Inequality and Poverty Traps

Amitava Bose Memorial Lecture, IIM Calcutta

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In Honour of Prof Amitava Bose (1947-2017)

Introduction

Inequality Traps and Poverty Traps

- In this lecture I will propose the concept of "inequality traps" as distinct from that of "poverty traps"
- Inequality traps may exist even when there are no poverty traps: they work through endogenous returns to occupations
- Plan of the talk
  - Start with some general discussion about poverty and inequality traps
  - Present some motivating stylized facts
  - Present a simple model where none exist and then present variations of it to examine conditions under when both exist, and one exists but not the other
  - Discuss policy implications of when one has poverty traps with or without inequality traps, and when one has inequality traps but not necessarily poverty traps
- I will draw on recent joint work with Andrew Newman as well as material from work done over several decades on these topics

Persistence of Poverty

- How can we think about persistence of poverty?
  1. **Conditional (plus slow) convergence or equal opportunity view:** Differences in individual traits like talent or motivation make the poor choose low-productivity jobs.
  2. **Poverty traps view:** Access to opportunities depends on initial wealth, and hence people who are born poor have no choice but to do low productivity jobs.
- There exists a *stubborn poverty problem* - a lot of poor people are left behind even as countries grow.
  - We need to understand why people stay *poor* in order to design policies that lift the poorest out of poverty.
- How can we reconcile the persistence of poverty with the convergence view?
  - Is convergence slow?
  - Is it conditional convergence?
  - If not, is there a poverty trap, and if so, what is the mechanism?

Poverty Traps

- **Generic story of poverty traps:** y depends on some choices x (likely, constrained) and then, x depends on y through either income effect or saving and accumulation.
- In Ghatak (2015), I distinguish between two kinds of poverty traps:
  - Friction-driven poverty traps
  - Scarcity driven poverty traps

External Frictions View - Overview

- The poor is just like the non-poor in terms of their potential (including ability and preferences) and they simply operate in an unfavourable environment or with low endowments.
- In terms of a production function, $q = Af(x)$,
  1. If we have a low x,
  2. If we have low A
  3. Or if actual A' is lower than potential A,

  Then, there may be poverty traps (i.e., if you start poor, you tend to stay poor).
- We lump all these under "external frictions" (along with frictions that arise from poor governance or infrastructure) that prevent the poor from making the best use of their endowments through exchanges in the marketplace or through technology.

External Frictions View - Policy

- To the extent this can be fixed by placing a poor individual in a favourable external environment, it will be a transient phenomenon - otherwise the poor may be trapped in poverty.
- Under this view, poverty is not only *inequitable*, but is also *inefficient*: a combination of individual rationality and market forces should work to utilise any potential gains (e.g., lost income from insufficient investment in human capital) and to the extent there are barriers preventing this from happening policy interventions (e.g., credit, redistribution) can raise overall incomes as well as reduce poverty
- In other words, there may not be an efficiency-equity trade-off as is commonly assumed in mainstream economics as you are *below* the frontier, not on it.

Choice Driven by Scarcity - A Digression

- Another view of poverty is that even if there were *no external frictions*, the poor are subject to different pressures and constraints from the non-poor driving them to making *choices* that are very different and more importantly, that can reinforce poverty.
- It is tempting to call this view a "behavioural" view of poverty but we are going to argue that this is a broader phenomenon.
- Even if all individuals are rational in the neoclassical sense, choices under extreme scarcity can reinforce the tendency of the poor to stay poor due to *non-homothetic preferences* or *strong income effects*.
  - E.g., at very low income levels, subsistence considerations may rule out the feasibility of saving at a reasonable rate and investing money in health and education to secure a better for future for themselves and their children.
- There are no self-correcting mechanisms present here, nor the scope of supply-side policies aimed at reducing frictions, but redistribution can raise both output and reduce poverty

Inequality Traps

- Poverty traps are usually at the individual level (or at a country level, using a representative agent framework) and refer to absolute income and capital (human, physical, financial)
- One critique of poverty traps is, through luck and with enough time, someone or some family can eventually escape poverty
- Moreover, with economic growth and technological improvements, eventually those trapped in poverty will escape it
- Still there may be systemic or economy-wide "poverty" traps that we call "inequality traps".

Inequality Traps

- Also, logically poverty traps can co-exist with high or low levels of inequality
- Empirically it tends to be the former
- Still, there can be some small group caught in a poverty trap in an economy that is otherwise not too unequal (think of urban ghettos or remote rural areas in a developed country like the Scandinavian ones where overall inequality is not high)
- Need a theoretical framework for this
- Inequality traps happen through wages being endogenous - having too many poor people initially will tend to act as a built-in depressor to the prospect of upward mobility of someone born in a poor family (and downward mobility of someone born in a rich family)
- In contrast, friction-driven poverty traps usually result from some non-convexities coupled with market frictions

Inequality Traps

- In Banerjee-Newman (1993) and Galor-Zeira (1993) what we call inequality traps are implicit, co-existing with poverty traps
- In these models, for the same basic parameters, depending on initial distribution of wealth, one can have multiple steady-states, one with low wages, little mobility, high inequality and low per capita incomes, and the other with high wages, high mobility, low inequality and high per capita incomes (see Ghatak and Jiang, 2002)
- However, as individual-level poverty traps are embedded in these models, there exist policies that could get these individuals out of poverty traps without altering the overall macro-level inequality trap
- In my ongoing work with Andrew Newman, we show that an *inequality trap* may exist at the economy-wide level even if there is no poverty trap at the individual level and policies aimed at addressing poverty traps will not be effective.

A Simple Scheme Capturing the Different Cases

	With Inequality Trap	**Without Inequality Trap**
With Poverty Trap	Banerjee and Newman (1993)	Balboni et al. (2022)
Without Poverty Trap	Ghatak and Newman (2024)	The Solow model

Some Stylized Facts

Poverty - Declining but Persistent

- Global poor are those whose income falls below the **global poverty line** - the famous"Dollar A Day" line.
- In September 2022 the World Bank updated the International Poverty Line to $2.15 using the 2017 PPP. From 2015 to 2022 it was $1.90 per day using the 2011 PPP.

