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**AN EXAMINATION OF CREDIT SUBSIDIES AND TRANSACTION COSTS FOR TWO  
GOVERNMENT CREDIT PROGRAMS IN OHIO**

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## **An Examination of Credit Subsidies and Transaction Costs for Two Government Credit Programs in Ohio**

by

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Government credit programs influence alternative methods to distribute and price credit in an attempt to reach policy goals (Hughes and Osborn). Credit assistance is intended to service highly leveraged agricultural borrowers during periods of financial stress and is usually extended to borrowers on more favorable terms than private lenders can offer. Subsidized credit programs transfer wealth to borrowers or the recipients participating in the programs, while offsetting costs diminish the net worth of the individuals making the grant or tax payment (Boulding).

Credit subsidies have been traditionally channelled by reducing the interest rate charged to borrowers, or distributing funds by direct payment. Ohio's Linked Deposit Program and other concessionary priced credit programs are examples of implicit transfers of interest rate savings to borrowers (Froerer *et al.*). Reduced rate deposits are made at lower returns than alternative, higher yielding investments. Foregone investment opportunities become an opportunity cost to the state's portfolio returns and ultimately a cost to the state's taxpayers.

Explicit grants provide direct transfers of resources (cash payments) to borrowers or lenders. Interest rate buydown programs and loan guarantee programs (unexpected expenditures resulting from borrower default) are two examples of shifts in wealth by a direct payment mechanism (Wallace *et al.*)

Although public credit programs provide a variety of benefits to a "targeted" group of borrowers, these programs are not without their related costs. Credit subsidies allocated to participating borrowers translate into cost burdens to the government entity or the taxpayer funding the credit program's operation. In addition to the payments listed above, dollar outlays are also needed to administer each credit program's operations.

This paper examines the subsidy costs for Ohio's Linked Deposit (LD) Program and Farmers Home Administration's (FmHA) loan programs. The paper also analyzes lenders' transaction costs to participate in the government credit programs and their transaction costs for different levels of credit risk.

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## The Agricultural Lending Process

Lending is a multi-stage production process (Sealey and Lindley). Transaction costs (noninterest costs) are incurred by lenders throughout the various stages of lending process (Vogel; and Cuevas). Lenders gather, filter and analyze information provided by potential borrowers regarding their past performance and financial status to determine their credit-worthiness. Once the borrower's application and financial information has been reviewed and analyzed, the lender makes a decision to accept or reject the applicant's loan package. The decision to grant a loan is based on the probability of success (repayment) or potential for failure (Lee et al.).

Lenders' transaction costs for servicing and monitoring different loans vary depending upon the type of loan produced, the size of the loan, and also the credit quality of the borrower. Problem loans and higher credit risk customers demand a greater time commitment by lenders to review collateral and monitor the progress of the loan to protect their interests. Default risk costs and the associated transaction costs involved with loan monitoring, interject potential unforeseen costs to the lender if the repayment pattern is interrupted. In addition to the higher monitoring costs, delinquent loans may also require added costs for loan restructuring, liquidation, foreclosure, or bankruptcy. Problem loans may also add the costs of pecuniary services, such as attorneys fees, appraisal costs and other third-party services needed to liquidate assets. Associated costs of loan loss is a normal but hopefully only a small portion of the cost of lending.

Monitoring loan repayment and periodically assessing the value of the collateral after the loan proceeds have been disbursed, involves an opportunity cost for lenders. Opportunity cost of a lender's time allocated for these tasks can be alternatively spent by initiating new loans or generating alternative income opportunities. Lenders must weigh potential default risk costs of not adequately monitoring loans with the opportunity costs of time spent assessing the borrowers' collateral and repayment ability. Lenders must ultimately determine if the financial returns derived from underwriting the loan outweigh the costs associated with loan assessment, monitoring the loan and the potential risks involved with the loan default (Baltensperger).

Total lending costs for different loan customers are not only determined by the transaction costs of screening, collecting, and monitoring a loan, but also their default risk costs and their interest costs of the loanable funds. To provide a positive return to its shareholders, a lender attempts to price loans to cover the cost of funds, the anticipated default risk costs and operating costs in the intermediation process (Niehans).

### *Government Credit Programs*

Government credit programs' requirements increase a lender's transaction costs. Lending procedures and the flow of funds process are modified when a government credit entity becomes involved. Additional requirements to complete application forms and other loan monitoring responsibilities may create artificial barriers for lenders to participate in the credit program lending process. Excessive paperwork and complicated procedures have discouraged lender involvement (Klinefelter).

Lenders apply their own perception to the costs and benefits of a credit program when deciding whether or not to participate. A program will be used less if the opportunity costs required to participate become cost prohibited (Lins *et al.*). Subsidized credit programs fall short of their expectations when lenders' transaction costs become too high and the process discourages lender participation.

The agricultural credit programs examined in this study include a government source as a facilitator in the lending arrangement. The type of subsidized credit and the mechanism by which subsidies are transferred to its benefactors vary by the requirements and conditions specified by the credit program. Government credit programs set their own internal rules and policies within the parameters of the legislation that impact the participating financial institution and modify the traditional flow of funds process. Not only are different values of acceptance criteria established by each credit program's guidelines, but application procedures change, the loan evaluation and approval processes are revised and the distribution of funds may also differ from normal lending procedure. Different procedures for lenders participating in the credit programs ultimately result in increased time to process and deliver the final loan package.

Direct communications continue between the lender and borrower in the lending arrangement for Ohio's Linked Deposit Program. The LD Program requires a separate application process, establishes its own selection criteria, is responsible for rationing the available funds, in addition to creating an alternative source of funding. Lenders are still responsible for default risk exposure.

The primary benefits of LD Program are the reduction in the price of loanable funds to borrowers, via reduced rate deposits available to lenders from the State Treasurer's portfolio of funds. Participating borrowers' loan repayments are made to the lenders, who in turn, repay the certificate of deposit (or debenture) to the State Treasurer. Lenders receive indirect benefits from the LD Program: 1) provides lower cost and equal return on their funds, 2) improves short-term cash flow of their higher risk borrowers, and 3) are a source of alternative funding for commercial banks (Kalbus and Lee).

