Towards a Theory of Behavioral Poverty Traps

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Abstract

Within a two-sector overlapping generations model, we show that even a slight pessimism among a subset of parents can significantly exacerbate the extent of the poverty trap. In particular, we assume that only uneducated parents are pessimistic. We find that without any biases, there exists a poverty trap only when parental altruism is low. With biases, there *emerges* a poverty trap even for moderate levels of parental altruism. When parental altruism is high, there *may* exist a poverty trap. *Interestingly*, the likelihood of a poverty trap increases with educated parents in the economy. Note, this poverty trap is not driven by any scarcity of resources. This paper establishes that pessimism interacts with resource constraints to magnify the expected mass of the population in poverty traps, as well as worsen income inequality. This highlights the necessity to design novel policies that address behavioral anomalies along with standard resource constraints.

Keywords: Behavioral Bias, Human Capital Investment, Poverty Trap.
JEL Codes: J62, D91, E2

1 Introduction

The existing literature assumes that agents *know and believe* the returns to investment. However, empirical evidence increasingly challenges this assumption. Das et al. (2019) demonstrate that people with low socio-economic status, particularly in terms of income and education, hold pessimistic views regarding the future. This could be attributed to the fact that poverty imposes mental constraints, leading individuals to adopt a pessimistic outlook due to the complexity of gauging their likelihood of success. Such pessimism diminishes people's belief in their ability to effect positive change. While it is obvious that extreme pessimism is detrimental to society, what if biases are not so extreme? Here lies the novelty of our model: the introduction of (slight) pessimism in a macroeconomic context. We assume that the most disadvantageous group exhibits pessimism regarding their own probability of success. We identify this as a new driver of the poverty trap, specifically a behavioral poverty trap.

Pessimism is increasingly being recognized as an important policy issue. Pessimism entraps the poor into making suboptimal choices (Kraay and McKenzie (2014)). In a theoretical framework, pessimism could be depicted in several ways. For example, Laajaj (2017) build a model with an endogenous determination of the agent's time horizon (or the degree of patience). Building on the psychology literature, they model that when people anticipate future poverty, it generates disutility (what we term pessimism). This encourages myopic behavior among the poor and makes it costly for them to have a long-term planning horizon. Poor remain in a behavioral poverty trap. But, unlike Laajaj (2017), we believe that pessimistic behavior does not stem just from low incomes, but from poor circumstances in general. This may include a lack of opportunity due to race, religion or even education. Lack of education, particularly, restricts social awareness and makes it harder for agents to ascertain the true probability of success. In our paper, uneducated parents are pessimistic. In the context of parental investments in their child's education, we show that pessimistic parents invest less in their children even when they face no resource constraints. In some cases, the poverty trap arises even for the slightest degree of pessimism and, interestingly, in the presence of a large mass of educated persons. This finding, to any policymaker, would be a grave concern.

In general, parental investments depend on some key societal attributes. Societies, where parents take pride in their children's achievements, tend to invest more in their children. Pessimism has differential implications in societies with different degrees of intergenerational altruism (or parental altruism or warm glow). We define a parameter δ to capture intergenerational altruism which refers to the sense of satisfaction and fulfillment experienced by parents when witnessing the accomplishments of the younger generations within their family.

How does the existence of pessimistic individuals affect them and society at large? We find that pessimism has no differential effect in societies with low or huge levels of intergenerational altruism. In the former case (or $\delta \leq \underline{\delta}$), uneducated people (whether or not they are pessimistic) do not invest in their children's education. For them, the loss in utility from spending on education costs is more than the little gain in utility from having more educated children. In the case of huge intergenerational altruism (or $\delta > \delta_\eta$), parents care for their children's future so much so that

they would invest despite any pessimism. To be precise, δ_η depends on the degree of pessimism. It increases as pessimism increases.

Pessimism has discernible effects in societies with intermediate levels of intergenerational altruism. We designate two kinds of outcomes in δ-moderate and δ-high ranges. Pessimism creates a poverty trap for δ-moderate societies and possibly in δ-high societies (depending on the extent of pessimism).[1] When parental altruism is moderate (or $\delta \in (\underline{\delta}, \bar{\delta}]$), even the smallest degree of pessimism incentivises uneducated parents not to invest in their children's education. Such children become uneducated parents and their dynasty forever earns unskilled (low) incomes. However, when parental altruism is high (or $\delta \in (\bar{\delta}, \delta_\eta)$), only when pessimism is sufficiently high would uneducated parents not invest in education.