Share of World Population Living in Absolute Poverty

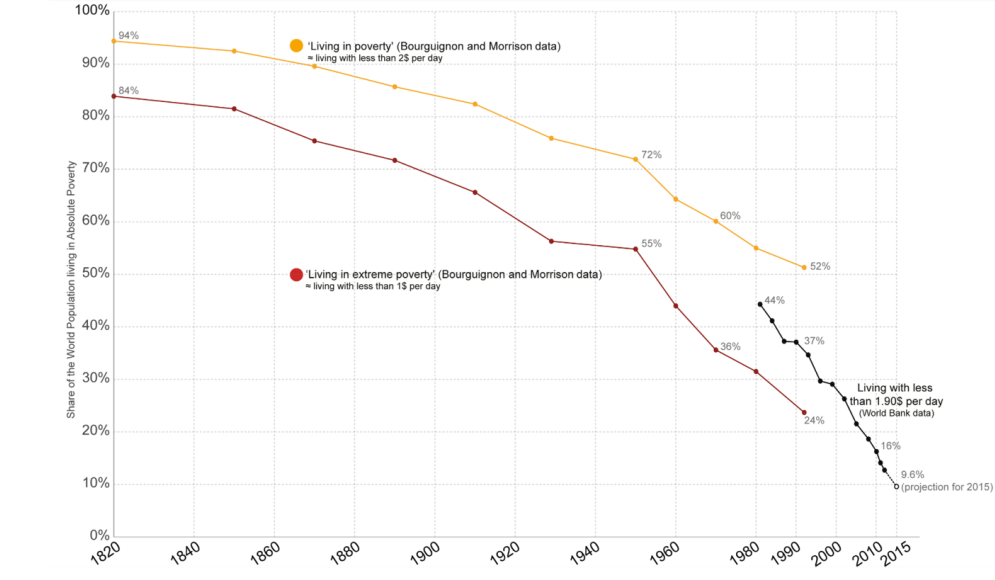


Figure: The share of people living in absolute poverty has been dropping steadily in the last 200 years. There

Total Population Living in Extreme Poverty, by World Region

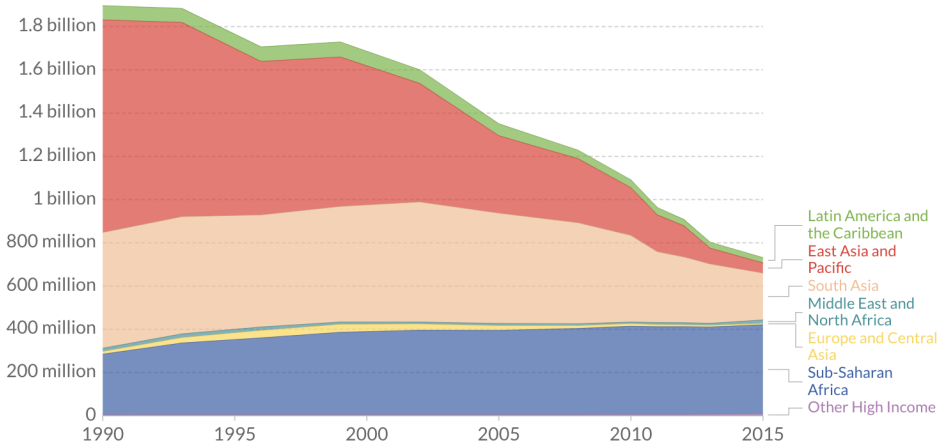


Figure: Numbers are stable in the poorest regions. Extreme poverty is defined as living with per capita household consumption below 1.90 international dollars per day (in 2011 PPP prices). International dollars are adjusted for inflation and for price differences across countries. Source: Our World in Data.

Has Growth Helped Reduce Poverty?

- Rich see much higher income growth, which comparatively swamps that of residents in poor countries.
- Poor residents in developing countries still gain, but their growth looks dismal compared to that of the global top 1, 0.1, 0.01, and even 0.001 percent.
- The global top 1 percent captured twice as much growth as the bottom 50 percent from 1980 to 2016.
- The same picture emerges if we look at growth incidence curves for specific countries, inlcuding India
- This is not consistent with a simple convergence or catching-up story

Source: Facundo Alvaredo, Thomas Piketty, Emmanuel Saez, Lucas Chancel, and Gabriel Zucman (2018). *World Inequality Report 2018*.

Bimodal Distribution

- If we look at distribution of per capita income across countries and over time, the picture that emerges is that of a bimodal (or more generally, multimodal) distribution
- Consistent with poverty or inequality trap type mechanisms at work than convergence

Distribution of Log GDP per capita

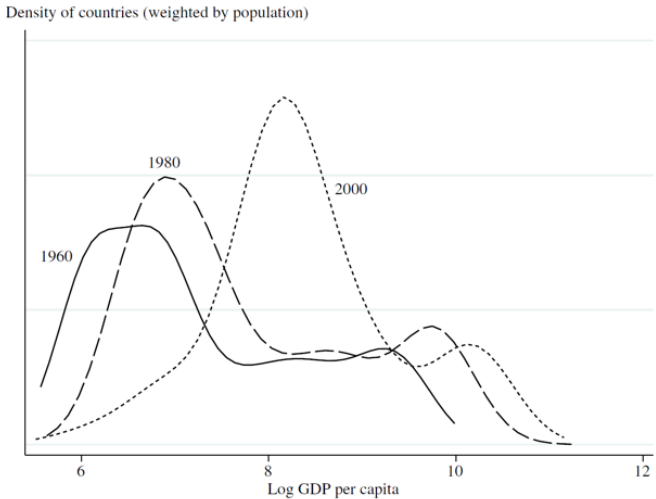


Figure: Estimates of the population-weighted distribution of countries according to log GDP per capita (PPP adjusted) in 1960, 1980, and 2000. Source: Acemoglu (2009)

