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# Credit Access and the Poor

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# 1 The neo-classical model of the capital market

- Everyone faces the same interest rate, adjusted for risk. i.e. if there is a $d\%$ risk of default then $(1-d)r$ (where $r$ is the gross interest rate) is a constant.

- The interest rate paid to depositors is equal to $(1-d)r$ less some small change for the cost of operating a bank.

- The expected marginal product of capital should be equated to $(1-d)r$.

# 2 Credit Markets: some facts

1. **Sizeable gap between lending rates and deposit rates within the same sub-economy:**

   Ghatak (1976) reports data on interest rates paid by cultivators in India from the *All India Rural Credit Survey* for the 1951-2 to 1961-2 period: The average rate varies between a maximum of 18% (in 1959-60) and a minimum of about 15% (in 1961-62). Around 25% of the borrowing reported in these surveys were zero-interest loans, usually from family members or friends. If these were left out, the average rates in these surveys would be above 20%. In comparison, Ghatak reports that the bond rate in this period was around 3% and the bank deposit rate was probably about the same.

Timberg and Aiyar (1984) report data on indigenous style bankers in India, based on surveys that they carried out. They report the gap between the average rate charged to borrowers and the average rate to depositors by Finance Companies was 16.5%. The same gap for financiers from the Shikarpuri community was 16.5%, 12% for financiers from the Gujerati community, 15.5% for the Chettiars, 11.5% for the Rastogis, etc.

The "Summary Report on Informal Credit Markets in India" (Dasgupta, 1989) reports that for the rural sector (the data is based on surveys of 6 villages in Kerala and Tamil Nadu), the average interest rate charged by professional money-lenders (who provide 45.61% of the credit) in these surveys is about 52%, while the average deposit rate is not reported, the maximum from all the case studies is 24% and the maximum in four out of the eight case studies is no more than 14%.

For the urban sector, the data is based on various case surveys of specific classes of informal lenders: For Finance Corporations they report that the maximum deposit rate for loans of less than a year is 12% while the minimum lending rate is 48%. For hire-purchase companies in Delhi, the deposit rate was 14% and the lending rate was at least 28%. For auto-financiers in Namakkal, the gap between the deposit rate and the lending rate was 19%. For handloom financiers in Bangalore and Karur, the gap between the deposit rate and the lowest lending rate was 26%.

Aleem (1990) reports data from a study of professional moneylenders that he carried out in a semi-urban setting in Pakistan in 1980-1981. The average interest rate charged by these lenders is 78.5%. The opportunity cost of capital to these money-lenders was 32.5%.

2. **Extreme variability in the interest rate within the same sub-economy:**

   Timberg and Aiyar (1984) report that the rates for Shikarpuri financiers varied between 21% and 37% on loans to members of local Shikarpuri associations and between 21% and 120% on loans to non-members (25% of the loans were to non-members and another 50% were loans through brokers). On the other hand, the Gujerati bankers charged rates of no more than 18%. Moreover, the rates faced by established commodity traders in the Calcutta and Bombay markets were never above 18% and could be as low as 9%.

The "Summary Report on Informal Credit Markets in India" (Dasgupta, 1989) reports that Finance Corporations offer advances for a year or less at rates between 48% per year and the utterly astronomical rate of 5% per day. The rates on loans of more than a year varied between 24% and 48%. Hire-purchase contracts offer rates between 28% to 41% per year. Handloom Financiers charge rates between 44% and 68%. Yet the Shroffs of Western India offer loans at less than 21% and Chit Fund members can borrow at less than 25%.

The same report tells us that among rural lenders, the average rate for professional money-lenders (who in this sample give about 75% of the commercial informal loans) was 51.86%, whereas the rates for the agricultural money-lenders (farmers who also lend money) who supply the rest was 29.45%. Within the category of professional money-lenders, about half the loans were at rates of 60% or more but another 40% or so had rates below 36%.

