

# Balancing growth with equity: The view from Development\*

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## Abstract

In a world of perfect markets, the distribution of resources in an economy would not affect investment and growth, and the ability to benefit from growth would only depend on one's intrinsic talents. However, if financial, land, and human capital markets do not function very well, the identity of who holds resources in an economy matters for how they are used. The poor can stay poor even if the economy as a whole grows. And growth can be slowed down because resources are not used in the most efficient way possible. Our understanding of why growth suddenly catches on in a poor country, and even more of what type of growth is inherently "pro-poor" or not is very limited. A long term strategy to balance growth with equity is thus to put in place policies that maximizes the chance that the poor are able to fully participate in markets, so that when growth starts, they can benefit from it. This paper describes market failures in developing countries, and discusses what is known, and not known, about such policies.

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## 1 Introduction

The title of this session assumes a trade-off between growth and equity, and a need to choose a point on that trade off. Indeed, a recurring issue in development circles is whether countries should focus their development strategies on growth or on poverty reduction strategies. The trade-off could come from a possible influence of growth on the distribution of wealth; or from a possible influence of the distribution of wealth on growth (presumably through an investment channel). A third possibility for a trade-off is that some policies that favor growth could have an increase in inequality as a direct by-product; or that policies that favor equity could have a decrease in growth as a direct by-product.

It is however not so obvious that such trade-offs necessarily exist in practice. Figures 1 to 3 show the long run evolution of one possible measure of inequality, the share of income that goes to the richest top 1%, taken from the World Income distribution projects in some countries. Singapore has experienced very rapid growth since 1960, and essentially a stable share until 1995. Argentina has seen inequality increase during both episodes of growth and episodes of stagnation and decline. Since 1980, Portugal has experienced both sustained economic growth and increased income inequality. In the long run, large shifts in inequality seem more related to institutional changes (changes in taxation) or big economic events (wars, huge financial crisis) than to productivity growth.

Indeed, the predictions from theory are not unequivocal. Depending on the form it takes, growth could be accompanied by an increase or a decrease in inequality. If factor markets were perfect, investment decisions and growth would have very little to do with the distribution of wealth: regardless of who holds the wealth originally, it would be allocated to its best use, through financial markets. Whether or not a particular investment is undertaken would depend only on its marginal return, corrected for the risk. There could still be an indirect effect of wealth distribution on growth through savings decision, if savings rates are correlated with wealth: the wealth distribution would affect the overall resources available to invest, though not how they are allocated in the economy. In this Kaldorian view greater inequality could increase growth.

However, one of the main contributions of development economics in the last 15 years or so is to have accumulated substantial evidence on how poorly different markets function in poor

countries. The scope for inequality to affect growth, and for growth to affect inequality, widens considerably once we introduce the possibility of imperfect markets. Then the identity of who owns a particular factor of production matters for what is done with it, which creates the scope for a link between inequality and growth.

The role for policy in this imperfect world is also very different from what it would be in a world with perfect factor markets. Most directly, in such a world redistribution could in principle lead to an increase in growth, not necessarily a decrease through the loss of efficiency that would be present in a world of perfect markets. More importantly, policies that correct the most egregious shortcomings in the efficiency of factor markets, and in particular the differences in access (to credit, savings instruments, insurance, etc.) among rich and poor, can in principle enhance both equity and efficiency.

There is no consensus on what policy is conducive to long term growth, and there may be an increasing consensus that we simply are unable to predict why growth suddenly catches on somewhere (for example, see Caselli, 2005, for a summary of the evidence on growth accounting: it seems we are able to account for very little). It is however very likely that, when growth catches on, it is more likely to benefit a broad segment of society, and more likely to be politically sustained in the long run if the poor are not shut out of the process by poor health and education, lack of access to credit and savings, and other consequences of combined inequality and imperfect markets. And fortunately, much more is known about how to achieve that, although there is still a lot to be learned.

There is a very large literature, theoretical and empirical, on the inter-relationship between inequality and growth, and there exist several excellent review books and papers (Fields, 1980, Banerjee 2010, Bourguignon, 2004), and it would not be productive to simply rehash it. In this paper, I will focus on one rather specific definition of equity, the welfare of society's very poor, compared to that of others in society (one could also consider, for example, that equity is about the difference between the income of the middle class and that of the very rich), and try to answer the following question: are there policies that are likely to improve the welfare of the poor here and now, and likely to be favorable to long term growth in developing countries. To this end, the first section of the paper will review the evidence on markets in developing countries. The second section will offer a brief discussion of the theoretical prediction of the inter-relationship

between inequality and growth in such a world. The third section reviews the (scant) empirical evidence in support of those theories, and argue that the traditional way to try to shed light on this question (cross country gross regressions) cannot provide us with as useful an insight as we need to inform policy. Finally, the fourth section will discuss policies. Section five concludes.

## **2 What is the evidence on markets in developing world?**

### **2.1 The Market for Credit**

In the textbook model of credit market, everyone faces the same interest rate, and the marginal return to capital is equalized across firms. Depositors are paid the marginal return minus some small change for the cost of operating a bank. This is what creates the separation between what people own and what they invest: if someone has a profitable investment opportunity, they borrow from people who do not. It turns out that two people who face the same return on investment will invest the same amount.

Reality seems very far from this model. Instead, credit markets in developing countries are characterized by a large gap between what is paid by lender and what is paid to depositor, and very variable interest rates. For example, the “Summary Report on Informal Credit Markets in India” (Dasgupta, 1989), 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 broad class of non-bank financial intermediaries called Finance Corporations, the maximum deposit rate reported 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 does not explain this pattern: Default costs only explain 4% of total interest costs. A well known study of rural money-lenders in Pakistan by Aleem (1990), finds that the median rate of default across money lenders is just 2 percent. In the rural version of the same report, the interest rates were even higher, and even more variable. That credit access and interest rates 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. Banerjee and Duflo (2007) report that, in Udaipur district, the interest rate from informal sources drops by 0.40 percent per month for each additional hectare of land owned.

None of these facts are necessarily surprising. Contract enforcement in developing countries is often difficult. In particular, it is not easy to get courts to punish recalcitrant borrowers. As a result, lenders often spend lots of resources ensuring 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.

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.

## **2.2 The Market for Savings**

The large gap between lending rates and deposit rates is not entirely due to the cost and the risk associated with lending: it may also be due to the cost of collecting and administering savings accounts. In many countries saving is (rightly) tightly regulated, to avoid the risk of fly-by-night operators absconding with the savings of the poor. For example, in India, Microfinance Institutions cannot collect savings, even from their own borrowers.

The result is that it is expensive for the bank to maintain small accounts, because the cost of maintaining a given account is essentially fixed. They pass these costs to customers in the form of very high fees. In Kenya, for example, opening a savings account at a local rural bank cost 450 Kenyan shilling (almost 7 dollars, at the current exchange rate) in 2010 (Dupas and Robinson, 2011). The bank does not pay interest, instead it charges a fee for every transfer: 30 KES for withdrawals less than 500 KES; 50 KES for withdrawals between 500 KES and 1,000

KES; and 100 KES for a larger withdrawal. For accounts that Dupas and Robinson opened as part of an experiment (waiving the fee for the person), an average of 5000 KES was deposited when the account was used at least once. The opening and transfer fees are thus extremely large compared to the typical deposit.