Global Distribution of Income Over time

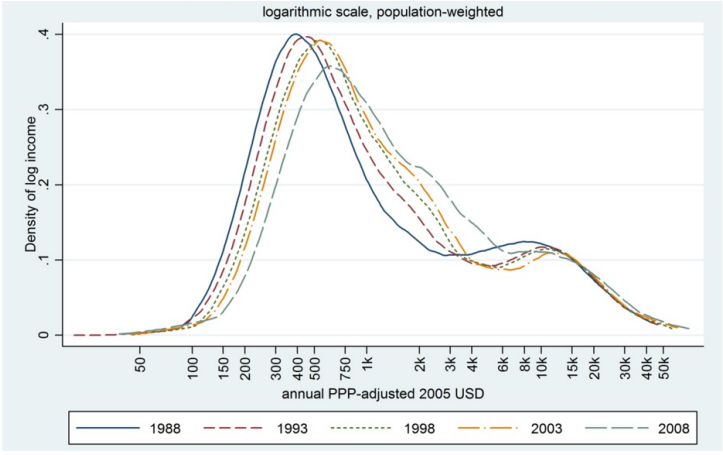


Figure: Global Distribution of Income Over time. Source: Lakner and Milanovic (2013)

Global Income Distribution, 1988

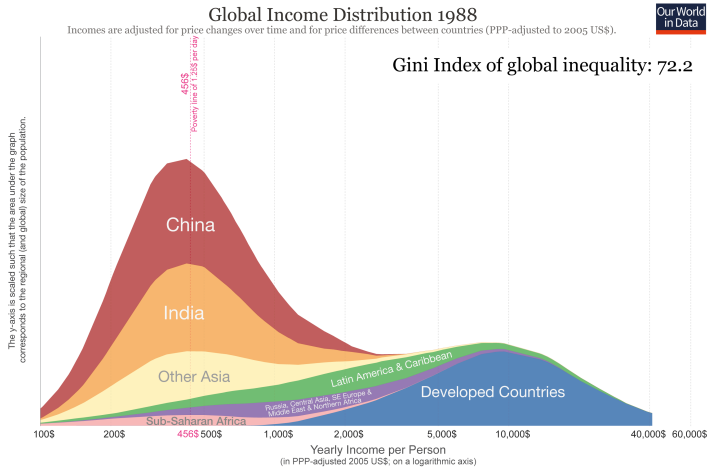


Figure: Global Income Distribution 1988. Source: Roser (2017)

Global Income Distribution, 2008

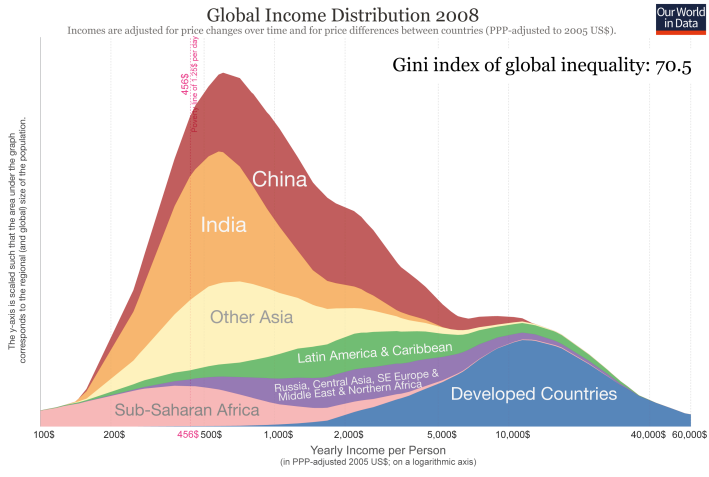


Figure: Global Income Distribution 2008. Source: Roser (2017)

Bimodal Distribution of Assets at Household Level

- In the BRAC asset transfer programme that we studied (Balboni et al, 2022) collecting household-level panel data for eleven years the distribution of assets is bimodal
- Consistent with a poverty trap model with two stable steady-states, with those in the middle either drifting up or down, making that part thin
- We are also able to estimate the transition equation of those who received a lumpy asset transfer and the shape is consistent with a poverty trap model

Distribution of Productive Assets in Bangladeshi Villages

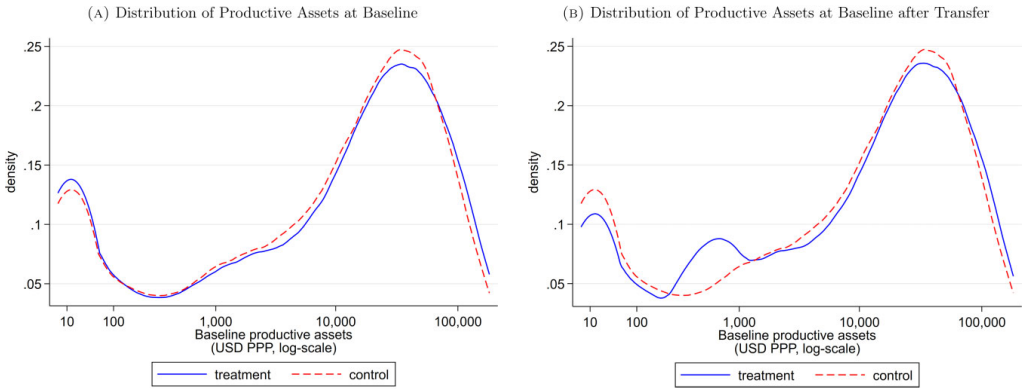
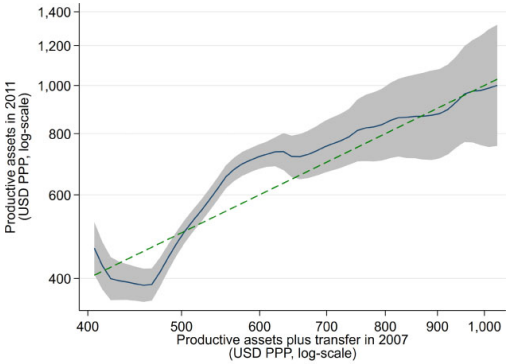
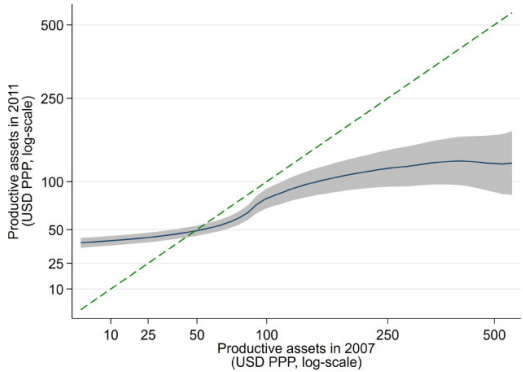