The study by Aleem (1990) reports that the standard deviation of the interest rate was 38.14% compared to an average lending rate of 78.5%. In other words, an interest rate of 2% and an interest rate of 150% are both within two standard deviations of the mean.

Swaminathan (1991) reports on a survey of two villages in South India that she carried out: The average rate of interest in one village varied between 14.8% for loans collateralized by immovable assets (land, etc.) and 60% for loans backed by moveable assets. The corresponding rates in the other village were 21% and 70.6 %. Even among loans collateralized by the same asset—gold—the average rate in one village was 21.8% but it went up to 58.8% when the loans were to landless laborers.

Ghate (1992) reports on a number of case studies from all over Asia: The case study from Thailand found that interest rates were 2-3% per month in the Central Plain but 5-7% in the north and north-east (note that 5 and 7 are very different).

Gill and Singh (1997) report on a survey of 6 Punjab villages they carried out. The mean interest rate for loans up to Rs 10,000 is 35.81% for landowning households in their sample, but 80.57% for landless laborers.

Fafchamps' (2000) study of informal trade credit in Kenya and Zimbabwe reports an average monthly interest rate of 2.5% (corresponding to annualized rate of 34%) but also notes that this is the rate for the dominant trading group (Indians in Kenya, whites in Zimbabwe) is 2.5% month while the blacks pay 5% per month in both places.

Irfan et al. (1999), mentioned above, report that interest rates charged by professional money-lenders vary between 48% and 120%.

3. **Low levels of default:**

Timberg and Aiyar (1984) report that average default losses for the informal lenders they studied ranges between 0.5% and 1.5% of working funds.

The "Summary Report on Informal Credit Markets in India" (Dasgupta, 1989) attempts to decompose the observed interest rates into their various components, and finds that the default costs explain 14 per cent (not 14 percentage points!) of the total interest costs for the Shroffs, around 7% for auto-financiers in Namakkal and handloom financiers in Bangalore and Karur, 4% for Finance Companies, 3% for hire-purchase companies and essentially nothing for the Nidhis.

The same study reports that in four case studies of money-lenders in rural India they found default rates explained about 23% of the observed interest rate.

The study by Aleem gives default rates for each individual lender. The median default rate is between 1.5 and 2% and the maximum of 10%.

4. **There seems to be ex ante competition in the markets**

Large numbers of lenders in any sub-market

- Aleem (1989) shows that lenders do not earn excess profits on average

The "Summary Report on Informal Credit Markets in India" (Dasgupta, 1989) claims that only a small part of the interest rate is explained by profits.

Ghate (1992) echoes the same conclusion.

5. **Production and trade finance are the main reasons given for borrowing, even in cases where the rate of interest is relatively high:**

   Ghatak (1976) concludes on the basis of his study that "the existing belief about the unproductive use of loans by Indian cultivators ... has not been substantiated."

   Timberg and Aiyar (1984) report that for Shikarpuri bankers (who charge 31.5% on average, and as much as 120% on occasion), at least 75% of the money goes to finance trade and, to lesser extent, industry.

The "Summary Report on Informal Credit Markets in India" (Dasgupta, 1989), reports that several of the categories of lenders that have been already mentioned, such as hire-purchase financiers (interest rates between 28%-41%), handloom financiers (44%-68%), Shroffs (18%-21%) and Finance Corporations (24%-48% for longer term loans and more than 48% on loans of less than a year) focus almost exclusively on financing trade and industry, and even for Chit Funds and Nidhis, which do finance consumption, trade and industry dominate.

Swaminathan (1991) reports that in the two villages she surveys, the share of production loans in the portfolio of lenders is 48.5% and 62.8%. The higher share of production loans is in Gokalipuram, which has the higher interest rates (above 36% for all except the richest group of borrowers).

Ghate (1992) also concludes that the bulk of informal credit goes to finance trade and production.

Murshid (1992) studies Dhaner Upore (cash for kind) loans (you get some amount in rice now and repay some amount in rice later) and argues that most loans in his sample are production loans despite the fact that the interest rate is 40% for a 3-5 month loan period.