Banerjee and Duflo (2007) document that few poor households have savings accounts, in 13 countries for which they have gathered collated statistics from household surveys. Except in Cote d'Ivoire, where 79 percent of the extremely poor households under \$1 a day had a savings account, the fraction is below 14 percent in each of those countries. In Panama and Peru, less than 1 percent of such households have a savings account. In most countries, the share of households with a saving account is similar in rural and urban areas, and similar for those under \$2 a day and those under \$1 a day. A lack of access to reliable savings accounts appears common to the poor everywhere, as documented in Stuart Rutherford's (2000) book, "The Poor and their Money".

Rutherford describes the many strategies the poor use to deal with this problem: They form savings "clubs," where each person makes sure that the others do their savings. Self-help Groups (SHGs), popular in parts of India, and present in Indonesia as well, are saving clubs which also give loans to its members out of the accumulated savings (they are also sometimes linked to banks). In Africa, Rotating Savings and Credit Associations (ROSCAs) allow people to lend their savings to each other on a rotating basis. Others pay deposit collectors to collect their deposits and put them in a bank. Yet others deposit their savings with local money-lenders, with credit unions (which are essentially larger and much more formally organized Self-Help Groups) or in an account at the local post office. And the reason why many of the poor respond so well to micro-credit, is not necessarily because it offers them credit, but because once you take a loan and buy something with it, you have a disciplined way to save, namely, by paying down the loan. However even participation in semi-formal savings institutions (such as Self-help Groups, ROSCAs and Microfinance Institutions), is not nearly as common among the poor as one might have expected. Even in India, despite the high visibility especially of SHGs, less than 10 percent of the poor in our Udaipur and Hyderabad surveys are part of an SHG or a ROSCA. The majority of the households who have any savings simply have it at the bank.

The lack of access to savings accounts has a number of implications. First, it makes it difficult

for the poor to save even relatively small amount of money for lumpy purchase (a household durable, an asset for their business, school fees). Second, while credit market imperfection may prevent them from taking advantage of growth opportunity by setting up new businesses in the most productive sectors, the limitation in the savings market means that they cannot even take advantage of it indirectly, by offering their money to a bank who will take care of the intermediation and lend to someone who has sufficient collateral. This may even be true for the middle classes: in India, where the real growth rate of GDP is very high, the real interest rates paid to depositor in traditional savings accounts are close to zero, when inflation is taken into account.

### **2.3 The Market for Insurance**

A considerable literature has investigated the extent of insurance in rural areas in developing countries (see Bardhan and Udry, 1999, for a survey). Townsend (1994) used the ICRISAT data, a very detailed panel data set covering agricultural households in four villages in rural India to test for perfect insurance. The main idea behind this test is that with perfect insurance at the village level only, aggregate (village-level) income fluctuation, and not idiosyncratic income fluctuations, should translate into fluctuations in individual consumption. He was unable to reject the hypothesis that the villagers insure each other to a considerable extent: Individual consumption seems to appear to be much less volatile than individual income, and to be uncorrelated with variations in income. This exercise had limits, however (see Ravallion and Chaudhuri, 2000, for a comment on the original paper), and subsequent analyses, notably by Townsend himself, have shown the picture to be considerably more nuanced. Deaton (1997) shows that there is no evidence of insurance in Cote d'Ivoire. Townsend (1995) finds the same results across different areas in Thailand. Fafchamps 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. Most interestingly, Townsend (1995) 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 family.

This last fact is attributed to the proximity to the city, which makes the village a less close-knit community, where enforcement of informal insurance contracts is more difficult. Coate and Ravallion (1993) was one the first paper to propose the now very popular model of insurance with limited commitment, and to show that, when the only incentive to contribute to the insurance scheme in good times is the fear of being cut away from the insurance in future periods, insurance will be limited. It will also be optimal to make payment contingent on past history, which will lead to a blur between credit and insurance. Other limits to informal insurance include moral hazard, hidden income, and hidden savings. Kinnan (2010) proposes a test to empirically distinguish between these different explanations, with panel data from rural Thailand.

Despite this evidence, we do not fully understand the reasons for the lack of insurance among households. It is unlikely that either limited commitment or the more traditional explanations in terms of moral hazard or adverse selection can explain why the level of insurance seems to vary from one village to the next, or why there is no more insurance against rainfall, for example.

In fact, a striking fact about insurance in developing countries is the remarkably low demand for formal insurance products, such as parametric weather insurance or catastrophic health insurance. In a randomized experiment in Ghana, farmers were offered a simple weather insurance product (paying a fixed amount per policy purchased when the rainfall at the weather station fell below some threshold). Demand is very high when the product is free or nearly free (Karlan et al., 2011). But at the actuarially fair price, less than 40% of farmers purchased any insurance, and at the price that an insurer would like to charge to cover its administrative costs, the demand fell below 20%. The same result was found in India. A group of researchers tried various ways of marketing weather insurance in two regions in India –Gujarat and Andhra Pradesh–both dry and drought prone. In both cases, it was sold through a well-respected and well-known microfinance organization. The company tried various ways to offer and present the insurance to farmers. Overall, the sign-up rates were extremely low: At most, 20 percent of farmers bought some insurance, and that level of sign-up only occurred when someone from those very well known MFIs went door-to-door to sell the product. Moreover, even those who bought some insurance bought very little: Most farmers purchased policies that would cover only 2 percent to 3 percent of their losses if the rains did fail. There are many reasons why the demand for insurance may

be low. One likely possibility (proposed by Banerjee and Duflo, 2011) is that the formal market is so limited in what it can offer (due to the familiar moral hazard, adverse selection, and fraud issues) that the resulting product is simply not attractive enough for the clients, as it leaves too many obvious risks un-covered.

## **2.4 The Market for Land**

The ideal market for land is one where it is possible to buy or sell as much land as one wishes to anyone, and to lease it, preferably for a fixed price to anyone possible. In fact, land markets in developing countries are very far from this ideal. This is particularly problematic for the poor, because it is often the one asset they own. Governments puts some limit of how much a person can own: 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. Property rights on land are not clearly defined, and can change depending on the political clout of the person who "owns" the land (Goldstein and Udry, 2008). In cities, land on which many of the poor live was often encroached on at a point or another, which creates further uncertainty in property rights.

When lands are leased, it is usually not for a fixed rent. Sharecropping is popular, both in the US and in many developing countries. While its preponderance suggests that it must correspond to a real need, sharecropping distorts the incentives to invest, both for the tenant and for the landlord.

## **2.5 The Market for Human capital**

Investment in human capital is special in that, in many instances, it must be done by parents on behalf of the child: as we will see below, in some conditions, this creates a wedge between the optimal investment (which should depend only on the return to human capital for this child) and the effective investment.

The functioning of the labor market also affects the rewards given to skills, and hence the incentives to accumulate them. There is evidence that labor market do not only reward skills in developed countries, for example due to discrimination (Bertrand and Mullainathan, 2004) or because jobs are obtained in parts through contacts and social networks (Granovetter, 1995, Munshi, 2003, Beaman and Magruder, 2011). In many poor countries, labor markets are often

vey segmented, with a formal market protected by very strong labor laws (Besley and Burgess, 2003, have codified them for India; Magruder, 2010, shows that collective bargaining institutions in South Africa, which cover both large and small firms, prevent employment growth and business creation), and a much more fluid, but less rewarding, informal market. Barriers to migration due to regulation limiting mobility (China), deficient urban infrastructure (pretty much everywhere), credit constraints, etc. further put limits on the ability of the poor in rural areas to take advantage of growth that is happening in urban areas. Permanent migration for work is relatively rare (Banerjee and Duflo, 2007). Transitory migration, whereby one family member goes to the city for a few weeks at a time, is much more frequent. But this temporary spell means that workers do not accumulate human capital that is specific to the jobs in the city: they remain limited to unskilled labor. Chowdhury et al. (2009) finds that when households are provided small incentives to migrate (in the form of the cost of the bus fare), they are much more likely to do so. Ardington et al. (2009) also find that the probability that a prime age worker migrates increases when one member of the household receives an old age pension.

