive externalities via criminal behavior.
- It is the changing sign of the externality at different stages of development that can generate a poverty trap.
- Policies that improve law enforcement and raise the expected costs of being a criminal not only reduce crime rates but may also trigger a sustainable economic take off.
- Improving the conditions of the worst off group may have similar growth enhancing effects.
- Downsizing the public sector may generate higher crime levels.