

Inequality and Investment

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1 Introduction

In a world where markets work perfectly, investment decisions should have very little to do with the income, wealth or social status of the decision maker. Whether or not a particular piece of investment should be undertaken ought to be determined by the returns it promises and the market price of capital, adjusted, if necessary, for the market price of the extra risk it entails. The logic is almost elementary: If someone has an opportunity to make money, then it really does not matter whether she herself has the money or not—she can always borrow what she needs, and if the risk bothers her, she can always sell shares in her business on the stock market and buy safer assets with the money she gets from the sale.

If this were indeed the world we lived in, the distribution of wealth/income would have no direct influence on the pattern of investment. There may still be an indirect influence, coming from the effect of wealth or income on savings decisions: It has been suggested that the poor are less inclined to save than the rich, and as a result, aggregate savings as a proportion of aggregate income may go up if the rich gain at the expense of the poor. This could affect investment decisions through the effect of the supply of savings on the price of capital. Inequality, in this Kaldorian view of the world (after Nicholas Kaldor, the Cambridge economist), would enhance growth, through it might yet be a Pyrrhic victory: Kaldor worried about the inevitability of crises under capitalism, and faster growth accompanied by burgeoning inequality, he saw as a recipe for ongoing crises.

The scope for a direct link between inequality and investment widens substantially once we give up the idea that markets, and especially asset markets, work anywhere close to perfectly. One of the great advances in development economics in the past fifteen years is the accretion of a substantial body of evidence on documenting how well (or badly) asset markets work in developing countries. It seems natural place to start with this evidence.

1.1 How well do asset markets work?

1.1.1 The market for credit

A well-functioning credit market, as every student of basic economics knows, is one where there is a single interest rate and everyone can borrow or lend as much as they want at that rate. The fact that you can borrow as much as you want at the current rate is what explains the presumption of a separation between the wealth or status of the investor and the amount he invests. Whether he is rich or poor, well-connected or just off the streets, an extra dollar of investment will be profitable for him if and only if the return he gets from it is more than the interest rate. If the interest rate is higher, he would be better off lending out that money if it was his own, or borrowing less if it were someone else's. Therefore, two people with the same return on investment will end up investing the same amount.¹

How close are real markets to this idealized market? Chambhar is a market town in Sindh, on the east bank of the Indus. In 1980-81, farmers from the area around Chambhar got most of their credit from a population of about 60 professional moneylenders. Based on detailed data from 14 of these lenders and 60 of their clients (see Aleem, 1990), the average borrowing interest rate charged by these lenders seems to have been 78.5%. On the other hand, if these farmers wanted to lend their money out, the banking system would only pay them about 10%. However, it is possible that they may not have been depositing in the banks. An alternative measure of the deposit rate relevant for these farmers is the opportunity cost of capital to these moneylenders, which is 32.5%. In either case, it suggests a gap of at least 45 percentage points between the borrowing and lending rates. The borrowing rate also varied enormously across borrowers: 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. One possibility is that these differences reflect differences in the default rate: Perhaps the expected repayment is the same for everybody, because those who pay higher rates are more likely to default. Also the expected repayment could be equal to the actual interest rate paid to the depositors, if the default rate is high enough. However, default is actually very rare: The study gives default rates for each individual lender. The median default rate is between 1.5 and 2% and the maximum is 10%.

The same pattern—high and variable borrowing rates, much lower deposit rates, and low default rates—also shows up in the “Summary Report on Informal Credit Markets in India” (Dasgupta, 1989), which reports results from a number of case studies that were commissioned by the Asian Development Bank and carried out under the aegis of the National Institute of Public Finance and Policy. For the urban sector, the data is based on various case surveys of specific classes of informal lenders: For the

¹Unless there are two different investment opportunities which have the exact same payoff, net of interest.

broad class of non-bank financial intermediaries called Finance Corporations, it is reported that the maximum deposit rate for loans of less than a year is 12% while the minimum lending rate is 48%. These corporations offer advances for a year or less at rates that vary from 48% per year to the utterly astronomical rate of 5% per day. The rates on loans of more than a year varied between 24% and 48%. Default, once again, is only a small part of the story: Default costs only explain 4% of total interest costs. The same report also tells us that for hire-purchase companies in Delhi, the deposit rate was 14% and the lending rate was at least 28% and could be as high as 41%. Default costs were 3% of total interest costs.

Table 1 reports borrowing rates from the rural version of the same report. This was based on surveys of 6 villages in Kerala and Tamil Nadu, carried out by the Centre for Development Studies, Trivandrum. Interest rates are high, but they are also variable and the rich (those with Rs.100,000 or more in assets) both get most of the credit (nearly 60%) and pay a relatively low rate (33%), while those with assets between Rs. 20,000 and Rs. 30,000 pay rates of 104% and get only 8% of the credit. Also, while not reported in the table, the average interest rate charged by professional moneylenders (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%. Within the category of professional moneylenders, about half the loans were at rates of 60% or more, but another 40% or so had rates below 36%. Default rates were higher than in the urban sector, but still cannot explain more than 23% of the interest costs.

The fact that credit access depends on social status, is also shown by Fafchamps' (2000) study of informal trade credit in Kenya and Zimbabwe. It reports an average monthly interest rate of 2.5% (corresponding to annualized rate of 34%) but also notes that the rate for the dominant trading group (Indians in Kenya, whites in Zimbabwe) is 2.5% per month while the blacks pay 5% per month in both places.²

None of these facts are necessarily surprising. Contract enforcement in developing countries is often difficult, and in particular, it is not easy to get courts to punish recalcitrant borrowers.³ As a result, lenders often spend lots of resources making sure that their loans get repaid: It is plausible that these are the resources that drive a wedge between the borrowing rate and the lending rate. Indeed, the paper by Aleem (1990) actually calculates the amount of resources spent by lenders on monitoring borrowers and shows that they are enough to explain the nearly 50 percentage point gap between the lending and borrowing rates in his data. Moreover, it is easy to imagine that borrowers who are easier to monitor will enjoy better rates, which would explain why lending rates vary so much.

²See also Gill and Singh (1977), Swaminatan (1991).

³See Djankov et al.

However, together this body of evidence makes it very hard to believe that credit markets, at least in the developing world, are anywhere near the ideal market that would make the distribution of wealth irrelevant for investment.

1.1.2 The market for insurance

The ideal insurance market is one in which people bear no avoidable risks. In a setting where a single village constitutes a separate insurance market closed to the rest of the world (so that only people in the village can insure other people in the village, in some kind of mutual insurance arrangement), this comes down to the requirement that individual consumption should only respond to aggregate (village-level) income fluctuations, and not to fluctuations in the income of specific individuals. Or to put it in blunter terms, your income fluctuations should not translate into fluctuations in your own consumption, as long as aggregate consumption is unchanged. Given that what an individual does has very little impact on aggregate uncertainty, this means that when insurance markets work well, risk considerations should not have a significant impact on the choices made by people, irrespective of their wealth.

While a perfect insurance market is a more complex object than a perfect credit market, and hence harder to detect, there have been a number of attempts to test the prediction about the irrelevance of fluctuations in your own income. The Cote D'Ivoire Living Standards Measurement Surveys from 1985 to 1987 provides panel data on the income and consumption of up to 800 households, where each household is tracked for 2 consecutive years (1985 and 1986 or 1986 and 1987). The relation between changes in consumption and changes in incomes is reported in Table 2 separately for the three main regions and separately for 1985-86 and 1986-87. The first row of the first block for each year reports the basic correlation between income and consumption: A fall in income always hurts consumption, though the coefficient varies between a low of .09 (a \$1 reduction in income means that consumption goes down by 9%) to a high of 0.46. The next row does the same thing, but now there is a village dummy intended to pick up any village-level changes in consumption. Remarkably, the coefficients on own income, which under perfect insurance should have fallen to zero once we controlled for village-level changes, do not budge at all.⁴

Not all the evidence is quite so pessimistic. Townsend (1994) used detailed household-level data from four villages intensively studied by the International Crop Research Institute in the Semi-Arid Tropics (ICRISAT) in India, to see whether it is consistent with the data. He found that while the data did reject the exact prediction, it did not miss by very much. In other words, his evidence suggested that villagers do insure each other to a considerable extent: Movements in individual consumption in his data seem largely uncorrelated with movements in income.

⁴See Deaton (1997) for more details.