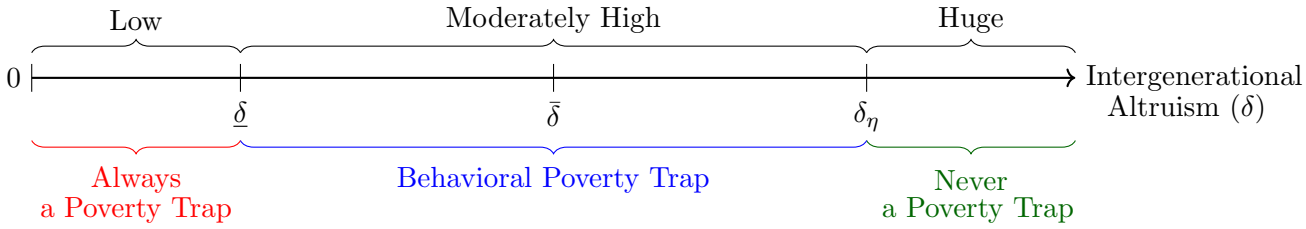

Figure 1: Implications of Behavioral Bias: A Steady State Overview [colored]

Figure 1 shows a summary of our findings. The key takeaway is that when uneducated parents are pessimistic, there may emerge a poverty trap for $\delta \in (\underline{\delta}, \delta_\eta)$ which would not be present if these parents were unbiased. Again note, this poverty trap is not driven by any lack of resources, in terms of 'ability to invest'. For biased parents, pessimism lowers their evaluation of the returns to investment. This produces a separating dynamic equilibrium, where biased individuals remain in a poverty trap but not unbiased ones.

This paper contributes to the literature on poverty traps and behavioral anomalies. The seminal paper Galor and Zeira (1993), in a traditional framework, establishes the existence of a poverty trap due to imperfect credit markets and fixed costs of education. Our model without behavioral bias is similar to Galor and Zeira (1993) in terms of the fixed cost of education but, unlike theirs, parental incomes are sufficient to pay for the cost of education. Without biases, in our framework, there is no poverty trap when intergenerational altruism is not low. However, in the presence of behavioral anomalies, there is an emergence of a poverty trap even when intergenerational altruism is not low. This paper conclusively shows that behavioral constraints magnify resource constraints. The two may interact to entrap more people in persistent poverty.

But behavioral models are not new. Barrett et al. (2019) discuss how mental illness, like depression, and psychological limitations, like low self-efficacy, and lack of hope or confidence, contribute to perpetuating poverty. Genicot and Ray (2017) model socially-determined aspirations as goals surpassing which gives utility to agents. They show that if aspirations are considerably

[1] Here, we refer to poverty trap as the steady state outcome where uneducated workers and their successive generations never invest in education and remain unskilled workers.

above the current standard of living, it may cause frustration and a poverty trap. Ghatak (2015) shows that poverty traps can exist even without any external frictions due to the operation of strong income effects in the behavior of individuals, and this is possible without any behavioral biases. Unlike these papers, we model pessimism differently. Our paper introduces pessimism as a belief characterized by a low probability of achieving personal success. Apart from this, the agents in our model are *rational*. This setup is similar to Dasgupta and Saha (2022). However, compared to this paper, they assume that income differences give rise to different kinds of biases, such as overconfidence in the rich and underconfidence in the poor; and this may exacerbate income inequality. Moreover, in Dasgupta and Saha (2022) the poverty trap exists only among extremely pessimistic persons. Unlike them, the poverty trap, in our model, arises even for small degrees of pessimism. Within a precise two-sector overlapping generations model, we have emphasized this pivotal outcome with *minimal behavioral assumptions*.

This paper establishes that pessimism interacts with resource constraints to magnify the expected mass of the population in poverty traps, as well as worsen income inequality. In the next section, we model the economy where parents invest in their children's education. In section 3, we prove our main theoretical result that behavioral biases expand the range of the poverty trap. Finally, in section 4, we conclude with a discussion. Here, we empirically show the existence of pessimistic adults and provide suggestive evidence that social networks contribute to this pessimism.

2 Model

In a discrete time framework, consider a single good economy, where production can occur either in the skilled or the unskilled sector. The production function in the skilled sector is (standard) strictly increasing, strictly concave – AL_{St}^{ϕ}, where L_{St} is the mass of skilled workers, $\phi \in (0,1)$ captures DRS and $A \geq 1$ is productivity. The production function in the unskilled sector is linear. Workers in each sector earn their wages and a part of the profit of that sector.[2] Therefore, each skilled worker earns $AL_{St}^{-(1-\phi)}$ and the income of an unskilled worker is 1. The total mass of workers is normalized to 1. Thus, by construction, the skilled sector is more productive, and the income of a skilled worker is strictly higher than that of an unskilled worker.

The household comprises overlapping generations with no population growth. We assume that only adults consume and they decide whether to invest in their only child's education. The fixed cost of education, denoted by $\bar{s} \in (0,1)$, is necessary but not sufficient to get a job in the skilled sector. The true probability that an educated individual becomes a skilled worker is $\beta \in (0,1)$. However, the parents may not believe this probability and, instead, infer its value based on their own life experiences. Accordingly, parents conjecture the expected income of their children, i.e. the return on their investment in their children's education. We assume an adult derives utility from

[2]To be precise, profit of each sector is divided among all the workers working in that sector equally.

her own consumption as well as the *conjectured* income of her child.

$$\max_{i=\{0,1\}} \frac{(c_t)^\sigma}{\sigma} + \delta \frac{(E\omega_{t+1})^\sigma}{\sigma}, \quad \sigma < 0 < \delta, \quad \text{subject to} \quad c_t + \mathbb{1}_i \cdot \bar{s} = m_t$$

where i takes the value 1 when the parent invests in her child's education, otherwise 0. The warm glow parameter is denoted by δ and σ is the CRRA parameter.[3]

