Poverty Reducing Credit Policies*

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1 Introduction

Capital does not simply flow unimpeded to those who can make the best use of it. Banks need assurance that loans will be repaid. For that reason, they do not lend to those who are too poor to put up collateral. Although the poor may have excellent investment opportunities, they are often excluded from financial markets and unable to invest. There is considerable empirical support for the existence of these "credit constraints" in developing countries. For example, Paulson and Townsend [12] find that the likelihood of starting a small business in Thailand increases dramatically with wealth (controlling for household characteristics that may serve as indicators of business talent). As is expected in credit constrained environments, their study suggests that the poor have higher returns from investment than the rich.

Since the poor cannot borrow against their future, they will under-invest in their farms and small businesses, in their health and education. Economic growth will be slow because investments with high returns are not financed. If the government could use public funds such as taxes or foreign aid to finance these investments, not only would the poor be better off but the economy's growth rate would rise. Any government contemplating such a poverty-reducing intervention will have to confront the following three problems. The first two stem from a lack of information, while the third is due to enforcement difficulties.

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1. *Distortions of Incentives.* Surplus-maximizing governments want to help credit constrained entrepreneurial poor who have promising investment projects. But cheap government loans and grants may end up in the hands of individuals who have no profitable investment opportunities. They may waste the money on unprofitable projects, or simply divert it to their own consumption. The result is a loss of surplus, not an increase. It is difficult to prevent such behavior, because it is practically impossible to know if someone truly has a profitable investment opportunity or is merely pretending to have one.

2. *Mistargeting.* Rawlsian government want to target those who are most in need, the poorest of the poor. But the chief beneficiaries of programs designed to reduce poverty may be the comparatively well-to-do. The result is more inequality, not less. Adams et al [1] show that rural credit programs have a disappointing history of not reaching the poorest of the poor. Such mistargeting may result from the simple fact that it is difficult to identify the most needy individuals.

3. *Defaults.* Borrowers may decide not to repay a loan even if they are able to do so. This problem is made worse by the fact that poor people - by definition - can provide little collateral. Loans that are not repaid are equivalent to grants. Instead of going through the rigmarole of loan forms and repayments, why not give grants directly ?

In view of these difficulties, it is not surprising that policy makers are wary of subsidizing credit. The prevailing wisdom seems to be that poverty reduction and credit provision should be kept separate. If governments simply give grants to the poor, with no strings attached, then poverty reduction will "occur as a natural result of efficient [financial] intermediation rather than through specific mandated [credit] programs (Meyer and Nagarajan [8])."

However, many governments do not follow this prescription and routinely mix poverty reduction with credit provision. For instance, the Mexican government gives cash grants directly in poor areas through an ambitious program called PROGRESA (recently renamed as CONTIGO). Recipients must send their children to school and attend regular health clinics to continue receiving these grants. By definition grants come with no obligation to repay. At the same time, the Mexican government subsidizes lending to the poor, both directly through a government-run rural bank and indirectly by funding "microcredit" organizations that make small loans all over Mexico. So poor households in many parts of Mexico can take a grant, a subsidized loan, or both. Rough estimates suggest the government spent twice as much on PROGRESA as on subsidizing credit provision in 1999. The Mexican government spent $300 million on subsidizing loans to 2.3 million households in 1999 (Comisión Nacional Bancaria y de Valores [6]) It spent about $777 million (about 0.2 percent of Mexico's GDP) on grants through PROGRESA which reached 2.6 million households in the same year (Skoufias and McClafferty [15]).

A government which does not have detailed information about each individual cannot easily target its spending. A uniform policy, such as just giving the same grant to everyone, is too blunt. A policy of only subsidizing loans distorts incentives and bypasses the poorest of the poor. The Mexican case suggests a different solution. By offering a *menu of choices*, the government allows poor people to self-select according to their preferences and opportunities. Loan subsidies remove credit constraints and stimulate investment. Contrary to conventional policy wisdom, they are a crucial part of any effort to reduce poverty. Combining loan subsidies with grants can reduce distortions. Moreover, unlike loan subsidies, grants can reach the poorest of the poor (as long as there are not too many strings attached). Thus, in our opinion governments should mix credit provision with poverty reduction. Depending on the government's objective, an optimal poverty reduction policy will involve *both* grants and subsidized loans. This will be illustrated in the next section via a simple numerical example.

