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Is microfinance raising village income? The issue of excess entry☆

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HIGHLIGHTS

- Microfinance does not always raise village income, and may even lower it.
- The problem is excess entry into existing industries, which may be facilitated by microfinance.
- Excess entry into existing industries can crowd out more innovative business activity, because of its effect on village wages.

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ABSTRACT

This paper offers new insight into the question of why we have not seen microfinance programs lift beneficiary regions out of poverty. We suggest that the explanation may lie in the industry choice of microfinance participants: if borrowers tend to enter imperfectly competitive sectors, such as retail, there may be a "business-stealing" effect that reduces incomes of existing businesses. Our model shows that microfinance may lower total incomes at the village level. The result is related to the classic Mankiw and Whinston (1986) result on excess entry. The results imply that microfinance organizations may want to steer recipients away from the petty retail sector in some markets.

1. Introduction

There is a growing body of evidence to suggest that microfinance is not having the desired effect of lifting communities out of poverty.[1] To date, the literature has focused on scale as the problem: the businesses started by microfinance recipients do not grow because owners do not borrow enough to achieve a profitable scale. Scale creates the possibility of a poverty trap (Banerjee and Newman, 1993) which can be amplified by microfinance (Ahlin and Jiang, 2008).

We offer a different explanation based on industry choice: Given that poor micro-entrepreneurs are exposed to high levels of risk (Banerjee and Duflo, 2012 Ch.6), they are likely to choose a well-worn and low-risk path to self-employment, by copying their neighbors. If their neighbor runs a small grocery store, they will open a similar one; if their neighbor sells tacos along the highway, they will do likewise.

This paper demonstrates that if microfinance recipients enter existing industries characterized by imperfect competition, such as petty trade, the village can be worse off as a result of increased access to microfinance. The model is related to the classic result by Mankiw and Whinston (1986) on excess entry: the new firm steals some business from previously existing firms, and thus entry can be individually profitable but not socially optimal.[2] Specifically, because the wage rate is endogenously determined, these entrants have a negative impact on the incentive to start more innovative businesses.[3]

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1 Overall, studies have documented some benefits of microfinance for the beneficiary family in the short run (Angelucci et al., 2015; Attanasio et al., 2015) while the long-run benefits appear to be relatively small (Banerjee et al., 2015).

2 Thus (Oo and Toth, 2014) provide experimental evidence showing that Vietnamese microenterprises may exert social pressure on each other not to perform too well, because strong performers hurt others' profits.

3 Kaboski and Townsend (2012) find that the primary impact of microfinance is on wages.

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2. Model of entry

We model the village as a type of "open economy" in order to measure firms' contribution to village income. The village sells all its output to the city; income is used to purchase a consumer good from the city.

There are three inputs: labor L, land A, and startup capital K. Agricultural output is produced from L_A units of labor and all of the land A^{tot}, using a constant returns to scale technology $F(A^{tot}, L_A)$. The agricultural good is the *numéraire*.[4] The wage rate will determine the allocation of labor across sectors, and thus

$$w = \frac{\partial F(A^{tot}, L_A)}{\partial L_A}. \tag{1}$$

The timing is as follows:

- Period 1: Villagers simultaneously choose whether to innovate (which we model as starting a new industry in which they are the only firm) or to enter an existing non-agricultural industry and compete against other firms.
- Period 2: The profitability of each industry is realized.

We denote the number of innovative firms N_i and the number of firms in *each* existing industry N_e. (We ignore integer constraints on N_e and N_i for brevity.)

Villagers borrow startup capital K from village moneylenders, who source funds from the city at the market interest rate r^*, and then lend at a rate $r > r^*$. Thus villagers will enter each existing industry until N_e firms break even, and each firm sells the quantity q_e that maximizes profits:

$$P(N_e, q_e)q_e - wq_e = K(1+r) \tag{2}$$

$$P_2(N_e, q_e)q_e + P(N_e, q_e) = w. \tag{3}$$

Assumption 1. $P_1 = \frac{\partial P}{\partial N_e} < 0$.

Assumption 1 implies that there is a business-stealing effect: new entrants will reduce the prices earned by existing firms (Mankiw and Whinston, 1986). This setup encompasses Cournot competition and differentiated Bertrand competition, including geographically differentiated competition.

Innovative industries are successful with exogenous probability p. Risk-neutral villagers will start innovative industries until they break even in expectation:

$$p(P(1, q_i)q_i - wq_i) = K(1+r) \tag{4}$$

$$P_2(1, q_i)q_i + P(1, q_i) = w \tag{5}$$

where q_i is the profit-maximizing quantity sold by an innovator whose industry proves profitable.