The conjectured income of a child is estimated based on the conjectured probabilities of an educated child becoming a skilled worker. Parents may be biased in perceiving the probability of a child from *their own community* getting a skilled job. This is the only source of behavioral anomaly in our model. To make the model sharper, we assume that only one type of parents are biased – in particular, only uneducated parents are biased. These parents, due to their lack of education and separation from the educated workforce, believe that a child from their community has a lower probability ($\eta \cdot \beta$, where $\eta \in (0,1)$) of obtaining a skilled job. Uneducated parents do not discount the corresponding probability for children from other groups. This represents the sole bias in our model, as other educated parents are rational and *accurately estimate* the expected income of their children.[4]

It is important to remind ourselves that parents differ in two dimensions – income and education. Income differences, which arise from employment in different sectors, make the utility costs of their children's educational investment different. The parental differences in education, on the other hand, influences the conjectured benefits of educational investment (via bias of uneducated parents). Therefore, we consider the investment decisions of three types of parents – educated-skilled (s), educated-unskilled (n), and uneducated (u). In period t, a skilled worker earns $A(\beta N_t)^{-(1-\phi)}$, where N_t is the mass of educated persons. When she believes that all uneducated parents, all educated-unskilled parents and all other skilled parents invest with probability μ_{ut}, μ_{nt} and μ_{st} respectively, she derives that

$$L_{st+1} = \beta\big[\mu_{st} \cdot \beta N_t + \mu_{nt} \cdot (1-\beta) N_t + \mu_{ut} \cdot (1 - N_t)\big],$$

and the income of a skilled worker at $t+1$ would be $AL_{st+1}^{-(1-\phi)}$.
At period t a skilled worker invests in her child's education *if and only if* the utility from investing in their child's education is higher than the utility from not investing in education, i.e,

$$\frac{\big(A(\beta N_t)^{-(1-\phi)} - \bar{s}\big)^\sigma}{\sigma} + \delta \frac{\Big[\beta \cdot A\Big[\beta\big[\mu_{st} \cdot \beta N_t + \mu_{nt} \cdot (1-\beta) N_t + \mu_{ut} \cdot (1 - N_t)\big]\Big]^{-(1-\phi)} + (1-\beta)\Big]^\sigma}{\sigma}$$
$$\geq \frac{\big(A(\beta N_t)^{-(1-\phi)}\big)^\sigma}{\sigma} + \frac{\delta}{\sigma}, \tag{1}$$

[3] We use the terms parental 'warm glow' and 'intergenerational altruism' synonymously. The higher the warm glow, the more child-loving the parents are considered to be.
[4] Note, lower η implies higher biases.

when μ_{st} is a fraction, the above condition holds with equality.
Similarly, at period t, an educated-unskilled worker invests in her child's education if and only if

$$\frac{(1-\bar{s})^{\sigma}}{\sigma}+\delta\frac{\Big[\beta\cdot A\Big[\beta\big[\mu_{st}\cdot\beta N_t+\mu_{nt}\cdot(1-\beta)N_t+\mu_{ut}\cdot(1-N_t)\big]\Big]^{-(1-\phi)}+(1-\beta)\Big]^{\sigma}}{\sigma}\geq\frac{1}{\sigma}+\frac{\delta}{\sigma}, \tag{2}$$

when μ_{nt} is a fraction, the above condition holds with equality.
Finally, an uneducated parent with behavioral bias η invests in her child's education if and only if

$$\frac{(1-\bar{s})^{\sigma}}{\sigma}+\delta\frac{\Big[\eta\beta\cdot A\Big[\beta\big[\mu_{st}\cdot\beta N_t+\mu_{nt}\cdot(1-\beta)N_t+\eta\mu_{ut}\cdot(1-N_t)\big]\Big]^{-(1-\phi)}+(1-\beta\eta)\Big]^{\sigma}}{\sigma}\geq\frac{1}{\sigma}+\frac{\delta}{\sigma}, \tag{3}$$

again, when μ_{nt} is a fraction, the above condition holds with equality.

An equilibrium, $\langle\mu_{ut},\mu_{nt},\mu_{st}\rangle$, is defined such that (i) no parent has an incentive to deviate unilaterally and (ii) the conjectured income, and hence the expected returns from investment, for any type of parent is consistent with their own beliefs.

To understand the effect of biases, first, we discuss the benchmark, where there is no bias. We, thus in the following proposition, characterize the investment decisions and their macroeconomic implications when no parent is biased (i.e., $\eta=1$). Now, educational differences do not present any heterogeneity among parents. Thus, the investment decision of the uneducated worker is the same as that of an educated-unskilled worker. The difference in investment, thus, only comes from the difference in income. As the income of the skilled parents is higher, their utility cost of investment is lower. This implies that skilled parents invest with certainty whenever unskilled parents invest with a positive probability.