However, later work by Townsend himself based on data he collected in Thailand, turned out to be less encouraging.⁵ Some villages seemed to be much more effective than others in providing insurance to their residents. Townsend describes in detail how insurance arrangements differ across villages: While in one village there is a web of well-functioning risk-sharing institutions, the situations in other villages are different: In one village, the institutions exist but are dysfunctional; in another village, they are non-existent; finally, in a third village, close to the roads, there seems to be no risk-sharing whatsoever, even within families.⁶

As in the case of credit, it is possible that the failure of insurance has something to do with informational asymmetries. It is not easy to insure someone against a shock that he alone observes, since he has every incentive to always claim that things had gone badly. However, as Duflo and Udry (2003) demonstrate, spouses in Cote d'Ivoire do not seem to be willing to insure each other fully against rainfall shocks that affect them differentially. Since rainfall is obviously observable, the problem has to be elsewhere. One possibility is that the problem is limited commitment: People may be happy to claim what was promised to them when it is their turn to be paid, and then default when it comes for them to pay. This may be particularly easy in a setting where the social relations between the set of people who are insuring each other are not particularly close: This is perhaps why Townsend find no insurance in the village closest to the road.

1.1.3 The market for land

The ideal land market is one where anyone can buy or lease as much land as they want for as long as they want at a price that only depends on the quality of the land (and the length of the lease). Moreover, the lease should be at a fixed rent, so that the lessor is the residual claimant on the produce of the land. The fact that land can be freely bought and sold ensures that there is no particular advantage or disadvantage to owning land *vis a vis* any other asset of comparable value. The fact that the lessor is a residual claimant means that the land is put to optimal use.

In practice, both properties fail systematically. Many developing (and some developed) countries have regulations about who can buy land and how much or how little. Binswanger, Deininger and Feder (1995) argue that almost every developing country today went through a phase when it had regulations on land ownership that were intended to generate concentrated land ownership. By contrast, Besley and Burgess (2000) provide a list of regulations from different states in India, each an attempt to limit the concentration of ownership in land. It is also often unclear who has the right to sell a particular plot of

⁵See Townsend (1995).

⁶Fafchamps and Lund (2003) find that, in the Philippines, households are much better insured against some shocks than against others. In particular, they seem to be poorly insured against health risk, a finding corroborated by Gertler and Gruber (2002) in Indonesia.

land, since there is frequently no single person/family who has a clear, undisputed, legal title to the land. This, in turn, reflects the importance of encroachments and land grabs in the evolution of land rights, as well as the importance of custom in governing land relations, especially in Africa. The recent popularity of land titling as a social intervention is a direct consequence of the growing recognition of this fact.

Where lease contracts exist, they are not always of the fixed rent type, at least when the land is used for cultivation. Many countries, including the United States, have a long tradition of an alternative contractual form, namely sharecropping. Under sharecropping, the farmer only gets a fraction of the produce of the land, but he does not need to pay a fixed rent. As Alfred Marshall pointed out more than one hundred years ago, this weakens incentives and reduces the productivity of the land, but the near universality of sharecropping suggests that it is a response to a real need. There is some disagreement among economists about the exact nature of that need,⁷ but it is plausible that it is related to the fact that farmers are often poor, and making them pay the full rent when their crop does poorly is difficult and probably not desirable.

Finally, leaseholds in developing countries tend to be relatively short-lived. The norm is for it to last either a year or a season. Longer leases are not unknown but are rare. This might reflect the fact that it is custom rather than law that secures most of these leases: Perhaps it is too much to rely on custom to enforce leases of arbitrary length.

1.1.4 The market for human capital

One thing that makes the market for human capital obviously different from all the other asset markets is the fact that many decisions about investment in human capital are taken by parents (or other family members) about their children. In other words, those who are taking these decisions are often different from those who get the human capital. It is not hard to imagine why this separation might introduce important distortions into the functioning of this market. We will come back to these in the next section.

We also want the market for human capital to be one where the reward is entirely based on the effective amount of human capital supplied and not on other attributes of the person supplying the skills. Discrimination based on gender, caste, religion or race obviously violates this, but so does a system of job allocation based on contacts. Until very recently, job discrimination based on gender was the norm all over the world, and there is a dwindling but significant number of countries where such discrimination is still either legally or socially accepted. Moreover, even where such discrimination is explicitly frowned upon, there is some evidence of continuing discrimination. The same is true of race, caste and religion: Most of the discrimination (unless it is legally mandated affirmative action in favor of a historically disadvantaged group such as low castes in India and African-Americans in the U.S.) happens despite

⁷See Banerjee (2000) for a discussion of the alternative views.

their being explicit laws against it.⁸

Bertrand and Mullainathan (2004) show evidence from a field experiment proving beyond reasonable doubt that there is a high degree of anti-African-American discrimination in the United States. They sent the same resumes to a large number of companies under either a stereotypically Caucasian name or a stereotypical African-American name, and found a 50% higher call-back rate when the name was Caucasian. In the data, this says that having a Caucasian name is worth as much as eight additional years of job experience. Moreover, the degree of discrimination tended to be greater when the resume corresponded to someone who was better educated, suggesting that investment in human capital among African-Americans is probably significantly under-rewarded.

A more insidious form of discrimination comes from the allocation of jobs based on contacts. Munshi (n.d.) shows persuasive evidence that contacts are very important in the allocation of jobs for migrant labor in the United States. The employment prospects for Mexican migrants in the United States, it turns out, are much better when they are from areas where there was an earlier outflow of migrants. In particular, quite remarkably, it helps if they are from areas where rains had failed several years ago—pushing out a cohort of migrants to the U.S. who help the later generations of migrants from that area to find jobs. On the other hand, and this is the clincher, it does not help to be from an area where rains had failed recently: In other words, we can be reasonably sure that it has nothing to do with being from areas where rains sometimes fail.

2 Wealth, Status and Investment Behavior

The fact that these asset markets rarely measure up to their ideal creates the possibility that wealth and social status, defined as the position in society both in terms of ascriptive identity and in terms of connections, will have an important influence on investment decisions. This is what we turn to next.

2.0.5 The effect of imperfect financial markets

The facts about credit and insurance markets, given above, have a number of immediate implications for the relation between wealth and investment. First, the fact that the rate of interest on deposits is much lower than the rate on loans means that the opportunity cost of capital for those who have their own money is much lower than the opportunity cost for those who have to borrow. This means that the wealthy will end up investing much more than the indigent, even if they face exactly the same returns on their investment. Second, the fact that richer people face different interest rates and better access to

⁸A partial exception is the institutionalized discrimination in favor of Malays in Malaysia, which is not easy to justify on the grounds that the Malays have historically been disadvantaged.

capital reinforces this conclusion, since it says that the wealthy have a lower opportunity cost when they too are borrowing. Finally, there is the direct effect of the fact that the rich have better access to credit.

We would therefore expect the poor to underinvest, certainly relative to the rich, but also relative to what would happen if markets functioned properly. The reason is that some of the non-poor actually end up overinvesting: The fact that the poor cannot borrow means that the non-poor cannot lend as much as they would like to (this is why deposit rates in developing countries are often very low), and given that they cannot lend, it makes sense for them to keep investing in their own firms, even when the returns are low.

The fact that the poor underinvest and therefore the opportunity cost of capital to the non-poor is lower than it would otherwise be, also changes the composition of the investors. In particular, firms that would be non-viable if markets functioned perfectly level (say, because the interest rate would be too high), can survive and even expand because markets are the way they are. In other words, the "wrong" firms end up investing.

The lack of insurance has a similar effect on the pattern of investment. The fact that many insurable risks are uninsured means that one cannot take on an investment without personally bearing a significant part of the concomitant risk. Indeed, big corporations that are able to sell their equity in organized equity markets may be the only "players" who can really hope to diversify away a large part of the risk of a particular project. Given this and the reasonable assumption that the poor are more risk averse, we are likely to be in the perverse situation where the poor who are more sensitive to a given risk may also find it hardest to reduce their exposure to risk. They are therefore likely to shy away from the riskier and higher return investments. This reinforces the prediction that the poor underinvest.

2.0.6 The effect of imperfect land markets

The imperfect saleability of land, of course, can hurt anyone who owns land. However, the rural poor probably have more of their wealth in the form of land than most people, and therefore making land non-saleable might be particularly harsh on them.

