

An Analysis of Two Alternative Funding Sources for Northeast Banks Lending to Agriculture

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A survey of agricultural banks in New York State found that inability to compete with the low interest rates offered by the Farm Credit Service (PCS) rather than the unavailability of funds per se was limiting agricultural lending by commercial banks. A MASI-like intermediary would (1) be of assistance only to banks unable to use loan participations and with high CD costs and (2) would likely require a large multistate area to be feasible. Only eight percent of the New York banks serving agriculture qualify for FICB funding. Further, FICB funding would be profitable only if banks experienced illiquidity at least 50 percent of the time.

Introduction

Commercial banks have long played an important role in providing financial support for U.S. agriculture. The share of agricultural debt held by banks, however, has been falling over the past 10 years. This trend, and recent deregulatory changes in the banking industry, have raised concern for the quality of the resulting financial services available to farm borrowers.

Attempts to explain and remedy the shrinking presence of commercial banks in agricultural financial markets have focused much attention on the sources of funds utilized by banks to support their lending activities. In 1982, over 50 percent of bank-held agricultural debt was owned by small banks with less than \$50 million in deposits. Often these small rural banks have limited access to national money markets and therefore rely primarily on locally generated deposits.

The Federal Intermediate Credit Banks (FICB's) were established in 1923, precisely for the purpose of providing a secondary market for agricultural loans. Banks, however, have made only limited use of this funding opportunity. In 1983, another secondary market for agricultural loans was created. Bankers

of 12 midwestern states formed the MABSCO Agricultural Services Incorporated (MASI) agricultural loan funding program which functions as an intermediary between member banks and Rabobank which has agreed to purchase qualified agricultural loans.¹

This article presents an analysis of the funding needs of commercial banks as determined from a survey of bankers, and assesses the potential of a MASI-like funding corporation and the FICB program to meet bank funding needs. The funding corporation analysis includes an assessment of the profitability of participated loans to the originating bank and the feasibility of establishing the necessary intermediary. The FICB analysis investigates the eligibility of New York State banks and the profitability of discounting loans.

The Survey

During 1983, 91 banks with a minimum of \$250,000 in agricultural loans outstanding were mailed a questionnaire requesting information on bankers' perceptions of obstacles to agricultural lending and on bank funding strategies currently being used. Survey results

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¹ MABSCO is owned by the banker's association of Arkansas, Colorado, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, North Dakota, Oklahoma, South Dakota and Wisconsin. MABSCO established MASI. Some banks in Montana and Oregon also use the MASI program.

from 51 of 56 respondents were complete and usable.² The banks of New York City having foreign offices were not included in this study because much of their agricultural loan activity is concentrated outside New York State and their funding concerns and strategies are atypical of most banks involved in agricultural lending.

Bank Characteristics

Study banks are larger in size than those in the nation as a whole as well as those banks of the region where the MASI program is currently operative (Table 1). The larger size of study banks means that the problem of federal and state loan limits is less significant than for banks of other regions. The size advantage also implies that study banks would have more capacity to tap funding sources such as CDs that might be less accessible to smaller banks. The existence of statewide branching in New York also alleviates some funding concerns by allowing banks to develop a deposit base over a more heterogeneous area than would be available under the regime of unit banking.

The 51 study banks were stratified into four groups on the basis of deposit volume (Table 2). An additional "agricultural"¹ category included those banks with more than \$2.5 million in agricultural loans and a minimum agricultural loan to total loan ratio of 10 percent.

Survey Responses

To determine the relative priority of the issue of funding sources, bankers were presented

* For more information on the survey and the results, see Carraro and LaDue.

Table 1. Distribution of Agricultural Loan Volume by Bank Size (New York, MASI States and U.S., January 1, 1983)

Bank Size (deposits) \$ million	Study Banks Percent of Agricultural Loan Volume	MASI State Banks	U.S. Banks
0-25	8.0	29.1	28.1
25-50	7.9	31.2	25.1
50-200	29.9	22.4	22.4
over 200	54.2	7.3	24.4

Source: FDIC 1982 Call Report (Report of Income and Report of Condition).

with a list of potential obstacles to agricultural lending and asked to rate the importance of each for the past five years and for the coming five years. Competition from the Farm Credit Service (PCS) was cited as the most important limitation both in the past and in the future (Tables 3 and 4). Bankers perceived the PCS to be a strong source of competition based on its ability to offer lower interest rates. The problem of loan fund availability was ranked relatively low by many banks. Only the class III and agricultural banks rated this among the top three obstacles for the coming five years.