2 The Simple Algebra of Grants and Subsidized Loans

Imagine a village with 100 inhabitants, of which 50 are *destitute*. Nobody will lend money to the destitute, since they consume rather than invest any money they get, and there is no collateral to seize if they default. The remaining 50 villagers are not destitute but poor. They can be trusted to repay up to \$80.[1] Half of these non-destitute individuals are *entrepreneurial types*, the rest are *consumption types*. Entrepreneurial types have access to an investment opportunity, called a *project*. This could be a small business project, education etc. The investment costs a fixed sum \$100, and generates a return of \$150. Consumption types do not have any investment opportunities, so they simply consume any money they receive.

The interest rate on a loan is 25%, so the required repayment on a loan of L dollars is $1.25 \times L$. The entrepreneurial types would happily accept a \$100 loan at 25% interest, which after repayment would yield them a net profit $150 - 125 = 25$ dollars. But since they can only be trusted to repay \$80 and not \$125 these entrepreneurs will not receive any financing for their projects. This is a classic market failure, caused by the difficulty of enforcing contracts.

The government has a welfare budget of \$2400 to spend on this village. However, it does not know which villagers are destitute, and it cannot distinguish entrepreneurial types from consumption types. What is the best way for a government to spend its welfare budget? This seems like a difficult problem. Of course, government officials could go to the village and ask the villagers about their situation, but the "game" must

[1] To be specific, suppose the non-destitute have some asset, tangible or intangible (such as "reputation"), worth \$80 that can be seized in case of default. The asset can be shown to the lender when the loan is given. The destitute, in contrast, have no assets.

be structured so that it is in the villagers' interest to answer truthfully.[2] This *incentive compatibility constraint* restrict the set of possible policies to only three candidates: a *grants-only* policy, a *loans-only* policy, and a *mix of grants and loan subsidies*. It turns out that a utilitarian government, which simply wants to raise the total village income, prefers the mix. A Rawlsian government, which wants to help the destitute, prefers grants-only. Loans-only is never optimal. The reasoning is interesting and reveals the trade-offs involved.

With a *grants-only* policy, the government spends the entire welfare budget on cash transfers to the poor. The grants have no strings attached: recipients can spend them any way they please. The problem is that the government's budget is so small that spreading it equally among everybody does not eliminate the credit constraints. Since there are 100 villagers and the government's budget is \$2400, the uniform grant is only \$24 per villager. With a \$24 grant, an entrepreneurial type still needs a loan of \$76 to start a project. But the repayment required on such a loan is $1.25 \times 76 = 95$ dollars, which is more than what the entrepreneurial types can be be trusted to repay. So no investment takes place. The policy simply transfers \$2400 from the government to the village, with no efficiency gains. Notice the crucial role played by indivisibilities: the fact that investments are "lumpy" and cannot be divided into arbitrarily small pieces argues against a policy of uniform grants.[3]

With a *loans-only* policy, the government stimulates investment by subsidizing lending, but gives no grants.[4] This policy distorts incentives, because people will try to take advantage of the subsidy even though they have no investment opportunities. Specifically, the government gives a loan subsidy of \$48 per \$100 loan. A micro lender who receives this subsidy can offer \$100 loans with a repayment of only $1.25 \times (100 - 48) = 65$ dollars (the subsidy is so big that the interest rate turns out to be negative). Of course, it only lends to to those 50 villagers who can be trusted to repay \$65 (the consumption types simply consume \$35, and put aside \$65 for repayment). The cost to the government is $50 \times 48 = 2400$ dollars. There are two problems. First, the loan subsidy does not reach the destitute. Second, incentives are distorted. The consumption types use the \$48 subsidy to raise their own consumption by \$35, which is inefficient but impossible

[2] In a previous footnote we argued that lenders will not lend to those who cannot show that they have collateral. Perhaps the government officials could equally well ask villagers to show their collateral, which would not be falsifiable. This would not change our argument because the incentive problem will turn out to be that villagers should not *hide* their assets.

