Theories of Poverty Traps and Anti-Poverty Policies*

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Abstract

In this paper we provide a conceptual overview of alternative mechanisms leading to poverty traps at the individual level, making a distinction between those that are due to external frictions (e.g., market failure), and those that are due to behaviour under extreme scarcity in the absence of any frictions. We develop a common theoretical framework to examine alternative scenarios, characterizing conditions under which poverty traps (in the sense of multiple stable steady states) arise, as opposed to (possibly, conditional) convergence to a unique steady state. We apply this framework to discuss the relative merits of alternative anti-poverty policies, such as unconditional and conditional cash transfers, and direct interventions aimed at improving market access to the poor or improving public service delivery.

1 Introduction

There are two distinct strands of thinking on poverty. One view is the poor is just like the non-poor in terms of their potential (that includes ability, preferences) and they simply operate with a tighter choice set. The best known statement of this view is Schultz’s phrase “poor but rational”. Modern development economics has extended this view to what Duflo (2006) calls “poor but neoclassical” by allowing various frictions that impede the smooth functioning of markets as well as technological non-convexities that make it disadvantageous to be poor or operating at very low levels of market activity.

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low scales. We lump these together and call them "external frictions" (along with frictions that arise from poor governance, infrastructure etc) that prevent the poor from making the best use of their endowment through exchanges in the marketplace or through technology. The implicit premise of this view is, poverty is a consequence of individuals operating with an unfavourable external environment. To the extent this can be fixed by placing a poor individual in a favourable external environment, it will be a transient phenomenon but otherwise the poor may be trapped in poverty.

In a sense, in this view the phenomenon of poverty, other than being inequitable, is also inefficient: a combination of individual rationality and market forces should work to utilize any potential gains (e.g., lost income from insufficient investment in human capital) and the question is, what frictions prevent this from happening.

A very different view of poverty is, even if there were no external frictions, the poor are subject to different pressures and constraints from the non-poor and that drives them making choices that are very different, and more importantly, that can reinforce poverty. Having very low incomes means an individual has to engage in a day-to-day struggle for survival for herself and her family, and there may be a self-reinforcing dynamics at work through the choices that are made under extreme scarcity that keep those with poor initial endowments of financial and human capital, poor over time and across generations. It is tempting to call this view "poor but behavioural" but we are going to argue that this is a broader phenomenon, as even if all individuals are rational in the neoclassical sense, choices under extreme scarcity can reinforce the tendency of the poor to stay poor. For example, 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. In fact, the relevant scarce resource does not have to be money but can also be time or attention span.\footnote{See Banerjee and Mullainathan (2008).}

In this paper we develop a conceptual framework and simple unifying model that distinguishes between what we call “friction-driven” and “scarcity-driven” poverty traps corresponding to the two views of poverty discussed above. We start with a standard dynamic model of an individual saving or leaving as bequests a constant fraction of income, and investing over time and study how her income and wealth grows. Then we introduce various external frictions and study conditions under which rather than converging to a unique steady state, there could be multiple stable steady states, and which steady state an individual ends up depends on her initial wealth, i.e., a poverty trap exists. We focus on poverty traps at the level of the individual: two individuals who are identical in all respects but only differ in their initial wealth may end up with different steady state incomes, and do not look at aggregate level poverty traps, which could operate at the economy-wide level.\footnote{See Azariadis (1996) and Banerjee (2003) for reviews of the literature on poverty traps, including those at the aggregate level. Also, we do not look at general equilibrium effects. See Mookherjee and Ray (2003) for an example of a poverty trap that arises from the equilibrium returns from different occupations adjusting in response to individual choices.}
We then extend the model to relax the assumption that people save a constant fraction of their income and allow the choice of saving to depend on income in a non-proportional way (which results from non-homothetic preferences) and characterize conditions for poverty traps to emerge. We consider the role of behavioural biases as well as insufficient inter-generational altruism in this context. We draw a number of interesting inferences. We show that capital markets frictions play an important role in determining the possibility of poverty traps, but these are neither necessary nor sufficient for poverty traps to arise, even if we restrict attention to friction-driven poverty traps. We also show that poverty traps can exist even without any external frictions due to the operation of strong income effects in the behaviour of individuals, and this is possible without any behavioural biases.

We then discuss the distinctive policy implications of these two kinds of poverty traps. We classify policies in terms of those that are aimed at improving market access to the poor as well as improve productivity in general (e.g., through better public service delivery) by dealing directly with the frictions, with those that involve direct transfers to the poor. We discuss the relative merits of alternative forms of transfers to the poor, namely, the relative merits of unconditional and conditional cash transfers, as well as in-kind transfers. Again, we draw a number of interesting conclusions. We show that if the source of poverty is scarcity rather than frictions, the obvious policy implication is a lump-sum transfer to the poor but to the extent scarcity and frictions co-exist, there are strong complementarities between policies that increase the purchasing power of the poor and intervene to remove a friction. We show that to the extent the preferences of the individual differ from that of the policymaker (which can be due to behavioural biases or insufficient inter-generational altruism or gender bias), unconditional lump sum transfers will not be the most efficient form of intervention and there may be a case for conditional cash transfers.

The plan of the paper is as follows. In section 2 we develop a benchmark model without any frictions, as well as any scope for the behaviour of the poor to be different due to the operation of income effects. In section 3 we analyze poverty traps that are driven by frictions (section 3.1) and, choice under scarcity (section 3.2). In section 4 we discuss the policy implications of our theoretical framework. Section 5 concludes with some observations of interesting issues that are worth exploring further in future research.

2 The Benchmark Model

In this section, we develop a standard model of a representative individual using capital to produce output, with no market friction or any kind of non-convexity. In addition, we assume preferences are homothetic in income, and therefore, in a proportional sense, there is no difference in the "behaviour" or "choices" of the poor from that of the rich, say, in the context of savings.
One-Period Model  Suppose production \((q)\) depends on one input \((x)\) given by a standard neoclassical production function:

\[
q = A f(x).
\]

\(A\) denotes the productivity parameter which could be driven by skills, ability, infrastructure, institutions. The function \(f(x)\) is assumed to have the standard properties of a neoclassical production function. Whenever convenient, we will use the example of the Cobb-Douglas production function: \(q = Ax^\alpha\) where \(\alpha \in (0, 1)\). We will focus here on physical or financial capital, denoted by \(k\) and so \(x = k\). We will consider the role of other inputs in the next section. Here we can think of a self-employed individual using capital to run a business.

To keep the notation simple, we assume \(k\) is working capital and therefore, fully depreciates after use. Since capital fully depreciates with use, returns to a unit of capital, denoted by \(r\), has to exceed 1. As mentioned earlier, we focus at a representative individual, and take \(r\) as exogenously given all through. An individual has capital endowment \(\bar{k}\). Her profits are

\[
\pi = \max_k A f(k) - rk.
\]

With perfect capital markets her income is:

\[
y = \pi + r\bar{k}.
\]

This shows that the endowment of capital or wealth does not matter for productive efficiency although it does matter for final disposable income. Through rental or sales (in a one-period model they are equivalent), they adjust to maximize efficiency, with all production units using the same amount of capital given by \(k^*\) which is a solution to \(A f'(k) = r\). If someone is capital-rich, she can lend capital, and borrow otherwise. Therefore, with perfect markets and no frictions (e.g., non-convexities), we have a separation between productive efficiency and individual economic outcomes.\(^3\) To the extent we care about an individual’s income falling below some minimum threshold, i.e., poverty, there is a case for redistributive transfers, but they will not have any positive productivity impact on the recipient.