The lack of an explicit title, and the insecurity of tenure more generally (caused, for example, by the short duration of leases and the possibility that the landlord might hold them up by threatening to take the land away at the end of the lease), tends to discourage investment on the land that is tenanted. From this point of view, it clearly helps if land is owned by the person who is contemplating the investment; the fact that most of those who work in agriculture tend to be too poor to buy out the land they are cultivating is therefore a potential source of underinvestment.

Moreover, when the tenancy takes the form of a share contract there is the problem, already mentioned, that the tenant may have insufficient incentives to put in the right amount of effort.

2.0.7 The problem of human capital investment

With investment in human capital, the primary concern, as we already mentioned, is the fact that the decision rights do not lie with the direct beneficiary of the investment. Gary Becker's classic formulation of the problem of investment in human capital avoids this problem by assuming that the family can borrow against the child's future income, thereby turning the problem into a conventional investment decision. The amount invested in that scenario will not depend on the families' wherewithal.

In the more plausible circumstance where parents cannot borrow against their children's future income, they might still hope that when he grows up and reaps the benefits of their investment, he might feel it fit to pay them back by taking care of them in their old age, but they know that he has no legal obligation to do so. If he does, it is either because he feels for his parents or because society expects him to do so. But then it is not clear that he would feel comfortable in entirely abandoning his parents if they failed to educate him. This is not to say that parents do not benefit by making their children richer, or even that they do not vicariously enjoy their children's success, but to suggest that investment in human capital may be driven as much by the parents' sense of what is the right thing to do, as by any calculation of costs and benefits.

Once we accept this premise, it becomes clear that children's human capital is not very different from any other consumption good, and therefore richer families will tend to invest more in their children's health and education. Also, as a consumption decision, human capital decisions may be more a product of culture and tradition than the cold calculation of benefits: This is not to say that benefits are irrelevant, but the responsiveness to them may not be as large as one might have expected.

Negative discrimination in the labor market based on gender, caste, etc., or what is in effect quite similar—the lack of the right contacts—will tend to discourage investment in the type of human capital that is rewarded by that market. However, for someone who has the wherewithal to invest but is discouraged from investing in a particular type of human capital because she faces discrimination, the natural response may be to switch to a very different type of investment.

2.0.8 The Evidence on underinvestment

Industry and trade Direct estimates of the marginal product show that there are a lot of unexploited investment opportunities. Figure 1 plots a non-parametric relationships between firm earnings and firm capital in Mexico.⁹ Even ignoring the astronomical returns at the very low values of firm capital, this figure suggests huge returns to capital for these small firms: For firms with less than \$200 invested, the rate of returns reaches 15% per *month*, well above the informal interest rates available in pawn shops or

⁹From McKenzie and Woodruff (2004), Table 1.

through micro-credit programs (on the order of 3% per month). Estimated rates of return decline with investment, but remain high (7% to 10% per month for firms with investment between \$200 and \$500, and 5% for firms with investment between \$500 and \$1,000). These firms are therefore all too small.

Trade credit is an important form of credit everywhere and perhaps especially where the formal institutions of the credit market are underdeveloped. Fisman (2001) looked at the relation between access to trade credit and capacity utilization in a sample of 545 firms in Cote d'Ivoire, Kenya, Tanzania, Zambia, and Zimbabwe and finds that firms that get trade credit from all its three main suppliers (on average, about one out of the three suppliers provide trade credit) have 10% better capacity utilization than firms that have no trade credit. Moreover, the relation is much stronger in industries where it is important to carry large inventories.

However such studies present serious methodological issues: The basic problem comes from the fact that investment levels are likely to be correlated with omitted variables. For example, in a world without credit constraints, investment will be positively correlated with the expected returns to investment, generating a positive "ability bias" (Olley and Pakes (1996)). McKenzie and Woodruff attempt to control for managerial ability by including the firm owner's wage in previous employment, but this goes only a part of the way if individuals choose to enter self-employment precisely because their expected productivity in self-employment is much larger than their productivity in an employed job. Conversely, there could be a negative ability bias if capital is allocated to firms in order to avoid their failure.

Banerjee and Duflo (2003a) take advantage of a change in the definition of the so-called "priority sector" in India to circumvent these difficulties. All banks in India are required to lend at least 40% of their net credit to the "priority sector", which includes small-scale industry, at an interest rate that is required to be no more than 4% above their prime lending rate. In January, 1998, the limit on total investment in plants and machinery for a firm to be eligible for inclusion in the small-scale industry category was raised from Rs. 6.5 million to Rs. 30 million. Banerjee and Duflo (2003a) first show that, after the reforms, newly eligible firms (those with investment between 6.5 million and 30 million) received on average larger increments in their working capital limit than smaller firms. They then show that the sales and profits increased faster for these firms during the same period. Putting these two facts together, they use the variation in the eligibility rule over time to construct instrumental variable estimates of the impact of working capital on sales and profits. After computing a non-subsidized cost of capital, they estimate that the returns to capital in these firms must be at least 94%.

A very different kind of evidence for underinvestment comes from the fact that many people pay the very high interest rates reported in the previous sub-section. Given that this money typically goes into financing trade and industry, our presumption is that the people borrowing at these rates of often 50% or more must have a marginal product of capital that is even higher. On the other hand, the average

marginal product in developing countries seems to be nowhere near 50%. One way to get at the average of the marginal products is to look at the Incremental Capital Output Ratio (ICOR) for the country as a whole. The ICOR measures the increase in output predicted by a one-unit increase in capital stock. It is calculated by extrapolating from the past experience of the country and assumes that the next unit of capital will be used exactly as efficiently (or inefficiently) as the previous one. The inverse of the ICOR therefore gives an upper bound for the average marginal product for the economy—it is an upper bound because the calculation of the ICOR does not control for the effect of the increases in the other factors of production, which also contributes to the increase in output.¹⁰ For the late 1990s, the IMF estimates that the ICOR is over 4.5 for India and 3.7 for Uganda. The implied upper bound on the average marginal product is 22% for India and 27% in Uganda.

The fact that many firms in India have a marginal product of 50% or more while the average marginal product is only 22% or so, is strong *prima facie* evidence for the misallocation of capital. The firms with the marginal product of 50% and more are clearly too small, while other firms (the ones who bring the average down to 22%) must in some sense be too large.

Agriculture There is also direct evidence of very high rates of returns on productive investment in agriculture. In the forest-savannah in Southern Ghana, cocoa cultivation has been receding for many years because of the swollen shoot disease. It has been replaced by a cassava-maize inter-crop. Recently pineapple cultivation for export to Europe has offered a new opportunity for farmers in this area. In 1997 and 1998, more than 200 households in four clusters in this area, cultivating 1,070 plots were surveyed every 6 weeks for approximately two years. Figure 2 reports the distribution of profits (in 1000 cedis) on the traditional cassava-maize inter-crop and on pineapples based on this survey.¹¹ Pineapple production first order stochastically dominates the traditional inter-crop and the average returns associated with switching from the traditional maize and cassava inter-crops to pineapple is estimated to be in excess of 1,200%! Yet only 190 out of 1,070 plots were used for pineapple. The authors say that, “The virtually unanimous response to the question ‘Why are you not farming pineapple?’ provided by our respondents was ‘I don’t have the money.’”,¹² though some heterogeneity between those who have switched to pineapple and those who have not, cannot be entirely ruled out.

Evidence from experimental farms also suggests that, in Africa, the rate of returns to using chemical fertilizer (for maize) would also be high. However, this evidence may not be realistic, if the ideal conditions of an experimental farm cannot be reproduced on actual farms. Foster and Rosenzweig (1995) show, for

¹⁰The implicit assumption that the other factors of production are growing is probably reasonable for most developing countries, except perhaps in Africa.

¹¹From Goldstein and Udry (1999), figure 4.

¹²From Goldstein and Udry (1999), page 38.

example, that the returns to switching to high yielding varieties were actually low in the early years of the green revolution in India, and even negative for farmers without an education. This is despite the fact that these varieties had precisely been selected for having high yields, in proper conditions. But they required complementary inputs in the correct quantities and timing. If farmers were not able or did not know how to supply those, the rates of returns were actually low.

Chemical fertilizer, however, is not a new technology, and the proper way to use it is well understood. To estimate the rates of returns to using fertilizer in actual farms in Kenya, Duflo, Kremer and Robinson (2003), in collaboration with a small NGO, set up small scale randomized trials on people's farms: Each farmer in the trial delimited two small plots. On one randomly selected plot, a field officer from the NGO helped the farmer apply fertilizer. Other than that, the farmers continued to farm as usual. They find that the rates of returns from using a small amount of fertilizer varied from 169% to 500% depending on the year, although of returns declined fast with the quantity used on a plot of a given size.

