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REDISTRIBUTION IN REVERSE: CHEAP CREDIT CANNOT REDISTRIBUTE INCOME IN FAVOR OF THE SMALL FARMER.

By

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Limited access to institutional credit and portfolio concentration characterize rural financial markets in the low income countries. This paper examines the powerful impact of differential access to credit on income distribution, both in a static and in a dynamic context. Interest rate restrictions usually imply the transfer of a substancial subsidy. This subsidy has a regressive direct impact on income distribution, since the transfer is directly related to the size of loan. The subsidy also has an indirect influence on distribution, through its impact on access to loans. Given the rationing behavior implicit in the iron law of interest rate restrictions, access to credit is further restricted by the exclusion of borrower classes, and loan portfolios are further concentrated, through the imposition of interest rate ceilings. Income distribution deteriorates.

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INTRODUCTION

Two of the main characteristics of the rural financial markets of the low income countries are:

a. limited access to institutional credit, and

b. a high degree of concentration of the loan portfolios of the formal financial institutions (FFIs).

That is, in the rural areas of these countries, only a small proportion of the total number of producers receive loans from FFIs and, among those with access to institutional loans, a very small group cpatures a very large share of the total amount of credit disbursed.

In effect, it has been estimated that, on the average, only about 15 percent of the farmers in Asia and in Latin America, and no more than five percent of the farmers in Africa, have had access to institutional credit. In addition, usually less than 20 percent of the total number of borrowers of the FFIs have received about 80 percent of the total amounts of agricultural credit disbursed. This means that, at the most three percent of the total number of agricultural producers in the low income countries have been the beneficiaries of at least 80 percent of the significant volumes of credit disbursed, during the last three decades, by the FFIs in the rural areas of the low income countries.

Limited access to institutional credit and a high concentration of the loan portfolios of FFIs characterize not only agricultural credit programs but, in general, the evolution of institutional credit markets in the low income countries. Industrial credit and housing finance, among others, are similarly characterized. These phenomena, however, seem to be particularly acute in the case of rural financial markets. Since the majority of the population of the low income countries lives and works in the rural areas, the income distribution implications of these phenomena are particularly important

Circumstances associated both with the demand and the supply of credit explain this limited access to credit and this high degree of concentration of loan portfolios. The low average returns and high risks associated with many agricultural activities induce a limited demand for agricultural credit. High transactions costs, for both borrowers and lenders, further contribute to reduce the size of these markets, and to restrict access to loans for many rural producers.

The high degree of concentration of the loan portfolios of the FFIs is, in turn, frequently explained in terms of the underlying concentration of wealth and of political power in the rural areas of the low income countries. If there are a few wealthy producers, who own a significant share of the total assets of the community, it is not surprising that they also receive a significant portion of the volumes of institutional

credit disbursed. However, there is increasing evidence that the distribution by size of loans of the credit portfolios of the FFIs is usually more concentrated than the distribution of income, the distribution of the value of the agricultural product, by size of farm, or the distribution of land and of other relevant assets in the rural areas of the low income countries. Credit concentration, therefore, requires an additional explanation.

Moreover, wealth and access to credit are not independent. In imperfect credit markets, previous wealth is an important determinant of differential access to loans, while in fragmented capital markets, the highly restricted access to credit explains a significant portion of the differential rates of growth of wealth through time. Differential access to credit, therefore, is not only a consequence, but also an important cause, of the increasingly more concentrated distribution of wealth in the rural areas of many low income countries.

Policy makers concerned with income inequalities have emphasized the redistribution of land and of other assets as a solution. Although access to credit is as crucial as access to land, in order to provide farmers with an adequate command over resources and, therefore, for their income growth, financial reform has been less popular than land reform. Rather, the

financial policies of the low income countries, particularly the imposition of interest rate ceilings, have accentuated this limited access to credit and, thereby, have aggravated the problem of very unequal wealth distributions.

Therefore, while the high degree of concentration of the loan portfolios of the FFIs in the low income countries may be largely explained by the underlying concentration of wealth and power in the rural areas, the relative extent of this concentration, and the *modus operandi* through which it is achieved, are mostly explained by the behavior of both borrowers and FFIs, and by the financial policies which influence this behavior and the regulations that constrain it.