FmHA was instructed to gradually move away from direct lending toward the use of loan guarantees under the *Food Security Act of 1985* (Koenig and Sullivan). The loan guarantee program was perceived as a way to lower interest rate subsidies, reduce potential for loan loss and decrease the operational costs for their loan programs (GAO/RCED-89-86). By guaranteeing loans, the government does not incur direct dollar outlays unless a borrower defaults. Loanable funds for the guaranteed program are generated from the lender's pool of funds, not from a government source. Potential program costs are shifted "off-budget".

To be considered for a FmHA guaranteed loan, borrowers must be initially considered to be an unacceptable credit risk by the lender without the loan guarantee. Commercial lenders are responsible for distributing the funds after FmHA's approval, monitoring the loan, inspecting the collateral and collecting the borrower's loan payments. FmHA loan officers enter into the lending process again to routinely monitor the borrower's repayment schedules, visit farms to examine the collateral, or handle situations if borrowers become delinquent and default on the loans.

## A Cost Minimization Approach

A cost minimization model was used to estimate the subsidy costs of government credit programs and lenders' transaction costs. The cost features for a financial firm isolate the loan production segment in the financial intermediation process to establish its analytical framework (Sealey).

The financial firm is assumed to purchase its inputs in a perfectly competitive market at constant unit prices. Given the production considerations for the amount of the  $i$ -th loan (output) to produce ( $L_i$ ), from a given set of inputs ( $x_1, \dots, x_m$ ), the production function is  $L_i = f(x_1, \dots, x_m)$ . An equivalent price ( $w_1, \dots, w_m$ ) is paid to utilize each input ( $x_1, \dots, x_m$ ) in the production process. The total cost ( $C$ ) for the firm is dependent on the volume of outputs produced,  $C = g(L_1, \dots, L_n)$ , in addition to the inputs needed to produce the  $i$ -th loan type,  $L_i = f(x_1, \dots, x_m)$ .

The cost equation for loan  $L_i$  can be written as the sum of the costs for each variable input component plus the fixed costs ( $b$ ) that are independent of variable inputs utilized or output level produced. Assuming the prices of the input factors ( $w_1, \dots, w_m$ ) and the other  $n-1$  outputs ( $L_1, \dots, L_{n-1}$ ) remain constant, total production costs are computed in terms of the amount of inputs used in the production of  $L_i$  in Equation 1:

$$C_{L_i} = \sum_{j=1}^m (w_j x_j) + (b) \quad (1)$$

A financial firm's total loan delivery costs are expressed in Equation 2:

$$C_{L_i} = \sum_{d=1}^h [r_d F_d + f(F_d)] + g(L_i) + \sum_{i=1}^n [L_i(1 + r_i) P(S_i) + P(S_i) k(O_i, K_i)] \quad (2)$$

- $r_d$  : the interest rate paid for fund type ( $F_d$ ), where  $d = 1, \dots, h$  types of funds;
- $F_d$  : the volume of the  $d$ -th type liability account for lenders;
- $f(F_d)$  : the operational costs associated with servicing the  $d$ -th type funding account;
- $g(L_i)$  : the operational costs associated with the lending process for loan type  $L_i$ ;
- $L_i$  : the dollar volume (number) of loan  $L_i$  produced;
- $r_i$  : the interest rate charged to borrowers for 1 to  $n$ -th loan categories and the  $n+1$  to  $s$ -th types of credit risk;
- $P(S_i)$  : the probability factor of default risk for the  $i$ -th type default risk borrower;  
 $0 \leq P(S_i) \leq 1$ , (where,  $P(S_i) = 0$ , for no default risk, and  $P(S_i) = 1$ , when the loan is in default);
- $k(O_i, K_i)$ : Additional variable transaction costs ( $O_i$ ), third-party services costs ( $K_i$ ) and loan loss associated with default risk for problem loans ( $L_i$ ).

Dividing the cost factors by loan volume, per unit lending costs are determined (Equation 3):

$$[C_{L_i}/L_i] = [r_F + o_{L_i} + k_{L_i}] \quad (3)$$

$C_{L_i}/L_i$  : average total loan delivery costs;

- $r_F$  : average funding costs per dollar loaned;
- $o_{Li}$  : average operating costs per dollar loaned;
- $k_{Li}$  : average loan losses per dollar loaned.

By including the assumption that a lender has a predetermined or maximum loan level for each borrower ( $L^0$ ), the production function becomes  $L^0 = f(x_1, \dots, x_m)$ . Lenders generally have an upper level of credit capacity that they are willing to extend to any one borrower. The underlying premise is based on a borrower's finite resource base and ability to repay the loan. Each borrower has an upper limit on credit reserves and at some point resources eventually become depleted (Barry and Fraser). In addition, credit programs examined in this study have an upper limit of funds available to each borrower and also an upper limit for the total funds available for distribution.

By incorporating the Lagrange multiplier ( $\lambda$ ) method into the original cost model (Equation 1), a constrained problem is converted into a mathematical form where the first-order conditions of an unconstrained equation can still be applied (Chiang). The constrained optimization problem is solved as an unconstrained optimum by including the production constraint,  $L^0 = f(x_1, \dots, x_m)$ , into the Lagrangean function ( $Z$ ), by treating the multiplier ( $\lambda$ ) as an added variable.

Total lending costs ( $Z$ ) become the sum of the input factor costs subject to a given level of output ( $L^0$ ):

$$Z = \sum_{j=1}^m w_j x_j + b + \lambda [ L^0 - f(x_1, \dots, x_m) ] \quad (4).$$

The costs of producing a predetermined level of output,  $L^0$ , defined in terms of variable input costs ( $w_j$  multiplied by  $x_j$ ) in the production of a predetermined loan level ( $L^0$ ) (Chiang). One benefit of implementing this approach is the ability to isolate the shadow prices of increasing (decreasing) binding constraints of loan volume. First-order conditions result in the ratios of the input prices ( $w_1/w_j$ ) being equal to the ratio of their marginal products ( $\partial MP_{x_1}/\partial MP_{x_j}$ ), in addition to the derivative of cost with respect to the output constraint level ( $\lambda$ ). Second-order conditions for a constrained minimum are satisfied if the signs of the determinants are negative (Henderson and Quandt).

### Estimation Procedures

Costs of government credit programs subsidies are traditionally absorbed through state or federal government budgets (Wallace et al.). Some credit programs are funded directly by a specific allocated budget item, while others are indirectly absorbed through budgets of existing operations (Lins et al.).