Evidence for a different type of underinvestment in agriculture is illustrated in Table 3. This is the so-called negative size-productivity relationship, the idea that the smallest farms tend to be the most productive. Each column of the table compares the productivity of small and large farms within a particular country.¹³ The gap is enormous: A factor of 6 in Brazil and a factor of $2\frac{3}{4}$ in Pakistan. It is smaller (only 1.5) in Malaysia, but then the large farm in Malaysia is not very large. Taken together, it provides strong *prima facie* evidence that markets are somehow not allocating the right amount of land to those who currently farm the smaller plots.

The problem with this kind of evidence is that it ignores the many reasons why the bigger farm may be inherently less productive—worse soil quality, for example. However, similar, but somewhat less dramatic, results show up even after we control for differences in land quality. Figure 3,¹⁴ shows the results of such an exercise: Each straight line in this figure represents the relationship between the profit-wealth ratio and a measure of underlying risk, namely the standard deviation of the date of monsoon onset, for four different size categories of farms. The data comes from the Indian ICRISAT villages. The first observation about the Table is that the profit-wealth ratio is the highest for the smallest farms, and when risk is comparatively low, the gap is more than 3:1. Because wealth includes the value of the land, the measure implicitly takes into account differences in the quality of the land, as long as land prices are a reasonable measure of land quality.

The second notable fact about this figure is that all the lines slope down: When risk goes up, the average return goes down. In part this may be inevitable, but it may also reflect the fact that the lack of insurance encourages people to avoid risky (but remunerative) choices.¹⁵ This is consistent with the

¹³Based on Berry and Cline (1979).

¹⁴Taken from Rosenzweig and Binswanger (1993).

¹⁵Some of the effects of lack of insurance may be quite subtle. Banerjee and Newman (1991) argue, for example, that the

fact that profitability falls faster for the poorer farmers (who are less able to self-insure) as the risk goes up. Specifically, a one standard deviation increase in the coefficient of variation of rainfall leads to a 35% reduction in the profit of poor farmers, 15% reduction in the profit of median farmers, and no reduction in the profit of rich farmers. The study also finds that input choices are affected by variability in rainfall, and in particular, poor farmers make less efficient input choices in a risky environment.

In related work, Morduch (1993) specifically investigated how the anticipation of credit constraint affects the decision to invest in HYV seeds. Using a methodology inspired by Zeldes (1989), he splits the sample into two groups, one group of landholders who are expected to have the ability to smooth their consumption, and one group that owns little land, whom we expect *a priori* to be constrained. He finds that the more constrained group devote considerably smaller fraction of their land to HYV seeds for rice and castor.

Another consequence of the lack of insurance is that it may lead households to use productive assets as buffer stocks and consumption smoothing devices, which would be a cause for inefficient investment. Rosenzweig and Wolpin (1993) argue that bullocks (which are an essential productive asset in agriculture) serve this purpose in rural India. Using the ICRISAT data, covering three villages in semi-arid areas in India, they show that bullocks, which constitute a large part of the households' liquid wealth (50% for the poorest farmers), are bought and sold quite frequently (86% of households had either bought or sold a bullock in the previous year, and a third of the household-year observations are characterized by a purchase or sale), and that sales tend to take place when profit realizations are high, while purchases take place when profit realizations are low. Since there is very little transaction in land, this suggests that bullocks are used for consumption smoothing. Because everybody needs bullocks around the same time, and bullocks are hard to rent out, Rosenzweig and Wolpin estimate that, in order to maximize production efficiency, each household should own exactly two bullocks at any given point in time. The data suggest that, for poor or mid-size farmers there is considerable underinvestment in bullocks, presumably because of the borrowing constraints and the inability to borrow and accumulate financial assets to smooth consumption: Almost half the households in any given year hold no bullocks (most of the others own exactly two).¹⁶ Using the estimates derived from a structural model where household use of bullocks as a consumption smoothing device in an environment where bullocks cannot be rented and there is no financial asset available to smooth consumption, they simulate a policy in which the farmers are given a certain non-farm income of 500 rupees (which represents 20% of the mean household food consumption)

availability of insurance in one location (the village), while its unavailability in another (the city), may lead to inefficient migration decisions, since some individuals with high potential in the city may prefer to stay in the village to remain insured.

¹⁶The fact that there is under-investment on average, and not only a set of people with too many bullocks and a set of people with too few, is probably due to the fact that bullocks are a lumpy investment, and owning more than two is very inefficient for production—there is no small adjustment possible at the margin.

every period. This policy would raise the average bullock holding to 1.56, and considerably reduce its variability, due to two effects: The income is less variable, and by increasing the income, it makes “prudent” farmers (farmers with declining absolute risk aversion) more willing to bear the agricultural risk.

There is also compelling evidence that sharecroppers lack incentives. Binswanger and Rosenzweig (1986) and Shaban (1987) both show that, controlling for farmer’s fixed effect (that is, comparing the productivity of owner-cultivated and farmed land for farmers who cultivate both their own land and that of others) and for land characteristics, productivity is 30% lower in sharecropped plots. Shaban (1987) shows that all the inputs are lower on sharecropped land, including short-term investments (fertilizer and seeds). He also finds systematic differences in land quality (owner-cultivated has a higher price per hectare), which could in part reflect long-term investment.

Finally, on the impact of security of property, Do and Iyer (2003) find that a land reform which gave farmers the right to sell, transfer or inherit their land usage rights also increased agricultural investment, in particular the planting of multi-year crops (such as coffee). Laffont and Matoussi (1995) use data from Tunisia to show that a shift from sharecropping to owner cultivation raised output by 33 percent, and moving from a short-term tenancy contract to a longer-term contract increased output by 27.5 percent.¹⁷

2.0.9 The evidence on underinvestment: human capital

According to the report of the Commission for Macroeconomics and Health (Commission on Macroeconomics and Health (2001)), returns to investing in health are on the order of 500%. However, these numbers have been arrived at on the basis of cross-country growth regressions, and are not as easy to interpret as what would actually happen if someone would invest an extra dollar on health. That being said, there are clearly examples of specific health interventions that have enormous private and social returns: There is substantial experimental evidence that supplementation in iron and vitamin A increases productivity at relatively low cost. Basta, Soekirman, Karyadi and Scrimshaw (1979) study an iron supplementation experiment conducted among rubber tree tappers in Indonesia. Baseline health measures indicated that 45% of the study population was anemic. The intervention combined an iron supplement and an incentive (given to both treatment and control groups) to take the pill on time. Work productivity among those who got the treatment increased by 20% (or \$132 per year), at a cost per worker-year of \$0.50. Even taking into account the cost of the incentive (\$11 per year), the intervention

¹⁷Another piece of relevant evidence comes from the effects of titling non-agricultural land. Field (2003) shows evidence from a land titling program in the slums of urban Peru which suggests that the lack of a clear title to the land where you have built your home reduces the ability of the household members to work outside. Field hypothesizes that this is because someone needs to be home to defend the untitled property from expropriation by others. However, she does not find any evidence that land titling improves access to credit.

suggests extremely high rates of returns. Thomas, Frankenberg, Friedman, Habicht and Al (2003) obtain lower, but still high, estimates in a larger experiment, also conducted in Indonesia: They found that iron supplementation experiments in Indonesia reduced anemia, increased the probability of participating in the labor market, and increased earnings of self-employed workers. They estimate that, for self-employed males, the benefits of iron supplementation amount to \$40 per year, at a cost of \$6 per year.¹⁸ The cost-benefit analysis of a deworming program (Kremer-Miguel (2003)) in Kenya reports estimates of a similar order of magnitude: Taking into account externalities (due to the contagious nature of worms), the program led to an average increase in school participation of 0.14 years. Using a reasonable figure for the returns to a year of education, this additional schooling will lead to a benefit of \$30 over the life of the child, at a cost of \$0.49 per child per year. Not all interventions have the same rates of return however: A study of Chinese cotton mill workers (Li, Chen, Yan, Deurenberg, Garby and Hautvast (1994)) led to a significant increase in fitness, but no corresponding increase in productivity.