[3] A grants-only policy can be combined with a lottery: instead of giving \$24 to everyone, 24 randomly chosen villagers could each get a \$100 grants, the remaining 76 get nothing. Entrepreneurial types who are among the lucky lottery winners will be able to invest. But neither utilitarian nor Rawlsian governments benefit from such a scheme. For the Rawlsian government, this is because some destitute individuals get nothing with a lottery. For the utilitarian, the mix of grants and loan subsidies dominates the lottery.

[4] The subsidy can either be given directly by the government (through a rural bank), or it can be given to a micro lender that makes the loan. For specificity, we assume the latter.

to prevent. The entrepreneurial types, on the other hand, use the \$48 subsidy to raise their own income by $150 - 65 = 85$ dollars. With imperfect credit markets, subsidies (to the right types!) typically have such multiplier effects.

The third and final possibility is a *mix* of grants and loan subsidies. The government gives an unconditional grant of \$20 to everybody *and* provides a subsidy of \$16 per \$80 loan. After receiving the grant, the entrepreneurial type needs an additional \$80 to start a project. If the micro lender receives \$16 for a loan of \$80, then the required repayment is $1.25 \times (80 - 16) = 80$ dollars. Such loans will be offered to all who are trusted to repay, that is, to all but the destitute. This interest-free loan is taken by the entrepreneurial types but not by the consumption types.[5] So the 25 entrepreneurs will start their projects, each raising her income by $150-80 = 70$ dollars. Everybody else just consumes the \$20 grant. The total cost to the government is $25 \times 16 + 100 \times 20 = 2400$ dollars.

The grants-only scheme raises total village income by \$2400, the loans-only scheme raises it by $25\times35+25\times85 = 3000$ dollars, and the mixed scheme raises it by $25\times70+75\times20 = 3250$. Thus, a *utilitarian* government, concerned with maximizing total income, prefers the mixed scheme. This deserves some explanation. It is clear that grants-only is an inferior policy: the loan subsidy encourages entrepreneurship and investment, which may not occur with a uniform small grant to everyone. Why does the mix dominate loans-only? With the mixed scheme, the entrepreneurial types can use the grant to pay part of their investment, so the loan subsidy can be smaller than under the loans-only policy. This in turn makes the subsidized loan less tempting for the consumption types, which reduces the distortion. (In the example the consumption types choose not take the subsidized loan under the mixed scheme thereby eliminating the distortions completely). In the jargon of mechanism design theory, by offering a menu of choices, the government can induce recipients to *self select* efficiently. Some villagers reveal themselves to be entrepreneurs by taking the subsidized loan. Other villagers reveal that they want to consume, by taking only grants. By forcing the government to use one instrument instead of two, neither a loans-only policy nor a grants-only policy can achieve an efficient separation of entrepreneurial types from consumption types. Notice, in passing, that a scheme that mixes loan subsidies and grants is easy to administer. Each villager gets a grant. Everybody who wants a loan (and can provide the assurance that she will repay) gets a loan. There is no need for the government to know anything about the individuals, because each type self-selects.

A *Rawlsian* government evaluates the different policies solely based on the welfare of the destitute. Subsidized loans are useless to a Rawlsian government, because they do

[5] The consumption types are actually indifferent between taking or declining zero interest loans, given that they do not discount the future. It is easy to make them strictly prefer to decline the loan, by simply raising the interest rate a bit.

not reach those who are too destitute to invest. A grant reaches everyone, including the destitute. Thus, the mix of loan subsidies and grants dominates loans-only. In turn, the grants-only policy dominates the mix. The grants-only policy has the lowest *average* benefit, but the destitute receive \$24, which is more than the \$20 they receive with the mixed policy.[6]

The example illustrates that some of the criticism of subsidized loans is misleading. A utilitarian government that wants to maximize village income should encourage investment by subsidizing microlending. Loan subsidies do tend to distort incentives, but other instruments such as grants can encourage the individuals to self-select into activities that are suitable for them. Grants have the additional benefit of reaching the destitute more effectively than a loan subsidy. It is only if the government's taste for equity is very strong that loan subsidies should be abolished completely.[7] This argument is very different from the naive argument, mentioned in the introduction, which proposes abolishing subsidies on efficiency grounds.