Infinite Horizon Model  We now introduce dynamics in the one-period model to allow for savings and capital accumulation over time so that the current endowment of the capital stock \(\bar{k}\) (equivalent to wealth in this model) is the result of past choices rather than being exogenously given. We assume preferences are homothetic and people save at a constant rate \(s\), as in the Solow model. Alternatively, we can assume that individuals live for one period, pass on a constant fraction \(s\) of

\(^3\text{This is the same as the separation result in the context of Agricultural Household Models, as developed by Singh, Squire, and Strauss (1986)}\)
their wealth as bequests to the next generation. In section 3.2 we will examine the consequences of relaxing the assumption of a constant saving rate.

The constant rate of saving or bequest can be micro-founded in the following way that is standard in the occupational choice literature (see Banerjee, 2003). Suppose individuals have preferences over consumption \((c)\) and bequests \((b)\) and the utility function is given by:

\[
U(c, b) = \log c + \beta \log b
\]

where \(\beta \geq 0\). As is standard, we assume bequests cannot be negative (we will discuss the implications of this in the next section). If we maximize this subject to the budget constraint \(c + b \leq y\) then we get the usual result: \(b = sy\) where \(s \equiv \frac{\beta}{1+\beta}\).

Let \(k_t\) denote the capital endowment in time \(t\). The bequest of generation \(t\) determines capital endowment in period \(t + 1\) : \(b_t = k_{t+1}\). With perfect capital markets we get:

\[
k_{t+1} = s (\pi + rk_t).
\]

Assuming \(sr < 1\) we get convergence to a unique steady state as Figure 1 shows, using a familiar diagram. In the figure, the red line (we will turn to the blue curve in the next section) represents the equation that gives the evolution of the capital stock over time. The unique steady state capital stock \(k^*\) is given by

\[
k^* = \frac{s\pi}{1 - sr}.
\]

Since we assume no inter-personal heterogeneity, all individuals will converge to the same steady state \(k^*\), i.e., we have unconditional convergence. However, as is well known, convergence may take time depending on parameter values, and so as in the one-period model, there may be a case for pro-poor policies on redistributive or equity grounds.

### 3 Departures from Benchmark Model

Now we proceed to study two sets of departures from this model: first, we introduce external frictions that constrain the choices available to the individual, due to market imperfections, technological non-convexities; second, we look at the consequences of individuals having non-homothetic preferences, so that the poor behave or make choices that are different from those who are not poor even in the complete absence of external frictions.

#### 3.1 External Frictions

In this section we discuss relaxing various assumptions of the model outlined in the previous section that allow the possibility that two individuals who are identical in all respects except for their initial endowment of capital (or wealth), \(k_0\), can end up with different levels of incomes and capital stocks in steady state, which is a formal way
Figure 1: Convergence in the Solow Model
of describing a poverty trap in this framework. Below we discuss the consequences of relaxing a number of assumptions in the benchmark model.

**Capital Market Imperfections** Suppose capital markets are imperfect. In fact, for expositional simplicity, let us assume that there are no capital markets. In the one-period model the separation result breaks down: output is now \( q = Af(k) \). Turning to the infinite-horizon model, the case of no capital markets is equivalent to the standard Solow model where individuals save a constant fraction of their income to accumulate capital over time. As we assume capital fully depreciates, the modified transition equation is:

\[
k_{t+1} = sAf(k_t).
\]

This is captured by the blue curve in Figure 1. Following a standard argument, there will be convergence to \( k^* \), assuming \( r \) is given by the marginal product of capital evaluated at the steady state capital stock, namely, \( Af''(k^*) \).\(^4\) Initial conditions will not matter in the long-run.

Of course, if \( A \) differs across individuals then we get conditional convergence. What this diagram shows is, if we introduce capital markets, convergence is speeded up. The capital stock used in production will reach the steady state level right away, while the owned capital stock of the individual will grow along with income, and eventually reach this steady state level.

We could allow intermediate levels of capital market imperfections, where the amount of capital that an individual can use is some multiple of her initial capital stock, i.e., \( \sigma k_0 \) where \( \sigma > 1 \) (and not too large so that capital market frictions do have bite), which can be generated by one of the standard channels of credit market frictions, such as \textit{ex ante} or \textit{ex post} moral hazard (see, for example, Banerjee, 2003).

The main lesson of this exercise is that, subject to the same fundamentals, being capital-poor is no handicap in the long run as individuals accumulate and converge to the same steady state even if capital markets are imperfect. Of course, the convergence can take a long time and this might be grounds to have in place policies that facilitate access to capital of the poor. But history does not matter and one-shot policies cannot have long term effects: two individuals who are identical except for their initial endowments of capital being different will end up in the same steady state. However, if there are additional frictions, then capital market frictions can lead to poverty traps, as we will see below.

**Non-convexities** Suppose the production technology is subject to non-convexities. In particular, let us introduce set-up costs as an example of non-convexities in the following form:

\(^4\)This is in order to have the same benchmark under these two different scenarios (perfect and no capital markets), and can be justified by the assumption of having many atomistic individuals with the same deep parameters (\( A, s \) etc), but with different initial values of \( k_0 \) (and in particular, those with \( k_0 \geq k^* \) being able to meet the demand of those with \( k_0 < k^* \), on aggregate).
\[ q = \begin{cases} Af(k), & \text{for } k \geq k_0 \\ w, & \text{otherwise.} \end{cases} \]

where \( 0 \leq w < Af(k) \), is returns from a subsistence activity. It is assumed that the subsistence activity needs no capital and only labour.

It is possible to interpret this non-convexity as reflecting imperfections in the market for some input other than capital. For example, suppose without a minimum amount of land, production using the modern technology (given by \( Af(k) \)) cannot take place. Clearly rental markets or time-sharing arrangements could overcome this indivisibility and to the extent those are not possible due to some institutional or contracting friction, the indivisibility will have bite. At the end of this section we will explore the role of inputs other than capital and imperfections in those markets.

First let us assume capital markets are perfect. Then profit maximization yields

\[ \pi = \max_k Af(k) - rk \]

for all individuals since the subsistence technology is an inferior option. As a result, with perfect capital markets the equation of motion is:

\[ k_{t+1} = s(\pi + rk_t) \text{ for all } k \geq 0. \]

It is depicted by the red line segment in Figure 2. As before, we will have a unique steady state at \( k = k^* \). Therefore, with perfect capital markets, an individual can borrow \( k \) or more, and so the indivisibility does not bind and there is no poverty trap.

