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## **Abstract**

We present a simple model in which a borrower with no collateral can either borrow from a moneylender with enforcement technology or from other potential lenders who do not have an enforcement technology and must rely on self-enforcing contracts to ensure that the borrower does not default voluntarily. We show that with many potential lenders without an enforcement technology, an equilibrium does not exist in which they will lend to borrowers without collateral unless they can commit not to extend loans to a borrower who has defaulted on a loan to any other lender without the enforcement technology. We argue that franchising can offer such a commitment technology. We show that with both the moneylender and franchisee lenders, the borrower is induced to borrow from the moneylender first even though some franchisee would have charged a smaller interest rate. The borrower welfare is higher if a moneylender is present in addition to franchisee lenders.

# 1 Introduction

Access to credit remains a matter of great importance in the rural sectors of developing economies. Significant efforts continue to be made to ameliorate the situation. Governments are undertaking various schemes to facilitate the process, either directly or indirectly. In India, for instance, various arms of the government offer both direct and indirect assistance in the form of subsidized interest rates on loans, requiring lending to “priority sectors” such as agriculture, promoting self-help groups (SHGs), and so on. Despite years of such efforts, significant portions of the rural poor are unable to access funds. Instead, the role of moneylenders continues to be critical in the provision of credit to the rural poor.

Moneylenders are an important source of funds in the rural economy. They are, however, known to charge usurious rates of interest, typically much higher than the prevailing market rates. The high interest rates are often attributed to the monopoly position of the moneylender arising perhaps from their informational advantage. Moneylenders are also believed to have the ability to monitor and enforce a contract thereby reducing the borrower’s incentive to default voluntarily. This could be the result of repeated interaction between a moneylender and a small group of borrowers belonging to the same community or greater proximity, allowing improved monitoring and enforcement with the help of social and/or physical sanctions.

It is alleged that borrowers usually have no other alternative source of funds. Financial intermediaries, such as banks, suffer from an informational disadvantage and the consequent costs associated with adverse selection and moral hazard may prevent them from profitably extending loans to borrowers with no collateral. It is not surprising why many schemes to extend credit to the rural poor do not survive unless they are heavily subsidized by the government. Even the very successful microfinance programs seem to depend critically on donor funds and socially conscious investors who are willing to accept a financial loss.<sup>1</sup>

In this paper, we argue that there exist many individuals in the neighborhood of any given borrower who possess relevant information about the borrower that is helpful in screening and monitoring the borrower. Some of these individuals may possess (possibly illiquid) collateral (such as houses, jewelery and animals) against which they could obtain loans from various financial intermediaries such as banks for on-lending to borrowers without such collateral but in need of

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<sup>1</sup>Morduch (1998).

funds. These potential lenders, let us call them local capitalists, may, however, lack the necessary enforcement technology that is available to the moneylender. They would have to rely on self-enforcing contracts to prevent the borrower from defaulting voluntarily. The fact that there may be many such local capitalists may, paradoxically, lead to a counterproductive outcome. This is because following default against one lender, the borrower may approach another lender for a loan subsequently. The possibility of voluntary default by a borrower in the presence of multiple lenders without an effective enforcement technology reduces and may eliminate the lenders' incentive to offer a loan in the first place. As a result, the borrower may be left with the monopolist moneylender as the only feasible source of credit often at usurious rates of interest.

The risk of voluntary default adversely affects both borrowers and local capitalists who could act as potential lenders. For the borrowers, there are fewer funding sources (often, only one) as a result. A lack of competition leads to high interest rates on loans. Local capitalists, on the other hand, lose a potential market for making profitable loans using funds borrowed against their assets from financial intermediaries such as banks. We argue that one possible institution that can overcome these problems that arise from voluntary default is Franchising.