These results indicate that inability to compete with the low interest rates offered by the Farm Credit Service rather than the unavailability of funds per se is limiting bank lending to agriculture. Thus, any proposed funding alternatives must be evaluated on the basis of their ability to allow banks to charge more competitive interest rates rather than on their ability to generate loanable funds per se.

To determine which funding alternatives the MASI and FICB programs should be judged against, bankers were requested to list the

Table 2. Characteristics of Bank Groups (51 New York Banks, 1983)

Bank Group ¹	Banks	Number of Branches	Total Ag Loans In Group (\$ mil)	Average Deposit Size (\$ mil)	No. of Borrowers	Loan to Deposit Ratio
I	(no.)	(average)	13.5	16.1	(total)	(average)
II	1211	41.7	6.3	16.0	646	379
III	1414	41.9	98.6	92.4	1576	54.1
IV	13	8.3	143.4	523.3	729	80.1
Ag			177.9	149.8	691	60.4

¹ Based on deposits: group I has less than \$25 million; group II, \$25-50 million; group III, \$50-100 million; group IV; more than \$200 million; Ag banks have a minimum of \$2.5 million in ag loans and a minimum agricultural loan to total loan ratio of 10 percent.

Table 3. Obstacles to Ag Lending, 1978-83

Obstacle	Bank Group					
	I	II	III	IV	Ag	All
	----- Average Ranking ¹ -----					
Other Loans						
More Profitable	1.8	2.2	2.2	2.9	1.6	2.3
Low Demand	3.6	4.6	2.4	2.6	2.1	3.2
FCS Competition	3.2	3.9	3.9	4.2	3.3	3.8
Bank Competition	2.2	2.1	2.2	2.1	2.3	2.1
Other Competition	2.4	1.9	2.6	2.3	2.7	2.3
Bank Policy	2.2	1.6	1.9	2.0	1.6	2.0
Limited Ag in Area	2.2	2.7	2.1	2.2	1.6	2.3
No Funds to Lend	1.5	1.6	1.9	1.6	2.1	1.7

¹ Banks were asked to rank each choice from one to five where: 1 = unimportant and 5 = very important. Nonranked choices were not considered.

funding strategies they *could* and *would* use in the event their bank's liquidity were limited. All but the largest banks indicated that the most likely means of raising loanable funds would be loan participations with other banks (Table 5). The largest banks expected to use large negotiable certificates of deposit (CDs). Federal Funds were also ranked high by many banks.

The MASI Program

This program involves an agricultural loan funding corporation, MASI, which serves as a financial intermediary between the participating banks that make loans to agriculture and the major money market participant, Rabobank, to which the loans are sold,

Table 4. Future Obstacles to Ag Lending, 1983-87

Obstacle	Bank Group					
	I	II	III	IV	Ag	All
	----- Average Ranking ¹ -----					
Other Loans						
More Profitable	4.9	5.0	4.9	3.9	5.4	4.1
Low Demand	2.8	3.1	4.5	4.9	4.7	3.9
FCS Competition	3.0	2.9	2.1	2.0	2.1	2.4
Bank Competition	5.1	5.2	5.5	5.1	5.4	5.2
Other Competition	4.8	5.5	5.1	5.3	4.5	5.2
Bank Policy	5.3	5.3	5.5	5.1	5.8	5.3
Limited Ag in Area	4.3	3.5	4.9	4.9	5.4	4.4
No Funds to Loan	5.8	5.0	4.7	5.7	4.4	5.3

¹ Banks were asked to rank each choice from one to five where: 1 = unimportant and 5 = very important. Nonranked choices were

Table 5. Loan Funding Methods Banks Would Use During Periods of Illiquidity (Study Banks)

