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Credit-Allocation Programs and Intermediation Costs in an Agricultural Development Bank

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Abstract

International donors have strongly encouraged the creation of specialized credit institutions in the last decade to service the needs of agricultural development. These institutions have a portfolio highly concentrated in agriculture and further in medium to long-term loans, little if any deposit or savings services and an expensive infrastructure to service loan targeting requirements of donors. Analysis of the data from the National Agricultural Development Bank in Honduras show that, contrary to donor expectations, an increasing share of donor targeted funds for agriculture in the bank's liabilities has not led to an increased participation of agricultural loans in the total portfolio of the bank nor to an increase in the share of small sized loans in the agricultural portfolio. This must reflect the fungibility of finance.

At the same time, regression analysis performed on the development bank's cost function indicates that there is a significant lagged ratchet type effect of donor and central bank targeted funds on the intermediation costs of the bank. These derive from increased resources devoted to accounting, monitoring, record-keeping and reporting requirements of targeted credit programs. International donors and local governments should seriously consider reducing their loan targeting policies in light of the limited portfolio impact and the significant cost increasing effects these policies have on financial intermediaries.

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1. Introduction

Specialized credit institutions have received particular attention from governments and international funding agencies in the last decade. Donors see these institutions as a financial innovation capable of increasing the flow of internal and external finance to selected sectors and client groups within the economy. These specialized institutions are characterized by a loan portfolio highly concentrated in agriculture and a limited scope for the provision of other banking services.

Large amounts of targeted funds have been channelled through these agricultural development banks from governments and donor agencies. These funds are invariably lent out at concessionary interest rates, a practice that contributes to the fragmentation of credit markets in low income countries. Until recently, little attention had been given to the costs of financial intermediation associated with these special credit projects or lines of credit. It has been assumed that these costs are negligible, with little effect on the behavior of the intermediaries or their clients. Recent research, however, has highlighted the importance of transaction costs associated with different stages of the intermediation process in many low income countries.[1/]

Financial intermediation costs can be identified at three levels: (1) expenses incurred by depositors in searching for a depository institution and making deposits; (2) resources drawn upon by the intermediary in servicing deposits and other funds, and in handling loan transactions; and (3) costs incurred by borrowers in negotiating, obtaining and repaying loans. In this study we concentrate on the costs borne by the intermediary and the relationship between these operational costs and loan targeting or end-use requirements. In particular we will document and analyze the effects of targeted funds on the intermediation costs of the National Agricultural Development Bank of Honduras (BANADESA). We will show that loan targeting requirements imposed on the bank have significant cost-increasing effects on its operations.

It is useful to distinguish between two effects of loan targeting on a lender's costs. The first effect is comprised of the direct costs of additional accounting and record-keeping personnel and materials necessary to comply with the reporting requirements of special credit programs. These direct costs would also include all additional personnel (agronomists, livestock specialists, etc.) specifically hired and trained to service the project's clientele or target-groups. Increased costs due to loan monitoring and supervision are also classified under this first category. Second, there is an indirect (or less visible) effect derived from the impact of interest-rate ceilings and special loan rates that accompany targeted funds. These constraints on the usual practice of loan-rate differentiation force lenders to establish complicated loan procedures in order to discriminate between potential borrowers with different degrees of risk. These regulatory-induced loan procedures generate further costs for both lenders and borrowers, in addition to the direct costs of loan targeting.[2/] In what follows, however, we shall focus on the direct or visible effects of targeted funds on the intermediation costs of the bank in question.

We first present a brief background and a methodological discussion of the procedures used in the study. The next section documents the performance of targeted funds over time in the agricultural development bank and analyzes their effects on portfolio composition and costs. In the final section we draw out the major conclusions of our analysis.

2. Background and Methodology

The Honduran financial system has been working under different regulatory schemes during the last decade. These have included interest-rate ceilings, manipulation of reserve requirements, and loan targeting, among other forms of intervention. There are 16 commercial banks, two government-owned development banks and several savings and loan institutions in Honduras. The Agricultural Development Bank accounts for about one-tenth of the value of all new loans made by Honduran banks, and nearly 30 percent of the value of new formal loans made for agricultural purposes. Agricultural loans account for about three-quarters of the value of the bank's loan portfolio.

The bank's cost function is used to assess the effects of targeted funds on the bank's intermediation costs. This cost function is derived assuming the financial intermediary minimizes costs subject to a production constraint that relates the provision of banking services to the use of productive factors and inputs. Thus the cost function depends on output levels and factor prices. In the two-output, two-input case, this implicit function can be written as:

$$C = f(q_1, q_2, p_1, p_2), \qquad (1)$$

q_1 : loans, q_2 : deposits,

p_1 : salaries and wages, p_2 : price of capital services.