Gill and Singh (1997) report that the bulk (63.03%) of borrowing from the informal sector goes to finance production. This proportion is lower for the landless laborers but it is an non-negligible fraction (36%).

6. **Rich people borrow more and pay lower rates of interest; more generally it appears that those who borrow more pay lower interest rates:**

   Ghatak (1976) correlates asset category with borrowing/debt in the *All India Rural Credit Survey* data and finds a strong positive relationship.

   Timberg and Aiyar (1984) report that some of the Shikarpuri and Rastogi lenders set a credit limit that is proportional to the borrower's net worth: Several lenders said that they would lend no more than 25% of the borrower's net worth, though another said he would lend up to 33%.

The "Summary Report on Informal Credit Markets in India" (Dasgupta, 1989) tells us that in their rural sample, landless laborers paid much higher rates (ranging from 28-125%) than cultivators (who paid between 21 and 40%). Moreover, Table 15.9 in that report clearly shows that the average interest rate declines with loan size (from a maximum of 44% to a minimum of 24%). The relation between asset category and interest rate paid is less clear in their data but it remains that the second poorest group (those with assets in the range Rs 5,000-10,000) pays the highest average rate (120%) and the richest (those with more than Rs 100,000) pay the lowest rate (24%).

Swaminathan (1991) finds a strong negative relation between the value of the borrower's land assets and the interest rate he faces: The poorest (those with no land assets) pay 44.9% in one village and 45.4% in the other, while the rich (those with land valued at more than Rs 50,000) pay 16.9% and 24.2% in the corresponding villages.

Ghate (1992) notes that the interest rate on very small loans in Bangladesh tends to be very high (Taka 10 per week on a loan of Taka 500, or 86% per annum).

Gill and Singh (1997) show that the correlation between loan size and the interest rate is negative after controlling for the wealth of the borrower, and that the correlation between the wealth of the borrower and loan size is negative after controlling for loan size. They also find a positive relation between the borrower's wealth and the loan he gets.

# 3 A simple model of the credit market

- Loan repayment is imperfectly enforceable.

- Suppose $k$ dollars invested yields a gross return $F(k)$ and that the gross interest rate is $r$. A borrower who has a wealth of $w$ and invests $k$ will need to borrow $k - w$. He is supposed to repay $(k - w)r$ at the end of the period.

- But by expending some resources, which we assume to be proportional to the size of the investment, he can avoid repayment altogether. We denote the constant of proportionality by $\eta$ and assume that it is less than the cost of capital, $\rho$.

- Lenders will only provide finance up to the point where the borrower has the incentive to repay: this requires $F(k) - r(k-w) \geq F(k) - \eta k$ which gives us:

$$\frac{k}{w} = \frac{r}{r-\eta} \equiv \lambda(r, \eta).$$

- Firms are credit rationed. They cannot borrow as much as they want.

- The amount you can borrow is increasing in your wealth and your $\eta$ but decreasing in the interest rate.

- The interest rate is equal to the cost of capital. It obviously does not vary across borrowers.

- This is a handy model but does not fit the facts.

## 3.1 Extending the model: 1

- It is natural to assume that the lender needs to spend resources in order to make the borrower want to repay. In other words, $\eta = 0$ unless the lender spends some resources.

- First let monitoring cost be linear in the amount borrowed: $\phi(k - w)$.

- In this case

$$\begin{aligned} r(k-w) &= \rho(k-w) + \phi(k-w) \\ r &= \rho + \phi \end{aligned}$$

- $r$ will only vary to the extent that $\phi$ or $\rho$ varies.

## 3.2 Extending the model: 2

- Let monitoring be a variable cost, $\phi$ per unit of $\eta k, i.e.$ the cost does not depend on the amount borrowed but on amount invested.

- Under the assumption of competition, the lender just breaks even:

$$r(k-w) = \rho(k-w) + \phi\eta k$$

- For any credit constrained borrower, $k = \frac{r}{r-\eta}w$, which implies that

$$r = \rho + \phi r = \frac{\rho}{1-\phi}.$$

- Aleem calculates $\phi r$ to be 50 cents per dollar lent on average, easily explaining the gap between the 32.5% cost of capital and the 78.5% average interest rate in this data.