The cost of lending procedures were separated into three components for measurement: funding cost (F), an operating cost (O) and a default risk cost (K). The cost approach (relative to measuring benefits) provided a estimate of the subsidized costs for each credit program. The cost approach can be used regardless of the internal pricing policies or default risk characteristics for each borrower (Hughes and Osborn).

Subsidized funding (F) becomes an effective cost when revenues received from the loan do not fully cover the market cost or opportunity cost of loanable funds. The incremental difference between the market rate and the rate charged to the borrower, multiplied by the loan volume, determines the funding subsidy segment for a particular time period (usually measured annually or by a per unit basis).

The operating component (O) contributes to credit subsidies if the interest rate charged to a borrower did not reflect the costs attributable to administering the credit program's day to day expenses of conducting business. The operating cost factor includes variable expenses, directly tied to the volume of loan activity, plus can also include fixed costs.

The third ingredient, the default risk (K), was included in the measurement of subsidies from loan loss or charges resulting from borrower default. Default risk subsidy estimates have been traditionally computed from net charge-off figures or projected loan losses based on delinquency rates (Herr; Hughes and Osborn; and GAO-RCED-92-86). Calculations of the cost estimates are not always an exact science. Default risk and the costs associated with loan delinquency are usually not resolved immediately, and the loan loss does not always occur during the same period the loan is charged-off.

Government credit programs may, or may not, include all three components in computing the subsidy costs of the credit program. The following sections specifically address how the cost components for the LD Program and FmHA's Guaranteed Loan Program enter into the subsidy equation and how they were estimated in this study. A nine year period was investigated (1985 to 1993).

### *Ohio Linked Deposit Program*

The Linked Deposit Program subsidy includes a cost of funds (F), and an operating expense (O) portion, but does not include the default risk component. Commercial lenders, not the LD Program or the State Treasurer's Office, are held responsible for the credit risk exposure.

Subsidy costs were computed by using the following equation for the LD Program:

$$S_{LD} = F + O \quad (5).$$

The opportunity cost (F) of alternative investment possibilities is the largest portion of the subsidized costs for the LD Program. Reduced rate deposits were assumed to be used for the entire year.

Operating cost estimates included both variable and fixed expense components. Variable costs were calculated by multiplying the number of applications received (a), by the labor time needed to process the application (t) and then multiplied by a cost per input unit (w) factor (labor, capital and other miscellaneous inputs). Variable cost factors for the operating subsidy are listed in Equation 6:

$$\text{Variable Costs} = (a) \times (t) \times (w) \quad (6).$$



The LD Program's fixed costs (b) included promotion and communication expenses, printing expenses for application forms and promotional flyers, postage and general overhead expenses.<sup>2</sup> Although some variance may exist in computing the operating cost estimates, these costs were minor compared to the funding portion's contribution to the total subsidy costs of the program. Annual subsidy costs for the LD Program were calculated by following equation:

$$S_{LD} = (\$100,000,000) (.04) (\text{months outstanding}/12) + [(a)(t)(w) + (b)] \quad (7).$$

### *FmHA Guaranteed Loan Program*

Cost estimates of FmHA's Guarantee Loan Program for most borrowers usually included an operating cost subsidy and risk premium. The cost of funds subsidy component was excluded, unless the borrower was also receiving interest rate assistance. For most FmHA's guaranteed loans the subsidy costs were computed by Equation 8:

$$S_{FmHA} = O + K - [A] \quad (8).$$

Operating expenses for the guaranteed loan program were partially offset by an administrative fee (A) charged to the lenders. The administrative fee was one percent of the amount of the loan guarantee. Fees assessed by FmHA for guaranteeing loans were up-front and the charge was normally passed on to the borrower and usually included in the amount borrowed. However, fees charged on guarantees do not fully cover the program's lending costs (Price Waterhouse; and GAO\RECD-92-86).

For those loans receiving interest assistance (F) the subsidy included all three components as shown in Equation 9:

$$S_{FmHA}^* = F + O + K \quad (9).$$

Administration fees were waived for those FmHA borrowers who qualified to receive interest rate assistance after 1990 (Koenig and Sullivan). Provisions for the interest rate assistance allowed qualified borrowers to receive reductions in interest up to four percentage points.<sup>3</sup>

Data availability problems were encountered from FmHA sources. Some data were unavailable or incompatible with LD Program's measurements. For example, data for loan volume of interest assistance funds were available from 1990 through 1992, but the specific interest rate reductions were not. Funding estimates (F) were calculated by multiplying the volume of interest assisted loans by 2 percent. For the years 1986 to 1989, a single cost was available for interest rate reductions. Funding estimates were equally divided for the 4 years.

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<sup>2</sup> The State Treasurer and her staff travelled to 4 to 8 county meetings throughout the state each year promoting the program.

<sup>3</sup> The previous interest rate assistance reductions for the guarantee program were equally shared by FmHA and lenders. Interest rate reductions ranged between 0 and 4 percent.

Interest assisted guaranteed FO loans were discounted over a longer period than OL guarantees, hence interest assistance and the associated costs were adjusted accordingly.<sup>4</sup>

Operating cost estimates for the guarantee program were also handled in a slightly different fashion from the LD Program estimates from Equation 6. Ideally, the total number of guarantee applications processed, the number of loans monitored, and the number of labor hours needed for servicing requirements would have provided a similar per unit cost estimate for variable costs. Unfortunately, consistent data were not available on a per case basis. An average per unit cost of the guaranteed loan volume was used to compute the program's operating costs (Herr). Annual loan volume data was used from FmHA's state office reports to compute operating cost estimates for the guarantee program. FmHA's state office also provided data on the number of loans made each year and annual appropriations for each loan program.

Default risk was the most difficult of the three subsidy cost components to measure. Problem loans and the associated costs of guaranteed loans are not realized until borrowers default on their repayment obligations and lenders collect on their loan guarantees. Loan guarantees are examples of "off budget" or "off balance sheet" liabilities to the government (Merton). The federal government provides no current or future cost obligations to the default risk (K) segment of the equation by issuing a loan guarantee, unless the borrower defaults and lenders need to be paid.

As a comparison, the FmHA Direct Loan Program's subsidy cost estimates were also computed. Credit subsidy costs for FmHA's Direct Loan Program were computed by the following equation:

$$S_{FmHAd} = L_{LR} (r_{mkt} - r_{LRR}) + L_d (o) + K \quad (10)$$

where,  $L_{LR}$  is the limited resource direct loan volume;  $r_{mkt}$  is the average cost of government funds;  $r_{LRR}$  is the limited resource interest rate;  $L_d$  is the direct loan volume issued during the year;  $o$  is per unit operating cost; and  $K$  is the loan principal charged-off.