The cost function (1) is specified here in translogarithmic form, an approach used in a number of recent studies on banking costs.[3] The main advantage of this functional form is its flexibility with respect to the characteristics of the underlying technology. The use of this functional form is specially pertinent in multi-output production, as is the case of financial institutions producing at least two different outputs, loans and deposit services, in varying proportions.[4]

Regulation-related variables are introduced in the cost function by assuming that the total demand for every factor of production X_i, can be decomposed into two parts: (a) X_{i1}, which corresponds to the level of X_i consistent with an unregulated environment; and (b), X_{i2}, an additional quantity or a differential skill that is required by existing regulations. Examples of these are additional personnel or special mechanisms devised to provide new customer services that compensate for deposit-rate ceilings, and teams hired and trained to deal with specific project funds and clientele. Also, additional accounting and record-keeping personnel become necessary to comply with the reporting requirements of special credit programs using targeted funds.

Typical sources of targeted funds in Honduras are the central bank, and donor agencies. Central-bank funds correspond mainly to crop-specific lines of credit designed to provide short-term financing to small and medium-size farms. Foreign funds usually come in the form of special projects targeted to specific activities and clientele, and tend to

include a larger proportion of long-term loans. In what follows, the term "external funds" will be used to refer to both central-bank and foreign funds. The other, non-targeted, source of funds for BANADESA are demand, savings and time deposits from public-sector institutions, and from the public at large.

It is hypothesized that the effect of targeted funds on costs in the development bank includes a "ratchet" effect. That is, the increased level of costs growing out of a new credit project contracted by the bank does not decline to the previously existing cost level once the loan funds have been disbursed to the ultimate borrowers. Additional resources are employed or purchased at the beginning of the project in order to comply with the project's targeting requirements, but these resources are not laid-off or sold once the funds are disbursed. In short, they become fixed rather than variable costs. The cost function will thus incorporate a set of variables that capture the effect of targeted funds under this "ratchet" effect hypothesis. Three indicator variables (S_k, k = 1,2,3) are defined to account for the effect of the three different sources of funds: deposits, central bank, and foreign funds. In order to capture the influence of targeted funds under the "ratchet" effect hypothesis, S_ks are defined so that $S_k > 0$ if the value of funds coming from source k has increased over the level observed in the previous year, otherwise $S_k = 0$. Specifically, the value of S_k in year t (S_{kt}) will follow a three-point distribution, such that:

$S_{kt} = 0$, if $\Delta_{kt} \leq 0$

$S_{kt} = 1$, if $0 < \Delta_{kt} \leq (1/2)\ \Delta_{ktm}$

$S_{kt} = 2$, if $(1/2)\ \Delta_{ktm} < \Delta_{kt} \leq \Delta_{ktm}$,

where, Δ_{kt} stands for the difference between the amount of funds coming from source k in year t, and the amount of these funds in year t-1.

Δ_{ktm} is the maximum value of this difference observed over the period covered by the data (1971-1982).

A combined variable, S_{23} is similarly defined to account for the effect of all external funds combined (central bank and foreign funds together). The "ratchet effect" hypothesis implies that a positive sign is expected in the coefficients of the S_k variables that capture the effects of targeted funds, i.e., central-bank and foreign funds. The estimation considers the possibility that these effects may be lagged, particularly for foreign-donor funds, since this source of funding is often in the form of special projects with a delayed period of disbursement and expenditures. Consequently, external funds combined, and foreign funds alone are also specified with a one-year lag, to capture the lagged effect increases in these sources of funds are likely to have on costs.

Estimation of the translog cost function drew upon data for 28 branches of the National Agricultural Development Bank over the 12-year period 1971 through 1982. This estimation was undertaken both as a single equation (by OLS), and as a cost system with the cost-share equations (by GLS). Joint estimation of the cost system considerably improved the efficiency of the parameter estimates, therefore, the results presented and discussed in the next section are based on this estimation technique.

3. Loan-Targeting and Intermediation Costs in the Development Bank

As indicated above, targeted funds are identified as funds obtained from central-bank rediscount lines, or from foreign donors. The term

"external funds" is utilized here to refer to both central-bank and foreign funds combined. Non-targeted funds are demand, savings, and time deposits captured from public institutions and from the general public.