- For this $\phi$ needs to be about 0.6

- Does not explain exclusion

## 3.3 Extending the model: 3

- Let the monitoring cost be a fixed cost $\phi$

- Then the lender's zero profit condition is

$$r(k-w) = \rho(k-w) + \phi$$

- In the model without default, the borrower's IC constraint is now given by

$$r(k-w) = \eta k$$

  which together give us

$$\rho(k-w) + \phi = \eta k$$

- We can rewrite this in the form $k = \frac{\rho w - \phi}{\rho - \eta}$. What if $\rho w < \phi$?Is this necessarily more than $w$?

- This implies that

$$r = \rho + \frac{\phi(\rho - \eta)}{\eta w - \phi}$$

- Multiplier property.

Implications of the model

- Can explain a large wedge between the cost of capital and the interest rate and by implication a very high monitoring cost.

- The interest rate can be very sensitive to the cost of capital and the monitoring cost, if 1-$\phi$ is small

- The interest rate will be especially sensitive where the interest rate is high relative to the cost of capital

- However we do not explain equilibrium default.

## 3.4 Some Policy Implications

- What is the total amount lent?

- In the model without default, the borrower's IC constraint is now given by

  $$r(k-w) = \eta k$$

  while the lender's zero profit condition is

  $$r(k-w) = \rho(k-w) + \phi$$

  which together give us

  $$\rho(k-w) + \phi = \eta k$$

  or

  $$k = \frac{\rho w - \phi}{\rho - \eta}$$

- One dollar subsidy to monitoring costs reduces $\phi$ by $\rho$ dollars (since we assume monitoring costs are paid at the end of the period) which increases the amount of resources going to the poor by $\frac{\rho}{\rho-\eta} > 1$ dollars.

- Keeping the interest rate fixed, the effect of \$1 subsidy would have been $\frac{r}{r-\eta} < \frac{\rho}{\rho-\eta}$. The mutiplier adds to the leverage, especially when monitoring is expensive.

- Cutting monitoring costs is the raison d'etre of the micro-credit movement.

- Note however that one dollar subsidy to wealth ($w$) would have the same effect.

- However this is only true for those who have $\eta w - \phi > 0$.

- Those who have $\eta w - \phi < 0$, start out unable to borrow.

- For these people a wealth subsidy dominates a monitoring cost subsidy.

- But selection issues favor a subsidy to $\phi$ (or equivalently to $\rho$).

- This may be why some micro-credit organizations insist on savings as a way into borrowing (especially under the self-help group model): Helping them save may be way to subsidize building wealth.

## 3.5 Is asymmetric information a problem? Observing unobservables (Karlan-Zinman)

- It is no longer controversial that credit markets are imperfect.

- The question is to understand the exact technology of lending, since policy implications depend on our understanding of this technology.

- This where "observing unobservables fits in"

- Experimental approach to identifying distortions in the credit market:

- 58000 thousand "good" clients of a South African bank: invited by mail to get a new loan.

### 3.5.1 The question

- Three interest rate effects:

  Adverse selection

  Repayment burden

  Moral hazard

- A design to separate them (Fig 1, Fig 2):

  Different offer rates

  Different contract rates

  Different length of potential contract

- Size of experimental variation (Fig 3)

### 3.5.2 Results(Table 3):

- Adverse selection for women

  Moral hazard for men

- Why is the contract rate effect so weak?

  Conservative choice of the original lending amount?

  Absence of moral hazard

- Why is the future interest rate effect stronger?

# 4 The Banking Channel

### 4.0.3 The banking channel

- Banks take money from depositors and relend them to firms

- Banks have very low cost of capital (because the average person keeps his savings there), they tend to "uptight" lenders

  Because they have to have enough liquidity all the time

  Because they are heavily regulated

  Because they use agents to do the lending and agency problems may be very serious.