Funding Method	Bank Group					
	I	II	III	IV	Ag	All
	--- Average Ranking ¹ ---					
Large CDs (over \$100,000)	5.9	4.7	4.9	3.3	5.5	4.6
Participation — Other Banks	3.0	3.0	3.7	4.9	3.4	3.7
Participation — Correspondent	5.1	4.3	4.9	5.3	4.8	4.8
Participation — PCAs	5.4	4.9	5.1	5.7	5.5	5.3
Discount Loans with FICB	6.2	6.0	4.5	6.2	4.7	5.6
Federal Reserve Borrowing	3.5	4.9	5.8	4.8	5.4	4.8
Federal Funds	3.5	5.4	4.6	3.7	4.9	4.3
Sell FmHA, SBA Loans	6.2	4.4	4.6	5.4	3.7	5.1
Sell Mortgage Loans	6.2	4.4	5.3	5.5	4.9	5.4

¹ First ranking assigned a value of 1, second ranking 2, etc. Non-ranked choices assigned the average they could receive given the ranking of other choices.

Participating banks join MASI by investing in a capital note which ranges in cost from \$5,000 to \$14,750 depending on the bank's volume of total deposits. Under the program, member banks can sell up to 80 percent of qualified agricultural loans to Rabobank by contacting MASI. Once MASI verifies that a loan meets a set of quality standards, it can automatically purchase the loan participation on behalf of Rabobank. Decisions to purchase loans not meeting all criteria are made on a case by case basis by Rabobank.

Loan participations are purchased at approximately 1.5 percentage points above Rabobank's cost of obtaining funds through its CDs and purchases of Federal funds. Maximum loan term is five years for most loans. The minimum participation size is \$25,000. Interest rates paid to Rabobank can be fixed for periods of one month to one year, as selected by the originating bank. The rate charged to the farm borrower is at the discretion of the originating bank.

During Periods of Liquidity

During periods of liquidity banks will, by definition, have sufficient funds to make all profitable loans. When a loan is sold by a bank, the proceeds of the loan sale must be invested. For this process to be profitable to the bank, the loan sale and reinvestment must be more profitable than retaining the original loan. Profitability for these two situations can be modeled using equations (1) and (2), where equation (1) indicates the cash flows resulting

from use of a MASI-like program under conditions of liquidity and equation (2) indicates the cash flows when only the bank's own funds are used under conditions of liquidity.

$$(1) \text{ NCF} = iX + a(PX) - b(X) - m(PX) - sX - d(1 - P)X$$

where:

- NCF = net cash flow
- i = interest rate on agricultural loans
- X = total loan volume
- a = return on alternative investments
- P = percent of loan sold via MASI
- b = bank's average cost of funds
- m = cost of MASI funds
- s = loan servicing cost (percent of loan volume)
- d = loan loss as a percent of loan volume

$$(2) \text{ NCF} = i(X) - b(X) - s(X) - d(X)$$

Equating (1) and (2) results in break-even equation (3).

$$(3) \quad a = m - d$$

Use of a MASI-like alternative is profitable only if the cost of MASI funds minus the expected loan loss rate exceeds the rate that could be received on alternative investments.

Research on agricultural loans (LaDue, Moss and Smith) found the net loss rate to be approximately 0.08 percent. Aggressively managed agricultural loan portfolios or average portfolios during poor economic times may incur higher loss rates. The average loan loss rate of the study banks during 1982 as indicated by Call³ report data, ranged from .3 to .9 percent.

The most likely investment vehicles to be used by banks are Federal funds, CD's of other banks and Treasury bills. Average returns for these investment opportunities during the 1974-83 period were 9.58, 9.72 and 10.18 percent, respectively. MASI rates, however, are based on a 1.5 percentage point mark-up over a combination of CD and "term" Federal funds rates. Since the loss rate is certainly less than the 1.5 percent mark-up, this is unlikely to be profitable. Further, comparing the average estimated MASI rate of 11.72 percent to the Treasury note rate also indicates little opportunity for profit. This result makes it unlikely that the MASI pro-

gram could allow banks to charge lower interest rates on agricultural loans. There appears to be little incentive for banks to use such a program during periods of liquidity.

During Periods of Illiquidity

Under conditions of illiquidity, banks need additional funds if all loan requests are to be satisfied. In this case, the profitability of a Masi-like funding program must be compared to the profitability of using other available funding sources. Thus, the rate of return on alternative non-loan investments becomes irrelevant. The important alternative in this case is the source of funds that would be used if MASI funds were unavailable. If no other source of funds were available, then sale of loans to such an intermediary would be profitable as long as the MASI rates were less than the agricultural loan rate minus service and loan loss fees. In this case, returns to invested capital can be quite high because the bank receives the margin on the entire loan but keeps as little as 20 percent of its own funds invested. The rate earned can be as high as five times the net interest rate spread.