Measured returns on private investment in education tend not to be quite so high. Banerjee and Duflo (2004) survey the cross-country evidence on Mincerian returns, and conclude that “Using the preferred data, the Mincerian rates of returns seem to vary little across countries: The mean rate of returns is 8.96, with a standard deviation of 2.2. The maximum rate of returns to education (Pakistan) is 15.4%, and the minimum is 2.7% (Italy).” On the other hand, most of the educational benefits of deworming mentioned in the last paragraph would be captured by a child whose parents are willing to spend 50 cents on the deworming medicine. This clearly offers a return that is much higher than the measured Mincerian returns at affordable absolute cost, though they are not strictly comparable, since deworming does not require the child to spend more years in school, but helps her get more out of the years that she is already spending in school. However, when the deworming medicine was offered free to the children, the take-up was only 57%. In this sense, it is clear that at least some of the causes of underinvestment have to be sought in the way the family makes decisions, rather than in the lack of resources per se.

There is also some interesting recent experimental evidence showing that even relatively young children internalize discrimination, and stop putting in effort when they suspect that they will be discriminated against. Hoff and Pandey (2003), who carried out the experiment, found that low caste children in Northern India are just as good as their high caste counterparts in playing analytical games when their caste identity is not mentioned, but do much worse once their caste status has been made salient.

Finally the fact that the lack of connections alters the nature of human capital investment is nicely demonstrated in a recent paper by Munshi and Rosenzweig (2003). They show that while liberalization

¹⁸This number takes into account the fact that only 20% of the Indonesian population is iron deficient: The private returns of iron supplementation for someone who knew they were iron deficient—which they can find out using a simple finger prick—would be \$200.

increased returns to knowing English, in families that had connections in the blue-collar sector, there is a much bigger gap between girls and boys in the increase in enrollment in English-medium schools compared to families that have no connections. This is because girls never really expected to get these blue-collar jobs, while for their brothers, it depended on whether they had the right contacts.

2.1 Inequality and investment

All of this evidence suggests that markets are imperfect and wealth and social status matter for investment. Inequality means that some people have more wealth or higher status than others. From what we said in the last section, at least some of these lucky people will end up over-investing, while others, typically those who do not have enough money or the right social connections, will invest too little.

Since some people overinvest and others underinvest, it is not obvious that aggregate investment needs to go down. For example, the economy could have a fixed supply of savings supplied inelastically: If the economy is closed, so that investment is always equal to savings in equilibrium, total investment will then be independent of the distribution of investments across population.

On the hand, consider a scenario where savings are interest sensitive. An increase in wealth inequality would typically imply that there are more people who cannot invest as much they would want to, say because they do not have enough credit or insurance. To compensate for the lack of investment demand from the poor, the rich, who are already in a position to invest as much as they want, would have to demand more capital. But this would only happen if the interest rate were lower and a lower interest rate tends to discourage saving and hence investment.

Where the investment is not a financial investment, but an investment of time or effort, there is no reason why the underinvestment by one person will be matched by an overinvestment by others. For example, consider a hypothetical setting where initially land was equally distributed and every farmer farmed his own land. Then, for some reason, land became more unequally distributed. Now some have more than they want to farm and some have less, and want to work as tenants on the land that the big farmers do not want to farm. However, let us assume that they are now too poor to feel comfortable with a fixed rent contract and become sharecroppers, with the concomitant loss in effort and productivity. This is a pure loss, not compensated by any gain elsewhere, since the land that continues to be owner-cultivated continues to have the previous (efficient) level of productivity.

In such an environment, a government intervention which forces the landlords to give their sharecroppers a higher share of the output than the market would give them should increase effort and productivity. This is exactly what happened in West Bengal, India, when a Left Front government came to power in 1977: The tenant's share of output was set at a minimum of 75% as long as the tenant provided all inputs, and in addition, the tenant was guaranteed a large measure of security of tenure, which may have

encouraged him to undertake more long-term investments on the land. Survey evidence shows that there was a substantial increase in both tenure security and the share of output going to the sharecropper. The fact that the implementation of this reform was bureaucratically driven and proceeded at different speeds in different areas, suggests the possibility of using variation in the implementation of the reform to evaluate its impact. The data suggests that there was a substantial increase in the productivity of the land (62%) Banerjee, Gertler and Ghatak (2002).

When the inequality is in power rather than in assets, the effects are potentially even more perverse because there is no reason why someone who has power would want to use it to do what the powerless cannot do. Indeed, it is entirely possible that the poor peasant decides not to invest because he is afraid the landlord will grab his land, and the landlord decides not to invest because he is too busy building up his ability to grab. In other words, inequalities in power have the potential to create a rent-seeking society, where everyone is busy either rent-seeking or defending against rent-seeking.

The role of inequalities in power is nicely exemplified by the Goldstein and Udry (2002) study of investment in land in a setting (rural Ghana) where land is allocated by custom. They show that, in Ghana, individuals are less likely to leave their land fallow (which is an investment in long-run productivity of the land) if they do not hold a position of power within either the hierarchy of the village or the hierarchy of the lineage to which they belong: The problem is that the land gets taken away from them when it is lying fallow. Since women rarely hold these positions, women's land is not left fallow enough and is much less productive than men's land. Obviously, the fact that the powerless are not fallowing enough cannot and should not be compensated by extra fallowing on the land owned by the powerful. Inequality here causes an immediate loss in investment and productivity.

There is also a long literature that claims that intra-family inequality, and particularly the fact that both income and expenditures are often controlled by the male members of the family, leads to underinvestment, especially in the health and education of girls. A particularly striking example of this is in figure 4.¹⁹ One fallout of the dismantling of the apartheid regime in South Africa was the extension of the South African social pension program to include the black population. The figure shows height-for-age for girl children born in black families around the time of the extension of the program. The three lines represent, respectively, families where the person eligible for the pension was the child's grandmother, the child's grandfather, and families where no one was eligible. For children born before the extension (i.e., in 1990 and 1991), height-for-age is, if anything, slightly lower in families where the grandmother will eventually get the pension. But for children born after the extension, in 1992 and 1993, they are significantly taller (except for the newborns). But there is no difference between non-eligible families and families where pension money goes to the grandfather. Also, boys are essentially unaffected.

¹⁹Taken from Duffo (2003).

The estimates suggest that receipt of the pension (the pension was about twice the per capita income among blacks) was enough to help girls bridge half the gap in height-for-age between South African and American children.

The effect of inequality on the *quality of investment* may be at least as important as its effect on the total amount invested. To see why the productivity of investment may go down with inequality, consider a situation where the returns to investment in a firm goes down with the amount invested, i.e., there are diminishing returns. Assume also that everyone can at most borrow some multiple of his wealth. In this setting, an increase in wealth inequality increases the dispersion in investment levels across firms, because borrowing (and therefore investment) is constrained by wealth. Given that there are diminishing returns, this increase in dispersion reduces the average return on the investment (effectively the small firm is too small now and the big firm is too big).

Of course, this argument turns entirely on the assumption about diminishing returns. When there is a fixed cost of production but diminishing returns otherwise, the effect of inequality may be quite different: If all the firms are equal and the maximum they can each invest is less than the fixed cost, then no one will be able to start a firm. Increasing inequality will raise the productivity of capital by making it possible for some firms to pay the fixed cost. However, since there is also diminishing returns, there will be a point where any further increase in inequality would be counterproductive. More generally, the effect of inequality will depend on the shape of the production function, and the size of the investment potential of the average person relative to the fixed cost.

How good or bad is the assumption of decreasing returns in the production function of an individual firm? As mentioned above, Mackenzie and Woodruff (2003) attempt to estimate a production function for small Mexican firms. Their estimates suggest that there are strong diminishing returns while Ravalion and Mesnard (2001) find weak diminishing returns using Tunisian data. However, estimation of a production function which exhibits local increasing returns is inherently difficult. This is because a firm is likely to grow (or shrink) very fast when it is in the region of increasing returns. Therefore we will observe few firms in this region, and are likely to reject the assumption of local increasing returns too often. Certainly the natural interpretation of the results in Banerjee and Duflo (2004), showing close to 100% returns in what are very large firms in India, is that there are increasing returns over some range.