# 5 A model of the banking channel

- Bankss are supposed to channel the deposits to the right people?

- Do they?

- Why may

## 5.1 The model

**Firms**:

- Firms in this economy come in two types–$H$ and $L$–in proportions $p$ and $1-p$.

- Their production function is as follows: with probability $p(k, \theta_i)$, where $i = L, H$, $\theta_H > \theta_L$ and $p(k, \theta_i)$ is a concave function of $k$, the firm produces $\mu k$. With probability $1- p(k, \theta_i)$ the firm produces 0.

- Assume that $p_k(k, \theta_i) < 0$, i.e. bigger projects are more likely to fail, that $p(k, \theta_H) > p(k, \theta_L)$ which defines the type $H$ firm to be the more productive firm, and that $0 > p_k(k, \theta_H) > p_k(k, \theta_L)$.

- Finally assume that $kp(k, \theta_i)$ is an increasing but concave function of $k$.

- Firms live for two periods and produce in both– the shock to its productivity is drawn independently from the same distribution in both periods.

- Firms do not save and have no equity, so in each period, production is entirely financed by credit and the current output is all they have to repay any loans.

- No firm-side moral hazard: firms never deliberately default. However if they do not have enough money they have no choice but to default.

**Bank**:

- There is a bank that is the sole source of capital to this population of firms.

- To simplify matters we will always assume that banks set a single interest rate $r$ for all loans.

- The cost of bank capital is $\rho < r$.

- Lending decisions are made by bankers who work for the bank but maximize their own expected earnings (rather than the bank's earnings), which in turn are a function of the incentives that the banks set for them.

**Bankers**:

- Each new firm get allocated to a banker who works with it for the next two periods.

- Bankers get paid an amount $C$ per unit they lend.

- They also get punished for any loans that they made that were ultimately defaulted upon. The punishment is given by $\tau F(k)$ where $k$ is size of the loan, $F$ is an increasing function and $\tau$ is a shift parameter which measures the intensity of the monitoring regimes.

- The fact that both $C$ and $F(k)$ are taken as being exogenous reflects an incomplete contracts approach

- Risk-Neutrality on all sides

**Information**:

- In the first period neither the firm nor the banker knows the firm's type.

- At the end of the first period they both observe the firm's output and update accordingly using the fact they both know how much the firm had invested:

- Successful firms are going to be type $H$ with probability

$$p_s(k) = \frac{pp(k, \theta_H)}{pp(k, \theta_H) + (1-p)p(k, \theta_L)}$$

  Since $0 > p_k(k, \theta_H) > p_k(k, \theta_L)$ and $p(k, \theta_H) > p(k, \theta_L)$, $\frac{p(k,\theta_H)}{p(k,\theta_L)}$ is increasing in $k$, which is why $p_s$ is increasing in $k$.

- Likewise the probability that a failed firm is type $H$, $p_f$, is declining in $k$.

- Informativeness goes up with $k$.

### 5.1.1 Lending to a successful old firm

- Suppose that a firm is in the second period of its life, was able to repay its first period loan and is of type $H$ with probability $p'$.

- Then the amount the banker would want to lend to that firm in the second period is given by maximizing

$$\begin{aligned} &Ck_2 - [p'(1 - p(k_2, \theta_H)) \\ &+(1 - p')(1 - p(k_2, \theta_L))] \times \\ &(q + (1 - q)\tau)F(k_2) \end{aligned}$$

  where we write $k_2$ to remind ourselves that this is the second period.

- As long as the second order condition for this maximization holds (which we assume), an increase in $p'$ will increase $k_2$.

- Also $k_2$ is declining in $q + (1 - q)\tau$, which is the expected value of $\tau$, which we will denote by $\tau^e$. More stringent punishments will discourage lending. Hence $k_2 = k_2(p', \tau^e)$, with $k_{2p} > 0$, and $k_{2\tau^e} < 0$.