Most survey bankers indicated that during periods of illiquidity they would use loan participations to fund added loans. Since loan participations do not add funds to the banking system, banks aggregate ability to use this mechanism is limited. However, the strategy could be employed on an individual bank basis.

Profitability of a MASI-like program under illiquidity can be modeled using equations (4) and (5). Equation (4) indicates the net cash flow generated using MASI funding during periods of illiquidity. Equation (5) depicts net cash flows during periods of illiquidity when participation is the alternate funding source.

$$4) \text{ NFC} = iX - bB - mPX - sX - d(1 - P)X$$

$$5) \text{ NFC} = iX - bB - yPX - sX - d(1 - P)X$$

where:

- y = cost of participation funds (and $y = \frac{B}{i - s}$)
- B = volume of bank funds used (and $B = \frac{B}{1 - PCX}$)

Equating (4) and (5) results in break-even equation (6)

³ Report of Condition and Report of Income, Compiled by Board of Governors of the Federal Reserve system.

(6) $m = y$

Use of a MASI-like program would be more profitable than use of participations if the MASI rate were less than the participation rate. Since the participation rate is effectively the rate on the loan minus the loan servicing fee, the issue becomes one of whether the MASI rates allow a margin that is larger than the loan servicing fee.

Illiquidity during the 1974-83 period was identified using banker responses to the quarterly survey conducted by the Chicago Federal Reserve Bank. Illiquidity was defined as that period when more bankers indicated that their loan to deposit ratio was too high, than indicated it was too low. The period of illiquidity covers the third quarter of 1977 through the third quarter of 1980.

Agricultural loan interest rate data and estimates of MASI rates based on historical Federal Funds data indicate that over the illiquid period MASI funds were 0.4 percent more costly than participation funds (Table 6). Alternatively, a participation with a loan servicing fee charged by the originating bank of 0.6 percent or more was more profitable than MASI funding.

An alternate funding source which could increase total lendable funds and the one which

Table 6. MASI Versus Participation Costs During Illiquidity

Year	Quarter	Participation Cost ¹	MASI Cost ²	Advantage of MASI
1977	III	7.4	Percent --	-.2 -
	IV	8.1	7.6 8.3	.2
	I II	8.3	8.6 9.2	-.3 -
1978	III	8.6	10.0 11.6	.6 -
	IV	9.4	12.1	.6 -
	I II	10.7	12.2 12.9	.9
1979	III	11.5	15.8	-.6 -
	IV	11.8	17.3 14.8	.4 -
	I II	11.9	11.8	1.0 -
	III	15.2		.6
		15.0		-2.3
1980		17.5		2.7
		11.8		0.0

¹ Participation costs are estimated at average rate charged by large banks on nonreal estate farm loans (as reported in Agricultural Finance Databook, Board of Governors of the Federal Reserve System) minus a one percentage point loan servicing fee.

² MASI rates are estimated using overnight Federal Funds rate for one month MASI rates and 1.4 times the Federal Funds rate for one to six month MASI rates. This may slightly underestimate MASI rates due to difference between overnight Federal Funds rates and Term Federal Fund rates.

large banks indicated they would use is large denomination certificates of deposit. Net flows using CDs as a funding source can be represented by equation (7).

(7) $NFC - i(X) - b(B) - z(Z) - s(X) - d(X)$

where:

z = cost of CDs

Z = volume of CDs ($Z = PX$)

Equating (4) and (7) results in a break-even equation (8)

(8) $m = z + d$

A bank, able to obtain funds through CDs at a cost below the MASI rate, less the loan loss rate, would find CDs more profitable than MASI funding. During the 1977-80 period of illiquidity, large banks that were able to sell CDs at rates equal to the published rates for money center banks would have found MASI funding at a 0.6 percent disadvantage (Table 7). Smaller and less well known banks, such as most of the study banks, must normally offer investors an interest rate premium over the rates paid by the largest banks. For these banks, the CD funding alternative would be