In the benchmark, we find distinct steady state outcomes for three ranges of parental altruism. First, when parents are very child loving, δ is large (formally defined in Definition 1), unskilled parents invest with probability one. The economy immediately reaches the steady state, where all adults invest with probability one. The steady-state mass of skilled workers at any period is β. At any time period, an adult from each family is likely to work as a skilled worker with probability β. In the second case, when the parents are moderately child loving, unskilled parents no longer invest with probability one, but with a positive fraction. The economy gradually reaches the steady state where all skilled parents invest with certainty and all unskilled parents invest with a fractional probability. The steady-state mass of skilled workers is less than β. At any period, the adult of a family works as a skilled worker with a positive probability. Therefore, there is no poverty trap in the economy. In the third case, when intergenerational altruism is low, unskilled parents never invest. The economy slowly converges to the steady state where eventually no parent invests in her child's education. The steady-state mass of skilled workers is zero. All adults work as unskilled

workers and remain under poverty trap forever.

We formally define the thresholds and ranges of the warm glow parameter to characterise the equilibria steady states subsequently.

Definition 1. *Intergenerational altruism is 'large' when* $\delta \geq \bar{\delta}$*, where* $\bar{\delta} \equiv \dfrac{(1-\bar{s})^{\sigma}-1}{1-(A\beta^{\phi}+1-\beta)^{\sigma}}$*, 'moderate' when* $\delta \in [\underline{\delta}, \bar{\delta})$*, where* $\underline{\delta} \equiv (1-\bar{s})^{\sigma}-1$*, and 'low' when* $\delta < \underline{\delta}$*.*

At the steady state, the mass of educated, hence the mass of skilled workers remains constant. However, the education and job status of a family may change over time. We say that a steady state has a poverty trap, if there exists a positive mass of families that remains uneducated forever. Thus, these families can never work in the skilled sector and remain poor forever.

Proposition 1. Benchmark: No Bias

1. *When the parents are child loving, there is no poverty trap:*
   (a) *With large intergenerational altruism* $\delta \geq \bar{\delta}$*, all parents invest with probability with one. In the steady state, the adult of each family works in the skilled sector with probability* $\beta > 0$*.*
   (b) *With moderate intergenerational altruism* $\delta \in (\underline{\delta}, \bar{\delta})$*, all skilled parents invest with probability one and all unskilled invest with a fractional probability. In the steady state, the adult of each family works in the skilled sector with a strictly positive probability.*
2. *When the parents are not child loving (*$\delta \leq \underline{\delta}$*), at the unique steady state, there is a poverty trap.*

In the next section, we aim to demonstrate that even slight pessimism can broaden the scope of the poverty trap. We have already established that societies with low intergenerational altruism tend to approach a poverty trap. Next, we focus on economies where unbiased parents are never in a poverty trap. Thus, hereafter, we limit our discussion to intergenerational altruism being not low ($\delta > \underline{\delta}$), where rational behavior does not lead to a poverty trap.

3 Biases and Poverty Trap

In this section, we show that the biases of parents expand the range of parameters under which a poverty trap exists in the economy.

Recall, only uneducated parents are biased. We show that as they become more pessimistic, the range of the altruism parameter, within which there is a poverty trap, increases. This implies that as uneducated parents perceive themselves to be more distant from the educated population, they will invest in their children's education only when they significantly care for their children. The following definition depicts this formally.

Definition 2. *For any $\eta \in [0,1)$, we define two thresholds. First, given a mass of educated workers, we define a threshold for the warm glow parameter, $\hat{\delta}(\eta, N)$. Second, given a warm glow parameter, we define a threshold for the mass of educated workers, $\hat{N}(\eta, \delta)$. At each of these threshold, an uneducated worker is indifferent between investing and not investing when all educated workers invest with probability one, and all other uneducated workers do not invest. Mathematically, from* (3)

$$\hat{\delta}(\eta, N): \quad \frac{(1-\bar{s})^\sigma}{\sigma} + \hat{\delta}\frac{[\beta\eta A(\beta N)^{-(1-\phi)} + (1-\beta\eta)]^\sigma}{\sigma} = \frac{1}{\sigma} + \frac{\hat{\delta}}{\sigma},$$
$$\hat{N}(\eta, \delta): \quad \frac{(1-\bar{s})^\sigma}{\sigma} + \delta\frac{[\beta\eta A(\beta \hat{N})^{-(1-\phi)} + (1-\beta\eta)]^\sigma}{\sigma} = \frac{1}{\sigma} + \frac{\delta}{\sigma}.$$

Observe, for any $\eta \in [0,1)$, $\hat{N}(\eta, \bar{\delta}) = \left[\frac{1}{\eta}\left(1 - \frac{1-\eta}{A\beta^{-(1-\phi)}}\right)\right]^{-\frac{1}{1-\phi}}$. And, if $\hat{N}(\eta, \bar{\delta}) < 1$, then $\hat{\delta}(\eta, N) > \bar{\delta}\ \forall N \in (\hat{N}(\eta, \bar{\delta}), 1]$. The parametric condition $\hat{N}(\cdot) < 1$ ensures that, even for high warm glow, there exists a range of N, the mass of educated, at which the uneducated workers do not invest in their children's education.