Figure: Distribution of Productive Assets in Bangladeshi Villages. Source: Balboni, Bandiera, Burgess, Ghatak, and Heil (2022).

Poverty Traps Empirics: Balboni et al. (2022)



(A) Treatment villages



(B) Control villages

Theoretical Framework

The Solow World: Conditional Convergence

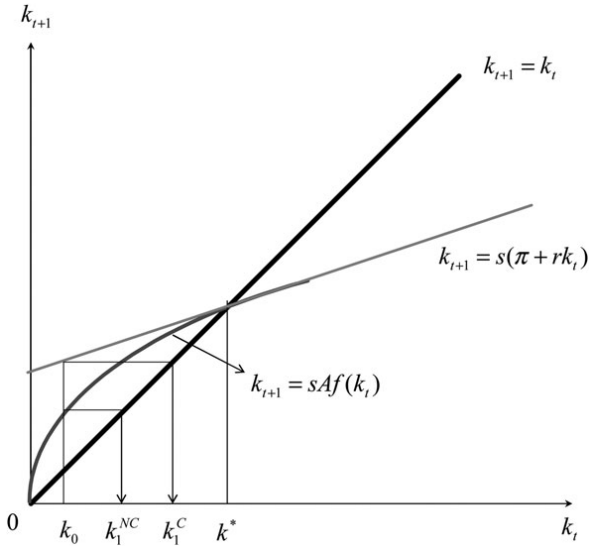
- The Solow model of economic growth assumes a representative agent inhabiting a Robinson Crusoe economy and so can be applied to individuals as well as countries
- There is neither a poverty trap nor an inequality trap.
- The production function as a function of capital k_t is $y_t = Ak_t^{\alpha}$.
- The representative agent saves a constant fraction s of his net investment and faces a depreciation rate δ so that the capital next period is

$$k_{t+1} = sy_t + (1-\delta)k_t = sAk_t^{\alpha} + (1-\delta)k_t.$$

- The steady state capital stock is

$$k^* = \left(\frac{sA}{\delta}\right)^{\frac{1}{1-\alpha}}$$

The Solow World: Conditional Convergence



The Solow World: Conditional Convergence

- Those who have a higher value of s and A or a lower value of δ will be richer in steady-state.
- The poor will tend to grow faster
- Being poor is no handicap in the long run and history does not matter (convergence).
- Any persistent differences across countries/individuals must be pinned down to differences in innate abilities, natural resources, technology, skill, institutions, and preferences regarding thrift and enterprise.
- There has to be permanent policy measures in place (e.g., tax incentives to encourage savings) to do anything about persistent differences and the equity-efficiency trade-off operates.

Convergence or Divergence?

- As noted earlier, we can apply these insights to countries or to individuals or households within a country
- We already looked at household-level data from the Bangladesh study that is not consisent with this model
- If we look at country-level data, then the implications of the Solow model hold up quite nicely if we look a developed countries – growth rate in richer countries slow down, leading to convergence
- However, if we put all countries in the mix, we do not see any evidence of convergence at all (no surprises - conditional on having become rich, those who started poorer must have grown faster).
- Total Factor Productivity (TFP) differences seem to explain most of the variation in growth performance – which is not reassuring for the growth model as it is assumed to be exogenous.
- Moreover, if we plot log GDP per worker in 2000 against log GDP per worker in 1960, there is remarkable persistence - there are absolute improvements, but the relative position of countries has not changed.

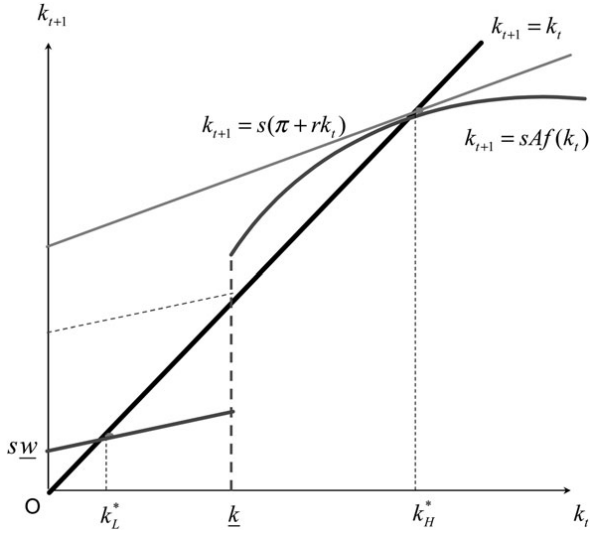
Departures from the Solow Model: A Roadmap

- Poverty Trap without Inequality Trap: Ghatak (2015), Balboni et al. (2022)
- Poverty Trap and Inequality Trap Coexist: Banerjee and Newman (1993), Ghatak and Jiang (2002)
- Inequality Trap without Poverty Trap: Ghatak and Newman (2024)
  - Ongoing research

Friction Driven Poverty Traps (Ghatak 2015)

- Let us now introduce set-up costs: suppose $y = Af(k)$ for $k \geq \underline{k}$, and $y = \underline{w} > 0$ otherwise.
  - Note that $\underline{w} < Af(k)$ is the return from subsistence activity.
- With perfect capital markets, it is possible to borrow k or more, and there is no poverty trap.
- However, with capital market imperfections, there will be multiple steady states. Alternatively, if s, w, or r are high enough, then can save your way out of the poverty trap.