### **3 The relationship between Growth and inequality in a world with imperfect markets**

#### **3.1 From growth to inequality**

Economic growth modifies the distribution of resources across sectors, relative prices, factor rewards (labor, physical capital, human capital, land, etc...); and the factor endowments of agents. These changes are likely to directly impact on the distribution of income, regardless of whether factor and goods markets are perfect or not. There are three broad class of models that generate a link between growth and inequality.

In the first class, the *selection models*, associated most prominently with Kuznets, growth comes from an increase in the productivity in one sector of the economy, which is initially the smaller sector (think of the urban sector, for example). Movement into that sector is slow (due to some friction in the labor market for example), and inequality initially increases as more and more people join the more productive sector. Over time, as more and more people join the productive sector, inequality diminishes again. This gives rise to the celebrated inverted

U-shaped Kuznets curve. Different selection models, however, have different predictions on the shape of this curve.

A second class model of model which leads to a prediction that growth would affect inequality is that of *human capital* based models. Growth may be skill-biased, i.e. lead to an increase in the returns to education, managerial ability, or other dimensions of human capital. Those who are endowed with more human capital, who were already presumably earning more, earn even more, and this leads to an increase in inequality. Skill-biased technological progress has been proposed as an explanation for part of the inequality increase in the US over the last few decades (Katz and Autor, 1999, Katz and Murphy, 1992).

Models with *threshold* effects form a third class of models where growth will affect inequality, and inequality will affect growth, in a setting with credit constraints. This class of models has seen considerable work in development economics over the last decade.<sup>1</sup>

Consider a model where every participant in the economy has access to the (same) production function. They chose investment, borrowing and savings and consumption to maximize life time utility, but they are credit constrained: they can only borrow a multiple of their wealth.

This model is a straightforward generalization of the standard growth model. What it tells us about the evolution of the income distribution and efficiency depends, not surprisingly, on the shape of the production function.

The simplest case is that of constant returns in production. In this case, inequality remains unchanged over time, and production and investment is always efficient.

With diminishing returns, greater inequality can lead to less investment and less growth, because the production function is concave. However, inequality falls over time and in the long run no one is credit constrained, although we do not necessarily get full wealth convergence. The long run interest rate converges to its first best level, and hence investment is efficient (Loury, 1981). To see why this must be the case, note first that because of diminishing returns the poor always have more to gain from borrowing and investing than the rich. In other words, the rich must be lending to the poor. As long as the poor are credit constrained, they will earn higher

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<sup>1</sup>see: Banerjee and Newman (1993), Banerjee and Newman (1994), Banerjee and Newman (1998), Dasgupta and Ray (1986), Galor and Zeira (1993), Lloyd-Ellis and Bernhardt (2000), Mookerjee and Ray (2002, 2003), Ghatak, Morelli and Sjostrom (2001, 2002), and Buera (2003).

returns on the marginal dollar than their lenders, i.e., the rich (that is what it means to be credit constrained). As a result, they will accumulate wealth faster than the rich and we will see convergence. This process will only stop when the poor are no longer credit constrained, i.e., they are rich enough to be able to invest as much as they want.

With increasing returns, inequality increases over time; we converge to a Gini coefficient of 1. Wealth becomes more and more concentrated with only the richest borrowing and investing. Because there are increasing returns, this is also the first best outcome. The logic of this result is very similar to the previous one: Now it is the rich who will be borrowing and the poor who will be lending, with the implication that the rich are the ones who are credit constrained and the ones earning high marginal returns. Therefore, they will accumulate wealth faster and wealth becomes increasingly concentrated.

The most interesting case is that of “S-shaped” production functions, which are production functions that are initially convex and then concave. A Cobb-Douglas with an initial set-up cost is a special case of such technology, or there could be multiple production function, where the productivity is embedded in fixed capital. What happens in the long run in this model depends on the initial distribution of income. When the distribution is such that most people in the economy can afford to invest in the concave part of the production function, the economy converges to a situation that is isomorphic to the diminishing returns case, with the entire population “escaping” the convex region of the production function.

However, if some people start too poor to invest in the concave region of the production function, the poorer among such people will earn very low returns if they were to invest and therefore will prefer to be lenders. Now, as long as the interest rate on savings is less than  $1/\delta$  (the discount rate), they will decumulate capital (since the interest is less than the discount factor) and eventually their wealth will go to zero. On the other hand, anyone in this economy who started rich enough to want to borrow will stay rich, even though they are also dissaving, in part because at the same time they benefit from the low interest rates. The economy will converge to a steady state where the interest rate is  $1/\delta$  (the invert of the discount rate) those who started rich continue to be rich and those who started poor remain poor (in fact have zero wealth). In this economy, if the return to the productive activity goes up, there will be both faster growth and more inequality.

## 3.2 From inequality to growth

### 3.2.1 Financial Markets

The model we just discussed implies a clear effect of the wealth an individual starts with on their own trajectory (creating an individual poverty trap). Furthermore, it opens the possibility of a collective poverty trap, even in a world where shocks may sometimes help people get over the hump. When there are many poor people who cannot invest, this drives down interest rates, and the low interest rates make it harder for the poor to save up to escape poverty even if they get a positive shock. As a result, in an economy that starts with lots of poor people, a greater fraction of people may remain poor.

The key to this multiplicity is the endogeneity of the interest rate. What sustains it is the pecuniary externality that the poor inflict on other poor people. This is why such poverty traps are sometimes called *collective poverty traps*, in contrast to the *individual poverty traps* described above.<sup>2</sup>

Banerjee and Newman (1993) propose an alternative mechanism for a collective poverty trap in a model with a S-shaped production function. In that model, the poverty trap is driven by the endogeneity of the wage: essentially high wages allow workers to become entrepreneurs more easily, and this keeps the demand for labor high, which keeps wages high.

These conclusions are reinforced in models where monitoring and contractual enforcement costs, and costs that are entailed in collection and administering savings, create a wedge between the interest paid to depositors and the actual interest rates. The poor will invest less than the rich, because they are unable to borrow to start a project, and the return on any savings is less than what it is for the rich. This also means that the rich will end up over-investing relative to what they would if financial markets worked perfectly. This will lower growth if there are diminishing returns. Because the interest rates will be lower, if savings is interest elastic, investment and savings will be even further affected.

The consequences of the misallocation of funds are even worse if, instead of facing the same

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<sup>2</sup>The investigation of the evolution of income distribution in models with credit constraints and endogenous interest rates goes back to Aghion and Bolton (1997), Matsuyama (2000, 2003) and Piketty (1997) which emphasize the potential for collective poverty traps in a variant of this model, without the forward-looking savings decisions.

production functions, people differ in their ability. Rich, but not very competent people, may end up having to invest in their own firms because they have no way to lend their money to someone else. These firms remain viable because the competition is less intense than it would have been under properly functioning capital markets; but many potential “good firms” never see the light of the day.

### **3.2.2 Insurance**

Irrespective of the ultimate reason for the lack of insurance, 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; a third of the household-year observations are characterized by a purchase or sale). Furthermore, the sales tend to take place when profit realizations are low, while purchases take place when profit realizations are high. 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 bullock (most of the others own exactly two).<sup>3</sup> Using the estimates derived from a structural model where household use 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

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<sup>3</sup>The 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.

500 rupees (which represents 20% of the mean household food consumption) 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.