A different type of inefficiency in investment arises when there is both inequality and heterogeneity. Then a wealthy but inept entrepreneur may end up running a much bigger firm than his poor but highly talented competitor, simply because he has the money and she does not. An interesting example of this phenomenon comes from a study of the knitted garment industry in the Southern Indian town of Tirupur (Banerjee and Munshi (2004); Banerjee, Duflo and Munshi (2003)). Two groups of people operate in Tirupur: the Gounders, who issue from a small, wealthy, agricultural community from the area around

Tirupur, who have moved into the ready-made garment industry because there was not much investment opportunity in agriculture. Outsiders from various regions and communities started joining the city in the 1990s. The Gounders have, unsurprisingly, much stronger ties in the local community, and thus better access to local finance, but may be expected to have less natural ability for garment manufacturing than the outsiders, who came to Tirupur precisely because of its reputation as a center for garment export. The Gounders own about twice as much capital as the outsiders on average. Figure 5a plots the capital stock of Gounder and outsider firms as a function of the age of the firm: It demonstrates that Gounder firms of all ages own more capital, though there is a strong tendency towards convergence as the firms age. Figure 5b plots sales, once again as a function of age. It is clear that the Gounders, despite owning more capital, lose their early lead in sales by about year 5, and end up selling less. The outsiders are clearly more able than the Gounders, but they nevertheless invest less²⁰ because they are less cash-rich and do not have the right connections..

This body of evidence, while suggestive, has the problem that it is just a set of examples. A numbers of authors have tried to look for something more definitive by examining the cross-country relation between inequality and growth (which is presumably what investment is meant to achieve). A long literature (see Benabou (1996) for a survey) estimated a long run equation, with growth between 1990 and 1960 (say) regressed on income in 1960, a set of control variables, and inequality in 1960. Estimating these equations tended to generate negative coefficients for inequality. However, there are obvious concerns about whether such a relation could be driven entirely by omitted variables. To address this problem, Li and Zou (1998) and Forbes (2000) used the Deininger and Squire data set to focus on the impact of inequality on short run (5 years) growth, and introduced a linear fixed effect.²¹ The results change rather dramatically: The coefficient of inequality in this specification is positive, and significant. Finally, Barro (2000) used the same short frequency data (he is focusing on ten-year intervals), but does not introduce a fixed effect. He finds that inequality is negatively associated with growth in the poorer countries, and positively in rich countries.

All of these results are based on linearly regressing growth on inequality. Banerjee and Duflo (2003b) regress growth (or changes in growth) non-parametrically on changes in inequality and find the relationship to be an inverted U-shape. In other words, both reductions and increases in inequality seem to be accompanied by a fall in growth. Banerjee and Duflo (2003b) worry that this result might either be driven by omitted variables or by the fact that inequality is poorly measured.

The bottom line seems to be that we may never be able to say anything entirely unambiguous about

²⁰This is not because capital and talent happen to be substitutes. In this data, as it is generally assumed, capital and ability appear to be complements.

²¹Forbes (2000) also corrects for the bias introduced by introducing a lagged variable in a fixed effect specification by using the GMM estimator developed by Arellano and Bond (1991).

the relation between inequality in general and investment. There are however clearly situations where there is a strong presumption that reducing inequality would promote better investment—such as when there is inequality in landholdings leading to sharecropping, or where there is inequality in the village hierarchy leading to underinvestment in land by women, or where there is male dominance within the family leading to less investment in the health and education of girls. In other words, we should focus on specific inequalities and not on Inequality.

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D. Asset groups and loans

Asset group (RS)	Average loan size	Average interest rate (% p.a.)	Cumulative proportion of credit
0-5000	799.84	50	10.23
5000-10000	116.67	120	10.79
10000-15000	633.37	35	12.31
15000-20000	285.91	71	13.91
20000-30000	668.00	104	21.93
30000-50000	652.50	58	27.15
50000-100000	1267.83	48	41.34
100000 and above	4075.00	33	100

** denotes one loan each

Table 6.5. OLS and IV estimates of the effects of income on consumption

	<i>West Forest</i>		<i>East Forest</i>		<i>Savannah</i>		<i>All rural</i>	
<i>OLS 1985–86</i>								
No dummies	0.290	(6.2)	0.153	(3.2)	0.368	(5.8)	0.259	(8.8)
Village dummies	0.265	(5.7)	0.155	(3.5)	0.373	(5.7)	0.223	(7.7)
Own income	0.265	(5.3)	0.155	(3.2)	0.373	(5.6)	0.223	(7.1)
Village income	0.199	(1.4)	-0.031	(0.2)	-0.050	(0.2)	0.252	(3.0)
<i>IVE 1985–86</i>								
No dummies	0.192	(3.9)	-0.003	(0.1)	0.271	(4.0)	0.126	(4.0)
Village dummies	0.171	(3.5)	0.029	(0.6)	0.270	(3.8)	0.107	(3.4)
Own income	0.171	(3.2)	0.029	(0.5)	0.270	(3.7)	0.107	(3.1)
Village income	0.161	(1.1)	-0.417	(2.0)	0.020	(0.1)	0.144	(1.6)
<i>OLS 1986–87</i>								
No dummies	0.458	(8.8)	0.162	(5.3)	0.168	(4.0)	0.239	(10.4)
Village dummies	0.424	(8.1)	0.173	(5.6)	0.164	(3.8)	0.235	(10.1)
Own income	0.424	(7.9)	0.173	(5.3)	0.164	(3.8)	0.235	(9.7)
Village income	0.350	(2.0)	-0.094	(1.0)	0.061	(0.4)	0.039	(0.5)
<i>IVE 1986–87</i>								
No dummies	0.418	(7.8)	0.090	(2.8)	0.088	(2.0)	0.177	(7.4)
Village dummies	0.388	(7.3)	0.105	(3.2)	0.087	(1.9)	0.177	(7.3)
Own income	0.388	(7.1)	0.105	(3.1)	0.087	(1.9)	0.177	(7.0)
Village income	0.353	(2.0)	-0.127	(1.3)	0.015	(0.1)	-0.002	(0.0)

Note: Absolute values of *t*-values are shown in brackets. The first row of each panel shows the coefficient on income change of a regression of consumption changes on income changes. The second row reports the same result when village dummies are included in the regression. The third and fourth rows show the estimates from a regression of consumption changes on individual household and village average changes in income. The IV regressions use the change in the value of cash income, individual and village average, as instruments for total income including imputations; the *t*-values on these instruments in the first-stage regressions are large, typically larger than 30. Because village dummies “sweep out” the village means, the coefficients—but not the standard errors—are identical in the second and third rows in each panel.

TABLE 2: Farm-size productivity differences, selected countries

Farm size ^a	Northeast Brazil ^b	Punjab, Pakistan ^c	Muda, Malaysia ^d
Small farm (hectares)	563 (10.0-49.9)	274 (5.1-10.1)	148 (0.7-1.0)
Largest farm (hectares)	100 (500+)	100 (20+)	100 (5.7-11.3)

Notes:

^a100 = largest farm size compared with second smallest farm size. Second smallest farm size used in calculations to avoid abnormal productivity results often recorded for the smallest plots.

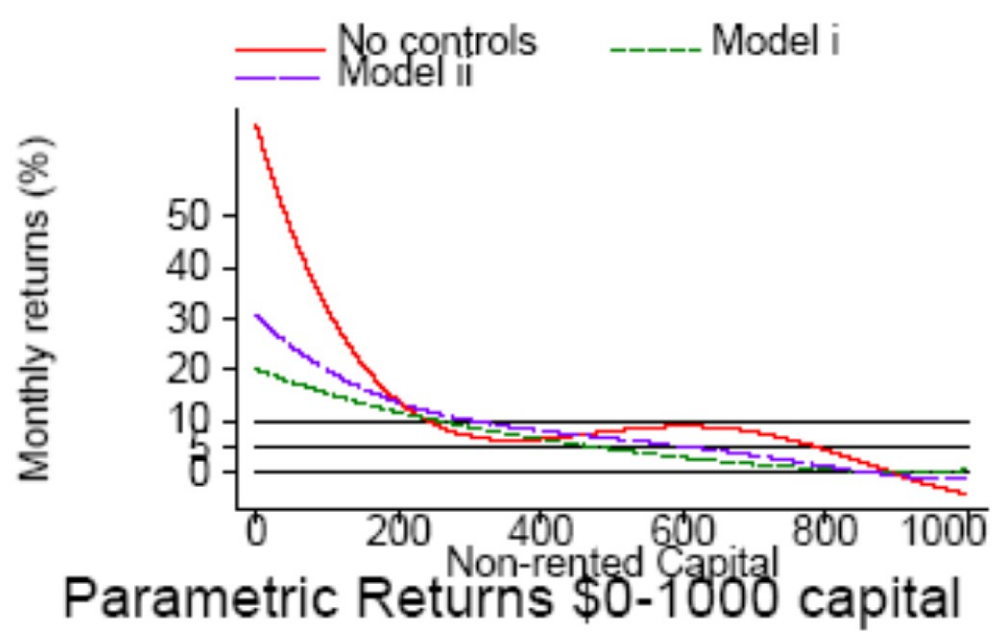
^bTable 4-1. Northeastern Brazil, 1973; Production per Unit of Available Land Resource, by Farm Size Group, p.46. Index taken using average gross receipts/areas for size group 2 (small) and 6 (large), averaged for all zones excluding zone F, where sugarcane and cocoa plantations skew productivity average for large farms.