Past studies used delinquency rates to estimate default risk costs for the direct loan program (Hughes and Osborn; and GAO/RCED-92-86). Measuring the value of defaulted obligations, based on historical delinquency rates, may not accurately measure the "true" costs of the federal government's risk exposure. Time lags occurred between the delinquency, the period of the corrective actions, the period of liquidation and when the final payments to the lenders to honor the losses on problem loans. Charge-offs on guaranteed loans were used to measure default risk. Measurement difficulties associated with the loan charged-offs period and the loan origination period were also encountered.

Guaranteed loan charge-offs were compiled from FmHA report 4131 and report 752. Lags in FmHA's reporting loan charge-offs overstate (understate) default risk costs for participating borrowers during periods when financial conditions improve (decline). Per unit

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<sup>4</sup> The length of interest rate assistance for farm ownership loans was not available. Each year FO guarantee loans receiving interest rate assistance are examined to reassess the need for interest rate relief.

estimates were computed on an annual basis by loan volume from 1985 to 1992, in addition to totalling the estimates for direct OL and FO loans each year. Charge-off data used to calculate the default risk subsidy estimates do not include an opportunity cost of the additional "in-house" FmHA loan officer time to resolve defaulted loans.

Although commercial lenders are primarily responsible for guaranteed loan monitoring, a borrower's progress is still subject to review by FmHA loan officers on an annual basis for multi-period loans. Different circumstances are warranted for each case and detailed information is only available at FmHA's local offices. General Accounting Office's studies and other secondary sources were also used to supplement FmHA's reports (GAO\RECD publication series; Herr; and Price Waterhouse). Operating cost estimates were calculated by a fixed rate similar to the procedure used in the Herr and Price Waterhouse studies.

### *Lender Transaction Costs*

An inventory assessment model was utilized to examine a lender's associated transaction costs in lending process. The inventory model monitored the lender's value-added ingredients to produce and service the loan. The amount of lender time allocated for a loan multiplied by a per unit cost factor translated into an input cost, or a lender's cost contribution to produce a loan. The inventory model also provides an indicator of the number of hours required (opportunity costs) for different risk classifications and a lender's involvement in credit programs (Garrison).

Inventory models have been traditionally used to monitor the value-added ingredients in the production process of the manufacturing industry. Agricultural loan production differs from the traditional production process. Producing farm loans is more service oriented compared to the manufacturing industry that produces and markets physical commodities. However, establishing a consistent and standardized procedure to measure deviations for different credit risks or loan types permits the use of the inventory assessment model as an appropriate tool.

One common feature among the lenders participating in the survey was that they all supplied nonreal estate agricultural loans ( $L_i$ ). The "average" amount of a lender's time ( $x_i$ ) to produce and service a "typical" nonreal estate loan ( $L_i$ ) were established as the input and output benchmarks. Once the performance standard was established, deviations from the norm were monitored (Garrison). The marginal product relationship ( $\partial L_i / \partial x_i$ ) was monitored to investigate incremental changes to the output-input relationship. Variations from these initial criterion reflect different lender requirements to service problem loans, different loan types, and also the requirements needed to service new customers.

Converting a lender's opportunity cost (time allocated in the lending process) to a transaction cost was computed by multiplying the number of lender hours required to produce and service a loan by an hourly wage rate (*Agri Finance*, 1992). The average salary of an agricultural lender in 1992 was \$42,100 per year, that converted to a lender hourly rate of \$21.05 per hour. The wage rate used in the calculations was \$27.50 per hour, including employee benefits at 30 percent.

## Results

The sample of loan officers consisted of 60 Farm Credit System and 139 commercial bank personnel. The commercial banks included the 75 "agricultural" banks selected for an earlier study of credit scoring (see LaDue, et al). These banks either had at least \$5 million of agricultural loans or had 50 percent of their portfolios in agricultural loans. Another 64 banks or branches were selected from a mailing list from the State Treasurer's Office. Statistical similarities were tested between the results of the two lists. The FCS list included virtually all Ohio offices of Mid-America ACA, which serves most of the Fourth Farm Credit District, and Ag Credit ACA, which serves an 18-county area in northern Ohio. The bank and FCS loan officers received essentially the same questionnaires. Responses from bankers and FCS lenders were also tested for statistical significance between lending groups.

A total of 43 FCS (excluding Special Accounts personnel) and 61 commercial bank loan officers responded, for an overall response rate of 52 percent. Results are reported separately for FCS and commercial banks for the time requirement responses, although differences in their responses were minor. Respondents represented offices with 16,000 non-real estate farm loans and 11,400 farm real estate loans outstanding as of year-end 1991.

### *Cost of Subsidized Agricultural Credit in Ohio*

Table 1 summarizes the average total costs per year and the per unit costs for each of the respective government credit programs. Cost estimates from other studies are included for comparison (Price Waterhouse; Herr; and Hughes and Osborn).

The LD Program has offered an interest rate reduction (up to 4 percentage points) for operating farm loans not to exceed \$100,000 per borrower. The Linked Deposit Program has supplied \$910 million in reduced rate funds for approximately 13,300 loans from 1985 to 1993. Subsidy cost estimates for the LD Program were estimated at \$3.97 million per year. Per unit costs were 3.9 percent for each linked deposit dollar distributed. The largest contributor to costs originated from the program's funding component (98 percent of the total costs). Operating costs comprised the program's remaining costs or approximately \$84,000 per year (0.08 percent of linked deposit dollars deposited).

Public funds were not at risk if borrowers were delinquent on repayment. Lenders remained responsible for default risk exposure throughout the duration the linked deposit loan was outstanding. Therefore, costs associated with default risk were excluded from the estimates. In our judgement, the LD Program has had a negligible impact on loan default.

Approximately 196 FmHA guaranteed loans have been made annually in Ohio from 1985 to 1993. The loan volume of guaranteed operating loans (OL) and farm ownership loans (FO) averaged \$21.1 million per year. Annual average costs for FmHA's guaranteed OL were \$454,000 per year or 2.88 percent of the guaranteed OL volume (1985 to 1993). FmHA's guaranteed FO loan subsidies averaged \$286,000 per year or 5.35 percent of the guaranteed FO loan volume.