Moreover, we observe only insurance against the risks that people have chosen to bear; the inability to smooth consumption against variation in income may lead households to choose technologies that are less efficient, but also less risky. Banerjee and Newman (1998) argue, for example, that the availability of insurance in one location (the village), and 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.

### **3.2.3 Land Markets and Property Rights**

Effective rates of return and investment rates can sometimes be low because the responsibilities and/or the benefits of the investments are shared, or because the investors are worried about being expropriated. The investor is then not capturing the full marginal returns of its investment. Imperfect property rights will thus lead to low investments. Poorly enforced property rights also make it difficult to provide collateral, which exacerbates the problems of the credit market (this is the mechanism emphasized by Hernando de Soto, who famously argued that the poor are sitting on billion of dollars worth of “dead capital”).

Even when property rights themselves are legally well defined and protected, there are institutions which reduce the private incentives to invest. Sharecropping is one environment where both the landlord and the tenants have low incentive to invest in the inputs that they are responsible for providing (Eswaran and Kotwal, 1985).

### **3.2.4 Human capital investment**

As we already pointed out, the decision to invest in human capital is normally taken by parents on behalf of their children. Thus, the way the decisions are made in the family has a direct impact on investment decisions. In the benchmark neo-classical model (Barro, 1974, Becker, 1981), parents value the utility of their children, perhaps at some discounted rate. This world tends to be observationally equivalent to one where an individual maximizes his long run income, and has the

same strong convergence properties. However, if parents are not perfectly altruistic, the ability to constrain the repayment of future generations influences investment decisions. This creates a wedge between the optimal investment in human capital, and the actual investment. Banerjee (2004) studies the both the short and the long-run implications of different ways to model the family decision-making process. He shows that incomplete contracting between generations generates potentially large deviations from the very strong convergence property of the Barro-Becker model. Deviations also occur if parents value human capital investment for its own sake (for example, because people like to see their children happy). These deviations may be the cause the inter-generational persistence of inequality, and to the extent that there is a mismatch between ability and education, lower efficiency and lower growth.

### **3.2.5 Political Economy**

Alesina and Rodrik (1994) proposed a political economy channel for the impact of inequality on growth: more inequality leads to demand for more redistribution, and the higher implied taxes reduce growth. The story can be extended to include conflicts over resources more generally. Alesina and Perotti (1996) argue that inequality can lead to less political stability, and this in turn can lead to sub-optimal investment levels. Rodrik (1998) finds that countries that experienced the sharpest drops in growth after 1975 were those with divided societies and with weak institutions, and this cripples the ability of their political systems to respond effectively to external shocks. Violence levels are have sharply increased in countries with very high level of inequality (Brazil, Columbia, Mexico, and also African countries, like Kenya and South Africa). The economic costs of violence are both direct: people are less likely to want to invest (in their own human capital or in physical projects) in violent environments, and indirect, through the opportunity costs of resources spent to end the violence and on the subsequent restorative efforts.

The experience of Brazil may be an illustration of the large negative effects of fast growth on inequality. In the 1960s and 1970s, fast growth accompanied with large increases in inequality fueled populist demands that eventually gave rise to hyper-inflation and stopped economic growth. When President Lula assumed office, and could credibly commit to help the poor with more long-term policies, the macro-economic situation stabilized, which created conditions for more permanent growth

Even in India, where the political system is stable, and there is little inequality-fueled violence outside of pockets of Maoist activities, political history over the last 10 years or so points to the political danger of ignoring the poor, and the resulting pressure towards populism: after more than a decade of fast growth, the BJP in power lost the election in 2004, largely voted out by the poor who were unconvinced by the “India Shining” slogan. The Congress-led government instituted a series of large transfer programs for the poor, including a cash-for-work scheme, which appear to suffer from significant diversion, and a loan waiver program which allowed some farmers to default on their bank loans. The MFI movement was pushed to the brink of death by political interference in Andhra Pradesh, when the State Government essentially made it acceptable for borrowers to default by claiming that the MFIs were not legitimate. The administration is now pushing for a “right to food” bill that may enshrine the current public distribution system, known for its inefficiency and corruption. These populist moves seem to be the way the administration has chosen to balance a generally pro-business macro-economic policy to avoid a social explosion fueled by the widening gaps between rich and poor, but it is likely that, in the not-so-long run, they will hurt India’s growth prospects and social fabric.

## 4 Evidence?

### 4.1 Cross-country regressions cannot answer the question

Inspired by one or the other of these theories, countless studies have tried to estimate the impact of growth on inequality, or the impact of inequality on growth (or sometimes both) using a cross country regression framework. Work attempting to prove the existence of a Kuznets curve was popular in the 1970s. Paukert (1973) and Chenery and his collaborators, including Ahluwalia (see e.g. Ahluwalia, 1976, and Ahluwalia, Carter and Chenery, 1976) seemed to find evidence of a Kuznets curve. Bourguignon and Morrison (1990) argued that this empirical relationship, while perhaps valid across countries in the 1970s, did not fit the subsequent evolution of inequality observed in a sample of countries.

This line of study received a boost when Deininger and Squire released a data set on income distribution, at regular interval, using all the data they could find on a number of countries. Deininger and Squire (1996) used their data set to revisit evidence for a Kuznets curve. While a

cross section of countries yields evidence of an inverted U-Shaped relationship between inequality and GDP, the relationship disappears once fixed effects are introduced. Dollar and Kraay (2002) use the Deininger and Squire data, complemented with other data, to estimate the relationship between growth in the income of the poor (measured as the share of income going to the poorest quintile, multiplied by the GDP of the country) and growth in GDP. Running the regression in logs, they find a coefficient of 1. To restate the result, what they find is that in their data set there is a coefficient of zero between the change in the log of the share of income (or consumption) going to the poorest 20% in a country, and the change in the log of GDP. Sala-i-Martin's (2002) well known calculation of the number of poor people in the world exploits this relative stability of the share of income going to the poor, to justify calculating the income of the poor by multiplying GDP by the same of income going to the poor in whatever year it is available.

Conversely, a large literature has tried to look at the effect of inequality on growth. There again, the Deininger and Squire dataset proved to be a bonanza, because it allowed researchers the possibility of running panel regression, and thus removing country fixed effects. 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. As the discussion in the previous subsection suggests, there are many reasons to think that this relationship may be biased upward or downwards. To address this problem, Li and Zou (1998) and Forbes (2000) used the Deininger and Squire dataset to focus on the impact of inequality on short run (5 years) growth, and introduced a linear fixed effect.<sup>4</sup> The results change rather dramatically: The coefficient of inequality in this specification is positive, and significant. Finally, Barro (2000) uses the same short frequency data (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 associated with growth in rich countries.

There are a number of practical and conceptual problems which mean that, unfortunately, the evidence presented in this literature is of little use.

At a practical level, the data available in the Deininger and Squire dataset is of very poor

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<sup>4</sup>Forbes (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).

quality (this is not their fault at all: they compile existing data). Atkinson and Brandolini (2001) demonstrate all the spurious patterns that emerge due to the use of different sources across countries and over time, different definitions of income, etc. Long series on inequality require the use of a consistent, high quality data set of income. The World Income Project (Alvaredo, Atkinson, Piketty, and Saez, 2011) represents such an effort, using tax data to put together comprehensive series on the share of the top 1% in income, but it covers a relatively small number of developing countries so far, and has less to say about the income of the poor (since taxation usually covers only the richest in a society). Even using data compiled from household surveys (and available through the PovCalNet project at the World Bank), which has the merit of being internally consistent, is not necessary very useful combined with National Accounts Statistics data (in the exercise that Sala-i-Martin performs for example), since the two sources seem to be measuring something different: generally, growth in consumption in household surveys is slower than growth in NAS data, and the source of the difference is unclear (Deaton, 2005). The two may not be measuring the same object even if they intend to.