Friction Driven Poverty Traps (Ghatak 2015)



Friction Driven Poverty Traps (Ghatak 2015)

- The poor is just like the non-poor in terms of their potential (including ability and preferences) and they simply operate in an unfavourable external environment due to having low endowments.
- To the extent this can be fixed by placing a poor individual in a favourable external environment, it will be a transient phenomenon - otherwise the poor may be trapped in poverty.
- Under this view, poverty is not only inequitable, but is also inefficient: a combination of individual rationality and market forces should work to utilise any potential gains (e.g., lost income from insufficient investment in human capital).
- No single friction is sufficient to trap individuals in poverty.

Scarcity Driven Poverty Traps (Ghatak 2015)

- When preferences are non-homothetic, we can obtain poverty traps that are driven by income effects alone.
- E.g., at very low income levels, subsistence considerations may rule out the feasibility of saving at a reasonable rate and investing money in health and education to secure a better for future for themselves and their children.
- The main idea is - there is no external friction that can be potentially fixed to help people get out of a poverty trap.
- People are trapped in poverty because insufficient endowments (we focus on money, but it could be time or attention span), and not exogenous frictions, prevent them from making the best use of their endowments through exchange in the marketplace.
- Poverty traps can exist even without any external frictions due to the operation of strong income effects in the behaviour of individuals.

Policy Implications of Poverty Trap Models

- Transfer programs that bring households above the threshold will see large effects on average, while transfers that fall short of this might have small effects in the long run.
- Relatively large asset transfers are required to elevate individuals above the poverty threshold, as opposed to providing minimum support to a larger group
- Policies that are aimed at specific frictions (such as credit market imperfections) will help

Problems with Poverty Trap Models

- They are mostly partial-equilibrium in nature, ignoring economy-wide forces at work - if economy-wide forces keep wages low and dampen upward mobility, lifting the poor one at a time, may be a bit like filling a bucket one drop at a time
- Scaled up, such policies are likely to have general-equilibrium effects that are going to further dampen their effectiveness
- Even theoretically, there are reasons to believe that poverty traps may not persist
  - In the presence of shocks, one can have upward and downward mobility, so in a stochastic sense no dynasty will be forever stuck in poverty (although this is in the statistical sense of a very long-run when some event, however rare, will happen)
  - More realistically, various forces of change that improve productivity are likely to push people out of poverty in the long-run as by improving absolute income levels
- Let me illustrate this point by allowing for productivity growth (due to technological progress, improvements in infrastructure, institutional and policy changes, etc) in the friction-driven poverty trap model.

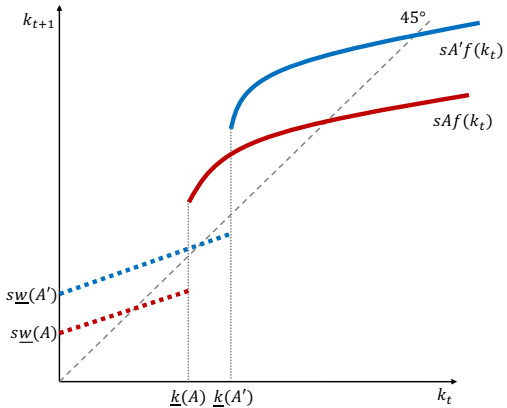
Persistence of Poverty Traps with Productivity Growth

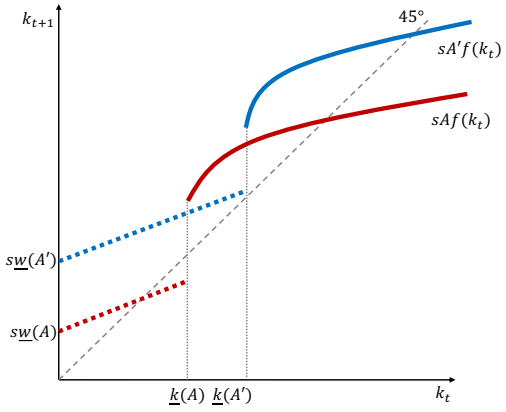
- Let A be the measure of productivity and let A increase over time, but in a way that affects not just the productivity of the modern technology in a conventional way, but also the subsistence option and the threshold of capital needed to start an enterprise:

$$\begin{aligned} y &= \alpha(A)\underline{w} \text{ for } k < \underline{k}(A) \\ &= Af(k) \text{ for } k \geq \underline{k}(A). \end{aligned}$$

- It is easy to see that if an increase in A increases all these three components in a uniformly proportional way, then poverty traps would persist even though the absolute level of income of all groups will increase.
- Otherwise, depending on whether $\underline{k}(A)$ increases faster than $\alpha(A)\underline{w}$ or not, poverty traps may persist or disappear.

Persistence of Poverty Traps with Productivity Growth





Let's turn now to inequality traps...

Coexistence of Poverty Traps and Inequality Traps: Ghatak and Jiang (2002)

- Canonical occupational choice model based on Banerjee-Newman, Galor-Zeira
- Each generation lives for one period, starts with wealth endowment of a_{it} & labor endow. of 1. Split end of period income into consumption $c_{it} = (1-s)y_{it}$ & bequest $b_{it} = sy_{it}$ for next generation.
- Suppose there are three occupations:
  - Subsistence: requires no investment, only labor, produces $\underline{w}$
  - Worker: work for someone else at market wage w
  - Entrepreneur produces q units of output using
    - Capital $I > 0$ (for training or buying a machine)
    - Two units of labor (his own labour and one hired labourer).
- The entrepreneurial technology is more efficient: $q - rI > 2\underline{w}$.
- Occupational Choice
  - Subsistence income: $y^S_{i,t} = \underline{w} + ra_{i,t}$.
  - Worker income : $y^W_{i,t} = w_t + ra_{i,t}$.
  - Entrepreneur income: $y^E_{i,t} = q - w_t + r(a_{i,t} - I)$.