Table 7. Advantage of MASI Over CD Funding of Loans During Illiquid Periods

Year	Quarter	MASI Cost ¹	Break-Even CD Cost ²	Advantage of MASI	
				Percent	
1977	III	7.6	7.0	-.6	
	IV	8.3	7.9	-.4	
1978	I	8.6	8.1	-.5	
	II	9.2	8.7	-.5	
	III	10.0	9.5	-.5	
	IV	11.6	11.7	.1	
1979	I	12.1	11.7	-.4	
	II	12.2	11.5	-.7	
	III	12.9	12.3	-.6	
	IV	15.8	15.2	-.6	
1980	I	17.3	11.7	-.6	
	II	14.8	12.9	-1.9	
	III	11.8	11.3	-.5	
Average					-1.60

¹ Estimated one to six month MASI rate using historical Federal Funds data (1.04 times Federal Funds rate). This may understate the MASI rate due to differences between overnight Federal Funds and (unpublished) term Federal Funds rates. ² Average of offering rate quoted by five dealers; annualized; x 365/360) and adjusted for reserve requirements of three per-

CD quoted rate plus 0.9 percent loan loss.

1.0-.03

Source: Federal Reserve Annual Statistical Digest

superior to the MASI alternative if banks could issue CDs while paying an average premium of .6 percent or less over quoted CD rates.

Feasibility of a MASI-like Organization

Based on historical interest rate data, the MASI program offers little hope for allowing commercial banks to lower agricultural loan interest rates. However, since future interest rate patterns may not follow historical trends, the feasibility of developing an independent funding intermediary for the Northeast in the mold of the MASI program was examined.

To be feasible, the intermediary must encompass a geographical area sufficiently large to generate an agricultural loan volume capable of covering the operating costs of the intermediary. In the MASI program, .25 percentage points of the 1.5 point interest rate markup are used to cover MASI expenses. Operating costs for the existing MASI organization were approximately \$216,000 for 1983.⁴ To cover these costs, over \$85 million of loans would need to pass through the intermediary each year to cover its costs (\$216,000 / .0025 = \$86.4 million).

To determine the geographical area required, the proportion of agricultural loans meeting MASI quality standards that would actually be sold to a MASI-like intermediary is estimated. From the survey it was determined that approximately 40 percent of the dollar volume of agricultural loans in New York State met the dual criteria of being larger than

\$25,000 in size and having maturities of five years or less. Only a portion of these loans, however, would meet established criteria of loan quality and purpose. This proportion would likely vary by bank and over time as economic conditions change. Further, banks would choose to participate only a portion of each eligible loan. Participation rates to date in MASI states have been quite low, but they may improve over time.

To appropriately assess the volume of agricultural loans required, a range of values for both the proportion of loans meeting quality criteria and the proportion of qualifying loans actually sold was used (Table 8). The required agricultural volume was then compared to the agricultural loan volume currently outstanding in various states. To exclude banks with certain access to credit market funds, only agricultural loans held by commercial banks without foreign branches were counted.

Under the most optimistic scenario, New York and the New England states could support such an intermediary. Under the least optimistic set of assumptions, all states east of the Mississippi River not already affiliated with the existing MASI program would be needed for the intermediary to succeed. A most likely scenario, which assumes that 60 percent of the loans would meet quality criteria and of these, 10 percent would be participated, would require the states of New England, New York, Pennsylvania, New Jersey, Maryland, Delaware and Ohio.

The required geographical area could be reduced by requiring a larger fee for the intermediary or modifying the program to accept a wider range of agricultural loans. Such changes would, however, raise the cost of the

⁴ Private communication with James Potter, Executive Director, MASI.

Table 8. Total Loan Volume Required to Support MASI-Like Agricultural Loan Funding Corporation¹

Qualified Loans Participated	Percent of Loans Meeting MASI Eligibility Criteria ²			
	20	40	60	80
	----- Agricultural Loan Volume (Billion Dollars) -----			
10	15.4	7.7	5.1	3.9
20	7.7	3.9	2.6	1.9
30	5.1	3.9	1.7	1.4
40	3.9	1.9	1.3	1.0
50	3.1	1.5	1.1	.8

¹ Percent of loans greater than \$25,000 and term less than five years assumed to be 40 percent. Participation level of loans sold was assumed to be 70 percent.

² Those meeting eligibility criteria and scoring less than 4.0 on the loan scoring matrix.

program to the member banks in the first case and the intermediary in the second.