Default risk costs for guaranteed loans were ultimately determined by the success or failure of borrowers' repayments. If borrowers repaid their obligations, FmHA's default costs

and the total costs of the program would be minimal. Default risk costs comprised the largest cost component for guaranteed loans (66 percent for OL and 65 percent for FO loans). Per unit costs for both guaranteed loan programs fell within the ranges of the Price Waterhouse and Herr estimates.

Administrative fees collected from issuing loan guarantees (one percent of guaranteed loan volume) primarily offset the program's operating costs. Funding costs added to the program's costs for borrowers who also qualified for interest rate assistance (project an income-to-expense margin below 10 percent). Funding costs (\$67,000 per year) for FmHA's two guaranteed programs in Ohio were relatively small compared to the LD Program's funding costs. Funding costs averaged 0.17 percent per operating loan dollar guaranteed and 0.74 percent per farm ownership loan dollar guaranteed.

Subsidy cost estimates were much higher for FmHA's direct loans. FmHA has experienced high levels of loan delinquency and credit risk exposure from their direct loan portfolio. Servicing delinquent direct loans was delayed as the result of the foreclosure moratorium from 1984 to 1988 and delinquent loans were not officially charged-off until well after loans became nonperforming.

Subsidy costs for FmHA's Direct OL Program averaged \$8.4 million per year in Ohio from 1985 to 1992 (24 percent of the direct OL loan volume). Although on the high side, the proportion was still comparable to those estimates computed by Herr (15.6 percent), and Hughes and Osborn (19.4 to 26.0 percent).

Subsidy costs for FO direct loans in Ohio averaged \$5.5 million per year (90 percent of the FO loan volume). Most of the direct loan costs were tied to the costs of loans charged-off. These estimates of FmHA's direct FO loans were substantially higher than those in studies of Herr (13.0 percent) and Hughes and Osborn (11.0 to 13.0 percent).

A number of items explain this difference. First, Hughes and Osborn derived their default risk estimates from delinquency rates of FCS lenders. FCS default rates were much lower than FmHA's. FCS borrowers as a whole were better credit risks than FmHA's direct borrowers. Second, the period investigated in the Hughes and Osborn study was 1978 to 1985, prior to the moratorium period when delinquency rates of FmHA's direct loans were lower. Third, default risk estimates from the Herr study were computed from a fixed percent of the total volume of direct loans.

Since 1985, FmHA's direct loan volume has declined substantially. About \$123.4 million (2029 loans) in direct OL and FO loans were made in 1985 compared to \$3.6 million (54 loans) in 1993 as the result of the program being phased out. Additional charge-offs for FmHA's delinquent direct OL and FO loans in Ohio range from a low of \$30.3 million to high of \$78.3 million.<sup>5</sup> Loan charge-offs represent direct loans that have been delinquent for a number of years. If FmHA maintains their rate of charge-offs, it will be another 3 to 4 years (1998) before existing delinquent loans are eventually charged-off.

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<sup>5</sup> Direct loans charged-off in 1993 were not included in the default cost estimates. The \$78.3 million was the amount of principal delinquent as of September 1992.

### *Lender Transaction Costs*

Lenders were found to spend an average of 6.9 hours per year with the "typical" nonreal estate agricultural customer (Table 2). Results between lending groups were nearly identical and were also very similar to the findings of bank credit delivery costs by Ellinger and Barry (7.1 hours per customer per year).

Loan monitoring and inspecting collateral accounted for the largest portion (29 percent) of a lender's time spent on a nonreal estate loan. Reviewing the loan application (22 percent) and maintaining and updating the loan file (17 percent) were loan functions that also placed demands on a lender's time. Ellinger and Barry found lenders spending 34 percent of their time analyzing, verifying and approving a loan, 25 percent for loan preparation, 24 for monitoring the borrower's progress and 18 percent for farm visits.<sup>6</sup>

As expected, the number of hours spent on an existing real estate loan was lower (2.1 hours) than the nonreal estate loan. Lenders' time allocated for a new real estate customer was 6.8 hours. A lender's time was converted into their input cost per loan by multiplying the number of lender hours needed to produce and service a loan by an hourly wage rate (*Agri Finance*, 1992). Lender's cost was \$190 per nonreal estate loan and an additional \$91 for a new customer. Average lender costs were \$58 per year for an existing real estate loan and an added \$187 per loan for a new real estate customer.

### *Problem Loans*

Incremental cost comparisons of producing a single loan differed from the average costs for the entire portfolio, especially if a problem occurred and the loan became delinquent. A lender's default risk cost varied according to the severity of the problem, the total dollars at risk and the amount of collateral attached to the loan agreement. Potential default costs were not only influenced by the uncertainty of repayment of principal and interest, but also by the costs of the third-party services required to resolve problem, including any of their own "in-house" labor.

Additional lender time to correct a delinquent loan required an additional 6.7 hours (an additional \$184 in lender costs per loan) or about twice that for the average nonreal estate loan (Table 3). FCS lenders reported spending an added 19.5 hours (an additional \$536 in lender costs per loan) to restructure a loan compared to 7.5 hours for bank lenders (\$206). Responses from lenders were statistically different between groups (at the 5 percent level of significance) to restructure a loan. FCS lenders required an added 27 hours to foreclose a loan (an additional \$756 in lender costs per loan) compared to 22 hours for banks lenders (\$605).

One explanation causing the disparity between lending groups maybe the result of legislation that outlined the procedures for FCS lenders to handle problem loan cases. The *Agricultural Credit Act of 1987* established specific guidelines for FCS and FmHA to follow when restructuring or foreclosing a loan. Borrowers were permitted to appeal within the various stages of the process which lengthened the period to resolve a problem loan. Time to resolve

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<sup>6</sup> Job duties were defined slightly different in the Ellinger and Barry survey.

a delinquent loan depend upon the severity of the problem, the particular skills of the individual handling the case and the amount of cooperation received from the borrower.

FCS's Special Account offices have specialized in resolving most problem FCS loan cases (loans delinquent for more than 60 days). Delinquent loan files remain in the Special Accounts loan officer's file (usually for one year) until the borrower became current on their payments, or the file was directed to their litigation personnel. The Special Account loan officer spent an average of 24 hours per year servicing each problem loan received.