Let $\bar{N}_i$ and $\bar{N}_e$ be the equilibrium values of N_i and N_e. If there are m existing industries, village income is

$$V = F(A^{tot}, L_A) + m\bar{N}_e P(\bar{N}_e, q_e)q_e - m\bar{N}_e K(1+r) + p\bar{N}_i P(1, q_i)q_i - \bar{N}_i K(1+r) \tag{6}$$

Let N_i^* and N_e^* be the values that would maximize V.

Proposition 1. *Suppose that villagers are risk-neutral, and that they can all borrow at the market interest rate r^*.*

a. *If $m = 0$, $\bar{N}_i = N_i^*$.*
b. *If $m > 0$, (i) $\bar{N}_e > N_e^*$ and (ii) $\bar{N}_i < N_i^*$.*

[4] We are assuming that the village is too small to affect the price of the agricultural good and the consumer good. Thus village income in terms of the agricultural good is a sufficient measure of welfare.

Proof of 1(b)i. We show that the derivative of village income V with respect to N_e is negative. Eqs. (4) and (5) determine the value of w and q_i. Then $\frac{dq_e}{dN_e}$ is implicitly defined by Eq. (2). Considering the total labor supply constraint leads to an implicit relationship between N_i and N_e:

$$L_A(w) + mN_e q_e + pN_i q_i = L^{tot}$$

$$\Rightarrow \frac{dN_i}{dN_e} = \frac{-mq_e - mN_e \frac{dq_e}{dN_e}}{pq_i}.$$

Differentiating Eq. (6) and simplifying using Eqs. (2)–(4):

$$\begin{aligned}
\left.\frac{dV}{dN_e}\right|_{N_e=\bar{N}_e} &= \frac{\partial V}{\partial N_e} + \left(\frac{\partial V}{\partial q_e} \times \frac{dq_e}{dN_e}\right) + \left(\frac{\partial V}{\partial N_i} \times \frac{dN_i}{dN_e}\right) \\
&= m\Bigg[Pq_e - K(1+r) + N_e P_1 q_e + (N_e P + N_e P_2 q_e) \\
&\quad \times \frac{dq_e}{dN_e} + pwq_i \times \frac{-q_e - N_e\frac{dq_e}{dN_e}}{pq_i}\Bigg] \\
&= m\Bigg[wq_e + N_e P_1 q_e + N_e w \times \frac{dq_e}{dN_e} \\
&\quad + w \times \left(-q_e - N_e \frac{dq_e}{dN_e}\right)\Bigg] \\
&= mN_e P_1 q_e < 0. \quad \blacksquare
\end{aligned}$$

Proof of 1(a) and 1(b)ii. See Appendix.

In innovative industries there is no business-stealing effect, and thus private and social incentives are aligned. Therefore the optimal level of innovation will take place if there are no 'existing industries' (Proposition 1a). But existing industries are characterized by excess entry because of the business-stealing effect. The proof demonstrates that the impact of entry into existing industries is negative at the margin, precisely because $P_1 < 0$. The impact is negative because the wage increase from excess entry crowds out entry into innovation.

3. The role of microfinance

We model microfinance as providing capital to villagers at a lower interest rate than village moneylenders: $r > r^m \geq r^*$. Let $\bar{N}_i^m$ and $\bar{N}_e^m$ be the equilibrium level of entry if the interest rate is r^m for **all** borrowers. Initially we model villagers as risk-neutral.

In the absence of business-stealing, microfinance is beneficial because the village interest rate was above the market rate, and therefore there were too few innovators:

Corollary 1. *If $m = 0$, then $\bar{N}_i < \bar{N}_i^m < N_i^*$.*

Now we turn to an environment with existing industries. In that case, microfinance may or may not be harmful:

Corollary 2. *If $m > 0$, there exists a threshold level $\hat{K}$ and interest rate $\hat{r}$ such that*

- *If $K \geq \hat{K}$ and $r \leq \hat{r}$, then $\bar{N}_i = \bar{N}_i^m = 0$, and $\bar{N}_e^m > \bar{N}_e > N_e^*$.*
- *If $K < \hat{K}$, then $N_i^* > \bar{N}_i^m > \bar{N}_i$ and $\bar{N}_e > \bar{N}_e^m$.*

Proof. For any wage w, there exists a value of N_e such that the variable profits of an innovative firm π_i and an existing firm π_e are equal (because existing firm profits are higher at $N_e = 1$ and then fall with N_e):

$$\big(P(1, q_i(w)) - w\big)pq_i(w) = \big(P(N_e, q_e(N_e, w)) - w\big)q_e(N_e, w) \tag{7}$$