Ghatak and Jiang (2002): Credit Market

- Enforcement Problem. A borrower may default on her loan (namely, $r(I-a)$), but the cost of this action is that she gets caught with some probability π & then has to pay a fixed non-monetary cost of F due to imprisonment or social sanctions.
- Thus only those individuals get loans whose wealth satisfies the incentive compatibility constraint (ICC):

$$\begin{aligned} (\ q - w_t) - r(I - a_{i,t}) &\geq (q - w_t) - \pi F \\ \text{or, } a_{i,t} &\geq I - \frac{\pi F}{r}. \end{aligned} \tag{1}$$

Set $\pi = 0$ for notational simplicity, so no borrowing possible.

Ghatak and Jiang (2002): Labor Market and Static Equilibrium

- The wage rate at which entrepreneurs are indifferent between working as wage laborers or hiring workers is given by $\overline{w} = \frac{q - rI}{2}$.
- Labor supply:

$$\begin{aligned} 0 \text{ if } w_t &< \underline{w} \\ [0, G_t(I)] \text{ if } w_t &= \underline{w} \\ G_t(I) \text{ if } w_t &\in (\underline{w}, \overline{w}) \\ [G_t(I), 1] \text{ if } w_t &= \overline{w} \\ 1 \text{ if } w_t &> \overline{w}. \end{aligned}$$

- Labor demand:

$$\begin{aligned} 0 \text{ if } w_t &> \overline{w} \\ [0, 1 - G_t(I)] \text{ if } w_t &= \overline{w} \\ 1 - G_t(I) \text{ if } w_t &< \overline{w}. \end{aligned}$$

Ghatak and Jiang (2002): The Static Equilibrium

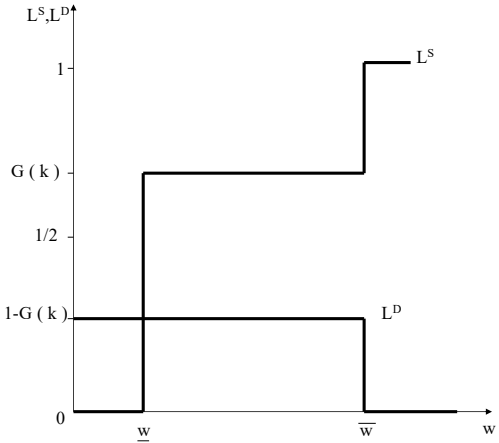


Fig 1: Low wage equilibrium

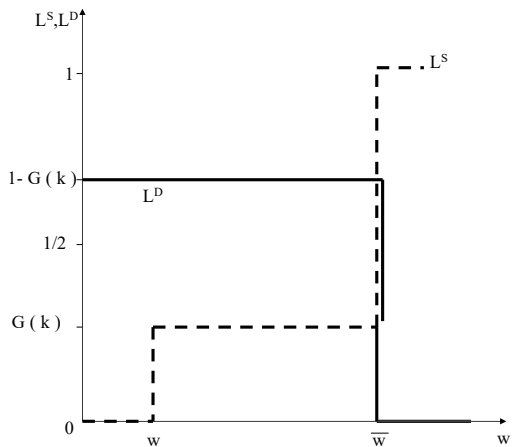


Fig 2: High wage equilibrium

Ghatak and Jiang (2002): Bequests and Dynamics of Wealth Distribution

- With the knowledge of an individual's occupational choice and that the wage rate can take only two values ($\underline{w}$ and $\overline{w}$), we can write down the difference equations describing the evolution of a dynasty i's wealth as:

$$\begin{aligned} a_{i,t+1}(a_{i,t} \mid w_t = \underline{w}) &= s[ra_{i,t} + \underline{w}] && \text{if } a_{i,t} < I \\ &= s[r(a_{i,t} - I) + \ q - \underline{w}] && \text{if } a_{i,t} \geq I \\ a_{i,t+1}(a_{i,t} \mid w_t = \overline{w}) &= s[ra_{i,t} + \overline{w}] && \forall a_{i,t}. \end{aligned}$$

- Assume $sr < 1$ to make sure these are stable.

Ghatak and Jiang (2002): Long Run Behavior of Economy

- Given that the difference equations are stable, we should be able to predict the long run wealth distribution and the long run equilibrium wage rate.
- Bad news: the transition equations depend on the wage rate, & they in turn depend on the wealth distribution (non-linear).
- Good news: we can show that the wage rate can change at most once - given any initial wealth distribution, there exists a unique stationary wealth distribution to which it converges.
- Note that it does not say that there is a unique stationary wealth distribution for *any* given wealth distribution.