Third-party services required to foreclose a loan also add to the lending costs. Third-party costs for loan foreclosure averaged \$1,485 per case for attorney fees, \$518 for court fees, \$210 for accountant fees and \$409 for appraisers (averaging \$2,600 per foreclosure case). In addition, auctioneers were normally paid on a percentage of the assets sold, usually ranging from 5 to 7 percent of the proceeds of the sale. These services did not include the costs involved with the loans charged-off.

#### *Lenders' Time Requirements with Government Credit Programs*

Lenders' responding to the survey represented considerable experience with the LD Program and the FmHA Guaranteed Loan Programs. All of the FCS lenders and 95 percent of the commercial bank respondents had participated in the LD Program. Lenders' response to the survey accounted for 949 linked deposit applications that were accepted in 1992, almost two-thirds of the accepted applications for a typical year. About two-thirds of the lenders reported some experience with the guaranteed loan program.

Agricultural lenders reported spending an average of 1.9 hours to comply with the requirements of the LD Program (1.8 hours for FCS lenders and 1.95 hours for bankers) (Table 4). Total lender costs to participate in the program averaged \$52 per lender per linked deposit loan. Completing the application required about 40 minutes. Other program requirements took between 20 to 30 minutes for each function.

Lenders' time spent on an average FmHA guaranteed loan was 15.2 hours for FCS respondents (added lender costs of \$418 per loan) and 10.4 hours for bankers (\$286 per loan). The application process occupied the largest portion (57 percent) of a lender's time to participate (9.2 hours for FCS lenders and 5.5 hours for bankers). Responses were statistically different between lending groups (at the 5 percent level of significance). This may be one reason why FCS lenders have been, and continue to be, reluctant to participate. In contrast, the typical nonreal estate loan application required an average of one hour per loan.

Approximately 50 percent more time was spent by FCS lenders than bankers to comply with FmHA's guaranteed loan requirements. Results may explain why fewer FCS lenders participate and account for only 29 percent of the guaranteed loans made in Ohio. FCS lenders received about half of the available funds for the LD Program. Another problem reported by FCS lenders was the inflexibility of FmHA to adjust their average interest rate pricing policy. FCS lenders and officials felt that if more of a lender's time was required to comply with FmHA program standards, then interest rates for these loans should be adjusted accordingly.

### *Credit Program Loan Officers' Time Allocations*

Interviews of three separately located FmHA loan officers revealed that in-house lenders required between 8 to 16 hours per loan to package a loan guarantee. FmHA's loan officers hours required almost double of their time allocated by a lender for the typical nonreal estate loan. Most of their time was allocated up-front in the application process and verifying FmHA's checklist of items to complete. The majority of the FmHA's loan officer's time (80 to 95 percent) was still involved with monitoring their direct loan portfolio.

Time requirements for a FmHA loan officer to complete the guarantee loan process varied with the commercial loan officer's familiarity with the application process. A commercial lender's lack of experience with the guarantee program would tend to lengthen the required time for the application process. Working with a new lender unfamiliar with the program may take up to 24 hours of a FmHA's loan officer's time per application. In contrast, the staff of the Ohio State Treasurer's Office averaged between 45 minutes and one hour to process, review each application and distribute the linked deposit funds (LD Program's coordinator interview).

FmHA's "operation assistance" loan process transfers the application responsibilities from commercial lenders to FmHA's loan officers. FmHA's loan officers assist with the application process to encourage more lenders, unfamiliar with the guaranteed program, to participate. FmHA provides training sessions and seminars to periodically educate lenders about their guaranteed loan program. Providing on-site assistance (specialized service) for lenders unfamiliar with FmHA's guaranteed loan application procedures encourages new lenders to participate. This has occurred in one of FmHA's local districts in the state.

When a guaranteed loan becomes a problem loan, the FmHA's local loan officer meets with the commercial lender to discuss and assist with the loan loss forms. Guaranteed loan loss claims of less than \$55,000 were handled at local FmHA offices with approval of the district manager. Losses greater than \$55,000 were handled at FmHA's state office in Columbus. Although most of the FmHA's loan officers responsibilities for guaranteed loans have been in the application and loan review process, additional labor hours were required with annual collateral inspections and with problem loans.

### **Policy Implications**

#### *Ohio's Linked Deposit Program*

Program officials have carried out the intent of the program in an efficient manner. Recommendations have been directed to legislative changes during periods of economic prosperity and to those borrowers who have repeatedly been accepted in the program and have continued to receive reduced rate funding. Borrower benefits from the linked deposit program are obvious, a 4 percent reduction in interest rates on operating loans up to \$100,000 per borrower (\$4,000 per year).

Ohio taxpayers bear the largest burden, about \$4 million per year in foregone interest earnings on the State's deposits, plus modest operating costs absorbed by the State Treasurer's Office. Contributing factors having the greatest impact on the program's costs were: the rate



of interest reduction (4 percent), the length deposits were held outstanding (up to 12 months) and the total funds available at reduced rates (\$100 million per year). Each contributed to the funding portion of the subsidy.

Any cost saving initiatives considered for the LD Program directly impact the benefits received by borrowers. For example, incremental reductions in the interest subsidy such as 100 basis points in 1993, lower the annual subsidy costs (and benefits) by \$1 million (25 percent) for reduced rate deposits of \$100 million. Decreasing the interval the linked deposits remain outstanding by three months from 12 months to 9 months (i.e., April to January) would also have the same effect. Lowering the program's funding costs by 25 percent would reduce the potential savings for borrowers from \$4,000 to \$3,000 per loan. Therefore, lowering the funding costs decreases the subsidies to borrowers.

Transactions costs for lenders to participate in the LD Program were minimal -- less than 2 hours (\$52 per loan). In some cases borrowers complete the application forms. Total subsidy costs of the LD Program (3.92 percent) were only slightly larger than the benefits in interest savings received by borrowers (3.84 percent). The trade-off between the program's costs and the borrowers' benefits were practically identical because of their low operating costs.

Lenders' benefits include an identical interest rate mark-up on linked deposit loans, to mark-ups on loans to high risk customers not participating in the program. Although lenders' goodwill toward their linked deposit customers has been an accommodating issue, the program's success has also be driven by a true business objective -- a high return on investment.

Program officials have reported that the LD Program was not intended to be a "cure-all" solution. The program's intent was to provide temporary relief to farm borrowers as they recovered from adverse economic conditions during the 1980's. However, the program has continued into the 1990's even though the general economic climate of the farm sector has improved and interest rates have declined.