The borrower's incentive for voluntary default arises from each lender's inability to credibly commit to not lending to a previous defaulter. Each lender may have an incentive to lend even if the borrower has defaulted in the past against another lender. This in turn provides the borrower with the incentive to default voluntarily. However, consider a franchising contract whereby each franchisee is required to refuse credit to a borrower who may have defaulted against another franchisee. If such an arrangement can attract local capitalists as lenders belonging to the franchise, it would reduce the borrower's incentive to voluntary default. There would be fewer opportunities for getting another loan if she defaults against a lender. Each franchisee would however be allowed to compete against other members for the borrower's business. The incentive for a local capitalist to become a franchisee would be the possibility of making a loan profitably where no such market is feasible in the absence of the franchise agreement.

We develop a simple model to formalize this notion of franchising. The model allows competition between a moneylender and many local capitalists who lend as franchisees. We obtain a remarkable result that competition between the moneylender and local capitalist franchisees forces the moneylender to reduce the interest rate charged to such an extent that the borrower is induced to

borrow from the moneylender first even though some local capitalist franchisee would have charged a smaller interest rate. It is only after the borrower is forced to default on the moneylender that he uses the option of borrowing from local capitalist franchisees. Also, we show that the borrower welfare is higher if a moneylender is present in addition to local capitalists as potential franchisee lenders.

## 2 The Model

We assume a local area, *e.g.*, a small village economy, with three sets of players - borrowers, moneylenders with enforcement technologies, and local capitalists with (possibly illiquid) collateral against which they can borrow funds from financial intermediaries to potentially lend to borrowers with no collateral. All players are risk neutral.

In every period, a borrower without any collateral and without any funds of his own, needs \$1 to fund a project. In the next period, the project generates a gross payoff,  $R$ , with probability  $p$ , and 0 otherwise. The project is a positive NPV project,  $\frac{pR}{1+r^f} > 1$  where all risk-neutral agents discount future cash flows at the risk-free rate  $r^f$ . Let  $r^d$  denote the discount rate adjusted for the condition that the positive payoff  $R$  is obtained only with probability  $p < 1$ . Thus

$$1 + r^d = \frac{1 + r^f}{p}. \quad (1)$$

The only contract that moneylenders can offer is a standard loan contract. For each borrower, there is a single moneylender in the village with two distinctive characteristics. One, he has the ability to enforce the loan contract.<sup>2</sup> We define enforcement as the ability of the moneylender to impose a cost on the borrower, explicit or implicit, either through social sanctions or physical sanctions, equal or greater than what is owed to him by the borrower. This ensures that the borrower obtains no benefit from voluntarily defaulting against the moneylender. Second, the moneylender incurs zero fixed cost of screening and monitoring the borrower.

There are a number of local capitalists in the village who own assets that they can pledge as collateral to borrow from banks at the risk-free rate. However, they do not have an enforcement technology of the type that is available to the moneylender. In addition, each such local capitalist incurs a

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<sup>2</sup>See Hoff and Stiglitz (1998) for a model with endogenous enforcement costs and effects of subsidies that might reduce these costs.

unique cost of screening and monitoring the loan (let us call it transaction cost of lending) to a given borrower every time he enters into a loan contract with the borrower. Local capitalists are differentially familiar with a borrower. The more familiar is the local capitalist, the lower is his transaction cost. Note that these costs are specific to the borrower. In other words, a local capitalist will have different transaction costs for different borrowers. Without any loss of generality let us denote these costs as

$$0 < c^1 < c^2 < c^3 < \dots\dots$$

(For simplicity, we will not carry any notation denoting the borrower.) One way to think about this is that the transaction cost is based on the distance between the lender and the borrower. Lenders incur a cost of monitoring to ensure that the funds are being used for the declared purpose. So, the closer the borrower, the lower the transaction cost. The moneylender is the extreme form where he incurs no transaction cost and is also able to prevent a willful defaulter from enjoying the spoils of default.