### 5.1.2 Lending to a failed old firm

- Consider now the alternative case where everything is the same about the firm except that it has failed in the first period and hence has no output to repay its loan.

- One thing the banker could do is to let the firm declare bankruptcy and then lend to it based on its $p'$ and the value of $\tau$ expected for the next period, i.e. $k_2(p', \tau^e)$.

- In this case the banker gets a punishment $F(k_1)$ for the first period default, where $k_1$ was the first period loan to the firm.

- The alternative is to bail it out: Give it a loan such that it can repay the first period loan (and thereby avoid defaulting) and as well as the second period loan, if it manages to the successful in period 2.

- This means a loan of size $k_b(k_1)$

$$\begin{aligned} \mu(k_b(k_1) - k_1 r) &= k_b(k_1) r \\ k_b(k_1) &= \frac{\mu r k_1}{\mu - r}. \end{aligned}$$

  This would avoid immediate default but create a risk of a bigger default in the future (since $r > 1, \frac{\mu r}{\mu - r} > 1$).

- Assume that this is bigger than $k_2(p', \tau^e)$ (if this is not true, always bailout).

- The basic trade off

  Bailout now avoids definite punishment

  At the cost of postponed probabilistic punishment for a bigger default

  And you get to lend more

- Whether there will be a bailout depends on

  Whether the probability of punishment is going up or down.

  Shape of punishment function

    The evidence from India seems to be that the punishment itself is clearly quite limited. Even among the most publicized cases one out of 76 went to prosecution

  The probability of punishment is increasing with loan size but slowly

### 5.1.3 Lending to a new firm

- Goes down relatively more when $\tau$ is high because there is more uncertainty about them.

## 5.2 Direct evidence for agency problems (from Hertzberg, Liberti and Paravasini, 2007)

- Take the model above of the banking channel and assume that a fraction of the firms survive to a third year but are transferred to another lender.

- Also assume that in order to justify lending a lot to an old firm it must be rated highly.

- So the bailed out firms were rated highly at the begining of the 2nd period.

- However the loan officer who takes over observes the history of what happened and can infer the borrower's likely type.

- He has no reason to give a big loan to those bailed out firms that succeeded in the second period and hence survive. He will want to cut the loan that they are getting

- He will surely down-grade them in terms of their rating.

- Anticipating this discrepancy, the first loan officer will start down-grading them from the end of the secodn period.

- And the ratings given at that time will be much better at predicting borrower perforamnce

- This is the prediction they test using Argentine bank data

- In this bank loans are supposed to get transferred every 3 years.

- They find that ratings crash at the end of that period and their predictive power rises.

## 5.3 More direct evidence (based on Banerjee-Cole-Duflo (2008)

**The effect of CVC investigations on Indian banks**

- Sharp increase in probability of an investigation followed by decline over 3 years

- Should lead to

  Slowing in lending

  Especially to young firms

  Possibility of bailouts

- Observable implications

  Immediate cut in lending

But the fall in lending persists

Because of bailouts slow down the initial cut

Less information generated about small firms

Default might go up later.

## 5.4 Are bank clients credit-constrained?(based on Banerjee-Duflo (2002)

- Access to banks is often used as a measure of financial development

- Only relatively privileged firms have access to bank credit.

- However as we have already seen, there are good reasons why bank clients may not get as much credit as they want from the bank

  This does not mean that they are credit constrained: they might get the extra credit they want elsewhere.

### 5.4.1 An empirical approach to credit constraints

- How do we know whether a firm is credit constrained?

- We need to know its marginal product of capital, but how can we estimate the production function?

- A natural experiment approach

- Indian banks, both private and public, are required to lend 40% of their portfolio to the priority sector.

- In January 1998 firms India with fixed capital between Rs. 6.5 million and Rs. 30 million became eligible for (possibly subsidized) priority sector credit from banks. Firms below Rs.6.5 million were already eligible.

- In early 2000, the limit was lowered back to Rs. 10 million.