If the intent of the program is to address the issue of affordable interest rates paid by farm borrowers, the program may have outlived its purpose. To reduce the number of repeat participants receiving linked deposit funds each year, the program's rules could include a provision to cap the number of years a borrower would be eligible to receive reduced rate funding. Linked deposit funds were provided to lenders at 0.5 percent in 1993 and 0.75 in 1994. As a cost savings measure, distribution of linked deposit funds could be discontinued during periods when interest rates fall below certain preestablished rates or when the interest rate savings exceeds a predetermined level (40 percent) of the total funding costs for participating borrowers.

#### *Farmers Home Administration's Guaranteed Loan Program*

Default risk exposure for FmHA's guaranteed loans has been established primarily as an off-budget expenditure. If default is kept to a minimum, administration fees cover the costs to operate the program. FmHA's default rates and the associated costs of loan loss are ultimately determined by loan acceptance standards, the delinquency rate, loan monitoring provisions, collateral and the general economic climate of the farm economy. To maintain control on the costs, each aspect of the lending process must be properly monitored.

Shifting program emphasis from direct loans to guaranteed loans and correcting internal lending problems will continue to reduce the costs of the lending programs. Often internal inconsistencies in FmHA standards, weak financial controls within the local FmHA offices and inadequate credit standards have jeopardized the program and increased the potential for "off-budget" government liabilities to become "on-budget" outlays.

FmHA should develop a consistent procedure among FmHA's local offices to accept and review applications. The use of a credit scoring model and FmHA use of lenders' financial records would improve procedures and improve lenders' attitudes toward the program.

FmHA policy has permitted the highest credit risk borrowers to participate in their loan programs. Although the federal government has been downsizing FmHA's direct loan portfolio, most of FmHA's loan officers workload is still spent monitoring the servicing their direct loan borrowers.

FmHA may want specialize in loan officers who provide loan assistance in the application and review process (regional assistance). If the guarantee program is to be successful, the guarantee loan process needs to be more "user-friendly" to induce lenders to participate. Lender involvement is required throughout the FmHA lending process. FmHA clearly needs to address the problems of complicated application procedures, slow turnaround and cumbersome loan servicing requirements. Much of a lender's time (57 percent) was spent on the application process.

FmHA's "Certified Lender" Program attempts to reduce the turnaround time and improve on their acceptance procedure. However, few lenders qualify for these privileges (only 9 lenders in Ohio). FmHA's "operations assist" has also helped to reduce a lender's time involvement in the application process. However, the assistance provided varies in different offices of the state. One FmHA office in northwestern Ohio has supplied about 17 percent of the guaranteed loan volume in the state.

The guaranteed loan program has developed into a "double-edged" sword. Lenders are released of their responsibilities of assuming most of the default risk because they are compensated for 90 percent of loan losses. Lenders shift their default risk to the federal government for servicing high risk borrowers, but yet have little incentive to recover claims if losses occur after the guarantee has been paid. FmHA should establish more consistent procedures to determine the type and amount of security required and hold lenders responsible for servicing requirements throughout the duration of the loan.

FmHA may consider aggregating problem loans into a special accounts area similar to the way the FCS's Special Account Offices operate. Loan problems would then require special monitoring or possibly a third-party service to perform the collection process and also monitor the collateral.

Inconsistent policy and legislative barriers have created a difficult environment for FmHA's loan officers to administer rules and procedures. With perpetual changes to legislation and complex guidelines to consider, FmHA's loan officers have evolved into diversified servicing agents, making it difficult to specialize in specific tasks.

Guarantee loans were not intended to be a bailout for lenders' with poor quality loans. FmHA's guaranteed loans were intended to provide financial assistance, not income transfers. Although policy guidelines dictates what type of borrower can participate, policy-makers should be concerned with program motives, the program's long-term effects and the costs to taxpayers for the type of subsidy involved. Policy should continue to strengthen the efficiency of program compliance and redirect the distribution of the benefits offered. Considerations of credit program policy should be developed to minimize costs given a set of parameters or reduce costs for a given set of benefits received. Both require a better understanding of the costs before the policy for FmHA's farm credit programs are established.

**Table 1. Total and Average Subsidy Estimates for Linked Deposit and FmHA Farmer Loan Programs, 1985 to 1993**

| Credit Program        | Cost of Funds | Administrative Costs <sup>a</sup> | Default Risk <sup>b</sup> | Administration Fees <sup>c</sup> | = Subsidy Costs |
|-----------------------|---------------|-----------------------------------|---------------------------|----------------------------------|-----------------|
| <u>LD Program</u>     |               |                                   |                           |                                  |                 |
| Cost/Year             | \$3,883,000   | \$84,000                          | -0-                       | -0-                              | \$3,967,000     |
| Ave Cost/\$           | (3.84%)       | (0.08%)                           |                           |                                  | (3.9%)          |
| <u>FmHA-G-OL</u>      |               |                                   |                           |                                  |                 |
| Cost/Year             | \$27,000      | \$178,000                         | \$398,000                 | \$149,000                        | \$454,000       |
| Ave Cost/\$           | (0.17%)       | (1.125%)                          | (2.52%)                   | (0.94%)                          | (2.9%)          |
| Price Waterhouse Est. | NC            | (0.1%)                            | (1.8%)                    | (0.86%)                          | (1.0%)          |
| Herr                  | NA            | (1.13%)                           | (10.0%)                   | (1.0%)                           | (10.1%)         |
| <u>FmHA-G-FO</u>      |               |                                   |                           |                                  |                 |
| Cost/Year             | \$39,000      | \$80,000                          | \$218,000                 | \$52,000                         | \$286,000       |
| Ave Cost/\$           | (0.74%)       | (1.5%)                            | (4.08%)                   | (0.97%)                          | (5.4%)          |
| Price Waterhouse Est. | NC            | (0.56%)                           | (3.94%)                   | (0.87%)                          | (3.6%)          |
| Herr                  | NA            | (1.6%)                            | (7.00%)                   | (1.00%)                          | (7.6%)          |
| <u>FmHA-D-OL</u>      |               |                                   |                           |                                  |                 |
| Cost/Year             | \$350,000     | \$1,600,000                       | \$6,538,000               | -0-                              | \$8,438,000     |
| Ave Cost/\$           | (1.0%)        | (4.5%)                            | (18.8%)                   | -0-                              | (24.3%)         |
| Herr                  | NA            | (4.5%)                            | (11.1%)                   | -0-                              | (15.6%)         |
| Hughes-Osborn         | NA            | NA                                | NA                        | -0-                              | (19.4% to 26%)  |
| <u>FmHA-D-FO</u>      |               |                                   |                           |                                  |                 |
| Cost/Year             | \$600,000     | \$363,000                         | \$4,500,000               | -0-                              | \$5,463,000     |
| Ave Cost/\$           | (9.8%)        | (6.0%)                            | (73.8%)                   | -0-                              | (89.6%)         |
| Herr                  | NC            | (6.0%)                            | (7.0%)                    | -0-                              | (13.0%)         |
| Hughes-Osborn         | NA            | NA                                | NA                        | -0-                              | (11% to 13%)    |