In effect, through several types of controls, most of the low income countries have kept nominal interest rates fixed during long periods, while in real terms these rates have often been negative, erratic and unpredictable. In addition, preferential rates have been frequently established, in an effort to favor agriculture and other priority sectors, at the expense of others. However, these interest rate policies have significantly contributed to the concentration of the loan portfolios of the FFIs and have accentuated the restrictions on access to institutional credit, to the extent of substantially contributing to the concentration of

wealth. Therefore, the modification of these financial policies is a necessary, although not a sufficient condition for greater equity in the rural areas of the low income countries.

INTEREST RATES AND INCOME DISTRIBUTION

Because interest rates, as relative prices, affect several types of decisions, they impact income distribution in several ways. As the relative price of the future in terms of the present, interest rates influence savings and investment flows and, therefore, affect the intertemporal distribution of income between present and future generations. As the price of financial assets, interest rates affect the composition of wealth portfolios and, thus, the distribution of income among asset holders. As a component of the costs of borrowing, interest rates affect the distribution of income between lenders and borrowers and between those with access and those without access to credit. Because they are compared to the rental price of capital, interest rates also influence the choice of techniques and the selection of investment projects, according to factor intensities. In this respect, interest rates affect the functional distribution of income among factor owners.

This paper explores the impact that the loan rates of interest charged by the FFIs have on the personal distribution of income; that is, on the distribution of income among bor-

rower and non-borrower individual producers or among producer classes. For these purposes, rural producers may be classified into relevant classes, according to their size (large-small), their wealth (rich-poor), the length of the banking relationship (new client-old client), the uncertainty associated with their productive activities (safe-risky), or according to any other criterion of socioeconomic, cultural or spatial location (urban-rural, literate-illiterate, private-public, neighbor-distant, etc.). Any of these classifications is relevant for the analysis, as long as it represents a classification related to the credit rationing behavior of the FFIs or as long as it is closely correlated to such classifications. The impact of credit, in general, on the personal distribution of income is explored first. The associated impact of concessional interest rates is examined in the second part of the paper.

CREDIT, INTEREST RATES AND INCOME

The income of any producer is determined by his productive opportunity and by his command over the (variable) inputs that allow him to take advantage of this opportunity. The producer's opportunity, in turn, is a function of his stock of (fixed) inputs, including his land, his physical and human capital, his knowledge, experience and entrepreneurial ability, as well as the characteristics of the natural, institutional and economic environment in which his activity takes place. Command over the required variable inputs, on the other hand, depends both

on the producer's own initial endowment, which is a result of his previous savings efforts, and on his access to resources external to his enterprise; that is, on his access to credit.

In the fragmented capital markets of the low income countries, potential productive opportunities are poorly correlated with command over resources. Given the heterogeneity of farmers, of all sizes, locations and experience, varied investment opportunities arise from the unique individual circumstances of each producer. Given investment indivisibilities and low levels of income, the past savings of many producers are frequently insufficient to fully take advantage of such opportunities, if at all. Therefore, many producers have attractive investment options, but do not possess enough resources of their own to proceed to their implementation. Fragmentation implies, in turn, that other producers with abundant resources are forced to invest them in less attractive ways, frequently even at negative rates of return. In this environment, access to credit is a crucial precondition to take advantage of productive opportunities and therefore for income growth.

In the absence of credit markets, producers are forced to self-financing. This, in turn, leads to a wide dispersion of the rates of return of different producers, and to gross social inefficiencies. Such a situation is represented in

