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Microcredit and development in an occupational choice model

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ABSTRACT

The existing literature on macroeconomic implications of microcredit is too generic and does not reflect some important characteristics of microenterprises. This paper proposes a potentially useful approach of modeling microcredit interventions in an occupational choice model.

1. Introduction

Although poverty and economic development occupy a significant slot in macroeconomic research, theoretical literature has been relatively quiet about macroeconomic implications of microcredit—the foremost contemporary mechanism of poverty alleviation. One explanation for it lies with the difficulty of accounting for microcredit in macroeconomic models.

The models of Ahlin and Jiang (2008) and Batbekh and Blackburn (2008), possibly the only papers on this subject to date, introduce microcredit in an occupational choice framework (Banerjee and Newman, 1993) as a decrease in the cutoff level of individual wealth for access to capital. Otherwise the businesses run by microentrepreneurs are defined in a conventional way of corporate finance.[1]

Unfortunately, these models are somewhat generic and do not reflect certain important characteristics of microenterprises. For example, in these models, the poor can gain access to financing as a result of shocks other than microcredit intervention. The social planner can make some poor richer by raising welfare packages or giving the poor other types of financial transfers. They do not necessarily have to cut the threshold value of wealth but can put some of the poor above that threshold and still be taken as microcredit.

To remedy this methodological problem this paper proposes a potentially useful approach of modeling microcredit interventions in macroeconomic models. This approach reflects the fact that microcredit normally supports microenterprises that employ primitive and easily imitable production technologies. Increase in the number of microentrepreneurs creates predatory competition. This is captured by setting the probability of success of individual microentrepreneurs dependent on the population of microentrepreneurs. Higher number of microentrepreneurs reduces the probability of success while smaller number of microentrepreneurs increases it. The idea borrows from the predator–prey models of evolutionary biology where higher number of prey species enables growth of predators and smaller number of prey causes reduction in their population.

The paper proceeds as follows. Section 2 discusses the reference model. Section 3 introduces the dynamic probability measure for the success of microentrepreneurs, and derives a result in contrast to that of the reference model. Section 4 offers concluding remarks.

2. The reference model

2.1. The setup

The reference model is that of Ahlin and Jiang (2008), henceforth AJ'08, with the following basic setup. The economy is

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[1] See Tirole (2006) for extensive textbook treatment.

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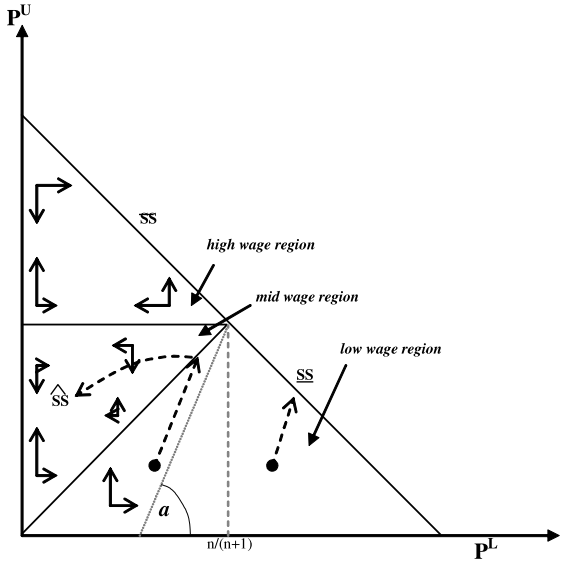

Fig. 1. Aggregate wealth dynamics with $a > \frac{1}{n}$.

closed and consists of a unit mass of heterogeneously wealthy agents. Two cutoff levels, w^{**} and w^{*}, of wealth divide the society into three classes respectively: upper, middle and lower class.

Individuals in each class have to choose between being employed (if the labor market offers sufficiently high wages) or running a business (if otherwise). The upper class has the most flexibility in occupational choice as its members are capable of pledging sufficient collateral to access credit markets to launch a business. Middle class can pledge less than the upper class. Lower class is excluded from financing due to a lack of collateralizable assets.

Microcredit represents an improvement in the capital market and lowers the value of the required collateral. It reduces the cutoff level of wealth between the middle and lower class, w^{*}, by giving access to credit to the richer of the poor. Microcredit enters the model as the growth in the middle class mirrored by an equal decline in the lower class population. The shares of the upper, middle and lower classes in the total population at time t are denoted respectively by P_t^U, P_t^M and P_t^L. Since they form a simplex, the population dynamics can be visualized in a two dimensional (P^U, P^L) plane (see Fig. 1).