We assume that project return, success probability, discount rates and lenders' transaction costs are all common knowledge. We further assume that borrowers have limited liability and funds that the borrower does not commit to a project cannot be laid claim upon in case of loan default. In other words, enforcement costs are implicitly assumed to be prohibitive for the local capitalists. The borrower can consume the funds after defaulting voluntarily but cannot default and invest these funds in future projects (in essence become her own banker for future projects).<sup>3</sup>

In case the project fails, the borrower would be forced to default. However, a borrower can also default voluntarily when the project is successful. We assume that lenders cannot identify the reason for defaulting. Each lender chooses never to re-lend to a borrower who has defaulted on his loan to him.<sup>4</sup>

In every period, there are two stages. In stage one, a lender decides whether to lend to a specific borrower or not, and what interest rate ( $r$ ) to charge. Then the borrower decides whether to undertake the project. If she decides to undertake the project, she chooses the lender to borrow from. In stage two, payoffs are realized and a borrower decides whether or not to default on the

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<sup>3</sup>See Chowdhry (1991).

<sup>4</sup>This can be supported by a reputation argument in which a lender deviating from this policy might be flooded by defaults by his other borrowers.

loan. The same game can be repeated over multiple periods for every borrower.

Borrower's participation constraint is simply that the total amount owed, the principal payment of 1 plus the interest payment of  $r$  amount owed cannot exceed the gross payoff from the project. Formally,

$$1 + r \leq R.$$

Lenders' participation constraints are that they must expect to recover the amount owed plus the transaction cost of making the loan,  $c$ . For the moneylender  $c = 0$ . For local capitalists  $c$  is positive. Let  $r^0(c)$  denote the minimum interest that a lender must charge to break-even (make zero expected profits). Thus  $1 + r^0(c)$  represents the total cost making a loan of 1 to the borrower. For the money lender, the total cost of lending is given by

$$1 + r^0(0) = 1 + r^d. \tag{2}$$

For a local capitalist with transaction cost  $c$ ,

$$1 + r^0(c) = (1 + r^d)(1 + c). \tag{3}$$

It is easy to see that

$$r^0(0) < r^0(c^1) < r^0(c^2) < r^0(c^3) < \dots\dots$$

Lenders' participation constraints, then are that the interest charged must be such that it exceeds the cost of lending. Formally,

$$1 + r \geq 1 + r^0(c). \tag{4}$$

## 2.1 A Monopolist Moneylender

We assumed that for every borrower, there exists a moneylender with zero transaction cost of lending and an enforcement technology. Suppose moneylender is the only lender willing to make a loan to the given borrower. In this case, because he is a monopolist, he will extract all the surplus possible and charge an interest rate  $r^M$  such that

$$1 + r^M = R.$$

This fits in well with the observation that borrowers in many cases face a monopolist moneylender who charges usurious rates on interest. So the borrower has a net payoff of 0. The entire surplus

that the moneylender enjoys is due to his monopoly position since in a competitive market, he would have charged  $r^0(0)$  and not suffered any voluntary default given his enforcement technology.

## 2.2 Many Local Capitalists as Potential Lenders

Now suppose that in addition to the moneylender, there exist many local capitalists who could potentially lend to the borrower. Let us look at borrower's incentives.

Let  $V_n$  denote the present value of borrower's surplus when there are  $n$  possible local capitalists she could potentially borrow from sequentially after each successive default. If the borrower does not default voluntarily, then with probability  $p$ , the project returns  $R$ , the borrower repays  $(1 + r_n)$  and she is in the same situation as before. With probability  $(1 - p)$ , the project returns zero, the borrower is forced to default and she now has only  $n - 1$  opportunities left for defaulting. Formally,

$$V_n = \frac{p\{R - (1 + r_n) + V_n\} + (1 - p)V_{n-1}}{1 + r^f}.$$

Clearly,  $V_0 = 0$  since there are no further credit opportunities to borrow from local capitalists. Whether the moneylender is still available to borrow from after exhausting all possible opportunities to borrow from local capitalists does not affect  $V_n$  since the borrower's surplus is zero when the moneylender is the last possible source of loans. Solving, we get

$$V_n = \frac{R - (1 + r_n)}{r^d} + \left[ \frac{(1 - p)}{(1 - p) + r^f} \right] V_{n-1}. \quad (5)$$