At a conceptual level, it is not clear that the linear regression model that is notionally inspired by the models discussed above make any sense. Banerjee and Duflo (2003) find that when growth (or changes in growth) is regressed non-parametrically on changes in inequality, the relationship is an inverted U-shape. There is also a non-linear relationship between past inequality and the magnitudes of changes in inequality. Finally, there seems to be a negative relationship between growth rates and inequality lagged one period. Taken together, these facts, and in particular the non-linearities in these relationships (rather than the variation in samples or control variables), account for the different results obtained by different authors using different specifications.

Townsend and Ueda (2003) illustrate very clearly that this diversity of results is likely to come from fundamental functional form and identification problems. As they point out, “although most of the theoretical models characterize economic growth with financial deepening and changing inequality as transitional phenomena, typical empirical research employs regression analysis to find a coefficient capturing the effect of financial depth or inequality on growth. The implicit assumptions of stationarity and linearity are incorrect, even after taking logs and lags, if the variables of actual economies lie on complex transitional growth paths, as they do in the theoretical models.” To demonstrate this point, they simulate the 30 year evolution for 1000

economies based on a model of Greenwood and Jovanovic (1990), which has non-linear individual production function and credit constraints. The economies start in 1976, with a distribution of wealth calibrated to match the Thai economy in the same year. They then introduce aggregate and individual level shocks, and run regressions similar to the regressions run in the literature. Using the 1985 year as the “base year”, they replicate the findings of the long run regressions. Using 1980 as the base year, they do not replicate those results. A regression similar to that of Forbes (2000) finds either positive or negative relationship, depending on sampling decisions. This exercise clearly shows that aggregate cross country regressions are not the right tool to evaluate the pertinence of this class of models.

## 4.2 Some micro-evidence

Given that looking at cross country relationships is not promising, we have to turn to microeconomic evidence to show whether the micro-economic channels that we have discussed, and that can be the source of an inter-relationship between growth and equity, are indeed at work. Is there evidence of under-investment, or miss-allocation of investments linked to the poor functioning of various markets, and is there a reason to think that this can induce a relationship between equity and growth?

### 4.2.1 Credit

The high and variable interest rates that we documented earlier, since in my case they measure credit taken for productive activities, are *prima facie* a sign of some form of under-investment, relative to a first best that has no transaction costs on lending. Borrowers seem to be willing to invest and generally do not default on loans with interest rates up to 60% or more. This must mean that the marginal productivity of their investment is that high. It could however be that this applies only to a minority of firms: the other ones are simply not borrowing.

In general, marginal returns to capital are difficult to measure directly, since firms that invest more are also likely to be the ones with the highest “ability”, or entrepreneurial talent (Olley and Pakes, 1996). So although credit constraint are a key part of the way development economists have described the world, there was until recently little very solid evidence to prove that they exist, and their importance.

McKenzie et al. (2008) implement an experiment to measure the marginal product of capital. From a sample of 408 very small businesses (with less than \$1,000 of fixed capital and an average turnover of \$100 a month) in Sri Lanka, a randomly chosen subset received a grant worth about \$100. Some of the grants were given in cash, while others were given in kind, in the form of a specific business asset chosen by the business owner. They then collected several waves of detailed data on these firms, including investment, sales, and cost. The productivity of additional capital for these firms turns out to be very high. The average monthly profits of firms that received the \$100 grants increased from \$38.5 to \$53, which corresponds to a marginal return to capital of 4.6 to 5.3 percent per month (55 to 63 percent per year). By comparison, banks charge 12 to 20 percent per year in Sri Lanka, but only 3 percent of the firms had a bank account for business use and only 11 percent of the firms got any money from any formal financial source to start their business. The pattern of these results is replicated for tiny retail firms in Mexico in McKenzie and Woodruff (2008), where they find even higher marginal productivities of capital (20 to 33 percent per month, and between 900 percent and 3000 percent per year).

Since the Sri Lanka experiment is focused on very small firms, it remains possible that larger firms are not subject to credit constraints, and correspondingly they may have much lower marginal returns. It is difficult to imagine carrying out the same randomized experiment for larger firms that are already connected to the banking sector. However, Banerjee and Duflo (2008a) take advantage of a natural experiment to estimate the effect of an inflow of credit on the investment and productivity of medium-sized firms in India. The study exploits a temporary policy change that increased the upper limit on fixed capital under which a firm was eligible for subsidized credit. After two years, the change was reversed. The firms affected by the policy were officially registered firms (they are not part of the informal economy) and fairly large by Indian standards, though not the largest corporate entities. Comparing firms that were always eligible to firms that became eligible for increased credit both before, during, and after the policy change, they find that firms newly eligible for credit experienced a large increase in sales and profits. The results suggest a very large gap between the marginal product and the interest rate paid on the marginal dollar. The point estimate for the firms whose credit actually went up is that Rs. 100 more in loans increased profits by about 90 rupees per year, whereas firms pay around 16 percent per year in interest.

These two examples suggest that some firms have very high marginal rates of returns. The average rate of return to capital, however, is not much higher in developing countries: Caselli and Feyrer (2007) find that the marginal product of capital is the same in poor and rich countries, and that, in fact, it is below 10 percent everywhere. Swan (2008), using a different series for the prices of capital goods, finds substantially higher estimates for developing countries, but even his estimates are much lower than many of the firm level estimates for the marginal product of capital. 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. ICOR provides 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 contribute to the increase in output. 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 some firms have marginal returns to capital of 70% or higher, while the average return to capital is 22%, is evidence that capital must be misallocated.

All this suggests that capital is not allocated to its most efficient use. It could be due to locally diminishing returns (very small firms could be a bit bigger; medium scale firms that have paid the fixed cost of plant and machinery could be much bigger). In this case, the distribution of wealth will have a direct impact on growth. As we noted, this conclusion is reinforced if there is heterogeneity in the production functions that people have access to.

Banerjee and Munshi (2004) offer a striking example that this happens from the knitted garment industry in the Southern Indian town of Tirupur. Two groups of people operate in Tirupur. First, the Gounders, who come from a small, wealthy, agricultural community from the area around Tirupur, and who have moved into the ready-made garment industry because there was not much investment opportunity in agriculture. The second group is composed of outsiders from various regions and communities who 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 abilities 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. They maintain a higher capital-output ratio than the outsiders at all levels of experience, though the gap narrows over time. The data also suggest that they make less good use of their capital than the outsiders: While the outsiders start with lower production and exports than the Gounders, their experience profile is much steeper, and they eventually overtake the Gounders in export and in production at high levels of experience, even though they have lower capital stock at every level. This data therefore suggests that capital does not flow where the rates of return are highest: The outsiders are clearly more able than the Gounders, but they nevertheless invest less.<sup>5</sup>

#### 4.2.2 Savings

There are two ways in which an inefficient savings technology leads to lower investment: it reduces the returns to savings, and if savings is interest elastic, this reduces savings, which lowers aggregate investment. Moreover, if, as in the model we discussed earlier, it is only possible to borrow a multiple of one's wealth (or not possible to borrow at all for the poorest), then the poor can only invest if they save. Investments that involve even small fixed costs (e.g. a large bag of maize to re-sell; a cart) may be hard to undertake. Dupas and Robinson (2011) find large increases in the consumption of households headed by a small business owner when this person was given access to a free savings account. They interpret this as an increase in profit, due to the ability to make slightly larger lumpy purchases.