Two final remarks need to be made. First, are there incentive-compatible policies which are even better than the three that we discussed? The answer is "no", which can be readily shown using the theory of optimal mechanism design, developed by James Mirrlees [10] (for which he received the Nobel prize in 1996). Second, is the example "cooked" to make the policy of a mix of grants and subsidized loans look good? The answer is again "no". The basic insights will be present in a more general model (for some preliminary calculations, see Rai and Sjöström [14]). Of course the example does abstract from many real-world complications. For example, there are no externalities. If the destitute get positive externalities from a rise in average village income, even the Rawlsian government may want to use loan subsidies.

3 Policy Implications

The last two decades have seen the growth of innovative microlending schemes, many of which are still subsidized by governments and by donors. The best known is the

[6] This is the highest possible transfer for the destitute, given the budget and the incentive-compatibility constraint. Notice that a scheme in which grants are *only* given to those who are destitute is not incentive compatible, since any villager can claim to be destitute.

[7] Suppose the government thinks raising the consumption of a destitute person by one dollar raises social welfare by $1 + \lambda$ dollars, where $\lambda \geq 0$. Utilitarianism is $\lambda = 0$, and Rawls is $\lambda \to \infty$. The social welfare for a grants-only policy is $2400 + 1200\lambda$, and the social welfare for a mix is $3250 + 1000\lambda$. The government will trade off the equity gains of 200λ from a grants only policy with the efficiency gains of 850 from the investment stimulated by a grants-with-loans policy. The former outweighs the latter when $\lambda \geq 4.25$. In other words, the government should abolish subsidies to microlenders if and only if a dollar to a destitute person is worth more than 5.25 dollars to a non-destitute person.

Grameen Bank in Bangladesh, which receives an 11 percent subsidy (Morduch [11]). Of the others, some are state-run (like Thailand's Bank for Agriculture and Agricultural Co-operatives and Bank Rakyat Indonesia), but most are non-governmental, such as numerous microlenders that operate under the umbrella of FINCA and ACCION Internacional. The three problems of government intervention, mentioned in the introduction, form a useful starting point for discussing the pros and cons of subsidized microlending.

3.1 Distortions of Incentives

In section 2 we showed how subsidies to microlenders will typically be part of an optimal anti-poverty intervention. But if subsidized loans are overused they can lead to considerable distortions. Field evidence from Bangladesh suggests that at least some Grameen Bank borrowers divert their loans to consumption purposes (Todd [16]). There is nothing wrong with this by itself: if households need money to buy food or medicines, then using a loan for that purpose makes them better off. The distortion occurs if a loan that costs society 11 cents per dollar results in a gain of less than 11 cents per dollar for the recipient. In other words, such a loan has a negative impact because the costs outweigh the benefits. If subsidized lending were the only anti-poverty instrument, then we would expect to see low *average* impacts: the gain to the truly credit-constrained will be much higher than the subsidy, but the gain to others will be outweighed by the value of the subsidy.[8] To increase the average impact of each dollar spent on poverty reduction, the Bangladeshi government and international donors should supplement subsidized microcredit by other poverty reduction programs that support consumption and non-business investments through grants. Such grant programs that provide food-for-work and food-for-education do exist in Bangladesh, but since they generate a lot less publicity than subsidized microfinance it is entirely possible that they are underfunded.

In the introduction we saw that the Mexican government spends twice as much on grants as on subsidizing microlenders. The average Mexican village may of course be nothing like our example. But at least the numerical example shows that it is possible to calculate an optimal policy, given assumptions about the proportion of poor entrepreneurs, the amount of subsidy they need to invest, etc. This information can be gathered from survey data, as well as by the less elegant method of experimenting with different policies and observing the outcomes. In principle, this information should allow the government to effectively divide its budget between grants and subsidized loans. Without such a calculation, it is impossible to know if the Mexican government

[8] Measuring the impact of microcredit programs is a hotly debated empirical issue. While several simplistic comparisons show large positive impacts, when controlling for self-selection into microcredit programs the impact may be much lower (Morduch [11]). We argue however that a crucial component of the impact of microcredit is exactly this self selection by the entrepreneurial poor.

is subsidizing microlenders too little or too much.