^cTable 4-29. Relative Land Productivity by Farm Size: Agricultural Census and FABS Survey-based Estimates Compared, (1968-9) p. 84. Index taken using value added per cultivated acre for second smallest size group and largest.

^dTable 4-48. Factor Productivity of Muda River Farms by Size, Double Croppers, 1972-3 p. 117. Index taken from value added in agriculture/relong (0.283 ha = 1 relong).

Source:

Berry and Cline (1978)



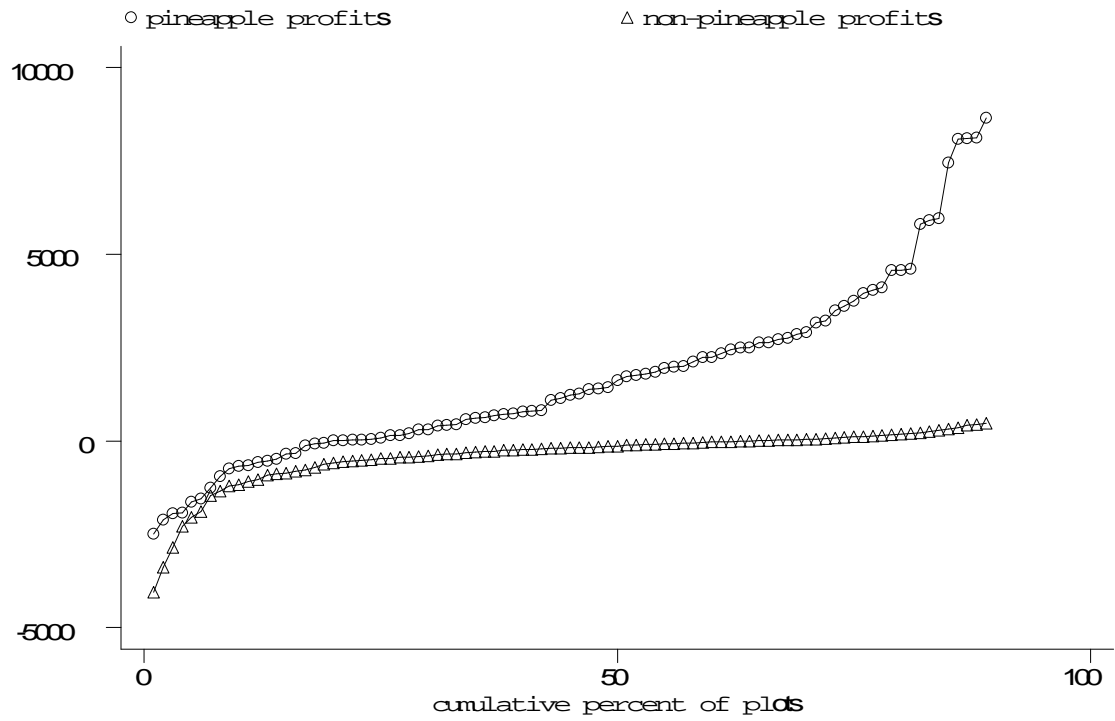


Figure 4: Distribution of Per-Hectare Profits (x1000)

Figure 3.

Profit-Wealth Ratios and Weather Variability, by Wealth and Class

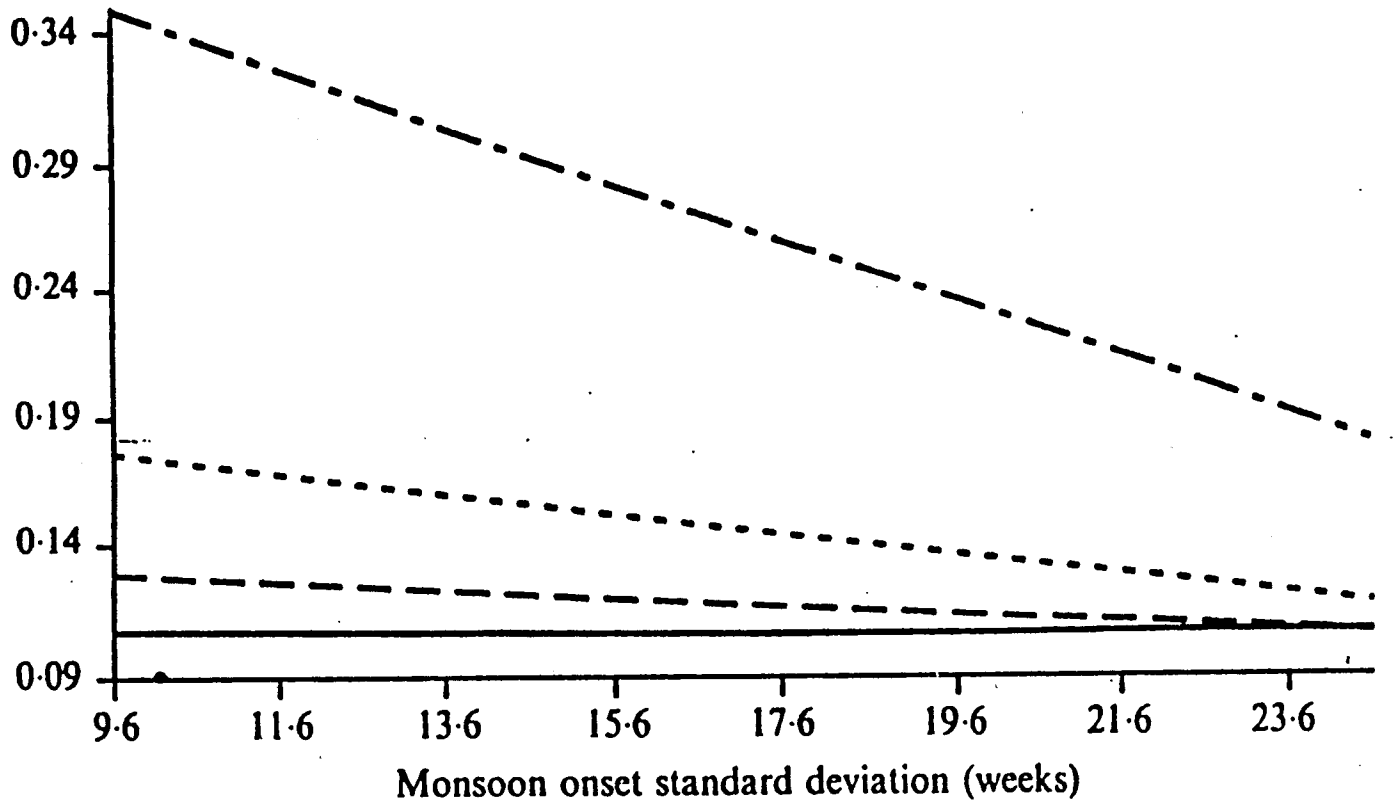
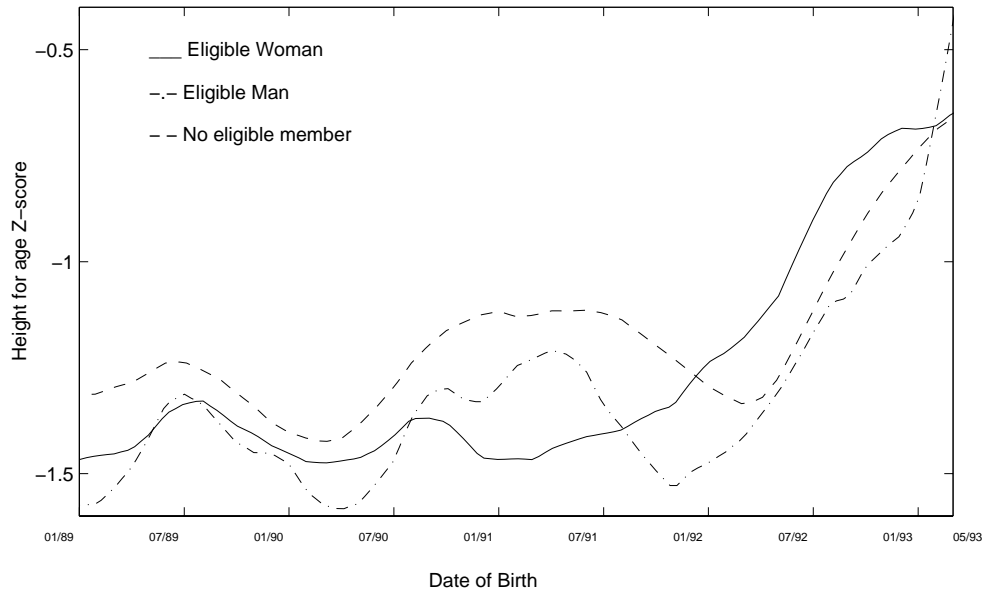


Fig. 3. Profit-wealth ratios and weather variability, by wealth class. Percentiles: —, 20th; — — —, 40th; - · - ·, 60th; · · · ·, 80th.