The first term in the above expression represents the present value of the surplus  $R - (1 + r_n)$  in perpetuity discounted at  $r^d$  which can be thought of as the risk-free rate adjusted for the probability of default by the borrower. For  $n = 1$ ,

$$V_1 = \frac{R - (1 + r_1)}{r^d}.$$

The borrower will choose not to default if what she owes to the lender  $(1 + r_1)$  is smaller than the value  $V_1$  from not defaulting. Formally, this condition is expressed as

$$(1 + r_1) \leq V_1 = \frac{R - (1 + r_1)}{r^d}.$$

Simplifying, we get

$$(1 + r_1) \leq \frac{R}{1 + r^d} \leq V_1. \quad (6)$$

Combining this with lenders' participation constraint (4), we get

$$1 + r^0(c) \leq \frac{R}{1 + r^d}. \quad (7)$$

This gives us our first proposition.

**Proposition 1** *If there is no lender with cost of lending  $1 + r^0(c)$  to the borrower smaller than*

$$\frac{R}{1 + r^d},$$

*the borrower will only be able to borrow from the monopolist lender who will extract all surplus.*

Financial intermediaries such as banks may be characterized by high transaction costs of lending (partly caused by asymmetric information) and no technology to enforce loan contracts such that (7) is violated which may explain why they are not able to loan to borrowers without collateral without suffering losses caused by frequent defaults by borrowers. We assume that there exist many local capitalists who possess relevant local information about any given borrower such that their transaction cost  $c$  is small enough that condition (7) is satisfied. We will now show that the mere presence of many such local capitalists does not guarantee that they will be willing to lend to the borrower with no collateral.

We derive a condition for the borrower not defaulting voluntarily when she has two opportunities for defaulting before exhausting all sources of credit from local capitalists. Substituting  $n = 2$  in (5), we get

$$V_2 = \frac{R - (1 + r_2)}{r^d} + \left[ \frac{(1 - p)}{(1 - p) + r^f} \right] V_1$$

which implies that

$$V_2 - V_1 = \frac{R - (1 + r_2)}{r^d} - \left[ \frac{r^f}{(1 - p) + r^f} \right] V_1.$$

Since  $V_1 \geq \frac{R}{1 + r^d}$  from (6), we get

$$V_2 - V_1 \leq \frac{R - (1 + r_2)}{r^d} - \left[ \frac{r^f}{(1 - p) + r^f} \right] \frac{R}{1 + r^d}.$$

The term  $V_2 - V_1$  represents the penalty of defaulting voluntarily when there are two opportunities to borrow from local capitalists because by defaulting voluntarily, the borrower forgoes one of the two opportunities. When  $n = 2$ , the borrower will choose not to default if

$$(1 + r_2) \leq V_2 - V_1 \leq \frac{R - (1 + r_2)}{r^d} - \left[ \frac{r^f}{(1 - p) + r^f} \right] \frac{R}{1 + r^d}.$$

Simplifying, we get

$$(1 + r_2) \leq \frac{1}{1 + r^f} \left[ \frac{R}{1 + r^d} \right].$$

Again, combining this with lenders' participation constraint, we get

$$1 + r^0(c) \leq \frac{1}{(1 + r^f)} \left[ \frac{R}{1 + r^d} \right]. \quad (8)$$

**Proposition 2** *Assume that there exist many local capitalists with costs of lending  $1 + r^0(c)$  such that*

$$\frac{1}{(1 + r^f)} \frac{R}{1 + r^d} < 1 + r^0(c) < \frac{R}{1 + r^d}.$$

*Lending by local capitalists, even though it is feasible, is not an equilibrium outcome.*