An analysis of the relationships between the sources of funds and portfolio composition in this bank may be summarized as follows: (a) the growing share of external sources of funds (largely directed towards agriculture) throughout the period 1971-82 has not been reflected in a significant change in the relative role of agricultural loans in the portfolio. The fungibility of finance is at work here, with external funds substituting for own-deposit funds that have been transferred from agricultural to non-agricultural loans. (b) The increased share of external funds may have induced the re-allocation of non-targeted funds to increasingly larger-sized loans in the non-agricultural sector. This cost-saving adjustment compensates for the increasing costs of handling a growing proportion of external funds in the "targeted" portion of the loan portfolio.

The cost-function estimates for the variables that capture effects of different sources of funds on intermediation costs are presented in table 1. Model 1 in this table includes the indicator variable for non-targeted funds (own-deposits, S_1), and the lagged combined effect of external funds (central bank and foreign funds). Model 2 also includes the non-targeted funds variable, but separates the effect of (current-year) central bank funds from those of foreign funds with a one-year lag.

The estimated coefficients for the variable that captures the effects of increases in the amount of non-targeted funds (S_1, deposits) are not statistically different from zero, with very low asymptotic t-ratios in both models. Targeted funds show significant cost-increasing effects, whether they are included as a combined variable (column 1), or as separate effects (column 2). Given the typical features of central-bank and foreign-funded projects, model 2 is a more appropriate representation of these targeting schemes than model 1. The results of model 2 indicate that increases in central-bank funds will have a contemporaneous cost-increasing effect on the development bank ($\omega_2 > 0$), given the short-term nature of the targeted programs funded through rediscount lines of the central bank. On the other hand, additional funds originated in foreign sources, usually targeted to medium-to-long-term activities with extended periods of disbursement, will exercise a cost-increasing effect with a one-year lag ($\omega_3 > 0$ for $S_{3(t-1)}$).

In summary, these results support the hypothesis that there is a lagged, "ratchet"-type effect of targeted funds on the intermediation costs of the development bank. Overall intermediation costs are increased as a result of additional funding received from external sources. This effect is more significant in the case of rediscount lines of credit coming from the central bank than in the case of foreign-funded projects. On the other hand, greater reliance on deposits as a source of loan-funds will not affect overall intermediation costs of the development bank.

4. Summary and Conclusions

In this study we have documented and analyzed the effects of targeted funds on the intermediation costs of the National Agricultural Development Bank of Honduras. Our results show that loan targeting requirements imposed on this lender have significant cost-increasing effects on its operations.

We found that the increasing share of targeted funds for agriculture in the liability portfolio of the development bank has not resulted in an increased participation of agricultural loans in the portfolio. Our analysis also indicates that this increased reliance on targeted funds has not had a significant effect on the average loan size of the bank's portfolio of new loans. These findings suggest that loan targeting has failed to meet the goals of an increased share for agricultural credit and an increased share of small-sized loans in the loan portfolio.

Table 1. Effects of Loan-Targeting on the Intermediation Costs of the Development Bank: Estimated Coefficients for Different Sources of Funds.[a]

Source of Funds, Parameter	Estimated Coefficients in Different Models[b] (1)	(2)
Non-targeted funds		
ω_1, deposits (S_1)	0.0056 (0.31)	0.0145 (0.76)
Targeted funds		
ω_2, central bank (S_2)		0.1129 (4.20)*
ω_{23}, lagged central bank and foreign ($S_{23(t-1)}$)	0.0756 (2.81)*	
ω_3, lagged foreign funds ($S_{3(t-1)}$)		0.0525 (1.94)**
Weighted R-square of the cost system	0.73	0.74
F-test of Joint Null Hypothesis: $\omega_k = 0$, all k	3.13**	5.30*

[a] Cost-system estimation, other parameters of the cost function not reported. Complete results are reported in Cuevas, and may be requested from the authors.

[b] Asymptotic t-ratios in parenthesis.

* : significant at 0.01 level; ** : significant at 0.05 level

Regression analysis performed on the development-bank's cost function indicates that there is a lagged, "ratchet"-type effect of targeted funds on the intermediation costs of this bank. Both foreign-funded projects and central-bank rediscount lines created additional intermediation costs, due to the increased resources that the bank devoted to accounting, monitoring, record-keeping and reporting, in order to comply with the requirements of targeted programs. The main policy implication of these results is that international donors and local governments should seriously consider reducing their loan-targeting policies in light of the limited portfolio impact and the significant cost-increasing effects these policies have on financial intermediaries.

Notes

1/ Several essays on these subjects appear in Adams, Graham and Von Pischke. See also Cuevas.

2/ An extensive treatment of regulation-induced costs of financial intermediation is found in Cuevas.

3/ Benston, Hanweck and Humphrey; Cuevas.

4/ For a detailed characterization of the translog function, see Binswanger; Christensen, Jorgenson and Lau.

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