If capital markets are absent then the transition equation is given by:

\[ k_{t+1} = \begin{cases} sAf(k_t), & \text{for } k \geq k_0 \\ s(w + k_t), & \text{otherwise.} \end{cases} \]

Since the subsistence activity needs no capital, any capital that an individual owns is part of total income, but there is no interest earned on it, as capital markets are assumed to be absent. We are assuming that saving is feasible even without capital markets, for example, through some storage technology. Also, we are assuming that all individuals save a fraction \( s \) of their income whether they are operating the subsistence technology (for which no capital is needed) or the modern technology. We could alternatively have assumed that for \( k \leq k_0 \) individuals don’t save at all, i.e., \( k_{t+1} = 0 \) and that would not change our conclusions. We postpone the discussion of the saving rate varying with income to section 3.2.

For \( k \geq k_0 \), the transition equation is strictly concave and increasing as in the case of no non-convexities and autarchy. This part is depicted by the blue concave curve in Figure 2. For \( k \leq k_0 \), the transition equation is linear, as given by the transition equation above. As there are no capital markets, the transition equation has slope \( s \) rather than \( sr \). It is depicted by the solid blue line segment in Figure 2. As we
Figure 2: Non-convergence in the Solow Model

\[ k_{t+1} = k_t \]

\[ k_{i+1} = s(\pi + r k_i) \]

\[ k_{t+1} = sAf(k_t) \]

\( O \)

\( S \)

\( W \)

\( k_L^* \)

\( k_H^* \)

\( k_t \)

\( k_{t+1} \)

Figure 2: Non-convergence in the Solow Model
can see that there will be multiple steady states: for those whose initial endowment of capital was \( k \) or more will converge to \( k_H^* \) while those who started with less than \( k \) will converge to \( k_L^* < k_H^* \). This is an example of a poverty trap: initial conditions matter, even in the very long run. However, having capital market frictions and non-convexities is not sufficient for poverty traps. If \( s \) or \( w \) are high enough (as depicted by the dashed blue line segment), then it is possible to save one’s way out of the poverty trap \(^5\).

Even if the production technology is convex, non-convexities can arise in other ways. For example, suppose \( A \) (which captures complementary inputs, such as, infrastructure) depends on \( k \) such that wealthy get an advantage, i.e., \( A = A(k) \) and in addition, this function is subject to non-convexities. If capital markets are perfect then individuals should be able to overcome this indivisibility through borrowing. A similar argument applies if in the absence of capital markets that prevent borrowing or saving through external financial institutions, the poor in addition, do not have access to a good savings technology (e.g., storage), due to, say, imperfect property rights while the rich do (because, for example, it is easier to steal from the poor). To the extent the relationship between wealth and the effective savings rate (as opposed the intended one, which is determined by preferences) is subject to non-convexities, poverty traps can result.

Alternatively, suppose that if \( c \leq \underline{c} \), people do not survive or are unproductive (similar to the nutrition-based efficiency wage argument as in Dasgupta and Ray, 1986). Now the transition equation is

\[
\begin{align*}
k_{t+1} &= sA f(k_t) \text{ for } (1 - s) f(k_t) \geq \underline{c} \\
&= 0, \text{ otherwise.}
\end{align*}
\]

Again, we will get a threshold \( \underline{k} \) defined by the equation

\[
(1 - s) f(k_t) = \underline{c}.
\]

If capital markets are perfect, individuals can borrow to and invest in their health and therefore, there is no poverty trap. Otherwise, this form of non-convexity, like those for the production technology, the savings technology, or the productivity parameter \( A \), can generate poverty traps when coupled with capital market imperfections.\(^6\)

More broadly, even though we have taken here the example of physical capital, the point about the relationship between capital market frictions and non-convexities affecting the production technology applies more generally. Instead of a minimum consumption constraint, suppose the productivity of individuals depend on nutrition

\(^5\)Non-convexities can take many other forms (for example, a \( S \)-shaped production function that captures increasing returns at low levels of capital, and diminishing returns at higher levels in a more continuous way), but the basic intuition of our analysis goes through.

\(^6\)An alternative way of treating minimum consumption constraints is discussed in the next section, where people choose to save at a lower rate when they are poor whereas here. Here it is modelled similar to an external biological constraint like "maintaining" the (human) capital stock.
(as in Dasgupta and Ray, 1986) and that relationship involves non-convexities. If capital markets existed and were perfect (a possibility that Dasgupta and Ray, 1986 do not allow), individuals would have borrowed and achieved the efficient level of nutrition. The higher wages that would result from being more productive would help them pay off the loan. To get a poverty trap in this setting, one would need capital markets to be imperfect.

Other Market Frictions Let us augment the basic one-period model of section 2 by adding an additional input, $h$ which we will refer to as human capital (but can be interpreted as other inputs such as land in some contexts, as discussed below). Suppose the initial endowment of human capital of the individual is $\overline{h}$ and that $h$ can be obtained from a competitive market at cost $\rho$ per unit. Output is now

$$q = Af(k, h).$$

Profits are $\pi = q - rk - \rho h$. Profit-maximization yields the standard first-order conditions:

$$f_k(k, h) = r \quad f_h(k, h) = \rho.$$

The optimal levels of $\hat{k}$ and $\hat{h}$ can be solved from these as functions of $r$ and $\rho$ and as before, the endowment of the individual will not matter in determining productive efficiency, although it will matter for the income of the individual. A rental or sales market will achieve the efficient allocation and in the absence of specific contracting frictions, these are equivalent. Even if there is a cash-in-advance constraint that applies for inputs other than capital - namely, they must be paid for in advance in cash - our conclusion is unchanged so long as capital markets are perfect.

Now let us assume that there is no market for $h$ (with or without cash-in-advance) while the market for $k$ operates just as before. In that case, the individual’s choice of $k$ will be given by:

$$f_k(k, \overline{h}) = r$$

and the optimal choice, which we will denote by $\hat{k}$, will depend on $\overline{h}$. For convenience, let us assume the Cobb-Douglas production function: $q = Ak^\alpha h^\beta$ with $\alpha, \beta \in (0, 1)$ and $\alpha + \beta \leq 1$. In this case, solving the above equation explicitly for $k$ as a function of $r$ and $h$ we get

$$\hat{k} = \left( \frac{A\alpha}{r} \frac{1}{h^\beta} \right)^{\frac{1}{1-\alpha}}$$

and substituting in the production function, we get

$$q = A \frac{1}{1-\alpha} \left( \frac{\alpha}{r} \right)^{\frac{\alpha}{1-\alpha}} h^{\frac{\beta}{1-\alpha}}.$$
Net output (taking into account the cost of $k$) is:

$$q - rk = A^{\frac{1}{1-\alpha}} \left( \frac{\alpha}{\tau} \right)^{\frac{\alpha}{1-\alpha}} (1 - \alpha) h^{\frac{\alpha}{1-\alpha}}.$$ 

Let $\phi(h) \equiv A^{\frac{1}{1-\alpha}} \left( \frac{\alpha}{\tau} \right)^{\frac{\alpha}{1-\alpha}} (1 - \alpha) h^{\frac{\alpha}{1-\alpha}}$ denote net output as a function of $h$. It is an increasing and strictly concave function of $h$ for the case of decreasing returns ($\alpha + \beta < 1$) or linear in the case of constant returns ($\alpha + \beta = 1$). Now the individual’s income $y$ is net output plus interest earned on owned capital:

$$y = \phi(h) + rk.$$ 

Turning to dynamics, let $h_t$ and $k_t$ denote the human and physical capital endowment of the individual at time $t$. Income at time $t$ is given by

$$y_t = \phi(h_t) + rk_t.$$ 

The equation of motion for $k_t$ is:

$$k_{t+1} = s(\phi(h_t) + rk_t) \text{ for all } k \geq 0.$$ 

Now we turn to the interesting question, namely, how does $h_t$ evolve over time.

