The poverty challenge: How individual decision-making behavior influences poverty

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Abstract

What drives poverty? We propose a research approach to study poverty by focusing on individual decision-making behavior in which the interaction between individual's innovativeness and time preference rate is crucial to begin understanding poverty. This approach enables policy makers to formulate efficient and effective policy and provides economists with an alternative research tool to study poverty.
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1. Introduction

Wealth creation is accomplished when decision makers invest in durable goods and services, and it is the inability to create wealth that in large part determines poverty. We argue that investments in durable

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assets are fundamentally affected by the decision maker's *psychological time preference* and *innovativeness*, and that the interaction between these two factors also influences poverty as a relatively high time preference rate reduces innovativeness when the payoff horizon from innovations is short. We also contend that only when the time preference rate has declined to a take-off time preference rate can innovative behavior be stimulated and contribute to wealth creation.

2. An alternative research approach

We begin by focusing on the decision maker and what separates the poor from the non-poor population. Poverty is a multidimensional concept that at its most basic level can be viewed as the absence of sufficient wealth (e.g., Ravallion and Bidani, 1994). We contend that the ability of the decision maker to create individual wealth (W) is influenced by individual time preference (TP) and degree of innovativeness (IN), expressed as:

$$W = f(\text{TP}, \text{IN}, \text{TP*IN}). \tag{1}$$

Time preference which is well established in the *economics literature* refers to the preference for immediate utility over delayed utility (see Frederick et al. (2002) for a review), and its strength is measured by the *rate of time preference* (Camerer, 1995). Individuals with different time preferences respond differently to similar economic stimuli. Workers in developing countries are more inclined to spend increased wages on consumption rather than savings which may be rational when the average life expectancy is 38 years (e.g., Guinea-Bissa). When people live day-to-day, survival, not long-term wealth maximization, is the main goal. Research by the World Bank (1992) and Lawrence (1991) finds that poor people have relatively high time preference rates, which keeps decision makers from making durable, long-term investments (Becker and Mulligan, 1997) that are key to breaking the circle of poverty.

Another important determinant of increasing individual wealth is innovativeness (Freeman, 1994). A decision maker's attitude towards innovation is often used in *management science* and *psychological* literature to explain behavior. This attitude indicates whether decision makers are open to new experiences and novel stimuli; possess the ability to transform information about new concepts, ideas, products or services for their own use; and can recognize the application of new ideas. Schumpeter (1942) argues that innovation occurs when decision makers seize opportunities that arise from the scientific insights to introduce new products. The interaction between time preferences and innovativeness is crucial and is to the knowledge of the authors not considered in previous research; lower time preferences reinforce innovativeness as the payoffs from innovations span longer horizons.

2.1. Time preferences and innovativeness: the macro-perspective

We argue that time preferences and innovativeness can be influenced by macro-policy. The *marginal* rate of time preference ρ measures the rate at which a person is willing to trade current utility for future utility where the discount factor is $1/1+\rho$. The aggregate discount factor reflects the interest rate, but the discount factor and the time preference are specific to each individual. Traditionally, time preferences were viewed as exogenous and constant across decision makers (Samuelson, 1937), but Becker and

Mulligan (1997) challenge this notion. They argue that time preferences are influenced by, among others, the interest rate and reflect the decision maker's price for preferring goods sooner rather than later. In this framework, maintaining low interest rates reduces the time preference rate and increases durable investments. Maintaining low interest over time is important because psychological factors such as time preferences change gradually. Time preferences are also affected by *life expectancy*; the higher the life expectancy, the lower the time preference rate. Health programs and improvements in medical care, and improved educational opportunities can expand life expectancy and reduce the time preference rate. Time preferences can also be influenced by increasing the likelihood of intergenerational transfers. Decision makers may be more willing to work and consume less during their own lifetime in order to ensure that offspring have a better life. Intergenerational transfers are facilitated by an *institutional environment* that allows people to transfer wealth (e.g., banks, legal framework for transferring assets). Hence, the decision maker's time preference that supports wealth accumulation can be influenced by macro factors, such as interest rate (IR), health expenditures (HE), and institutional environment (IE) as shown in:

$$\mathrm{TP} = f(\mathrm{IR}, \mathrm{HE}, \mathrm{IE}). \tag{2}$$

Eq. (2) bridges one part of the gap between individual wealth creation and aggregate macro factors that can be influenced by policy makers.

The other bridge is *innovativeness* which is also affected by several factors. Innovativeness is influenced by the decision maker's risk attitude. Empirical research has shown that risk-taking behavior is typical of innovative managers (Nakata and Sivakumar, 1996; Bhoovaraghavan et al., 1996). Further, Shapira (1995, p 54) finds that managers unequivocally describe risk-prone managers as innovative. At the same time, heightened risk has been shown to adversely affect input decisions for some producers. Further, elicitations of the risk attitudes of farmers suggest that the levels of relative risk aversion are considerably higher among farmers in developing countries (e.g., Binswanger, 1981; Pennings and Smidts, 2000). Since risk-aversion plays an important role in adopting and investing in innovative production technology, it is important for governments to create an environment where *facilitative institutions* (such as futures markets, insurance programs, as well as credit institutions) can develop to assist decision makers to manage risk in a manner consistent with their preferences.