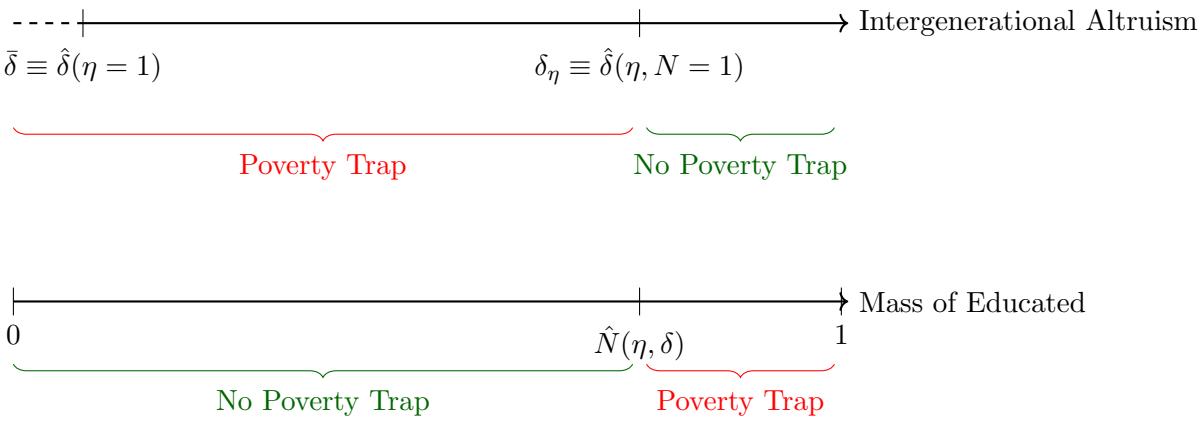

Figure 2: Pictorial representation of Definition 2

Let us provide intuition behind this definition. We first understand the effect of bias on parental warm glow such that there is a poverty trap. Recall, when the parental warm glow is large ($\delta \geq \bar{\delta}$), all unbiased parents invest with probability one. Thus, with behavioral bias, only two types of steady states are possible: (a) without a poverty trap – all parents invest with probability one, (b) with a poverty trap – only the educated invest with probability one and the uneducated do not invest. We find (b) *indeed* exists when uneducated parents are biased – ($\eta < 1$). To understand the rationale behind this we have to consider two opposing forces that the bias creates: First, uneducated parents discount the probability of an educated child from their community becoming a skilled worker. They underestimate the mass of the skilled worker, and hence their income, in the next period. However, the former dominates the latter, hence, a biased individual invests with a strictly lower probability than their unbiased counterpart. Therefore, the threshold of parental

altruism beyond which there does not exist any poverty trap must be higher than $\bar{\delta}$. As parents become more and more biased (η becomes lower) this threshold increases. Accordingly, we define $\hat{\delta}(\eta, N)$.

Now, we consider the effect of the mass of educated parents on the investment decision of the *biased* uneducated parents, and hence on the poverty trap. We find, for a given level of intergenerational altruism and bias, there exists a threshold ($\hat{N}(\eta, \delta)$) such that if the mass of educated is more than that then the society remains under a poverty trap – no uneducated invests and all uneducated families remain under poverty trap, forever; otherwise, there is no poverty trap. This is because as the mass of educated in the current period increases, the mass of future skilled workers increases and hence their income decreases. Hence, uneducated parents do not invest when the mass of currently educated parents is too high. Accordingly, we define the threshold of the educated parents $\hat{N}(\eta, \delta)$.

Finally, observe when $\eta = 1$, i.e. there is no bias in the economy, the decision problems of investment of all uneducated are the same. Thus, $\hat{\delta}(\eta = 1)$ is independent of N. And, we have $\bar{\delta} = \hat{\delta}(\eta = 1)$.

Given this definition and intuition, we are in a position to depict the main results of this paper. Before discussing those in detail, we provide a preview of our findings in Figure 3.