One extreme possibility is it is transmitted perfectly and intact from generation to generation:

$$h_{t+1} = h_t = h.$$ 

In that case, by definition there will be (perfect) history-dependence in terms of the level of human capital. In this case, $k$ would converge to a steady-state level:

$$k^* = \frac{s\phi(h)}{1 - sr}$$

(and as before, we assume $sr < 1$) but this is conditional convergence as different families will have permanently different levels of $h$.

The above formulation of evolution of $h$ does not allow for any choice by the individual. To consider this possibility, suppose income can saved and spent on investing in $h$, similar to how savings is used to accumulate $k$. Even though in a given period, $h$ cannot be rented or bought to be used in production, suppose it can be "produced" for the next period by saving a certain fraction of income (e.g., investing in the education of children). In particular, let

$$h_{t+1} = \gamma y = \gamma (\phi(h_t) + rk_t)$$

where $\gamma \in (0,1)$ and $s + \gamma < 1$ to ensure that total saving (in $k$ and $h$) as a fraction of income is less than 1. The advantage of this formulation is that the accumulation equation for $h$ is identical to that for $k$, up to a multiplicative constant:

$$h_{t+1} = \frac{\gamma}{s} k_{t+1}.$$
The equation of motion of $k$ in this case is:

$$k_{t+1} = s \left( \phi \left( \frac{\gamma}{2} k_{t} \right) + r k_{t} \right).$$

This allows us to characterize the steady state level of $k^*$ by standard arguments:

$$k^* = \frac{s \phi \left( \frac{\gamma}{2} k^* \right)}{1 - sr}$$

and $h$ too converges to

$$h^* = \frac{\gamma}{s} k^*.$$

What is interesting to note is, in none of the cases above we get the possibility of poverty traps. In the first case (full persistence of $h$) we get conditional convergence, and the second case ($h$ being able to be "produced" by saving out of income), we get unconditional convergence.

Of course, this conclusion changes if there are non-convexities in the relationship between $h$ and $y$. Suppose the production function is

$$q = \begin{cases} \overline{A} k^\alpha & \text{for } h \geq \overline{h} \\ \underline{A} k^\alpha & \text{otherwise} \end{cases}$$

where where $\overline{h} > 0$ and $\overline{A} > \underline{A} > 0$. The only change from above is now net output as a function of $h$ as captured by $\phi(h)$ is no longer a smooth and continuous strictly concave function but has a discrete jump at $h = \overline{h}$. Income $y$ is given by:

$$y_t = \begin{cases} \overline{A} \frac{1}{1-\alpha} \left( \frac{\alpha}{r} \right)^{\frac{\alpha}{1-\alpha}} (1 - \alpha) + r k_t & \text{for } h \geq \overline{h} \\ \underline{A} \frac{1}{1-\alpha} \left( \frac{\alpha}{r} \right)^{\frac{\alpha}{1-\alpha}} (1 - \alpha) + r k_t, & \text{otherwise.} \end{cases}$$

If $h$ shows full persistence, then clearly we can get poverty traps: dynasties for which $h$ is less than $\overline{h}$ will converge to a low income steady state, and those with a higher level of $h$ to a high income steady state. If $h$ can be accumulated by a fraction $\gamma$ of income, then $h_{t+1} = \gamma y_t$ (and $k_{t+1} = s y_t$ in both cases) and both the human and physical capital transition equations will be piecewise linear with discrete jumps at $h_t = \overline{h}$ and $k_t = \frac{s}{\gamma} \overline{h}$, respectively. The transition equation for $h$ is given by:

$$h_{t+1} = \gamma \left\{ A \frac{1}{1-\alpha} \left( \frac{\alpha}{r} \right)^{\frac{\alpha}{1-\alpha}} (1 - \alpha) + \frac{sr}{\gamma} h_t \right\}$$

with $A$ taking the values $\overline{A}$ or $\underline{A}$, depending on whether $h_t \geq \overline{h}$ or $h_t < \overline{h}$. There will be a parallel transition equation for $k$. By standard arguments, we may have two stable steady states, i.e. a poverty trap may exist as we have depicted in Figure 4 (ignoring the dashed blue line for the moment).
Figure 3: Human capital & poverty traps
However, as noted in the context of a single input production technology and non-convexities earlier, one can have a unique steady state in the same environment, depending on parameter values. If $A$ and/or $\frac{\tau}{\gamma}$ are not too low, then it is possible that through their saving behaviour, individuals escape the poverty trap. If the transition equation for $h_t < \hat{h}$ is given by the dashed line instead of the continuous one, then there is a unique steady-state and that involves a high level human capital in steady state.

Let us examine what assumptions drive this kind of a poverty trap. We already saw that when the relationship between $h$ and $y$ was given by a smooth strictly concave function we get a unique steady-state, exactly as in the Solow model. Therefore, non-convexity in the production technology with respect to $h$ is playing a key role here.

It is interesting to think about what is the role of market frictions here. We are assuming capital markets are perfect as far as $k$ is concerned. It can be bought, sold, rented and accumulated without any friction. The market for $h$ is imperfect however, and that is clearly driving the results. If $h$ could be bought or rented without any constraints, we would get unconditional convergence as we saw above. When $h$ can only be autarchically "produced" by saving out of current output, this reflects a market failure that prevents individuals who have a higher endowment of human capital from transmitting it to children of families where parents have a lower endowment of human capital, e.g., through a perfect market for education. Alternatively, if $h$ is interpreted as land and not human capital, the presumption is, a land-poor individual cannot rent or lease in land due to some institutional failure but it is possible to accumulate it by buying it from their savings. However, to the extent this input $h$ can be accumulated through savings, capital market frictions implicitly show up, since what can be accumulated through savings can presumably be bought by a loan, an issue we discuss in the next subsection. When $h$ cannot be bought or rented or accumulated through savings we have the case of perfect persistence. This reflects an extreme form of market failure in $h$: there is no way to overcome it. However, even in this case, we would get conditional convergence and not poverty traps, unless there are non-convexities in the production technology with respect to $h$.