The constraints to savings may not all be external: Duflo et al. (2010) find that the use of fertilizer by farmers increased by about 50% when they were offered a slight incentives to buy fertilizer early on (which is effectively a way to save) rather than wait until they needed to use the fertilizer. This shows that behavioral factors may also play a role in limiting savings and profitable investments.

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<sup>5</sup>This 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.

### 4.2.3 Insurance

There is empirical evidence that households' investment is affected by the lack of *ex post* insurance. Binswanger and Rosenzweig (1993) estimate profit functions for the ICRISAT villages, and look at how input choices are affected by variability in rainfall. They show that more variable rainfall affects input choices, and in particular, poor farmers make less efficient input choices in a risky environment. Specifically, a one standard deviation increase in the coefficient of variation of rainfall leads to a 35% reduction in the profit of poor farmers, a 15% reduction in the profit of median farmers, and no reduction in the profit of rich farmers.

It is worth noting that the estimated impact of a lack of insurance on investment is likely to be a serious underestimate. It is not clear how one could evaluate how much the lack of insurance affects investment. While we might observe certain options considered by the investor, there is no obvious way to know what other, even more lucrative choices, he chose not to even think about.

Another strategy for looking at the effects of underinsurance is to calculate the effect based on the assumption of a specific utility function. This, in effect, is what Krussel and Smith (1998) do. They argue that for reasonable parameter values the effect on aggregate investment tends to quite small: This is because most people can self-insure quite well against idiosyncratic shocks, and those who cannot, mainly the very poor, do very little of the investment in any case. However as pointed out by a more recent paper by Angeletos and Calvet (2003), the Krusell and Smith result relies heavily on the assumption that one cannot limit exposure to risk by investing less. If greater investment exposes you to greater risk, even the non-poor will worry about risk, because they are the ones who invest a lot and therefore stand to suffer greater losses.

### 4.2.4 Land, Power, and Property Rights

Inequality in power matters for investment, to the extent that it lowers the strength of property rights. Goldstein and Udry (2008) show that, in Ghana, individuals are less likely to leave their land fallow (which is an investment in its long run productivity) if they do not hold a position of power within the family or the village hierarchy which ensures that their land is not taken away from them when it is fallow. Hornbeck (2010) finds that the introduction of barbed wire in the US, which allowed people to more effectively protect their property rights at a cheaper costs

than before in places that did not previously have access to cheap wood to make fences, led to an increase in agricultural investment and an increase in yield in these regions. Leight (2011) finds that, in China, where there is periodic re-allocation of lands, households who have more secure property rights (because they live in a village, where, for exogenous reasons, re-allocation is not very likely) invest more, plant on a larger area, and all in all have 10% higher inputs relative to households who face insecurity in tenure.

There is also considerable evidence on the inefficiency of share cropping: Binswanger and Rosenzweig (1986) and Shaban (1987) both show that, controlling for a 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 land has a higher price per hectare), which could in part reflect long-term investment.

#### **4.2.5 Human capital**

If human capital were investment, parents would only respond to returns when making investment decisions. And indeed, the evidence suggest that they do pay attention to it. Foster and Rosenzweig (1996) find that, during the Green Revolution, education grew faster in regions that were more suitable to the new technologies (which increased the returns to education). Oster and Millett (2011) found that in India, there was a very large increase in education level in towns that housed call centers. Jensen (2010) runs a randomized experiment where recruitment drives were conducted in villages in North India. Employment for young girls increased, and the education of even younger girls increased as well: their parents figured out that it made sense to education girls, and they were happy to comply.

At the same time, a number of factors suggest that true returns are not the only things that matter. Education also play a social role: Munshi and Rosenzweig (2004) find that in Bombay in the midst of India's globalization, parents from lower castes continued to send their boys to Marathi medium school in larger number, even as they were willing to send their girls to learn English: Marathi-medium education was a way to signal and strengthen relationships to the

traditional caste network.

Another problem is that parents appear to be mistaken about the shape of the returns to education. When questions about the benefits of education at various years are asked, they tend to answer that the returns to education are very low for the first few years, and high subsequently (Banerjee and Duflo, 2011). In reality the returns seem close to log-linear. This perception creates a poverty trap based on a spurious belief. If a child is not perceived to be bright enough to get enough education to get a government job, parents are not very interested in their education. (They will send them to school, but perhaps desultorily: child absence rates in developing countries where enrollment rates are high are nonetheless staggeringly high, from 30% to 50% in Bihar and Uttar Pradesh for example). And both parents and children of poor families are less likely to think that the children can “make it” in school, perhaps due to the prejudice of teachers. In Uttar Pradesh, Hoff and Pandey (2006) found that performance of kids at solving mazes is lower when they have to announce their caste name before starting to play. In Rajasthan, Hanna and Linden (2011) found that lower caste teachers systematically gave lower grades to lower caste kids when their names were displayed than when they graded an assignment anonymously.

Investment in children also depends on the balance of power *within* the family, and hence the structural equality between men and women. Families do not bargain perfectly, and to the extent that women care more about children (perhaps for cultural reasons), the amount of resources they control also affect investment in children. Duflo (2003) found that, in South Africa, when a woman received the old age pension, she started feeding her grandchildren (particularly her granddaughters) better. But there was no such change when a man received the pension.

#### **4.2.6 Political Economy**

The paper on China by Leight (2011), which we just discussed, is one of the few micro-founded pieces of evidence for the political economy channel emphasized by Alesina and Rodrik: inequality leads to pressure to redistribute, and redistributing is inefficient. The paper shows that, keeping other factors constant, villages that are more likely to re-allocate are those where the re-allocation is the most effective at reducing the inequality in access to land: thus, it is the fight against inequality that induces the relative loss in efficiency that we documented earlier. Another political

economy channel linking inequality and inefficiency is described in Banerjee et al. (2001) in the context of sugar cooperatives: when the interest of the controlling members of a cooperative is not aligned with that of most of the farmers (which is more likely to happen if there is more inequality), there is more incentive for these members to distort prices to syphon off surplus.

Direct evidence that historical inequities in power lead to lower prosperity in the long run is provided by Banerjee and Iyer (2002). During British colonization, different districts got different systems of land-revenue collection, for largely accidental reasons (mainly, what institution was chosen dependent on the ideology of the British servant in charge of the districts, and the views prevalent in Britain at the time of conquest). In the *zamindari* system, the local landlord was given the responsibility for collecting land taxes: this served to confirm their power and strengthen feudal relationships. In the *rayatwari* system, farmers were individually responsible for their own taxes: these regions developed more cooperative and horizontal social relationships. The areas that were placed under elite domination still have tenser social relationships, lower agricultural yield, and fewer schools and hospitals than those placed under village control, 150 years later and long after all land-revenue collection has stopped.

### **4.3 What does all this amount to?**

The discussion of functional form and identification, coupled with the empirical evidence of non-linearities even in very simple exercises, suggests that cross-country regressions are unlikely to be able to shed any meaningful light on the empirical relevance of models that integrate credit constraints and other imperfections of the credit markets. This is made worse by the poor quality of the aggregate data, despite the considerable efforts to produce consistent and reliable data sets. This contrasts with the increased availability of large, good quality, micro-economic data sets, which allow for testing specific hypotheses and derive credible identifying restrictions from theory and exogenous sources of variation. Throughout this chapter, we quoted many studies using micro-economic data which tested the micro-foundations for the models we discussed in this section.

Even a series of convincing micro-empirical studies will not be enough to give us an overall sense of how, together, they generate aggregate growth, the dynamics of income distribution, and the complex relationships between the two. A relatively recent literature starts from well-

founded micro models, and tries to calibrate them to assess the extent to which such models predict the co-evolution of inequality and growth. These papers have yet to distinguish between different forms of inequality and different forms of market imperfection, but they give us a clear indication of the potential of these models.