Ghatak and Jiang (2002): Poverty and Inequality Traps

The initial distribution of wealth matters in determining the stationary distribution of wealth and the long run equilibrium wage rate if and only if

$$s(\ q - \underline{w}) \geq I \geq \frac{s\underline{w}}{1 - sr}.$$

Otherwise the economy converges to a high wage equilibrium (if $I < \frac{s\underline{w}}{1-sr}$*) or a subsistence equilibrium (if* $I > s(\ q - \underline{w})$*) irrespective of initial conditions.*

Ghatak and Jiang (2002): Poverty and Inequality Traps

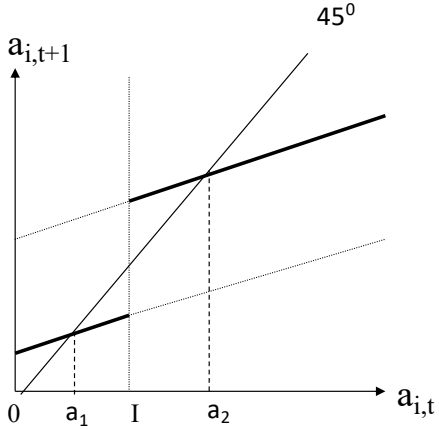


Fig. 3(a)
($w_t=\underline{w}$)

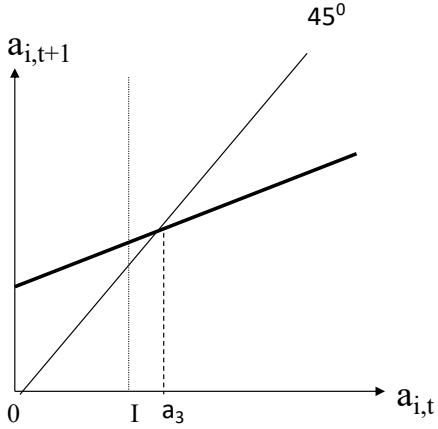


Fig. 3(b)
($w_t=\overline{w}$)

Ghatak and Jiang (2002): Poverty and Inequality Traps

- Figure 3 (a): long run equilibrium has low wages, high inequality and low levels of per capita income
- Figure 3 (b): long run equilibrium has high wages, zero inequality and high levels of per capita income
- What is interesting is, if the condition mentioned in Proposition 2 holds, then for the same set of parameters, both types of long run equilbria are possible
- If you started unequal (in particular, $G(I) > \frac{1}{2}$), you end up as in Figure 3(a)
- If you started equal (in particular, $G(I) \leq \frac{1}{2}$), you end up as in Figure 3(b)
- Big implication: History matters i.e. convergence may not occur
- If the economy is too unequal initially, the wage will be low, upward mobility will be low & so converge to a low wage equilibrium with a small class of rich people & a large class of poor people.

Ghatak and Jiang (2002): Poverty and Inequality Traps

- What parameters make "poverty traps" more likely?
  - Obvious ones: high I, low q, low s.
  - Less obvious: high $\underline{w}$. While it makes upward mobility for the very poor easier, it makes capital accumulation for the rich harder.
  - Also, if you increase F or π then capital market will improve.

For parameter values for which initial conditions matter, the greater is the fraction of the population who are initially poor, the lower is steady state income.

- Total income of the economy:

$$Y = G(I)w + \{1 - G(I)\}\{\ q - w - Ir\}$$

- Decreasing in the number of non-entrepreneurs (workers + subsistence earners)

Inequality Traps without Poverty Traps: Ghatak and Newman (2024)

- We now show a basic model with capital market imperfections but without technological non-convexities.
- While the earlier literature (Banerjee-Newman, 1993 and Ghatak-Jiang, 2002) showed that individuals *can*, with luck, escape poverty once we allow some randomness in the model, the basic non-convexity of the production technology always was a confound that would appear to make poverty and what we call inequality traps co-exist
- With uninsurable risks, we are able to show the existence of two stationary equilibrium, one with high wage, high aggregate wealth and low inequality, and the other with low wage, low aggregate wealth and high inequality.
- The latter one can be called an inequality trap and what is interesting is, policies that would work
- In our ongoing work, we will show that technological non-convexities introduces an incentive to accept lotteries, which then effectively makes the the agent's value function concave
- Therefore poverty trap may disappear but inequality trap remains.

Ghatak and Newman (2024): Set Up

- There is only one consumption good (y) that is produced using labour (l) and capital (k), which are perfect complements, up to a capacity constraint so that output is capped at $\overline{y} > 0$:

$$y = \min\{\overline{y}, A \min\{k, l\}\} \tag{2}$$

  Thus there is a maximum amount of capital (and labor) $\overline{k} = \overline{y}/A$ that any agent would demand. The good, capital, and wealth are all measured in units of the same good.
- Labour markets are competitive and subject to no distortions. The outside option of not joining the labour market is some subsistence activity with returns $\underline{w} > 0$.

Ghatak and Newman (2024): Set Up

- Capital markets are imperfect and in particular we take the extreme form of it:

$$k \leq \min\{a, \overline{k}\}.$$

- For the constrained agent $a < \overline{k}$, their payoff is simply $\Pi(a) = (A - r - w)\, a + w + ar = (A - w)\, a + w$.
- For the unconstrained agent $a \geq \overline{k}$, $\Pi(a) = (A - r - w)\, \overline{k} + w + ar = (A - w)\, \overline{k} + w + \left(a - \overline{k}\right) r$.
- The marginal return to a for a poor person is $A - w$ while that of a rich person is r. For any investment to take place, it is necessary that $A - w \geq r$.
- This puts an upper bound on the wage rate

$$w \leq \bar{w} \equiv A - r.$$

Ghatak and Newman (2024): Labor Market Equilibrium and Wealth Dynamics

- The population size is normalized to 1 and everyone inelastically supplies one unit of labour. So the labour supply is $L^S = 1$.
- Labour demand consists of the amount of overall investment since, due to the assumption about the technology, capital and labour are used in fixed proportions:

$$L^D = \left(1 - F\left(\bar{k}\right)\right)\bar{k} + \int_0^{\bar{k}} af\left(a\right) da = \bar{k} - \int_0^{\bar{k}} F\left(a\right) da.$$

- Therefore, if $L^D > L^S$, the equilibrium wage rate is $w^* = \bar{w}$ and if instead $L^D < L^S$, equilibrium wage rate is $w^* = \underline{w}$.
- Let β be the saving rate. Then the transition equation is

$$\begin{aligned} a_{t+1}(a_t) &= \beta\left[\left(A - w\right)a_t + w\right] \text{ for } a_t < \overline{k} \\ &= \beta\left[\left(A - w\right)\overline{k} + w + \left(a_t - \overline{k}\right)r\right] \text{ for } a_t \geq \overline{k}. \end{aligned}$$

Ghatak and Newman (2024): High Wage Equilibrium

- In a high-wage equilibrium, $w^* = \bar{w} = A - r$; then the transition equation is the same for everyone irrespective of wealth, i.e., for all a_t

$$a_{t+1}(a_t) = \beta\left(A - r + ra_t\right).$$

  We need to impose $\beta r < 1$.