FIGURE 1

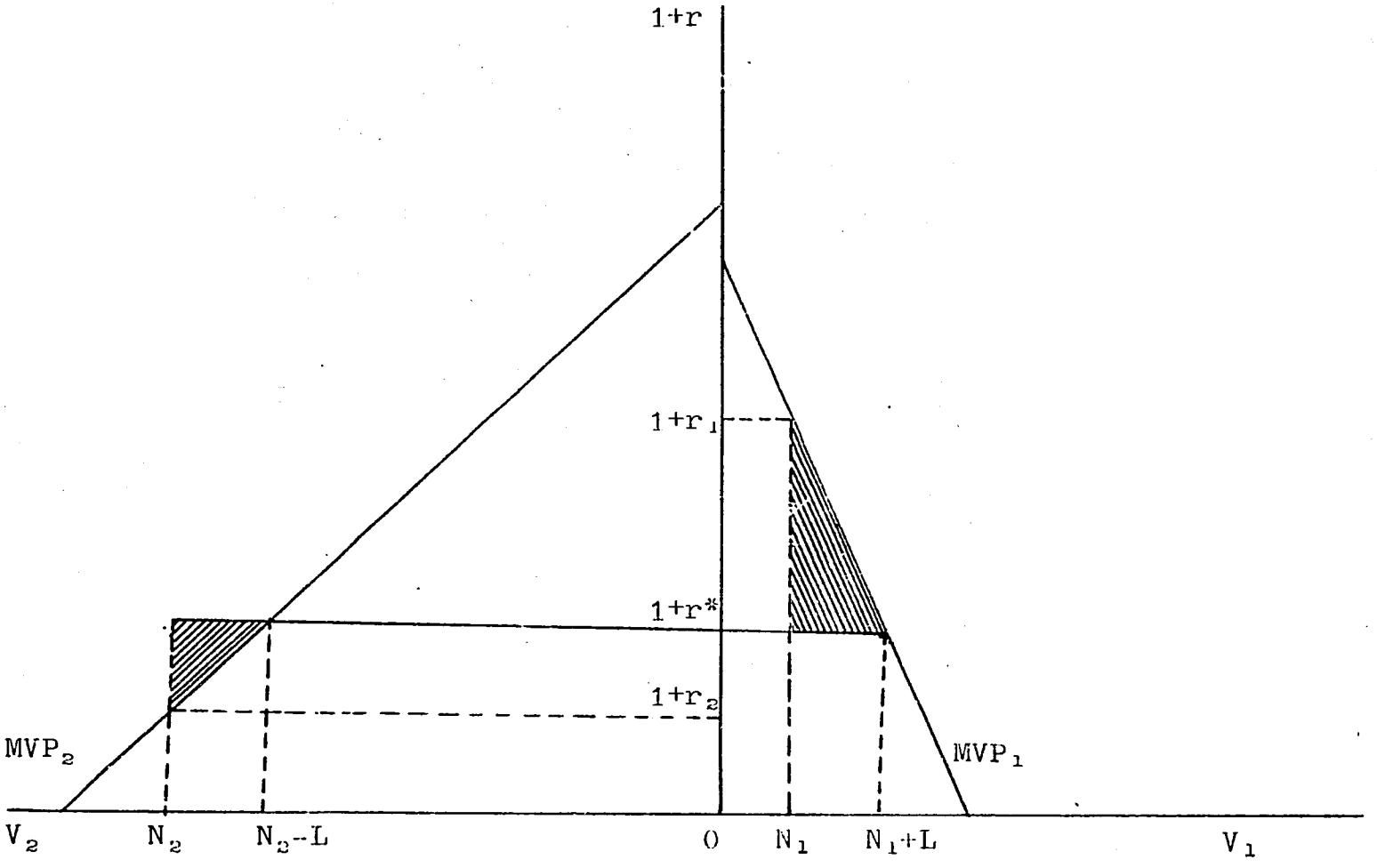

Figure 1, for a two producers case. In this Figure, positive amounts of variable inputs (V_1 and V_2) are measured in both directions from the origen. The productive opportunity of each producer is represented by the corresponding curve of the marginal value of the product of the variable inputs employed (MVP_1 and MVP_2). Diminishing marginal returns are assumed throughout.

Given their initial endowments of variable inputs (N_1 and N_2), the gross income of each producer, represented by the area under the curve of the marginal value of the product of the variable inputs, is given by:

$$(1) \qquad Y_i = \int_0^{N_i} (1 + r_i)\, V_i \, dV_i \qquad i = 1,2.$$

Income differences are explained both in terms of the different productive opportunities ($r_2 > r_1$, for a given amount of variable inputs, V), and of the different initial endowments ($N_2 > N_1$). Because the superiority of the larger producer is assumed to be relatively greater in terms of initial endowments, than in terms of productive opportunities, under conditions of self-financing, the marginal rate of return of the larger producer is lower than the marginal rate of return of the smaller producer (that is, in equilibrium, $r_2 < r_1$). This is a situation frequently encountered in the rural areas of the low income countries.