*Proof:* The condition on cost of lending satisfies (7) but violates (8). In this case, any of these local capitalists will be willing to lend to the borrower if he knew that the borrower will not get an opportunity to borrow again from any other (current or future) local capitalist. But no local capitalist wants to be the first to offer the loan because he knows that the minimum interest rate that he must charge to recover his costs are so high that the borrower has an incentive to default on the loan offered by the local capitalist and then subsequently borrow from the another (current or future) local capitalist. So, lending by local capitalists, even though it is feasible, is not an equilibrium outcome. ■

### 2.2.1 A Franchising Solution

Lending by local capitalists fails to occur in equilibrium because of a coordination failure on the part of these potential lenders. Each local capitalist has an incentive to make a loan to the borrower who may have defaulted against another local capitalist lender. If it were possible for local capitalists to credibly commit to not extend credit to a borrower who has defaulted on another lender's loan, the borrower would effectively face a single typical local capitalist lender and will have an incentive not to default voluntarily.

One mechanism for such a credible commitment would be the institution of franchising. Suppose that there exists an external player that offers a franchise to all local capitalists who can become potential lenders. The terms of the franchise are that no franchisee can offer a loan to a borrower

who may have defaulted against any franchisee lender. However, there is no restriction on the interest rate that any participating franchisee may charge.

Assume that the moneylender does not obtain the franchise but the local capitalists do. So, a default against the local capitalist franchisee does not preclude the moneylender from extending another loan to the borrower and vice versa. With local capitalists as franchisees, effectively, there is only one possible opportunity to borrow from local capitalists.<sup>5</sup> With the moneylender as the other borrowing possibility, the borrower has two chances to default before getting shut-off completely from the market for loans.

The borrower can approach the moneylender and local capitalist franchisees in two possible sequences. The first is to borrow from a local capitalist first and in the event of a non-voluntary default, go to the moneylender as the last resort. The second possible sequence is to borrow from the moneylender first and in the event of a non-voluntary default, go to a local capitalist franchisee as the last resort.

We have seen earlier that if the moneylender is borrower's only lending source, he acts as a monopolist and will charge him an interest rate  $r_1^M$  to extract all the surplus. Formally,

$$1 + r_1^M = R. \quad (9)$$

The subscript 1 on the interest rate indicates that the borrower has one chance to default before exhausting all borrowing opportunities.

On the other hand, if the borrower has already defaulted on the moneylender and local capitalist franchisees are the only sources left for borrowing, there will be Bertrand competition among the local capitalists and the local capitalist with the smallest transaction cost to the borrower,  $c^1$ , will lend and charge an interest rate that prevents the local capitalist with the next smallest transaction cost,  $c^2$ , from offering the loan and making a positive profit. Formally,

$$1 + r_1^1 = 1 + r^0(c^2). \quad (10)$$

At this interest rate local capitalist with the smallest transaction cost  $c^1$  will expect to make a positive profit whereas all remaining local capitalists with transaction costs greater than or equal to  $c^2$  will make non-positive profits.

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<sup>5</sup>This can be generalized to an endogenously determined and finite number of allowable defaults as in Chowdhry (1991).

Let  $X(r, c)$  denote the present value of the profits made by a lender charging an interest rate of  $r$  and transaction cost  $c$ . Then,

$$X(r, c) = -(1 + c) + \frac{p\{(1 + r) + X(r, c)\}}{1 + r^f}.$$

The term  $1 + c$  represents the total upfront costs of making a loan of 1. With probability  $p$ , the borrower will repay  $(1 + r)$  next period and the lender will be in identical situation. The payoff next period is discounted at the risk-free rate. Solving for  $X(r, c)$ , substituting from (1), (3) and simplifying, we get