- Then the steady state value of wealth in a high wage equilibrium is simply

$$a^H = \frac{\beta\left(A - r\right)}{1 - \beta r}. \tag{3}$$

- To ensure $L^D \geq L^S$, we need $a^H \geq 1$, which is equivalent to $\beta A \geq 1$.

Ghatak and Newman (2024): Low Wage Equilibrium

- If the wage rate is low in the equilibrium labor market, i.e. $w^* = \underline{w}$, then the transition equation depends on whether a_t is less than or greater than $\bar{k}$:

$$\begin{aligned} a_{t+1}(a_t) &= \beta\left[(A-\underline{w})\, a_t + \underline{w}\right] \text{ for } a_t < \bar{k} \\ &= \beta\left[A\bar{k} + \left(1-\bar{k}\right)\underline{w} + \left(a_t - \bar{k}\right) r\right] \text{ for } a_t \geq \bar{k}. \end{aligned}$$

- We can show that for a low wage equilibrium to exist, we need

$$a^L = \frac{\beta \underline{w}}{1-\beta\left(A-\underline{w}\right)} < 1,$$

where a^L is the steady state wealth level. This inequality is equivalent to $\beta A < 1$.

- **Summary**: if $\beta A \geq 1$, the only steady state equilibrium is the high wage equilibrium where everyone converges to a^H. If instead $\beta A < 1$, the only steady state equilibrium is the low wage equilibrium where everyone converges to a^L.

Ghatak and Newman (2024): Inequality Traps with Uninsurable Risks

- So far, with everyone converging to the same wealth level, the coexistence of multiple steady states where steady-state wealth levels differ is not possible in our model. Adding uninsurable risk will change this.
- Our approach here will be to assume that the bequest propensity β is a random variable, independently drawn over time and across lineages.
- Suppose that β can assume two values $\{\underline{\beta}, \overline{\beta}\}$, with $0 \leq \underline{\beta}A < 1 < \overline{\beta}A$.
- Assume that the probability of $\overline{\beta}$ is q.. In particular suppose that in a generally prosperous economy the likelihood $1 - q$ of leaving one's child with less bequest $\underline{\beta}$ is substantially smaller than in a poorer economy: when the wage or the average wealth is high, $q = \overline{q}$, and when wages or wealth are low, $q = \underline{q}$, where $\underline{q} < \overline{q}$.

Ghatak and Newman (2024): Inequality Traps

- Denote $\tilde{\beta}^H = \overline{q}\overline{\beta} + (1-\overline{q})\underline{\beta}$ and $\tilde{\beta}^L = \underline{q}\overline{\beta} + (1-\underline{q})\underline{\beta}$. Then we can establish:

  Proposition: Suppose $\overline{\beta}r < 1$ and $\underline{\beta} < \overline{\beta} < \frac{\bar{k}}{(A-\underline{w})\bar{k}+\underline{w}}$. In addition, suppose that $\overline{q}$ and $\underline{q}$ are such that $\tilde{\beta}^L A < 1 < \tilde{\beta}^H A$. Then, there exist two distinct stationary distributions, one with high wage, high mean wealth, and low inequality, and the other with low wage, low mean wealth, and high inequality.

- This establishes the existence of two stationary distributions. We have not relied on technological non-convexities, only on credit market imperfections and imperfect insurance against miserly parents.

Ghatak and Newman (2024): Implications

- Frequently inequality traps are confounded with poverty traps, even though the latter is an individual (lineage) phenomenon, while the former operates at the general equilibrium level.
- Poverty traps are often modeled by combining a non-convexity with a credit constraint.
- Early inequality trap models were often modeled with the same assumptions about technology and the credit market, giving the impression that the non-convexity is necessary for the inequality trap to be operative. As we have already seen, this is untrue.
- As has been noted in the literature, the non-convexity introduces an incentive for rational agents to accept lotteries, which effectively makes their value functions concave in a manner similar to convex technologies.
- Moreover, it tends to cause poverty "traps" to disappear, while inequality traps may remain.

Ghatak and Newman (2024): Implications

- If we compare with friction-driven poverty trap model, the main difference is, micro-level redistributive strategies (such as asset transfer programmes) will not have a large effect on output or poverty reduction
- More systemic and economy-wide redistributive strategies can release the economy from an inequality trap
- However, credit policies would still help by reducing the dependence on wealth and capital used in production

Concluding Observations

Concluding Observations

- What are the policy implications of separating out the concepts of poverty and inequality traps?
- The most important one is, in a poverty trap world one can lift one poor person at a time and improve welfare and that has been the focus on microfinance institutions, some (not all) NGOs, and has also been one of the main goals of donors
- Even in the academic world, the focus on programme evaluation in general and RCTs more specifically has been *what works* at the micro level (or what has been called the *plumbing approach*)

Concluding Observations

- A very different perspective comes from the saying that in the presence of systemic inequalizing forces at work, the gains from micro-interventions are inherently limited - a bit like filling a leaky bucket one drop of water at a time
- If there are inequality traps without poverty traps, then nothing short of income and wealth redistribution would do even if one is focusing just on raising per capita incomes and not intrinsically focusing on reducing inequality!
- This is a critique that has been made by many, suggesting to focus more on economy-wide forces, including political economy, inequality, governance, safety-nets
- One does not have to take an adversarial approach : one does need to study the micro to get a better sense of macro, but sometimes focusing too much on the trees would make one lose sight of the forest
- Moreover, the focus on scaling up micro-level interventions is in sync with this approach.