Given these differences in marginal rates of return, both producers can increase their incomes, through a direct loan, of size L, from the larger producer to the smaller one, at the rate of interest r*. After repaying the principal plus the interest on the loan [(1 + r*) L], the smaller producer has increased his income by the equivalent of the shaded area in the right-hand quadrant of Figure 1. At the same time, the larger producer obtains an increase in his income, over that previously earned from his own productive activity, equivalent to the shaded area in the left-hand quadrant of Figure 1. These increments in the incomes of both producers are, respectively, given by:

$$(2) \quad dY_1 = \int_{N_1}^{N_1 + L} (1 + r_1)\, V_1\, dV_1 - (1 + r^*)\, L =$$

$$= \int_{N_1}^{N_1 + L} (r_1 - r^*)\, V_1\, dV_1$$

$$(3) \quad dY_2 = (1 + r^*)\, L - \int_{N_2 - L}^{N_2} (1 + r_2)\, V_2\, dV_2 =$$

$$= \int_{N_2 - L}^{N_2} (r^* - r_2)\, V_2\, dV_2$$

Therefore, while the incomes of both producers increase, as a result of a better allocation of resources, the income of the smaller producer will increase more, if the marginal returns

to the variable inputs employed by this producer decline more rapidly than the marginal returns to the variable inputs used by the larger producer. That is, $dY_1 - dY_2$ will be positive, as long as:

$$(4) \quad \frac{\partial^2 r_1}{\partial V_1^2} > \frac{\partial^2 r_2}{\partial V_2^2}$$

The assumption that diminishing marginal returns are more pronounced for small than for large producers is a reasonable one, in view of the smaller stock of fixed inputs and, possibly, less favorable access to technologies of the former. If this is the case, credit not only improves the allocation of resources; it also improves income distribution. That is, the net gain of the smaller producer will be larger than the net gain of the larger producer, as represented by the shaded areas in Figure 1.

In summary, income differences among producers are due to differences in productive opportunities and to differences in initial endowments. Access to credit for the acquisition of variable inputs tends to eliminate those differences that are due to diverse initial endowments. Access to credit for investment in physical or human capital, in turn, may also tend to eliminate income differences due to differencial access to productive opportunities. In this static context, therefore, access to credit is crucial for the generation of higher incomes. Those producers with access to credit, <u>ceteris</u>

paribus, will generate higher incomes than those producers without access to credit. Differential access to credit, therefore, is an important determinant of income distribution differences.

CREDIT, INTEREST RATES AND GROWTH

In a dynamic context, access to credit increases the rate of growth through time of the producer's initial endowment (his wealth). In any given time period, the producer's net income is given by:

$$(5) \quad Y = a\,(N + L) - i\,L$$

where: a : average rate of return of the variable inputs employed,

N : the producer's initial endowment (wealth),

L : the size of the loan received,

i : the rate of interest paid on the loan.

Under the assumption that all of his net income is added each period to the producer's wealth, the rate of growth through time of his initial endowment is given by:

$$(6) \quad g = \frac{Y}{N} = \frac{a\,(N + L) - iL}{N} = a + l\,(a - i)$$

where $l = \frac{L}{N}$ is the leverage ratio.

That is, the rate of growth of the producer's wealth is directly associated with the average rate of return on the

variable inputs used by the producer and with the leverage ratio, while it is inversely related to the rate of interest paid on the loan. These three variables, however, are not independent. Even if the rate of interest paid is given, the average rate of return will be inversely related to the leverage ratio, if decreasing marginal returns are present as more variable inputs are employed. Taking the total differential of (6), the impact on the rate of growth of wealth of a larger loan is given by:

$$(7) \quad \frac{dg}{dL} = \frac{\partial a}{\partial L} + 1\,\frac{\partial a}{\partial L} + \frac{1}{N}\,(a - i) = \frac{N + L}{N}\,\frac{\partial a}{\partial L} + \frac{a - i}{N}$$

However, the marginal rate of return, r, is equal to:

$$(8) \quad r = (N + L)\,\frac{\partial a}{\partial L} + a$$

Therefore:

$$(9) \quad \frac{dg}{dL} = \frac{r - i}{N}$$

That is, the rate of growth of the producer's wealth will increase as his access to credit increases (the size of loan L increases), as long as the marginal rate of return on the variable inputs employed is higher than the rate of interest paid.