Here is an algorithm for the design of poverty reduction programs (in Mexico, Bangladesh, or elsewhere). First settle on an objective. Is the emphasis on efficiency (raising the income of the average person) or on equity (raising the consumption of those furthest below the poverty line)? Then estimate the extent of credit constraints. Since countries differ substantially in how well their financial markets work, this is the hardest part and involves the careful use of data from village and small business surveys. Finally, for a given budget calculate the impact of policies involving grants-only and both grants and subsidized loans. Even rough calculations to determine the mix between grants and subsidized loans are better than none at all.

3.2 Mistargeting

One common criticism of subsidized rural credit programs is that the loans are diverted to "rich" households who would have been able to finance the investments on their own anyway. This can be thought of as leakage. We can modify our example to allow for leakage by assuming that some fraction p of the entrepreneurial types are "rich" (have savings of at least \$100), and that neither the government nor the micro lender can distinguish these "rich" people from those that are truly credit constrained. A high p implies a lot of leakage, which makes loan subsidies less attractive relative to grants. At least in Bangladesh, the evidence we have seems consistent with low leakage. Amin et al [2] study two villages in rural Bangladesh before the Grameen Bank and other microlenders began to give loans. They find that the households that did eventually receive loans were poorer than those that did not (in the months before the loans were given). Unlike old-style rural credit programs, the problem of leakage to the rich seems to be a less serious problem for microfinance.

Of course, subsidized microcredit may not reach the poorest of the poor either. Amin et al [2]'s study suggests that households that are vulnerable to income risk are less likely to be included in microcredit programs. But these limits to the reach of microcredit are to be expected. In our example, for instance, a policy of offering only subsidized loans will not benefit the poorest households. So even if subsidized loans reach those who are relatively less poor and only marginally credit constrained, their is no reason to discontinue their use. Grants and other poverty reduction efforts can help the poorest, and loan subsidies can simultaneously boost average income.

3.3 Defaults

In the example we assumed that some poor villagers could be induced to repay loans, perhaps by the threat of seizing their collateral. In practice the poor have few assets and limited property rights, however. So microlenders rely on collateral substitutes, such as "social sanctions" or the denial of future loans, to ensure repayment. What is remarkable about microlending is how successful they have been at achieving high repayment using these collateral substitutes. Many microlenders use *joint liability loans*. The borrowers are asked to select into small groups, each is given a loan, and all are held liable for each other's repayment. To illustrate how joint liability works, let us modify the example slightly. Suppose that a fraction of the destitute have access to investment opportunities. Since they cannot be trusted to repay, nobody would lend to them unless they could find a guarantor. In this village, the guarantors are obvious: it is the consumption types who can be trusted to repay the bank yet have no investment projects of their own. So a microlender could offer a loan to a destitute person where the consumption type is held jointly liable for repayment. The destitute person would invest. Of course such a loan would only succeed if there was some trust between the villagers. The consumption type would only agree to be a guarantor if he could be sure that the destitute person would not run away with the money.

There are other reasons why microlenders are repaid. Joint liability loans ensure that borrowers pay different interest rates in line with the riskiness of their investment (Armendáriz de Aghion and Gollier [3], Ghatak [7]). It encourages villagers to monitor each other's investment to ensure its success (Armendáriz de Aghion [5], Laffont and Rey[9]). But this is not the only technique microlenders use to induce repayment. Microlenders ask borrowers about each other at village meetings to induce successful ones to help out those in hard times (Rai and Sjöström [13]). They also use frequent repayments and direct monitoring to ensure loan recovery (Armendáriz de Aghion and Morduch [4]). In short, since these loans are repaid, they are not simply grants.

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