- We study the impact of newly becoming eligible/ineligible for subsidized credit on the growth rate of borrowing, sales and profits using firm level data that we collected from a single bank.

### 5.4.2 Theoretical challenge

- The fact that firm absorbs more subsidized credit does not mean that it is credit constrained.

- To be credit constrained you should be willing to borrow more at the interest rate you pay on the marginal dollar you borrow (not necessarily the subsidized rate, which may be infra-marginal).

- Unconstrained firms will use subsidized credit to pay down their existing debt:

  - they only expand production once they only have subsidized debt.

  - their production(sales) will grow slower than their credit.

- Constrained firms will use subsidized credit to expand sales.

### 5.4.3 Estimation

- We will mainly estimate

$$\begin{aligned} y_{it} - y_{it-1} &= \alpha_y BIG_i + \beta_y POST_t \\ &\quad + \gamma_y BIG_i * POST_t + \epsilon_{yit}, \end{aligned}$$

  for $y =$ logcredit, logrevenue, logprofits, etc; $BIG$ represents newly eligible firms; the dummy $POST$ represents the post January 1998 period or the post January 2000 period.

- We will also estimate the effect of credit on sales or profits by instrumenting credit by $BIG*POST$

- $BIG*POST$ is uncorrelated with the probability of an enhancement in the loan size.

- Strongly correlated with loan size conditional on there being an enhancement.

- Because it is uncorrelated with the probability of enhancement, we can focus on the firms that got an enhancement

**Results**

- The OLS effect of growth in credit on growth in revenues is essentially zero. Why might this be?

- What do we learn from using the policy shock? Who would be the compliers in our theory?

- Credit to BIG firms grows faster in the POST period (column 2)

- No change in the interest rate (column 3)

- Firms appear to be credit constrained–sales grows almost as fast as credit (column 5) suggesting that they are not using subsidized credit to pay off market borrowings (substitution).

- Sales grows at about the same rate at firms that have no market borrowing and at firms with some market borrowing (Column 5,6), confirming that there is no substitution.

- Profit has an elasticity of 1.8, implying that an extra rupee of credit increased profits net of interest by almost 1.4 rupees.

**Conclusion**

- Firms are clearly severely credit constrained.

- There is clearly a large wedge between the rates paid to savers and the marginal product of capital

- Marginal product is very high (possibly over 100%) for the set of compliers.

- This does not directly tell us about whether the marginal product is equalized in all uses.

- However it does suggest that people who have wealth would rather invest it than put in the bank, even if the investment is not the most productive.

## 5.5 Is the marginal product of capital equalized?(from Banerjee-Munshi (2001))

- If the credit market institutions function poorly, people will prefer to lend to relatively unproductive people who they trust, over a highly productive stranger. As a result social conections, as much as productivity, will determine the allocation of capital.

- Exporters in the knitted garment industry in Tirupur, India, belong either to the local Gounder community or are Outsiders. The Gounders are reputed to be cash rich.

- Our strategy is to compare the investment and production behavior of Gounders and Outsiders, based on our survey data. Essentially all we do is to compare means and growth rates, after controlling for cohort effects and years of experience.

**Results**

- Gounders who start firms start with almost three times as much fixed capital as the Outsiders

- Gounders own more fixed capital, at all levels of experience, though Outsiders catch up over time.

- Gounders own significantly more fixed capital per unit of production, at all levels of experience.

- Initially Gounders produce more, but the Outsiders have faster growth rate and produce significantly more after being in business for six years or more.

- Within each community those invest more produce more and grow at least as fast.

## Conclusions

- The contrast between within community and across communty patterns rules out any obvious exclusively technological explanation of this evidence, suggesting that community-specific factors must play a role.

- We can plausibly rule out community specific factors other than access to capital:
  - Gounders ought to have better access to inputs other than capital (sub-contracting, politically provided inputs). But then Gounders should have been more productive.
  - The fact that Gounders start big may result from better acess to buyers, but why would they invest more even when they produce less?

- We conclude that Gounders invest more despite being less good at making use of their capital.