The impact of differential access to credit on the rates of growth of wealth can lead to dramatic differences in the procuers' future endowments and, therefore, in the level of their incomes through time. Assume that, initially, two producers, X and Z, possess identical productive opportunities and identical

initial endowments. That is:

(10) $a_x = a_z = a(V)$, for any given level of variable inputs used, and

$N_x = N_z = N_o$, in the initial period 0.

Assume that each one of these producers adds to his initial endowment, each period, all of his net income. Assume that, while producer Z has access to credit, producer X does not. The rates of growth of their initial endowments will be:

(11) $g_x = a_x$

$g_z = a_z + l\ (a_z - i)$

After n periods of time, the wealth of these producers will be:

(12) $N_n^x = (1 + g_x)^n\ N_o = (1 + a_x)^n\ N_o$

$N_n^z = (1 + g_z)^n\ N_o = [1 + a_z + l\ (a_z - i)]^n\ N_o$

After n periods of time, therefore, the relative size of their endowments will be:

(13) $$W = \frac{[\ 1 + a_z + l\ (a_z - i)\ ]^n}{(1 + a_x)^n}$$

That is, W indicates how many times the wealth of the producer with access to credit is larger than the wealth of the producer without access to credit. In the initial period, W = 1. The differences that will exist after some time are directly related to the number of periods that have passed (n), the difference between the average rates of return,

a_x and a_z, the leverage ratio (l), and the rate of interest paid (i). The following table illustrates the impact of these variables on W, under the assumption that the average rate of return is constant (constant returns to the variable inputs employed).

			W		
a	r	l	n=5	n=10	n=20
.25	.20	1	1.2	1.5	2.2
.25	.05	1	2.1	4.4	19.5
.25	.05	3	7.1	50.4	2,542.3
.25	- .10	3	21.1	444.8	197,859.3
.10	- .30	4	89.1	7,938.0	63,011,755.0

That is, given a constant average rate of return, in real terms, of 25 percent, for example, if each year one of these two producers receives a loan equal to three times his initial endowment, at a rate of interest of minus ten percent, in real terms, and the other producer does not receive any loans, after five years the wealth of the former will be more than 20 times larger than the wealth of the latter. After 20 years, the wealth of the borrower will be almost 200,000 times larger than the wealth of the non-borrower ! This is a formidable impact on wealth distribution.

The previous simulation illustrates the magnitude of the impact of differential access to credit on rates of growth of wealth and on income distribution. Differences in wealth between producers increase as the difference between the average rates of return earned and the rate of interest paid increases. The most dramatic differences, however, are directly related to the leverage ratio, $\frac{L}{N}$. That is, access to credit, in comparison to the producer's initial endowment, is the most important determinant of his relative level of wealth and income in the future. Therefore, the key mechanism for influencing the distribution of wealth through time is access to credit.

INTEREST RATE POLICIES

The interest rates charged by the FFIs have been administratively set, or constrained by usury ceilings, in most of the low income countries. Even in the presence of high rates of inflation, these interest rates have been kept at low nominal levels. As a result, in real terms many of these rates have been negative, erratic and unpredictable. These rates have not reflected the opportunity costs of the resources transferred by the FFIs to their borrowers; have not equated the supply and demand for institutional loans; and have not covered the costs and risks associated with lending to numerous borrower classes. Most importantly, these low interest rates have implied the transfer of a substantial subsidy to the relatively few, not so poor, beneficiaries of loans from the FFIs.

Interest rates not only have been kept at too low levels; an inverted and differentiated interest rate structure has been usually enforced. That is, interest rate differentials have not reflected the different costs and risks associated with lending to different borrower classes. Rather, these differentials have reflected the intentions of policy makers to favor some sectors and activities at the expense of others. However, the borrower classes usually favored with the preferential rates, like small farmers, are associated with the highest costs and risks for the FFIs. As a result, the FFIs have been forced to charge the lowest rates precisely to those borrower classes to which they would want to charge the highest interest rates. As a result of these discrepancies, the borrower classes which the authorities have intended to favor have been actually harmed. Recent interest rate reforms, that have increased all but the preferential rates, have significantly increased the differentials within the inverted interest rate structure and have thus accentuated their consequences on credit allocation and on the composition of loan portfolios. For example, in the mid 1970s, while the commercial interest rates and Government bond rates had reached 50 percent per annum and more in Brazil, the interest rates charged on agricultural loans were kept at 15 and 17 percent per annum. Substantial inefficiencies in credit allocation and inequities in income distribution resulted from this policy.