$$X(r, c) = \frac{(1 + r) - [1 + r^0(c)]}{r^d}.$$

The expression above has a simple intuitive interpretation. The lender collects  $(1 + r)$  every period whereas the cost of making the loan is  $[1 + r^0(c)]$ . This difference between two is lender's surplus in perpetuity which is discounted at the default-risk adjusted rate  $r^d$ . Thus, for the moneylender lending last, from (9)

$$X(r_1^M, 0) = \frac{R - [1 + r^0(0)]}{r^d}, \quad (11)$$

and for the local capitalist with transaction cost  $c^1$  lending last, from (10)

$$X(r_1^1, c^1) = \frac{[1 + r^0(c^2)] - [1 + r^0(c^1)]}{r^d} = \frac{1 + r^d}{r^d} (c^2 - c^1) > 0. \quad (12)$$

Let  $r_2^M$  denote the interest charged by the moneylender, if he decides to lend first and the borrower has two opportunities to default before exhausting all sources of credit. Then,

$$X(r_2^M, 0) = \frac{(1 + r_2^M) - [1 + r^0(0)]}{r^d}. \quad (13)$$

Similarly, let  $r_2^1$ , denote the interest charged by the local capitalists with the smallest cost,  $c^1$ , if he decides to lend first and the borrower has two opportunities to default before exhausting all sources of credit. Then,

$$X(r_2^1, c^1) = \frac{(1 + r_2^1) - [1 + r^0(c^1)]}{r^d}. \quad (14)$$

We now examine lenders' incentives to lend first rather than wait for the borrower to default and then lend. Let  $Y(r_1, c)$  denote the present value of a lender's expected profits, if he waits for the borrower to default against the first lender, which happens with probability  $(1 - p)$ . With

probability  $p$ , the borrower repays the loan to the first lender in which case the lender who waits is in exactly the same situation. Then,

$$Y(r_1, c) = \frac{pY(r_1, c) + (1-p)X(r_1, c)}{1+r^f}.$$

Solving for  $Y(r_1, c)$ , we get

$$Y(r_1, c) = \theta X(r_1, c),$$

where

$$0 < \theta \equiv \frac{(1-p)}{r^f + (1-p)} < 1. \quad (15)$$

Notice that  $\theta$  is high if the probability of default  $(1-p)$  is high. The lender's cost of waiting is smaller if the borrower is more likely to default. Similarly,  $\theta$  is higher for smaller  $r^f$  – the smaller the risk-free rate  $r^f$ , the smaller is the cost of waiting.

The moneylender will choose to lend first rather than wait for the borrower to default and then lend if

$$X(r_2^M, 0) \geq Y(r_1^M, 0) = \theta X(r_1^M, 0).$$

Substituting from (11) and (13) and simplifying, we get

$$1 + r_2^M \geq \theta R + (1-\theta)[1 + r^0(0)]. \quad (16)$$

The right hand side of the above condition is a weighted average of what the moneylender will collect if he waits to lend to the borrower after she has defaulted on the local capitalist franchisee lender,  $R$ , and the smallest rate the moneylender can charge without making losses,  $[1 + r^0(0)]$ . The weight given to  $R$  is  $\theta$  which has an intuitive interpretation as discussed before.

Analogously, the local capitalist with transaction cost  $c^1$  will choose to lend first rather than wait for the borrower to default and then lend if

$$X(r_2^1, c^1) \geq Y(r_1^1, c^1) = \theta X(r_1^1, c^1).$$

Substituting from (12) and (14) and simplifying, we get

$$1 + r_2^1 \geq \theta[1 + r^0(c^2)] + (1-\theta)[1 + r^0(c^1)]. \quad (17)$$

The right hand side of the above condition is a weighted average of the rate the local capitalist will charge when he competes with the local capitalist with the next smallest transaction cost,  $[1 + r^0(c^2)]$ , and the rate he can charge without making losses,  $[1 + r^0(c^1)]$ .