**Restrictions on Intertemporal Transfers**

There is a sense in which we are assuming an inter-temporal capital market imperfection when discussing technological non-convexities in physical or human capital. Since saving out of income does help accumulate $h$ or $k$, in principle, individuals could be forward looking, and as capital markets are being assumed to be perfect, they should be able to borrow and/or save at temporarily high rates to get over the hump at $\hat{h}$. We briefly explore here modifying our basic model of choice between consumption and bequests in section 2 by allowing individuals to be forward-looking and flexible in their savings behaviour and given this, examine the role of inter-temporal constraints on resource allocation.

Suppose as in our basic model output depends on one non-labour input $x$ given by
the same production function \( q = Af(x) \). However, now \( x \) is required to be invested in the current period to be of productive use in the next period. In the current period, individuals are endowed with an exogenous level of capital \( x_0 \) and rental markets are not useful given the lagged nature of the production process. Therefore, current output is \( q_0 = Af(x_0) \), and in the next period output is, \( q_1 = Af(x) \) where \( x \) is chosen by the individual. We can view \( x \) as physical or human capital, although the particular lag structure suggests human capital to be a better example.

Individuals value consumption \((c)\) and bequests \((b)\) and the utility function is the same as before:

\[
\log c + \beta \log b.
\]

However, there being no constraints on inter-temporal transfers, the intertemporal budget constraint is:

\[
c_0 + \frac{c_1}{r} + x \leq q_0 + \frac{q_1(x)}{r}
\]

which can be rewritten as

\[
c_0 + \frac{c_1}{r} \leq q_0 + \frac{q_1(x)}{r} - x.
\]

It follows immediately that independent of their preferences over present and future consumption, individuals will choose \( x \) to maximize their lifetime resources. This is an extension of the separation result mentioned in the one-period model in section 2 to a two-period setting - with perfect markets and no constraints on inter-temporal transfers, individual preferences should not affect the efficiency of inter-temporal resource allocation. The optimality condition in the choice of \( x \) is

\[
Af'(x) = r
\]

which is, the marginal return of capital should equal the interest rate.

The result holds even if the production technology is non-convex with respect to \( x \). Suppose investment is a binary decision \( x \in \{0, 1\} \) and the cost of investment is normalized to 1. Without investment, output is \( q_0 \) but with investment, it is \( q_0 + \Delta \). This is similar to the model with human capital in the previous subsection. So long as \( \Delta > r \) individuals would undertake the investment.

Even if capital markets are perfect as such, in most societies negative bequests are not permissible by law and violations of this are considered morally offensive, such as bonded labour. This is equivalent to an inter-temporal borrowing constraint: a poor parent cannot borrow to send her child to school such that the child will pay off the loan when she is an adult.

What this discussion implies is that, to the extent bequests are required to be non-negative, this puts a constraint on inter-temporal resource allocation which is separate from what is usually meant by capital market frictions. Coupled with other frictions (e.g., non-convexities in the production technology), this can lead to poverty traps. Of course, additional capital market frictions (due to standard frictions such as problems of enforcement and informational asymmetries) will reinforce this tendency.
Friction-Driven Poverty Traps - The Key Implications  The key points from our discussion of friction-driven poverty traps are as follows.

First, no single friction is sufficient to trap individuals in poverty. Whether it is capital market frictions or restrictions on inter-temporal resource allocation as implied by the constraint that bequests have to be non-negative, we would require some other friction, such as non-convexities in the production technology, to prevent the poor to be able to save the "right" amount of physical or human capital and for their families to escape poverty in the long-run. That is why the fact that some studies fail to find any direct evidence of lumpiness of investments or find that microfinance loans have not been effective in reducing poverty significantly, alone is not sufficient to conclude that there is limited empirical support in favour of poverty traps (see, Kraay and McKenzie, 2014).

Second, if capital is the only input or all other inputs have perfect rental or sales markets so that capital is, in effect, a "sufficient" input (for example, in the presence of cash-in-advance constraints), and so capital market frictions play a central role in determining whether poverty traps could arise. In this case, capital market frictions or restrictions on inter-temporal resource allocation are necessary for friction-driven poverty traps to emerge independent of any other frictions.

Third, if inputs other than capital are needed for production (such as human capital or land) and these markets are subject to imperfections, then the previous conclusion has to be modified and direct intervention in the market of this input would be warranted. Consider the most extreme case where this input is not available in the market at all or is prohibitively costly. For example, consider a village where the scope for receiving training in certain types of skills is simply not available locally. In such cases, even if capital markets are perfect and there are no constraints on inter-temporal transfers (i.e., bequests can be negative) we could get poverty traps. For this to happen, the endowment of this input needs to be persist from generation to generation, and in addition, the production technology must be non-convex with respect to it. If instead the production technology is convex with respect to this input, then we get conditional convergence, with the steady state income reflecting differential access to this input (as would be the case with different values of the productivity parameter $A$) but controlling for this, the initial level of the capital stock (or more broadly, financial wealth) would not matter in the long-run. However, to the extent this input can be acquired by money, even though its market is imperfect, the importance of the capital market re-emerges.\footnote{Ownership of land in a feudal or tribal system, or, restrictions to occupational mobility on the basis of caste, race or gender would be other examples.}

\footnote{A deeper issue is what are the underlying sources of these frictions in capital markets and markets for other inputs, and to what extent they may be inter-related. As we know from the literature of land reform (see Mookherjee, 1997) if there are agency problems, a landlord will not sell off his land to his tenant or offer a fixed rent contract instead of a sharecropping contract, even though that will give the tenant better incentives because the tenant will not be able the afford the price at which the landlord will be willing to sell. However, for exactly the same agency problem, a lender cannot step in and offer the tenant a loan to buy off the land, since in the loan repayment}
3.2 Non-Homothetic Preferences

In section 3.1 we assumed preferences are homothetic and focused on external frictions. Now we assume there are no external frictions, and examine the role of how extreme scarcity may cause the poor behave differently from the non-poor, and whether this can lead to poverty traps. For example, the poor may discount the future too heavily, be too risk averse, may not care enough about their children, or may be more subject to various behavioural biases. With non-homothetic preferences, income effects can play an important role, and in particular, even though the deep preference parameters are the same ($\beta$ in our framework) and there are no external frictions, for low levels of income individuals may behave differently (in terms of how much they save or leave as bequests) and this can reinforce low incomes, generating a very different mechanism for a poverty trap. We call these kind of poverty traps scarcity-driven poverty traps.\footnote{Azariadis (1996) provides an overlapping generations version of a model that is similar in spirit to the one that is presented in this section.} We focus on money, but will discuss the relevant scarce resource being time or attention span. This argument is to be distinguished from one which says preference-related parameters have an effect on an individual’s economic outcome. That is a conditional convergence type argument: for example, those who do not put enough weight on the future (lower $\beta$) will end up with a lower steady state income.

The main idea is there is no external friction to be potentially fixed to help people get out of a poverty trap. What is interesting about scarcity-driven poverty traps is that, short of a direct transfer of income or a general increase in productivity (an increase in $A$ that raises $\pi$, for example) they can persist even when a whole range of supply-side interventions aimed at fixing various kinds of market failures are in place.