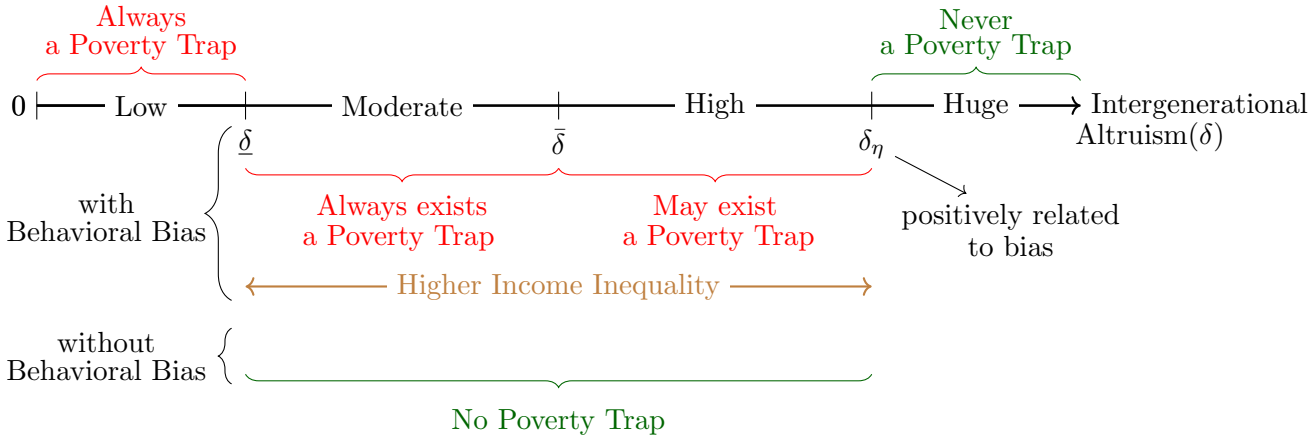

Figure 3: Implications of Behavioral Bias: A Steady State Overview [colored]

We now characterize the steady states for different ranges of parental warm glow. These characterizations demonstrate the effects of biases of uneducated parents on the steady states, and hence, on the economy in the long-run.

Proposition 2. Steady State for High Warm Glow

1. *Suppose* $\eta \in (0,1)$ *is such that* $\left[\frac{1}{\eta}\left(1 - \frac{1-\eta}{A\beta^{-(1-\phi)}}\right)\right]^{-\frac{1}{1-\phi}} < 1$. *When the warm glow parameter is high:* $\delta \in [\bar{\delta}, \delta_\eta)$ *and the mass of educated workers is larger than* $\hat{N}(\eta, \delta)$, *there is a poverty trap – all educated invest with probability one and no uneducated invest. For* $\delta \geq \delta_\eta$, *there does not exist any poverty trap.*

2. Income inequality is weakly higher with behavioral biases.

We collect all the the proofs in the Appendix.

Figure 4 depicts a numerical example where the true probability of success is 0.9 but biased parents believe it to be 0.63 (or $\eta = 0.7$).[5] Even for warm glow as high as $\delta = 0.89$, about 5% of the population ends up in a poverty trap (i.e. $\hat{N}(0.7, 0.89) = 0.958$).

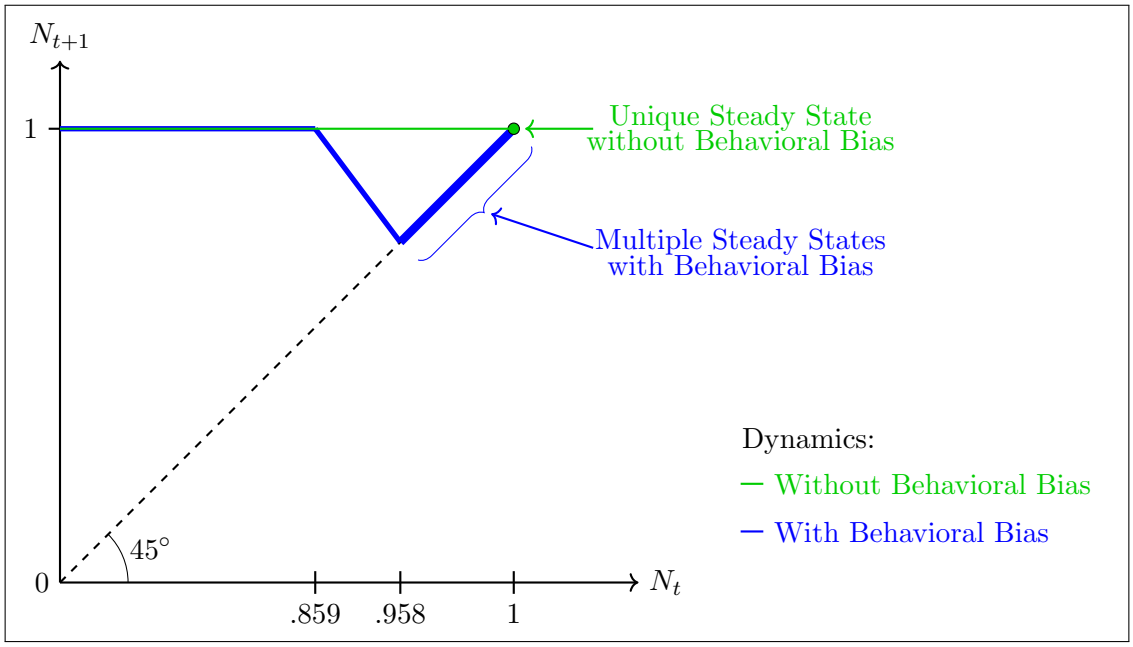

Figure 4: Dynamics and Steady States: High Intergenerational Altruism (the figure is not to scale) [colored]

Now, we consider the range of moderate warm glow parameter, $\delta \in (\underline{\delta}, \bar{\delta})$. Recall, in the absence of biases, though unskilled workers do not invest with certainty, there is no poverty trap in the economy. With biased uneducated, we find no matter how small the mass of educated be, there always exists a poverty trap.