Let  $V_2^{M,1}$  denote the present value of the surplus captured by the borrower if he chooses to borrow from the moneylender first and then the local capitalist with transaction cost  $c^1$ . The surplus after defaulting on the moneylender, denoted,  $V_1^1$ , is:

$$V_1^1 = \frac{R - (1 + r_1^1)}{r^d} = \frac{R - [1 + r^0(c^2)]}{r^d}. \quad (18)$$

Thus,

$$V_2^{M,1} = \frac{p\{R - (1 + r_2^M) + V_2^{M,1}\} + (1 - p)V_1^1}{1 + r^f}.$$

Simplifying and substituting from (15), we get

$$V_2^{M,1} = \frac{R - (1 + r_2^M)}{r^d} + \theta V_1^1. \quad (19)$$

Let  $V_2^{1,M}$  denote the present value of the surplus captured by the borrower if chooses to borrow from the local capitalist with transaction cost  $c^1$  first and then the moneylender. The surplus after defaulting on the local capitalist, is zero as the moneylender extracts all the surplus from the borrower when he is the last lender. Thus,

$$V_2^{1,M} = \frac{R - (1 + r_2^1)}{r^d}. \quad (20)$$

**Proposition 3** *Each borrower will choose to borrow from the moneylender first and after she is forced to default on the moneylender, she will borrow from the local capitalist with the smallest transaction cost of lending to her.*

*Proof:* Suppose that the local capitalist with transaction cost  $c^1$  offers the smallest possible interest rate that is consistent with his incentive to lend first. This is when the condition (17) is satisfied as an equality:

$$1 + r_2^1 = \theta[1 + r^0(c^2)] + (1 - \theta)[1 + r^0(c^1)]. \quad (21)$$

Suppose the moneylender, competing with the local capitalist, offers an interest rate that is slightly below  $r_2^M$  that satisfies the following equation:

$$1 + r_2^M = (1 + r_2^1) + \theta [R - [1 + r^0(c^2)]] \quad (22)$$

to induce the borrower to borrow from the moneylender first. Substituting from (21) into (22) and simplifying, we get

$$1 + r_2^M = \theta R + (1 - \theta)[1 + r^0(c^1)]. \quad (23)$$

It is easy to see that  $r_2^M$  given above is consistent with the moneylender's incentive to lend first as it satisfies the condition (16) because  $r^0(c^1) > r^0(0)$ . Substituting (22) and (18) in (19) and simplifying, we get

$$V_2^{M,1} = \frac{R - (1 + r_2^1)}{r^d} = V_2^{1,M} \quad (24)$$

and thus the borrower is indifferent between borrowing from the moneylender first or from the local capitalist franchisee first if interest rates are chosen as specified in (21) and (22). She will choose to borrow from the moneylender first if the moneylender offers an interest rate slightly below  $r_2^M$  given by (22) which is feasible for the moneylender to offer. ■

The moneylender is able to compete with the local capitalist franchisee because his transaction cost is smaller than that of the local capitalist franchisee. He is able to lower his interest low enough that the borrower prefers to borrow from the moneylender first. It is easy to see that the moneylender and the local capitalist with the smallest transaction cost  $c^1$  make strictly positive profits in equilibrium. From (13), the moneylender makes positive profits if  $r_2^M$  exceeds  $r^0(0)$  which follows clearly from (23). From (12), it follows that the local capitalist with transaction cost  $c^1$  makes strictly positive profits.

**Proposition 4** *The interest rate charged by the moneylender is higher than what the local capitalist will charge to lend first.*

*Proof:* From (22), it trivially follows that

$$1 + r_2^M > 1 + r_2^1. \blacksquare$$

The result above is interesting – it shows that the borrower prefers to borrow from the moneylender first even though the interest rate charged by the moneylender is higher than what the local capitalist franchisee would charge to lend first. The reason is that if the borrower borrows from the local capitalist franchisee first, after her first default, the moneylender becomes a monopolist and extracts all surplus from the borrower. On the other hand, when the moneylender is competing for borrower's business with the local capitalist, he has an incentive to offer a competitive interest rate.