We avoid calling this class of poverty traps "behavioural" poverty traps because that may be confused with those arising from behavioural biases only (e.g., loss aversion, hyperbolic discounting, excessive expenditure on temptation goods). That is certainly a possible channel, as we discuss below, but it is possible to have these kinds of poverty traps with standard preferences as well, as the model below indicates.

**Scarcity Driven Poverty Traps - The Benchmark Model** As in the benchmark one-input model of section 2, assume that output is given by $q = Af(k)$ where the technology is convex, and that capital markets are perfect, so that the income of an individual is

$$y_t = \pi + rk_t$$

where

$$\pi = \max_k Af(k) - rk.$$
As before, let us assume agents derive utility from consumption $c$ and from bequest $b$. Even though in a narrow sense $b$ captures financial bequests, we can interpret it as any investment (e.g., human capital) from current income that enhances the productive capacity of children (e.g., health, education). Even though this is the interpretation we will focus on, as earlier, we could also view $b$ as saving or an investment in an individual’s own human capital. For now, let us assume $b \geq 0$ but we will see below that in this particular model, this "friction" that constrains inter-temporal resource allocation, does not play a major role.

In addition, we allow individuals to consume a luxury good $z$. The utility function is given by:

$$U(c, b) = \log c + \beta \log(b + B) + \gamma \log(z + Z)$$

where $B > 0$, $L > 0$, $\beta \in (0, 1)$, and $\gamma \in (0, 1)$. We assume that the marginal utility of bequests at $b = 0$ is higher than the marginal utility of luxury goods when $z = 0$:

$$\frac{\beta}{B} > \frac{\gamma}{Z}.$$  

We can think of $c$ as basic consumption, $b$ as money passed on to children, and $z$, a luxury good (durables, a vacation) which is not essential for survival but is consumed as income goes up. Our assumption will ensure that for low levels of income, all income is spent on $c$, for moderate levels of income it is split between $c$ and $b$, and finally, for high levels of income it is split between $c, b$, and $z$.

Total income at time $t$ is

$$y_t = \pi + r k_t$$

and as before, $k_{t+1} = b_t$. The budget constraint is

$$c_t + b_t + z_t = \pi + r k_t.$$  

It is straightforward to derive that there will be two income thresholds, $y$ and $\bar{y}$, and two corresponding thresholds for capital:

$$k \equiv \frac{B - \beta \pi}{\beta r}$$

and

$$\bar{k} \equiv \frac{(1 + \beta)Z - \gamma B - \gamma \pi}{\gamma r}$$

such that $\bar{k} > k$, which follows from our assumption

$$\frac{\beta}{B} > \frac{\gamma}{Z}.$$  

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Using the fact that \( b_t = k_{t+1} \), we get the dynamics of how the capital stock will evolve:

\[
k_{t+1} = \begin{cases} 
0 & \text{for } k \leq \underline{k} \\
\frac{\beta}{1 + \beta} (rk_t + \pi) - \frac{B}{1 + \beta} & \text{for } k \leq k \leq \overline{k} \\
\frac{\beta}{1 + \beta + \gamma} (rk_t + \pi) - \frac{(1 + \gamma) B - \beta Z}{1 + \beta + \gamma} & \text{for } k \geq \overline{k}.
\end{cases}
\]

This is depicted in Figure 4.

We have assumed in the figure that \( \frac{\beta}{1 + \beta} r > 1 > \frac{\beta}{1 + \beta + \gamma} r \) and \( B - \beta \pi > 0 \) (which is likely in economies with low productivity, namely, a low level of \( A \)). Moreover, for a poverty trap to result, the middle segment of the equation of motion needs to intersects the 45° line at a point that is lower than \( \overline{k} \), the specific condition being
Under these conditions, families that start poor (capital stock less than $k$) don't save at all and therefore, have a steady state capital stock of 0, those who start with more than $k$ grow rapidly up to the point where the saving rate falls (as luxury consumption kicks in), and they converge to a high capital stock ($k^*$). Of course, if the above conditions are not satisfied, it is possible to have a unique steady state (for example, if $B - \beta \pi \leq 0$).

A reasonable question to ask is, rather than having warm-glow type preferences where parents care about the bequests they pass on to their children, suppose they cared about the utility of their children. In other words, the question is, whether our results go through when we have Barro-Becker altruistic preferences, which by a standard recursive argument becomes equivalent to an individual maximizing the present discounted value of the utility stream of current and future generations in a forward-looking way. A complete treatment of this issue is beyond the scope of the present exercise. However, there is an earlier literature that shows that similar results go through when the poor discount the future too heavily (see, for example, Uzawa, 1968, and Azariadis, 1996 for more references on what he calls "impatience traps").

As noted above, so far we assumed $b \geq 0$. Suppose we allow $b < 0$ (but smaller is absolute value than $B$, given the utility function we have assumed), i.e., parents can borrow against the earnings of their children which the children will have to pay off. Given that in the current framework, this borrowing cannot be used to invest in the human capital of children that will generate returns in the next period, this option turns out not to be consequential. In particular, it is straightforward to show that instead of $b = 0$, for families starting with low initial levels of assets, $b < 0$ (as opposed to $b = 0$) will be a stable steady state under conditions similar to those derived above, in addition to a high wealth steady state.

**Time Rather than Money Being the Scarce Resource**

The sources poverty traps that are possible if preferences are non-homothetic in income, can be more general than in the specific channel developed above. For example, the scarce resource in question may be time or attention span or cognitive capacity rather than physical or financial capital. Suppose individuals can allocate time between generating current income, and spending it with their children to help develop their human capital. Assume income depends on human capital only, and physical or financial capital plays no direct role in production. In particular, suppose the budget constraint is:

$$c_t \leq wh_t (T - l_t)$$

where $c_t$ is consumption, $l_t$ is the time spent with children, and $h_t$ is human capital at time $t$. We assume that $w$ is the exogenously given wage rate per unit of human capital, so that someone with twice as much human capital will earn twice as much for the same amount of time spent working. Also, let $h_{t+1} = h_t l_t$ be the equation of motion of human capital - a more educated parent is more effective in converting
her time spent with the children to transmit human capital to them.\textsuperscript{10} Suppose preferences are similar as before:

\[ \log c_t + \beta \log (l_t + B) + \gamma \log (z + Z). \]

It is straightforward to check that, for low levels of \( h_t \), individuals may choose \( l = 0 \) and we can have a poverty trap.

**Extending the Scarcity Channel** It is possible to extend the scarcity channel to consider how it interacts with insufficient intergenerational altruism, as well as various behavioural biases. Interpreting \( b \) broadly as any investment in the productive capacity or welfare of children, suppose society puts a greater weight (say, \( \bar{\beta} \)) on the welfare of children (or, in the case of gender bias, a greater weight on the welfare of female children) than parents do (namely, \( \beta \)) where \( \bar{\beta} > \beta \). Given the income effect identified under the scarcity channel, we can readily see that the gap between the socially optimal level of investment and what will be chosen by parents will be larger, the poorer are the parents.