Banerjee and Duflo (2005) first calibrated a simple model with misallocation of resources and a production function with thresholds to aggregate quantity for the US and India. They argue that credit constraints would not explain the difference between India and the USA in a model with just diminishing returns. The problem is that the additional productivity gap that the misallocation generates in a model with diminishing returns is more than compensated for by the effect of making the production function concave while keeping the number of firms fixed. On the other hand, a model which has several thresholds, where a more productive technology is associated with a larger investment, does quite well in explaining the productivity gap. Along similar lines, Jeong and Townsend (2007); Restuccia and Rogerson (2008); Hsieh and Klenow (2009); Bartelsman et al. (2009); Alfaro et al. (2008), and Buera et al. (2009) all argue that the extent of misallocation of resources in poor countries is large enough to explain a large part of the total factor productivity (TFP) gap between rich and poor countries. Hsieh and Klenow (2009), in particular, find that TFP could be between 40% and 60% higher in India if capital and labor were allocated optimally. They also find that deteriorating efficiency in the allocation of capital may have shaved off 2% of Indian growth between 1987 and 1994, while improving efficiency in China may have boosted Chinese growth by 2% over the same period.

## 5 Balancing Growth with Equity: Policies

This discussion provides some guidance on which policies have the potential to balance growth with equity (defined as the relative welfare of the poor): they are policies that can help make sure that the poor would benefit from an increase in growth, whatever its source. This section will necessarily be more tentative. As already noted, we have little idea of how to engineer long run growth, and there are some areas where we have more questions than answers on how the poor could benefit from growth. But even laying out such questions may be useful.

## 5.1 Financial services: Savings, credit, Insurance

What kind of policy can significantly affect credit constraints? And if we worry most about the welfare of the poorest, whose credit constraints should be alleviated?

The answer to the latter question is not as obvious as it may seem. After the failure of government administered social lending programs amidst widespread default, the microfinance movement has been remarkably creative at finding ways to lend to the poorest at rates which, although they remain high, are nowhere near the rates they pay to money lenders. Yet, the effect of microcredit on reducing poverty has been limited. In an evaluation of a typical group liability program (modeled on Grameen bank) in Hyderabad, Banerjee et al. (2010) found a small impact of access to credit on business creation. However, there was no effect on per capita average consumption, either in the short run (15 months after the credit was given) or in the longer run (more than 4 years after the credit was disbursed). An evaluation of a rural microcredit program in Morocco likewise found that households invested more in their existing activity (livestock or agriculture), but compensated an increase in revenue by saving more and working less. There was thus no increase in consumption levels. Part of the problem comes from the shape of the production function: if it has, as we suggested above, multiple thresholds associated with fixed costs, returns could be steeply declining for small businesses. A microcredit loan may allow a household to start a business or run an existing one slightly better, but the loans are not large enough to allow them to invest enough to start a really profitable activity: for even though the marginal rate of returns are high, it appears that the average profit of the businesses of the poor and even the lower middle class are quite low. Banerjee and Duflo (2008b) calculate that the profits of the median household that runs a small business in Hyderabad, India are negative once we account for the implicit wage of the owner. So microcredit does help people live a little bit better, but it cannot help them get out of poverty (barring some exceptional cases which are trumpeted on the MFI's web pages). It can probably not be a big source of productivity growth at the aggregate level either: in Banerjee and Duflo (2005) we argue that if only the very smallest firms are credit constrained, this would not really matter for growth, since while they are numerous, the share of capital in these firms is too small to have much power in terms of explaining the cross-country productivity differences.

On the other hand, if it is the medium-sized firms that are constrained, the productivity loss

due to the misallocation of capital caused by credit constraints may be potentially very large: we argue that it may be large enough to explain the entire productivity gap between India and the US. That means that a policy that would have more chances to make a difference for growth would be one that managed to put capital in the hands of the medium and large firms. One way to do this may be to try to improve the functioning of the credit and equity markets for those firms: India's expedited debt tribunals have led to an increase in lending to firms (Visaria, 2009). But it is not clear how much can be achieved by this route: Mookherjee et al. (2010) found that the debt tribunal actually reduced the amount of loans to firms that were relatively small, to the benefit of the very large firms (where collecting collateral is easier following a court order). It follows, therefore that there may be a case for using some governmental resources to help create enough large businesses—by providing loan guarantees to medium-size ventures, for example. Something like that happened in China, where state businesses, or at least part of their equipment, land, and buildings, were quietly handed over to their employees. This was also, more explicitly, part of the Korean industrial policy.

Would such a policy create inequity? After all, if large capital must be handed over to people who have enough education and entrepreneurial ability to run relatively large firms, and given the inequality in the education system, one may worry that it would be the case. However, if large firms hire more people, this will push wages and reduce employment. Stable and higher wages would give workers the financial resources, the mental space and the sense of security both to invest in their children and save more. With those savings, and the access to easier credit that a steady job brings, the most talented among them would eventually be able to start businesses large enough to, in turn, hire other people.

There is unfortunately little evidence to on this issue and, beyond the somewhat anecdotal evidence of China and Korea, little specific guidance of how such a policy may look like. This is one of the very interesting frontiers of development economics.

Access to insurance can increase investment: for example, Karlan et al. (2011) look at the investment decision of people who were offered weather insurance for free (recall that few of those who were asked to pay for it did so). They find that farmers that were offered *both* credit an insurance at the same time were more likely to invest in fertilizer and improved seeds. These investments appear to have been efficient: households in these groups had higher profits and were

less likely to report hunger. The problem is that this insurance policy was heavily subsidized and, as we noted earlier, the demand for insurance is very low at market price. The reasons seem to be structural, rather than due to a mis-understanding of the product. A possible policy would thus be to subsidize things like weather and catastrophic health insurance, at least for a while.

## **5.2 Land reform and Property Rights**

In principle, given the sluggishness of the land market, and the inefficiency associated with the existing leasing agreements, land reforms could increase both productivity and efficiency. In practice, successful land reforms seem to have been few and far between, and more likely to be due to major political upheaval (e.g. the redistribution of land in Korea after the Second World War). As shown in Leight's paper, there is also a tension about the static goal of equity at a given point in time, and the loss in efficiency due to uncertainty about who really owns the land. For this reason, partial land reform seems to have been both easier to implement, and more successful. Banerjee et al. (2002) study a tenancy reform which increased the tenants' bargaining power and security of tenure. They found that the land reform resulted in a substantial increase in the productivity of the land (62%) in early years. Since the reform took place at the same time as the Green Revolution, this increase in productivity is probably in part due to an increased willingness to switch to the new seeds after the registration program. Recent work by Bardhan and Mookherjee (2007), which showed little differences between registered and non registered sharecroppers after several year also suggests that this may have been due to exit from sharecropping.

There have also been several attempts to improve security of land rights by distributing titles, including a few that have been evaluated. Field (2005, 2007) shows that, in Peru, people squatters who were given a land title for their land were more likely to go outside to work, and more likely to repair their house. Galiani and Schargrotsky (2010) find the same result for squatters who were given property titles for land they had occupied illegally for years.

### 5.3 Human Capital

Education policy can play a key role in balancing growth and equity. The current education system, which largely reproduces the existing social structure (the children of the poor go to bad schools, which teach them very little for five years before they drop out; the children of the rich all attend private schools supplemented with tutoring sessions), teaches very little to the poor (in Kenya, in class five, almost a quarter of students cannot read a grade one level paragraph either in English, or in Kiswahili, and about a third cannot do a simple mathematical operation; similar results were found in Ghana, India, Tanzania and Pakistan), and does not do a good job of identifying those who are talented. This is of course bad for equity, and for growth, since the economy is deprived of precious human capital.