**Proposition 5** *The borrower's welfare is the highest when he is able to borrow both from the moneylender and the local capitalist franchisee, followed by when he is able to borrow only from the local capitalist franchisee, followed by when he is able to borrow only from the moneylender.*

*Proof:* From (24),

$$V_2^{M,1} = \frac{R - (1 + r_2^1)}{r^d}.$$

From (18),

$$V_1^1 = \frac{R - [1 + r^0(c^2)]}{r^d}.$$

From (21), it is easy to see that  $r_2^1 < r^0(c^2)$  since  $r^0(c^1) < r^0(c^2)$  which follows from  $c^1 < c^2$ .

Therefore, it follows that

$$V_2^{M,1} > V_1^1 > 0 = V_1^M.$$

$V_1^M = 0$  follows from the fact that when moneylender is the only source of credit, he extracts all surplus from the borrower. ■

The result above shows that even though the moneylender acts as a monopolist when he is the only source of credit for the borrower, his presence helps lower the interest rate offered by the local capitalist franchisee. A situation in which the moneylender does not exist will hurt the borrower because then the local capitalists only compete with each other with positive costs of lending whereas the moneylender enjoys zero transaction cost. If the local capitalists were provided with large enough subsidies by the government or private charities, they may be able to out-compete the moneylender for lending first to the borrower.

### 3 Conclusion

We have shown that a franchising contract in which each franchisee is required to refuse credit to a borrower who may have defaulted against another franchisee can attract local capitalists as lenders belonging to the franchise. This has the advantage of providing a competitive alternative to moneylenders who are notorious for charging usurious interest rates when they are able to act as monopolists. Financial intermediaries such as banks do not have local information to be able to profitably compete with moneylenders whereas local capitalists have local information but may not have liquid funds. Franchising by financial intermediaries such as banks can provide both funds as well as a mechanism by which local capitalists are able to make self-enforcing lending contracts feasible. Each franchisee is, however, allowed to compete against other members in terms of pricing the loans to attract the borrower's business. This ensures that the local capitalist with

the smallest transaction cost for a particular borrower is able to attract her business resulting in natural segmentation of borrowers based on smallest lending costs.

We show that competition between the moneylender and many local capitalists who lend as franchisees forces the moneylender to reduce the interest rate charged to such an extent that the borrower is induced to borrow from the moneylender first even though some local capitalist franchisee would have charged a smaller interest rate. It is only after the borrower is forced to default on the moneylender that he uses the option of borrowing from local capitalist franchisees. Also, we show that the borrower welfare is higher if a moneylender is present in addition to local capitalists as potential franchisee lenders.

A number of Micro Finance Institutions (MFIs) in many developing countries have, with varying degree of success, been able to penetrate the market for microloans. Some of this success has come because MFIs, who have received subsidies either from governments or from private charitable organizations, have underpriced their loans. Our model predicts that in markets where MFIs have seen spectacular success in stealing business away from moneylenders are those in which loans have been substantially underpriced. In such markets, MFIs must not be making economic profits. Also, in these markets borrowers will go to moneylenders only when the option of borrowing from MFIs, perhaps because of prior default history, does not exist. Moneylenders will continue to charge high usurious interest rate for such borrowers. On the other hand, if there are markets where MFIs are pricing their loans to ensure that they make non-negative economic profits, our model predicts that moneylenders will drop their interest rates sufficiently to induce the borrowers to use moneylenders as a first option for borrowing. In such markets, interest rates charged by moneylenders are likely to have dropped after entry by MFIs. In such markets, MFIs are likely to attract business only from those borrowers who have exhausted the option of borrowing from the moneylender. We will test these predictions of our model in our future work.

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