Note: The onset date of the Monsoon was the single most powerful of eight different rainfall characteristics to explain gross value of farm output.

Figure 1: Height for age of children living with eligible women, eligible men, no eligible member



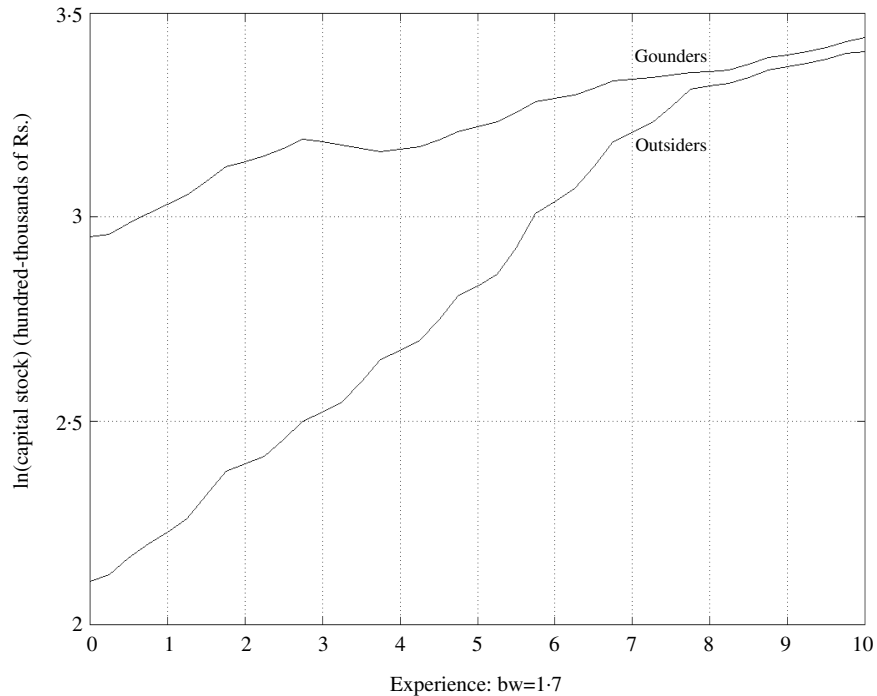


FIGURE 1
Capital stock—net cohort effects

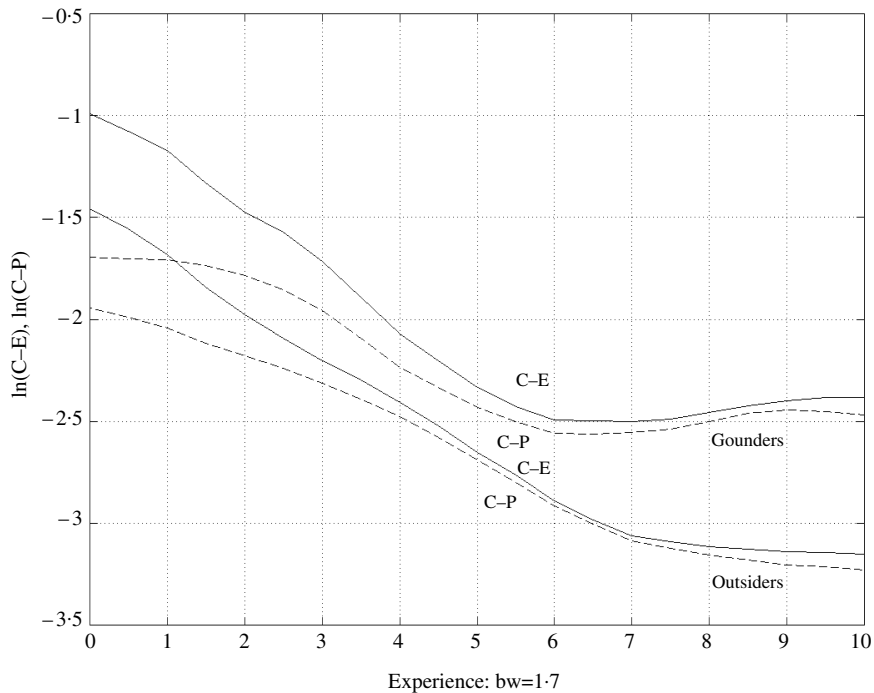


FIGURE 2
C-E ratio, C-P ratio—net cohort effects

Table 1: Descriptive Statistics

Community:	Direct Exporters	
	Gounders	Outsiders
	(1)	(2)
A. Experience		
Mean (standard error of the mean)	2.75 (0.17)	2.87 (0.18)
0.25 quantile	1	1
0.50 quantile	2	2
0.75 quantile	4	4
0.90 quantile	7	7
0.95 quantile	9	8
B. Production		
Mean (standard error of the mean)	268.13 (19.32)	216.92 (22.68)
0.25 quantile	80	70
0.50 quantile	150	130
0.75 quantile	300	250
C. Capital Stock		
Mean (standard error of the mean)	54.12* (4.31)	29.34* (3.55)
0.25 quantile	7.0	5.0
0.50 quantile	20.0	14.0
0.75 quantile	84.5	31.6
D. Other Investment Statistics		
Mean (standard error of the mean)		
Starting capital stock	23.14* (5.91)	8.03* (1.76)
Capital-Export ratio	0.57* (0.08)	0.23* (0.02)
Capital-Production ratio	0.31* (0.04)	0.19* (0.02)
% production as indirect exporter	21.69* (2.16)	12.9* (1.91)
Number of Observations	239	191

Experience is measured as the length of time after the year of entry as a direct exporter.

Production and Capital Stock are measured in Lakhs of Rupees.

1 Lakh = 100000 and the exchange rate during the sample period was approximately Rs.27 to the dollar.

* denotes rejection of the equality of means for the two communities with greater than 95% confidence.

Table 2: Investment Trajectories

Dependent variable :	ln(capital stock)			ln(cap-prod ratio)	ln(cap-exp ratio)
	OLS	Fixed-effects	Entry dummies	Entry dummies	
	(1)	(2)	(3)	(4)	(5)
Experience	0.222 (0.044)	0.165 (0.041)	0.165 (0.034)	-0.165 (0.047)	-0.247 (0.048)
Experience*Gounder	0.034 (0.058)	-0.029 (0.050)	-0.111 (0.050)	0.034 (0.070)	-0.005 (0.076)
Gounder Dummy	0.438 (0.267)	0.696 (0.135)	0.918 (0.063)	0.258 (0.072)	0.512 (0.078)
Constant	1.745 (0.194)	2.051 (0.098)	2.047 (0.039)	-1.869 (0.053)	-1.414 (0.055)
Entry dummies	No	No	Yes	Yes	Yes
Fixed Effects	No	Yes	No	No	No
Year Dummies	Yes	No	No	No	No
R-squared	0.252	0.960	0.865	0.782	0.704
Box-Pearson Q Statistic	1.541	0.013	1.654	1.350	1.155
Number of observations	434	434	434	430	421

Note: Robust standard errors in parentheses.

$Q \sim X_1^2$ under H_0 : no serial correlation. The critical value above which the null is rejected at the 5 percent level is 3.84.

Entry dummies are constructed using all the possible years of entry.

Columns 1 - 3: Capital stock regressed on experience.

Column 4: Capital-Production ratio regressed on experience.

Column 5: Capital-Export ratio regressed on experience.