Proposition 3. Steady State for Moderate Warm Glow

1. *With behavioral bias $\eta \in [0, 1)$, there always exists a poverty trap – all educated invest with probability one and no uneducated invest.*

2. *In any steady state with behavioral bias, as long as the educated-unskilled are investing with a positive probability, income inequality is weakly higher.*

In Figure 5, we depict the previous numerical example ($\eta = 0.7$) for a moderate warm glow (in particular $\delta = 0.51$) and find 8-14% of the population remains in a poverty trap. For some initial conditions, $N_t (\in [.703, .72]$ for example), there are multiple equilibria. Due to behavioral anomalies, there are multiple steady states and at each of them, there is a poverty trap, i.e. the descendants of an uneducated worker always remain uneducated.

[5] Recall, higher η signifies lower bias, $\eta = 1$ being no bias at all.

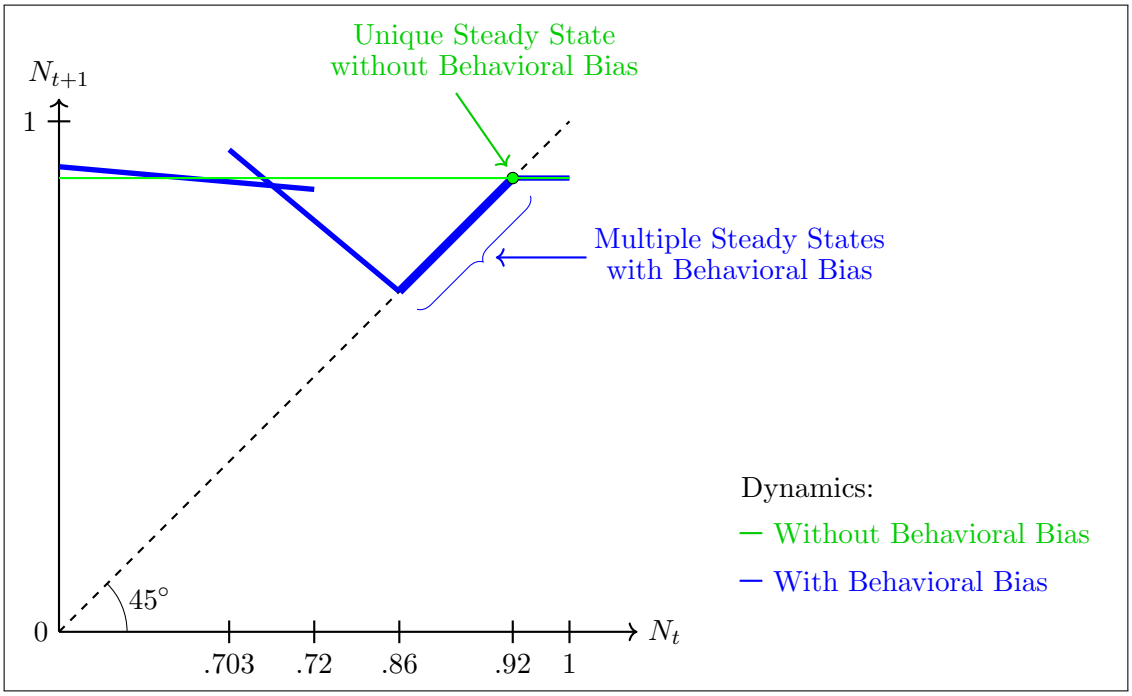

Figure 5: Dynamics and Steady States: Moderate Intergenerational Altruism (the figure is not to scale) [colored]

4 A Discussion

We have shown pessimism, even slight pessimism, causes a poverty trap. Figure 6 depicts that, for a given warm glow parameter, biases increase the steady-state mass of families which are in a poverty trap. It also depicts that, for any bias, a lower warm glow pushes a larger mass of the population into a poverty trap. In the remaining section, we discuss suggestive evidence of the effect of biases on educational investments.

While it is difficult to get data on parental beliefs about their children's future, we find empirical evidence that low confidence in schools, in general, lowers educational investments. The India Human Development Survey-II (IHDS-II) conducted in 2011-12 asks whether the heads of the household are confident in the ability of government or private schools to provide good education.[6] To match our theoretical framework, we term households who have little or no confidence in public or private schools as 'pessimistic' households. We discuss the data in more detail in the Appendix.

We find three key findings on the role of pessimism and educational investments. First, 14% of the sample report some or no confidence in government and private schools' ability to provide good education. Based on this, we can claim at a 0.01 level of significance that the share of pessimistic households in the economy is around 13.52%-14.41%. Second, households with poor socio-economic indicators tend to be more pessimistic. For example, households with lower incomes, those who come from backward caste categories, those who do not own mobiles, or those who show

[6]The survey is a nationally representative survey of 42,152 Indian households in 1,503 villages and 971 urban neighbourhoods across India.