<sup>a</sup> Administrative costs were computed for operating loans by multiplying the annual loan volume by 1.5 percent (Herr). Herr's estimates slightly higher because of converting the costs as a percent of loan volume guaranteed rather than volume of the loans.

<sup>b</sup> Default risk costs were computed from FmHA Reports 4067 and 4131 (loan charge-off figures). The accounting period loan was charged-off does not always match the period loan became delinquent. Average cost for Ohio may overstated because some of the loans issued before 1985 were charged-off during the period examined.

<sup>c</sup> The administrative fees collected are computed at 1 percent of the annual guarantee loan volume issued. Guaranteed loans receiving interest rate assistance are not required to pay administrative fees.

NA - Not available in the subsidy computation.

NC - Not considered in the subsidy computation.

G - Guaranteed Loan; D - Direct Loan; OL - Operating Loan; FO - Farm Ownership Loan.

Source: FmHA reports 4131 and 752, various issues; Herr; Hughes and Osborn; and Price Waterhouse.

**Table 2. Lenders' Time Required to Service Agricultural Loans, 1992**

| Typical Nonreal Estate Customer                                | Lender Hours Per Loan |       |       | Lender Cost Per Loan |
|--|-----------------------|-------|-------|----------------------|
|  | FCS                   | Banks | Total |                      |
| Fill out or complete application                               | 1.09                  | 0.80  | 0.91  | \$25                 |
| Review application and financial statements                    | 1.56                  | 1.46  | 1.51  | 42                   |
| Maintain and update file                                       | 1.30                  | 1.04  | 1.15  | 32                   |
| Monitor loans and inspect collateral                           | 1.61                  | 2.26  | 1.99  | 55                   |
| Loan collection  | 0.69                  | 0.75  | 0.73  | 20                   |
| Credit checks, court house visits                              | 0.76                  | 0.72  | 0.74  | 20                   |
| Average Hours Per Customer <sup>a</sup>                        | 6.91                  | 6.92  | 6.92  | \$190                |
| Average additional hours for new non-real estate loan customer | 3.15                  | 3.40  | 3.29  | \$91                 |
| Average hours for a new real estate loan customer              | 7.38                  | 6.43  | 6.83  | \$187                |
| Average hours per year for existing real estate loans          | 1.65                  | 2.38  | 2.08  | \$58                 |

<sup>a</sup> Column figures may not total because of rounding in the computations.

Source: Lender survey; *Agri Finance*, September, 1992.

**Table 3. Lenders' Time Required to Service Agricultural Loans, 1992**

|   | Average Hours Allocated Per Borrower |       |                   | In-House Lender Cost      |                     |
|---|--------------------------------------|-------|-------------------|---------------------------|---------------------|
|   | FCS                                  | Banks | Total             | Additional Costs Per Loan | Total Cost Per Loan |
| Additional hours per year for a delinquent loan | 6.4                                  | 6.9   | 6.7 <sup>b</sup>  | \$184                     | \$374               |
| Additional hours to restructure a loan          | 19.5 <sup>a</sup>                    | 7.5   | 11.0 <sup>b</sup> | \$303                     | \$493               |
| Additional hours to foreclose on a loan         | 27.5                                 | 22.0  | 23.1 <sup>b</sup> | \$635                     | \$825               |

<sup>a</sup> Lending group response found to be statistically significant at the 95 percent confidence level.

<sup>b</sup> Totals for all lenders submitting response (excludes special accounts section for FCS). The special accounts section handles these type of loans for the FCS lenders in Ohio.

Source: Lender survey.

**Table 4. Lenders' Time Allocated to Participate in Government Credit Programs, 1992**

| Ohio's Linked Deposit Program            | Additional Minutes Per Borrower |       |             |
|--|---------------------------------|-------|-------------|
|  | FCS                             | Banks | All Lenders |
| Completion of Linked Deposit Application | 38                              | 39    | 38          |
| Distribution of the Funds                | 24                              | 23    | 24          |
| Loan Monitoring                          | 28                              | 26    | 27          |
| Collection of Loan Payments              | 24                              | 19    | 22          |
| Processing of State Deposits             | 18                              | 26    | 24          |
| Total Additional Minutes <sup>a</sup>    | 108                             | 117   | 113         |
| Standard Deviation                       | 59                              | 79    | 71          |
| Lender Participation Cost Per Borrower   | \$50                            | \$54  | \$52        |

| FmHA Guaranteed Loan Program        | Additional Hours Per Customer |       |             |
|-------------------------------------|-------------------------------|-------|-------------|
|                                     | FCS                           | Banks | All Lenders |
| Application                         | 9.2 <sup>b</sup>              | 5.5   | 7.2         |
| Distribution of Funds               | 1.5                           | 1.3   | 1.4         |
| Loan Monitoring                     | 3.9                           | 2.8   | 3.3         |
| Collection                          | 1.5                           | 2.5   | 2.0         |
| Total Additional Hours <sup>a</sup> | 15.2                          | 10.4  | 12.6        |
| Standard Deviation                  | 14.1                          | 12.1  | 13.3        |
| Lender Participation Cost Per Loan  | \$418                         | \$286 | \$347       |

<sup>a</sup> Column figures may not total due to averaging.

<sup>b</sup> Differences between lenders' response statistical significant at the 5 percent level.

<sup>c</sup> Cost was calculated by multiplying the number of hours times the lenders' wage rate (\$27.50/per hour).

Source: Lender survey, and *Agri Finance*, September, 1992.

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