Discounting with the Federal Intermediate Credit Banks

Discounting with the Federal Intermediate Credit Banks can be accomplished by a commercial bank in either of two ways. The first is for a bank to directly discount eligible loans with the FICB. The second is for a commercial bank to form an agricultural credit corporation (ACC) through which loans would be made to farmers and discounted with the FICB.

Only the option of discounting agricultural loans via an ACC is considered here because direct discounting does not offer relief from high loan to deposit ratios nor does it provide a source of funds for overline loans because the bank itself must guarantee the loan. With an ACC it is the ACC and not the bank that guarantees the loan, thereby providing liquidity and overline assistance for the bank. The analysis of FICB funding focuses first on the requirements which banks must meet to qualify for the program and secondly on the profitability of using this funding alternative.

A bank can qualify for discounting privileges with the FICB if the following criteria⁵ are met:

- (1) The bank has a minimum agricultural loan to total loan ratio of 15 percent at the seasonal peak.
- (2) The bank has a minimum loan to deposit ratio of 60 percent except in periods of general economic decline.
- (3) The bank makes continued use of the discounting program rather than using it only when funds are unavailable elsewhere.
- (4) The bank is unable to reliably access national or regional capital markets either by *itself* or via its holding company.
- (5) The bank continues to use the same proportion of its own funds to support agricultural lending activities.
- (6) The ACC discounts a minimum of \$1.5 million dollars of agricultural loans.

Banks Qualifying for Discounting Privileges

Based on survey and Call report data, only 26 banks met the first criteria of having a mini-

imum agricultural loan to total loan ratio of 15 percent. Two of the 26 banks are members of large bank holding companies giving them access to financial markets. These two were therefore judged ineligible on the basis of the fourth requirement of lack of access to the money markets. For a bank to discount the minimum required volume of \$1.5 million and not diminish the percentage of its own resources dedicated to agricultural lending in compliance with the fifth condition, it would likely need a current agricultural loan volume of at least \$3 million. Only seven of the 24 potential discounters had agricultural loan volumes larger than \$3 million. Loan volume was measured as of May 1983 for the 15 survey respondents and as of December 1982 for the nine nonrespondents.

The seven potentially qualifying banks account for a total of \$62 million of agricultural loans, or roughly 16 percent of all New York State agricultural loans made by non-New York City banks. Six of the seven banks answered a survey question asking if the banks would use the FICB discounting option given the opportunity to do so. Two answered they would not use it, two were undecided and two stated that they would discount agricultural loans with the FICB given the opportunity.

The extremely limited number of banks eligible for the FICB program in combination with the lack of willingness to use the program among those banks qualified to do so indicate that this funding option could have at best a relatively minor contribution to improved competition in agricultural credit markets in New York State.

According to FICB guidelines, loans must continue to be discounted regardless of a bank's liquidity position. Thus, it is the consolidated results including both periods of liquidity and illiquidity that determines profitability.

Profitability During Periods of Liquidity

The FICB accepts only fully guaranteed loans for discounting and therefore the ACC bears all loan risk. By slightly altering equation (1) to reflect the absence of risk sharing, the net cash flow with FICB funding under liquidity can be modeled, resulting in equation (9).

$$(9) \quad NCF = iX + aPX - bB - iPX - sX - dX$$

⁵ The requirements listed are those of the Springfield Farm Credit Banks. Requirements in other districts are similar but not necessarily the same.

where:

P = percent of loans sold to FICB

f = cost of FICB funds

Equating (9) and (2) gives the break-even equation (10) indicating that the rate received on alternative investments must exceed the cost of FICB funds for profitability to improve.

$$(10) \quad f = a$$

The cost of FICB funds includes the direct bank charge for the use of funds and the cost of ACC capitalization. The Springfield Farm Credit Banks require purchase of non-interest bearing FICB stock certificates equal to 10 percent of the anticipated discount volume. The FICB charge for funds was adjusted for the capitalization requirement using procedures outlined by LaDue. When the effective cost of FICB funds is compared to the return, banks could earn investing in large denomination CDs during the liquid periods of 1973-84 (Table 9), it is clear that except for high interest rate periods, banks would not gain from use of FICB funds. The average loss over all 26 quarters of liquidity was 1.0 percent. If the appropriate alternate investment were Federal Funds or three-year Treasury Notes rather than CDs the disadvantage of FICB funding would average 1.2 and 1.1 percent, respectively.