2.2. Population dynamics

There are two production technologies available in the economy: entrepreneurship and self-employment. The equilibrium wage in the labor market can also take three values $\underline{v}$, $\widehat{v}$ and $\overline{v}$ such that: $\underline{v} < w^{*} < \widehat{v} < w^{**} < \overline{v}$.

The upper class agents, which have at least w^{**} of owned assets, are wealthy enough to access entrepreneurship, the more efficient production technology. It requires capital K^E, n employees and the manager, or $n+1$ individuals in total. The returns from such enterprises can be high or low with probabilities π_h^E and π_l^E respectively. Low returns create enough losses for the owner to migrate down from his class.

The expected output per unit of labor in entrepreneurship determines the equilibrium wage $\overline{v}$. If the wages are higher then everybody chooses to supply labor (including all the upper class agents) pulling the wages down. If the wage is lower than $\overline{v}$ (but above w^{**}) then everybody in the upper class becomes an entrepreneur creating the demand for nP_t^U units of labor. Excess demand of labor, when $nP_t^U > P_t^L + P_t^M$, increases the wage up to the equilibrium level of $\overline{v}$. At that level the upper class agents are indifferent between running a business or getting a job. Under this scenario the evolution of the economy is described by the following system:

$$\begin{cases} \dot{P}_t^U = (1 - P_t^U) - \dfrac{\pi_l^E}{1+n} \\ \dot{P}_t^L = -P_t^L + \dfrac{\pi_l^E}{1+n}. \end{cases}$$

The first equation says the change in the upper class population comes from all middle and lower class agents taking a high wage job less the fraction of unlucky entrepreneurs who drop to the lower class. The maximum possible number, and the actual number when the wage is $\overline{v}$, of entrepreneurs is $1/(n+1)$. The second equation says the change in the lower class population consists of all unlucky entrepreneurs less the poor who migrate to the upper class due to high wages. The steady state of this system $\overline{SS}$ is

$$\begin{cases} \left[P_t^U\right]_{\overline{SS}} = 1 - \dfrac{\pi_l^E}{1+n} \\ \left[P_t^L\right]_{\overline{SS}} = \dfrac{\pi_l^E}{1+n}. \end{cases}$$

The members of the middle class can only access the less efficient technology that requires capital K^S and one worker. This technology, self-employment, embodies projects that can be undertaken via microcredit. The returns from such projects can be high, medium or low. Such microentrepreneurs can only migrate to the upper class if they earn high returns. Similarly, low returns move the agent to the lower class while medium returns allow her to stay in the middle class. Probabilities of high, medium and low returns are π_h^S, π_m^S and π_l^S respectively.

The expected output of self-employment determines the medium level equilibrium wage $\widehat{v}$ that makes the middle class agents indifferent between getting a job and undertaking self-employment. This will be the case when the demand for labor from the upper class entrepreneurs excludes a part of the middle class population $P_t^L < nP_t^U < P_t^L + P_t^M$. The dynamics of the economy is then given by:

$$\begin{cases} \dot{P}_t^U = \pi_h^S \left(1 - (n+1)P_t^U\right) - \pi_l^E P_t^U \\ \dot{P}_t^L = \pi_l^S \left(1 - (n+1)P_t^U\right) - P_t^L. \end{cases}$$

Here, mobility to the upper class is provided by the successful self-employed microentrepreneurs[2] less unsuccessful upper class entrepreneurs. At the same time, unsuccessful microentrepreneurs migrate down to the lower class where all the members have moved up by getting a job. The steady state of this system $\widehat{SS}$ is reached at

$$\begin{cases} \left[P_t^U\right]_{\widehat{SS}} = \dfrac{\pi_l^E/a}{n+1+\pi_l^E/\pi_h^S} \\ \left[P_t^L\right]_{\widehat{SS}} = \dfrac{1}{n+1+\pi_l^E/\pi_h^S} \end{cases}$$

where $a = \pi_h^S/\pi_l^S$.

The lower class agents have no access to any production technology and can only either subsist or work for an entrepreneur. When the equilibrium wage is low at $\underline{v}$ it means that there are very few entrepreneurs and the wage is bid down. For simplicity it is assumed that $\underline{v}$ is so low that even if an entrepreneur fails

[2] Here $1-(n+1)P_t^U$ is the self-employed in the middle class, i.e. the population of microentrepreneurs.