Similarly, we can allow individuals to have behavioural biases in addition to the channel of limited time or attention span discussed in the previous subsection (see, for example, Banerjee and Mullainathan, 2010, and Bernheim, Ray, and Yeltekin, 2013). The point is not that only the poor are subject to these kinds of biases, but that low incomes exacerbate these biases, or, their negative consequences. A satisfactory treatment of this issue is beyond the scope of the present exercise but we can modify the benchmark model above to briefly examine the implications. Suppose we introduce an inessential consumption good (e.g., tobacco or alcohol) \( v \) and add the term \( \delta \log (v + V) \) (where \( \delta \in [0, 1] \) and \( V > 0 \)) to the utility function and make the assumption \( \frac{\delta}{V} > \frac{\beta}{B} \). This is similar to what Banerjee and Mullainathan (2010) call a temptation good. By a familiar argument, individuals will spend all their income on \( c \) for very low levels of \( k \), but now they will spend some of their incomes on \( v \) as \( k \) crosses a threshold, and only for a higher threshold they will choose a positive value of \( b \). Earlier, a cash transfer to increase the financial resources of a poor family above \( k \) would be sufficient to help them escape the poverty trap. But now, there is an intermediate range of \( k \) such that an unconditional cash transfer will partly get frittered away on \( v \), an issue we will touch upon in section 4 where we discuss anti-poverty policy.

**Combining Friction and Scarcity Driven Poverty Traps** Clearly, external frictions and income effects can coexist and can combine to generate poverty traps.

\textsuperscript{10} Notice that, in principle, we can allow for a market in hiring a private tutor - parents can buy \( h' l \) units worth of human capital for their children by paying an amount \( w h' \), where \( h' \) can be different from \( h_t \). What matters here is full income in the sense of Becker.
Indeed, Banerjee and Mullainathan (2008) is an example of this.\footnote{Similarly, Moav (2002) shows that a convex bequest function may lead to poverty traps using a utility function that leads to corner solutions in bequests that is similar to us. However, he assumes capital markets to be imperfect.} Their core model is similar to the time allocation problem in the previous subsection.\footnote{In their model, individuals either choose all of their time (or attention span) at home or at work, but as we saw above, one can get a poverty trap even with interior solutions.} They juxtapose this with a model where human capital affects income via productivity but there are non-convexities in this relationship, while current human capital depends in a linear fashion on the previous period’s human capital. As we saw in section 3.1, these two features are sufficient to generate poverty traps via the external frictions channel alone. Therefore, from the theoretical point of view, having both these channels is not necessary to generate poverty traps. However, the interaction between scarcity and friction driven poverty traps does raise interesting conceptual issues. For example, in an environment where the population is very poor, there will be little incentives for suppliers of specific inputs to set up shop due to lack of sufficient demand, and so supply-side frictions may be endogenous. We will return to this issue when discussing policy in section 4.

Another example of a combination of a friction-driven and a scarcity-driven poverty trap is when individuals are risk-averse and the degree of risk-aversion is decreasing in income (e.g., if the utility function displays decreasing absolute risk aversion). The poor will focus on low risk low returns projects while the rich will focus on high risk and high returns projects, and these can generate poverty traps. However, this argument implicitly assumes insurance markets being imperfect, because otherwise, with full insurance all individuals would maximize the certainty equivalent of their income and this kind of poverty trap will be difficult to sustain. More generally, it is hard to separate the roles of credit and insurance markets, because if individuals are risk-averse then the optimal contract should factor in both liquidity constraints and uninsured risk (as in the standard principal-agent model where the principal is risk neutral and the agent is risk-averse). Therefore, the emphasis on capital market frictions should be broadened to financial markets more generally when agents are risk-averse.

**Scarcity-Driven Poverty Traps - The Key Implications** The key points from our discussion of scarcity-driven poverty traps are as follows.

First, poverty traps can exist even without any external frictions due to the operation of strong income effects in the behaviour of individuals. This is possible without any behavioural biases, although it is consistent with the attention span of the poor being overloaded with decisions that have to do with day to day struggle for survival, at the detriment of forward-looking planning or expending greater productive effort at work (Mullainathan and Shafir, 2013).

Second, as the root cause of scarcity-driven poverty is scarcity, the most obvious policy implication is a lump-sum transfer to the poor. Of course, if there are external
frictions to fix (say, in capital markets or in health or education) then these can go together, but there are likely to be strong complementarities between these kinds of policies, as we discuss in the next section.

Third, to the extent there are grounds for a paternalistic intervention, because the preferences of the individual is different from that of the policymaker (which can be due to behavioural biases or insufficient intergenerational altruism or gender bias), unconditional lump sum transfers may not be the most efficient form of intervention and there may be a case for other policy instruments (e.g., conditional cash transfers).

4 What Theory Can Tell Us About Policy

We now turn to discussing the implications of our theoretical framework for the design of anti-poverty policy. Various anti-poverty policies can be divided into three broad categories: those that are aimed at enabling the poor greater access to markets, those that are aimed at improving the access of the poor to public services and infrastructure, and those that are explicitly redistributive in nature. Examples of the first include reducing transactions costs in specific markets (e.g., savings, credit, insurance), providing inputs which are not readily available in the market (e.g., training specific skills), improving access to information, and reforming property rights. Examples of the second include various measures to improve accountability and reduce leakage and corruption in the provision of public services like health and education. Examples of the third class of policies involve directly transferring resources to the poor, in cash or in kind. Cash transfers can be unconditional, or conditional on children attending school and family members receiving preventative health care (e.g., programmes such as Progresa, renamed Opportunidades and more recently, Prospera, in Mexico, and Bolsa Familia in Brazil) or in-kind (e.g., food, sanitation, education, health services provided free or at a subsidized rate to the poor). We will refer to the these as UCTs, CCTs, and IKTs.

Given the focus of this article, we will ignore delivery or implementation issues that imply an entirely different set of costs and benefits of alternatively anti-poverty policies. For example, conditional transfers have the advantage that they can screen out the non-poor and achieve better targeting than unconditional cash transfers). Similarly, we will not discuss situations where externalities are important (e.g., health interventions like deworming or insecticide-treated bednets) that make certain types of conditional transfers preferable to unconditional ones.13 I will also not attempt a review of the extensive empirical literature evaluating the performance of these programmes, but rather will make a number of conceptual points based on the framework developed in the previous section.14

The first point is other than improving access to capital and savings, or an UCT,