A reform of the education system thus seems like it would be a top priority for a country focused on growth and equity. The good news is that, as far as primary education is concerned, there is now considerable evidence on how to improve the quality of primary education. Interventions that force teachers to focus on what children actually know (as opposed to what they should know as a function of their class and the curriculum), and provide targeted instructions at this level have shown to have large impacts in India (Banerjee, Cole, Duflo, and Linden, 2007, Banerjee et al., 2010, Duflo, Dupas, Kremer, 2008). Teachers are sensitive to incentives (Muralidharan and Sundararaman, 2009, Duflo, Hanna and Ryan, 2010, Glewwe, Ilias, and Kremer, 2010), and would likely respond if the system's demands were re-oriented along these lines. The less good news is that it is not entirely clear that the education establishment is going in this direction. The recently passed "Right to Education" in India forces private school to admit some poor children, which seems a good thing. But it also imposes so much constraint on what constitute a "school" that the existence of little private schools and community schools that have played a key role in educating poor children is at risk.

Much less is known about how to deliver quality secondary education at an affordable cost, and what type of benefits this would bring to individuals or the country: this remain an essential topic for further research.

## 6 Concluding thoughts

Balancing growth with equity in developing countries will be achieved, not by trying to affect the sources of growth (which we have no idea how to do anyway) but by designing policies that will allow the poor access to the opportunity generated by growth whenever it happens. To some extent, this means trying to fill holes in very imperfect markets, either through better regulation or through better enforcement of those regulations. To some extent, however, it will require some redistribution through government programs.

The financing of these policies raises the question of government resources. A good education system will require careful planning, but it will require money as well. So would subsidizing health and weather insurance. So, most likely, would any system of transferring resources to help set up medium and large businesses. Today's rich countries have developed strong governments and the resulting social policies by expanding their tax base as they were growing. It is hard to imagine that it could be avoided in today's developing countries.

Increasing tax rates is politically difficult, as the current debate in the US suggests, and may lead to political upheaval and distortions. But countries that are growing have a window of opportunity to increase taxes without creating major political difficulties: as they grow, they can choose to let the tax brackets unchanged (at least in real terms), and let taxpayers creep into new brackets. Because it does not change the status quo, it is probably significantly easier to do politically than trying to create or expand a taxation system. A country like China has done exactly that (Piketty and Qian, 2009). India, instead, continuously adjusts the tax brackets such that the tax base does not increase nearly as fast as growth would permit. Government spending is now in part financed by a tax on middle-class savers, through a combination of low interest rates on government bonds which the banks are forced to hold, and a reasonably high inflation rate. This hurts equity, as the rich are able to invest directly in the stock market or their own businesses, but the poor do not. It seems that balancing growth with equity will require, for India and many other countries in similar shoes, a re-thinking of taxation policy, to make it both more transparent and more progressive.

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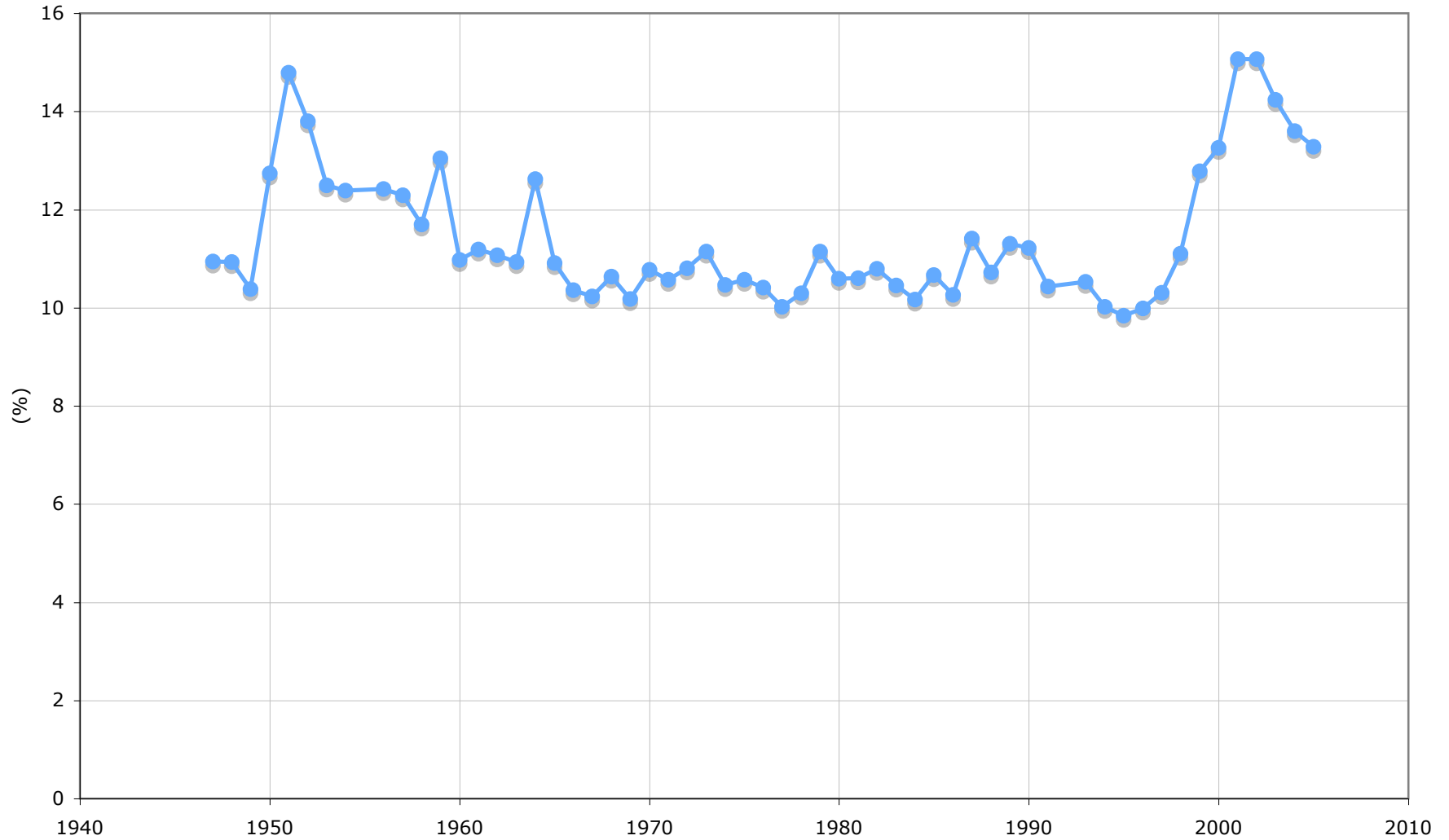
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### Figure 1. Top 1% Income Shares in Singapore: 1947 - 2005

Source: The World Top Incomes Database. <http://g-mond.parisschoolofeconomics.eu/topincomes>



### Figure 2. Top 1% Income Shares in Argentina: 1932 - 2004

Source: The World Top Incomes Database. [Http://g-mond.parisschoolofeconomics.eu/topincomes](http://g-mond.parisschoolofeconomics.eu/topincomes)



### Figure 3. Top 1% Income Shares in Portugal: 1976 - 2005

Source: The World Top Incomes Database. [Http://g-mond.parisschoolofeconomics.eu/topincomes](http://g-mond.parisschoolofeconomics.eu/topincomes)