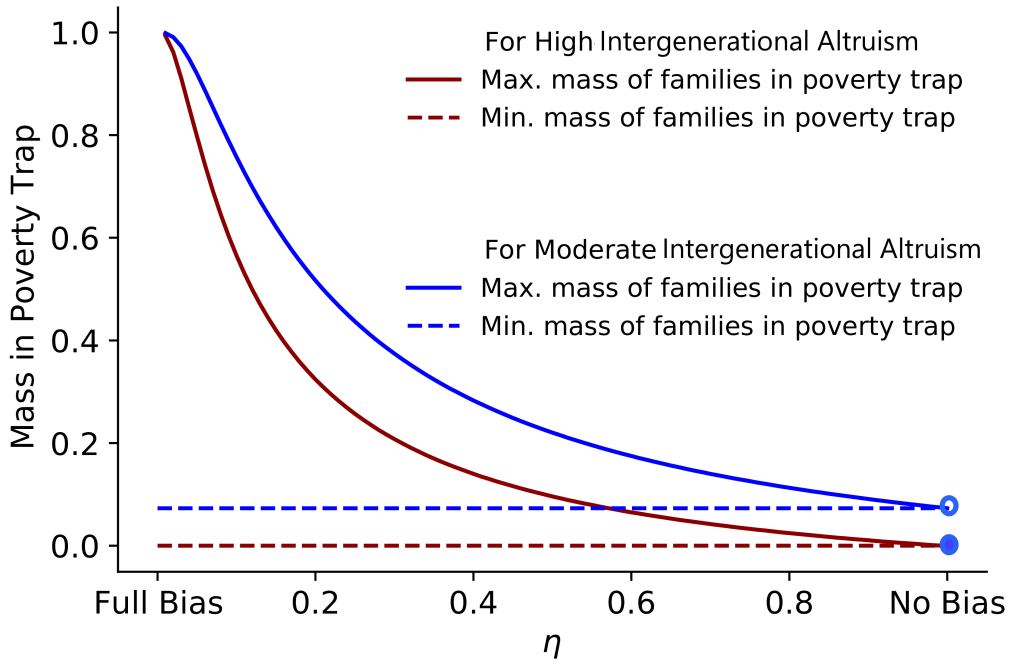

Figure 6: Range of Population Mass in Poverty Trap [colored]

weak acquaintances with professionals are more likely to be pessimistic. We report the difference in means of socio-economic indicators between the pessimistic and non-pessimistic groups in the Appendix, Table 1. Third, most importantly, pessimism adversely affects moderately important educational investments. We find that while pessimism does not affect investments in school fees, it adversely affects more important investments, such as spending on school books and private tuition.

To see the effects of pessimism on educational investments, we run a cross-sectional regression with village/neighbourhood fixed effects. Even after controlling for all socio-economic factors, we find that pessimistic households tend to invest less in school books and private tuition. (See Appendix, Tables 2 – 3). This aligns very well with our theoretical findings.

Our model shows pessimism has detrimental aggregate effects in economies with a not-huge warm glow. Our empirical exercise corroborates this claim: pessimistic beliefs do not matter for essential investments in schools, but they do for more discretionary investments such as books and private tuition. In India, books and private tuition are important means to build human capital and continuously perform well in schools. The absence of such investments makes it harder for a student to complete schooling and, hence, limits their employment opportunities to low-paying jobs in the unskilled sector.

Through a theoretical model and an empirical exercise, we have established the notion that pessimism can lead to reduced investments in important decisions (or decisions for which parental

warm glow is moderate). Such low investments may cause a poverty trap. In terms of policy implications, the theoretical model as well as our empirical exercise suggests that biases *cannot* be corrected simply via greater access to information. Instead, there is a need to design well-thought-out policies which address cognitive limitations along with other resource constraints.

References

Barrett, Christopher Brendan, Michael R Carter, Jean-Paul Chavas, and Michael R Carter, *The economics of poverty traps*, University of Chicago Press Chicago, 2019.

Das, Sreyoshi, Camelia M Kuhnen, and Stefan Nagel, "Socioeconomic Status and Macroeconomic Expectations," *The Review of Financial Studies*, 03 2019, *33* (1), 395–432.

Dasgupta, Dyotona and Anuradha Saha, "Perceptions, biases, and inequality," *Journal of Economic Behavior & Organization*, 2022, *202*, 198–210.

Galor, Oded and Joseph Zeira, "Income Distribution and Macroeconomics," *Review of Economic Studies*, 1993, *60*, 35–52.

Genicot, Garance and Debraj Ray, "Aspirations and Inequality," *Econometrica*, 2017, *85* (2), 489–519.

Ghatak, Maitreesh, "Theories of Poverty traps and Anti-Poverty Policies," *The World Bank Economic Review*, 2015, *29* (Suppl_1), S77–S105.

Jensen, Robert, "The (perceived) returns to education and the demand for schooling," *The Quarterly Journal of Economics*, 2010, *125* (2), 515–548.

Kraay, Aart and David McKenzie, "Do poverty traps exist? Assessing the evidence," *Journal of Economic Perspectives*, 2014, *28* (3), 127–148.

Laajaj, Rachid, "Endogenous time horizon and behavioral poverty trap: Theory and evidence from Mozambique," *Journal of Development Economics*, 2017, *127*, 187–208.

Oster, Emily, "Unobservable Selection and Coefficient Stability: Theory and Evidence," *Journal of Business & Economic Statistics*, 2019, *37* (2), 187–204.