Innovativeness is also influenced by the *legal* and *educational systems* in which decision makers operate. The availability of a legal system that protects patents is a crucial incentive for decision makers to be innovative. The educational system provides the leadership and problem-solving capacities, and an environment to generate and disseminate new ideas. This role of education builds on its effect on time preferences that make individuals more aware of how to increase life expectancy and appreciate its value. Hence, the decision maker's innovativeness is driven by the facilitative institutions (FI), the legal system (LS), and the educational system (ES) as shown in:

$$\mathrm{IN} = f(\mathrm{FI}, \mathrm{LS}, \mathrm{ES}). \tag{3}$$

In a linear framework, a representative decision maker's wealth can be formulated as:

$$W = \alpha_1 \mathrm{TP} + \alpha_2 \mathrm{IN} + \alpha_3 \mathrm{TP*IN}. \tag{4}$$

Eq. (4) shows how decision makers' psychological characteristics are driving the wealth at the micro level. Eq. (4) stresses, by means of α_3, the importance of recognizing the interaction between decision

maker's innovativeness and time preference rate when understanding wealth creation. By substituting Eqs. (2) and (3) into Eq. (4), we can develop the relationship at a macro-level:

$$W = \alpha_1(\beta_1\text{IR} + \beta_2\text{HE} + \beta_3\text{IE}) + \alpha_2(\beta_4\text{FI} + \beta_5\text{LE} + \beta_6\text{ES})$$
$$+ \alpha_3(\alpha_1(\beta_1\text{IR} + \beta_2\text{HE} + \beta_3\text{IE})*\alpha_2(\beta_4\text{FI} + \beta_5\text{LE} + \beta_6\text{ES})). \tag{5}$$

Eq. (5) reveals the macro-factors that affect wealth creation and hence provides information on how to reduce poverty.

Our conceptual model focuses on how innovativeness and time preferences affect wealth. It is clear that wealth also affects decision makers' patience or time preference rates. In a development context, lower time preference rates stimulate wealth creation which can further lower time preference rates and increase wealth.

3. Timing

The discussion has centered on the factors that reduce poverty by enhancing innovative behavior and decreasing the time preference rate. But at what point should policy be implemented? We argue that only when the time preference rate has declined to a take-off time preference rate can innovative behavior be stimulated and contribute to wealth creation. Above that point, the struggle for physical survival is so dominant that innovativeness cannot play a role in wealth creation. Stated simply—first a minimum life expectancy and improved well being must be established before innovative behavior can be stimulated. Including this order effect yields:

$$\text{If } \text{TP} > \mu \text{ then: } W = \alpha_1(\beta_1\text{IR} + \beta_2\text{HE} + \beta_3\text{IE}) \tag{6}$$

$$\text{If } \text{TP} \leq \mu \text{ then: } W = \alpha_1(\beta_1\text{IR} + \beta_2\text{HE} + \beta_3\text{IE}) + \alpha_2(\beta_4\text{FI} + \beta_5\text{LE} + \beta_6\text{ES})$$
$$+ \alpha_3(\alpha_1(\beta_1\text{IR} + \beta_2\text{HE} + \beta_3\text{IE})*\alpha_2(\beta_4\text{FI} + \beta_5\text{IE} + \beta_6\text{ES})) \tag{7}$$

where μ is the take-off time preference rate.

4. Discussion and research agenda

In this paper, we link individual innovativeness, time preference rate and wealth in a framework for identifying their interaction and potential effects on poverty reduction. This time preference–innovativeness framework carries implications for developing countries, foreign aid organizations, UN policy, IMF, World Bank, universities and national policies of developed countries. It suggests that policy directed at poverty may be most effective when consistent with individual decision-making processes, focusing on innovativeness and time preferences, in particularly the interaction between them. Priority should be given to achieving the take-off time preference rate. Steps to stimulate wealth development through innovative behavior before a take-off time preference rate level has been achieved may be counterproductive. Funds obtained by governments through exports, other revenue-generating and transfer programs should be directed to first achieving the take-off time preference rate through investments in the health, and in financial, legal, and educational systems that affect time preferences.

Our decision-making behavior focus recognizes the importance of the individual as focal point of economic phenomena. Efforts should be made to carefully determine the relationships between factors influencing changes in wealth and poverty at the micro and macro levels in a context that allows for heterogeneous behavior. Research also is needed to determine empirically the take-off preference rate in different countries. Such work could assist decision makers to identify how policy instruments can be most effectively implemented to stimulate wealth creation and to reduce poverty.

Acknowledgments

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