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13We refer the reader to Das et al (2005) for a good discussion of some of these issues.
14See Baird et al (2013), for example, for a review of CCTs and UCTs in the context of developing countries.
any other single intervention is unlikely to get rid of poverty traps. This follows from our discussion of friction-driven poverty traps where we saw that other than removing whatever constrains the ability of the poor to borrow and save, no single friction is sufficient to trap individuals in poverty. Also, for both friction and scarcity-driven poverty traps, a UCT of an appropriate size will help the poor overcome poverty traps in our framework, unless there are grounds for paternalism, an issue we discuss below. More broadly, this reflects the standard economic argument that unless we know what is the specific friction, it is best to leave it to the recipient to decide what she will do with the savings or loan, or the cash transfer. Only in an extreme case where some critical non-capital input (e.g., training or land) is not available in the market or is very costly, and the income generation technology is non-convex with respect to it, there are grounds for intervening directly to make that input accessible to help overcome poverty traps. This is one of the arguments behind the recent policy interest in UCTs. For example, the work of GiveDirectly in Kenya, a charity that gives no-strings attached cash grants, equivalent to almost two year’s worth of local income, to the poor has received a lot of attention. While long term impacts are yet to be known, at least in the short-run the impacts are quite good in terms helping build assets, encouraging investment in and generating revenue from businesses (Hausman and Shapiro, 2013). In addition, several studies using randomized field experiments have highlighted the importance of capital and access to a savings technology. A well-know study by De Mel et al (2008) have found high potential rates of return to capital in small business among Sri Lankan microenterprise owners that far exceed formal sector interest rates. Another important study show that providing access to non interest-bearing bank accounts led to significant increase in savings, productive investments and private expenditures (Dupas and Robinson, 2013).

Second, even with policies that improve access to capital or savings or a UCT, at best poverty traps in a narrow sense will be eliminated. That is, two individuals who, except for income or wealth (y or k in terms of our model), are identical will not end up very differently in the long-run. But if other markets are underdeveloped (e.g., acquiring skills), infrastructure is poor, then neither will do very well. In terms of our model the main problem is A is low, i.e., the problem of conditional convergence remains and individuals who are otherwise identical but live in better environments (in terms of market access, infrastructure) will do better. As noted above, cash transfers or facilitating borrowing or saving will have limited impact on incomes if markets for certain critical (non-capital) inputs are not developed. In such circumstances, a direct intervention in improving A (or, encouraging migration from a low A to a high A area) may be the best policy, and an excessive focus on poverty traps can distract our attention from this more basic problem. Indeed, even if there does not exist multiple steady states, the elasticity of response to changes in certain policies can be quite high. In the version of the Solow model we discussed in the previous section, the steady-state level q is \( q^* = (A)^{\frac{1}{\alpha - \delta}} s^{\frac{\alpha}{\alpha - \delta}} \), i.e., the steady state output is a convex function of A and so elasticity of response to policy changes could be quite high.
Third, a mix of interventions that relax the budget constraints of the poor and remove certain external frictions are likely to yield significantly high returns compared to an intervention that addresses only one of these problems. For example, if we fix financial markets or give a large cash grant, and improve access to training or infrastructure, gains are likely to be much higher than these individual interventions. Recall from our model that \( q = Af(k) \), i.e., \( k \) (or \( h \)) and \( A \) are complements. Indeed, Bandiera et al (2013) find that sizable transfers of assets and training to impart skills in Bangladesh enable the poorest women to shift out of agricultural labor and into running small businesses, which persists and strengthens after assistance is withdrawn, and leads to a 38% increase in earnings. Similarly, Blattman et al (2014) find that cash transfers coupled with business training very effective among impoverished Ugandan women. In contrast, McKenzie and Woodruff (2014) review training business owners from a dozen randomized experiments and find little lasting impact on profits or sales.

Fourth, some interventions (e.g., credit, savings) are likely to have similar effects, and it is important to diagnose which underlying friction is more important. For example, if the main problem facing the poor is they do not have access to a good savings technology (with or without self-commitment problems), then availability of small loans to be paid in short installments via microfinance may help them smooth consumption or purchase durables, but a better solution yet might be to improve their ability to save. Indeed, Dupas and Robinson (2013) find that the take-up for their savings package is very high (87%), in contrast to the relatively low take-up rate in most rigorous studies of microfinance (e.g., 27% in the study by Banerjee et al (2014) of a microfinance in India) and this suggests that access to a good saving technology may be a higher priority for the poor.

Finally, we turn to the question of under what circumstances CCTs may be strictly preferred to UCTs. In our model this can happen only in the case where the individual’s preference and the policymakers preference differs, due to the presence of behavioural biases (e.g., excessive weight on temptation goods or present consumption), insufficient intergenerational altruism, or gender bias.\(^{15}\) As we saw, a low value of \( \beta \) coupled with low incomes can generate poverty traps. Even though there isn’t that much evidence that the poor fritter the money away (Evans and Popova, 2014), there is fairly compelling evidence that CCTs are more effective than UCTs in raising educational outcomes. Baird et al (2013) studied twenty-six UCTs, five UCTs, and four programmes that ran both in parallel and found that school enrolment rose by 41% on average across all the CCT programmes, while under the UCT programmes, the increases was 25%. This does not necessarily mean CCTs are better in welfare terms than UCTs, but as with taxes or subsidies on a specific good or service, it does affect behaviour through the standard combination of price and income effects. Also, if the amount the poor invest on children (\( b \) in our model) depends on income (\( y \)) or wealth (\( k \)) in a way that is convex over some region (as in section 3.2), then given

\(^{15}\) As noted earlier, we are ruling out screening issues in targeting the poor, or more generally, implementation-related issues.
the complementarity between $A$ and $k$ noted above, combining a UCT with a policy that directly tackles a friction on the supply side (say, better schools or health facilities) or raises overall productivity $A$, is likely to yield higher returns than a policy (with a comparable budget) that makes a cash transfer conditional on individuals undertaking a certain minimum investment in $b$. However, if indeed the underlying grounds for paternalism are strong or externalities are significant, then arguments in favour of CCTs continue to be valid.

5 Conclusion

We developed a conceptual framework to examine conditions under which individuals can be trapped in poverty, distinguishing between the role that external frictions play, versus those that are due to choices made under extreme scarcity. We then applied this framework to discuss various types of anti-poverty policy, distinguishing between policies that are aimed to facilitate market access for the poor, and those that are redistributive in nature, and in the latter category, discussed the relative merits of unconditional and conditional cash transfers and in-kind transfers.

There are several related and interesting issues that we did not address. First, we worked with a representative agent framework and this precludes many interesting issues that heterogeneity among individuals raise. Even within the same area and similar socioeconomic characteristics, individuals have different preferences, abilities, beliefs, and aspirations and therefore, we have to think beyond a one-size-fits-all policy. Indeed, most studies evaluating specific policies find significant heterogeneity in their impact on different individuals. Second, we did not discuss problems of implementation, including targeting, and this raises a whole new set of interesting issues. Third, the policy interventions that we discussed are likely to alter individual behaviour if they are expected to be in place, and as the discussion of various welfare programmes in developed countries suggest, it is important to study the incentive effects of various anti-poverty policies, rather than viewing them as being administered from “outside the system” to lift the poor out of poverty. Finally, another interesting issue is how to diagnose what the most binding constraint is in a given environment at the microeconomic level, similar in spirit to the growth diagnostics approach (see Rodrik, 2010). Is it an external friction, and if so, which one, or is it really the behaviour of the poor under extreme scarcity? All these, and undoubtedly many more, seem potentially exciting avenues of future research.
References