THE INTEREST RATE SUBSIDY

Two kinds of consequences on income distribution result when restrictions are imposed on the rates of interest charged by the FFIs on their loans:

a. a direct impact, due to the implicit subsidy, and
b. an indirect impact, due to the differential influence of the restrictions on access to credit.

When the interest rates charged on loans do not reflect the social opportunity cost of the resources disbursed, plus the social cost of transfering them, a subsidy is implicit in the credit transactions. This subsidy, per se, can have a significant impact on income distribution.

Suppose, very conservatively, that the social costs of the loan amount, in real terms, to ten percent per annum. If the nominal rate of interest charged is 15 percent per annum, but the rate of inflation is 55 percent per annum, then the real rate of interest charged is about minus 40 percent per annum. If a positive rate of 10 percent should have been charged, while a negative rate of 40 percent was actually charged, there is an implicit rate of subsidy of 50 percent implicit in this credit transaction. That is, 50 cents out of every dollar loaned represent an outright, unrequited, free transfer of resources; a gift.

The magnitude of this subsidy can be substantial. Suppose that the total volume of agricultural credit disbursed by the FFIs represents 60 percent of the gross value of the domestic agricultural output. In this case, the total amount of the subsidy, the grant transferred, will be equivalent to 30 percent of the value of this output. This is a very sizable transfer of resources and its impact on income distribution is very significant.

Because the subsidy implicit in underpriced credit can be so substantial, it is not surprising that policy makers consider it and value it as a powerful instrument for income redistribution. Unfortunately, for the reasons explained in this paper, the subsidy seldom reaches its intended beneficiaries. The vested interests of the outspoken powerful groups that eventually capture the subsidy, on the other hand, originate unsormountable political difficulties for interest rate reform in the agricultural credit programs of the low income countries.

The main claim of this paper is that credit, in general, and interest rate subsidies, in particular, are actually a very poor tool for income redistribution. The mechanism is inefficient, because the same redistributive objectives could be achieved at much lower social costs by other means. Even as a second best solution, moreover, the subsidy is not justified, because it is ineffective; that is, because it is intrinsically

incapable of achieving the desired redistributive goals, and because, for most empirically relevant circumstances, it is perverse; that is, it leads to a redistribution "in reverse", actually accentuating the concentration of wealth, instead of alleviating it. This is the case because, while the direct impact of the subsidy is regressive, its indirect impact further restricts access to institutional credit, and further concentrates the loan portfolios of the FFIs in the hands of a few large borrowers.

THE DIRECT IMPACT OF THE SUBSIDY

To become a beneficiary of the interest rate subsidy, a producer must meet a precondition. He must first become a borrower from any of the FFIs. Access to credit, however, is very restrictive. As a consequence, a large proportion of the total number of producers are excluded, ad portas, from benefiting from this subsidy.

Moreover, the amount of the free grant is directly proportional to the size of the loan received. That is:

$$G = [\, r^* - r \,]\, L(W) \tag{14}$$

where G: amount of the grant,

L: size of the loan,

W: the borrower's wealth,

r*: the social opportunity cost of the resources loaned, and

r: the rate of interest charged on the loan.

That is, the larger the loan, the larger the grant. In addition, since there is a high correlation between previous wealth and the size of the loan received, the wealthier the borrower, the larger the free grant. As a result, in the rural areas of the low income countries, large producers have had access to large loans and to the accompanying large grants. Medium-size producers, on the other hand, have had access to small loans and to the associated small grants. Small producers have had no loans, no grants.

Moreover, when the rate of subsidy ($r^* - r$) increases, the large non-rationed borrowers have access to loans larger than before and the magnitude of their grans increases more than proportionately. The size of the loans granted to rationed borrowers, on the other hand, declines, as will be explained. The magnitude of the grant, in this case, could increase or decline, depending on the relative position of the marginal cost curve of lending to them.

There is one more way in which subsidized credit has a direct unfavorable impact on income distribution. The resources freely transferred to the priviledged borrowers are collected by the FFIs through the exploitation of savers and, in general, of the holders of financial assets, through the inflation tax. In most of the low income countries, the distribution by size of the borrowers of the FFIs is much more concentrated than the distribution of the holders of claims on the financial system.

As a consequence, the majority of the population of the low income countries has been paying a substantial tax used to finance a subsidy enjoyed by a few priviledged borrowers.

THE INDIRECT IMPACT OF THE SUBSIDY

Interest rate restrictions influence income distribution through their differential impact on access to credit. The nature of this impact depends on the rationing behavior adopted by the FFIs when the ceilings are imposed. Most of the likely mechanisms for rationing adopted by the FFIs tend to redistribute loan portfolios in favor of some borrower classes (e.g. large, safe, well known borrowers). 1/

For these purposes, producers can be classified into three groups, according to the nature of their access to institutional credit:

a. Non-rationed borrowers, that is, producers that receive all the credit that they demand at the rate of interest charged by the FFIs;

b. Rationed borrowers, that is, producers who are granted by the FFIs loans smaller than the size they demand at the going rate of interest, so that they are left with an unsatisfied excess demand for institutional credit; and

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1/ For a complete discussion of rationing behavior see Claudio Gonzalez-Vega, "On the iron law of interest rate restrictions: the rationing behavior of financial institutions matters.", in this volume.

c. Excluded borrowers, that is, potential or previous borrowers, that the FFIs are not willing to serve at the constrained interest rates.

In general, in the case of FFIs with a profits strategy, if the maximum rate of interest that can be charged covers the marginal costs of lending to a particular borrower, his demand will be satisfied. If, on the other hand, this maximum rate of interest does not cover the marginal costs of lending, the FFIs will tend to reduce the size of the loan granted, below the size of the loan demanded, until the rate of interest and marginal costs are equated. Finally, when the maximum rate of interest does not cover the average variable costs of granting the loan, the FFIs will exclude the borrower from their portfolios.

Lending costs tend to be particularly high in rural financial markets. There is a great diversity among rural producers and the information required for borrower selection, concerning entrepreneurial ability, productive opportunities, access to resources, etc., is very expensive. Risks are also particularly high, due to the importance of exogenous factors in determining the outcome of investment efforts, and creditworthiness is difficult to ascertain. Even if ex post small producers tend to be less delinquent than some of the larger producers, it is difficult to choose from the heterogeneous mass of rural producers.

One of the consequences of these high costs and risks of lending is that rural producers, in general, and small farmers, in particular, will be among the rationed classes of borrowers. When ceilings on interest rates are imposed or lowered (by decree, regulations of the monetary authority, or automatically by inflation), the amounts of credit demanded by all classes of borrowers increase. However, according to the iron law of interest rate restrictions, only the size of the loans granted to non-rationed borrowers will actually increase. In the case of the rationed borrowers, on the other hand, the size of loan granted by the FFIs declines, while in certain circumstances these borrowers will be excluded from the loan portfolios altogether.

In summary, interest rate ceilings redistribute the loan portfolios of the FFIs in favor of non-rationed borrowers, thus modifying the access to credit by different producer classes. Since access to credit is a crucial determinant of differences in the growth of wealth through time, these changes in loan sizes significantly influence income distribution. The non-rationed borrowers tend to be the largest and most influential producers. Interest rate restrictions lead to the concentration of credit portfolios in favor of these priviledged producers.

For a rural producer, the most important aspect of

financial markets is his degree of access to credit. Ironically, the policies that have attempted to keep the price of credit artificially low, have at the same time modified access in unwanted ways: these policies have improved the access of the large and influencial producers, while at the same time they have limited, or completely eliminated, the access of the small producers to the loan portfolios of the FFIs. That is, these policies have not only reduced the efficiency in the allocation of the economy's resources; they have also reduced the financial viability of the FFIs and have contributed to more concentrated distributions of wealth and of income in the rural areas of the low income countries.

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