Profitability During Periods of Illiquidity

During periods of illiquidity banks would need to attract outside funds to support expanded loan activity. The seven banks that qualify for the FICB program indicated that they were most likely to use loan participations during times of illiquidity. The net cash flows generated by a bank using FICB funds during illiquidity are represented by equation (11).

$$(11) \quad NCF - i(X) - b(B) - f(PX) - s(X) - d(X)$$

Equating (10) and (5) results in the break-even relationship using FICB funds under illiquidity (12)

$$(12) \quad f = y - d$$

FICB funding is advantageous if the FICB cost is less than the participation rate minus the loan loss percentage. The loan loss rate is important because losses are shared with par-

Table 9. Advantage of FICB When Released Funds Would Be Invested in CDs During Periods of Liquidity

Year	Quarter	CD Investment Return ¹	Cost of FICB Funds ²	Advantage of FICB Funding
		Percent		
1974	I	8.7	9.2	-.5
	II	11.1	9.5	1.6
	III	12.2	9.8	2.4
	IV	9.5	10.1	-.6
1975	I	6.8	10.0	-3.2
	II	6.1	9.1	-3.0
	III	6.9	8.4	-1.5
	IV	6.4	8.4	-2.0
1976	I	5.3	8.2	-2.9
	II	5.6	8.1	-2.5
	III	5.5	7.7	-2.2
	IV	5.0	7.5	-2.5
1977	I	4.9	7.3	-2.4
	II	5.3	7.2	-1.9
1980	IV	16.0	12.2	3.8
1981	I	16.1	13.8	2.3
	II	17.0	14.7	2.3
	III	17.7	15.5	2.2
	IV	13.7	15.7	-2.0
1982	I	14.4	15.2	-.8
	II	14.4	14.9	-.5
	III	12.1	14.3	-2.2
	IV	9.1	13.0	-3.9
1983	I	8.6	11.4	-2.8
	II	8.9	10.8	-1.9
	III	9.7	11.2	-1.5
Average				-1.0

¹ Three month CD annualized return rate, Federal Reserve Bank Statistical Digests 1974-83.

² Effective cost of FICB funds adjusted for capitalization requirements, FICB-Springfield.

ticipation loans and absorbed entirely by the bank when FICB funding is used.

Over the 13 quarters of illiquidity during 1973-84, the cost of FICB funds was less than the break-even rate using participations during most quarters (Table 10). The average advantage of FICB funding was 1.1 percentage points. Similar calculations using large bank CDs as the alternative funding source indicate no advantage for FICB funding. For small banks, the advantage of FICB funding was, thus, equal to the premium over the large bank rate that the smaller bank must pay.

When the results during periods of liquidity and illiquidity are combined, the average advantage of FICB funding is -.3 percent (Table 11). Even if a bank were qualified, the profitability of using FICB funds was inferior to the

Table 10. FICB Versus Participation Funding During Illiquidity

Year	Quarter	Break-Even Rates Using Participation ¹	Cost of FICB Funds ²	Advantage of FICB
1977	III	7.0	7.2	-2-
1978	IV	7.7	7.8	.3
1979	I II	7.9	7.9	0.0
	III	8.2	8.3	-.1
	IV	9.0	8.5	.5
1980	I II	10.3	9.1	1.1
	III	11.1	10.0	1.0
	IV	11.4	10.4	.9
Average	I II	11.5	10.6	3.5
	III	14.8	11.3	4.2
		14.6	12.3	—
		17.1	12.9	31.1
		11.4	11.7	

¹ Participation rate is the average large bank (greater than \$500 million in assets) agricultural loan rate less one percent servicing fee. Break-even rate is the participation rate minus .4 percent loan loss. Loan loss rate is calculated for the seven potentially eligible banks.

² Effective FICB rate including capitalization stock cost.
Source: Federal Reserve Bank Agricultural Finance Databook, FICB-Springfield.

use of currently available funding techniques over the 1974-83 period. While the FICB program was profitable during periods of illiquidity, it was not sufficiently profitable to outweigh the losses that resulted during periods of liquidity. Banks would need to be illiquid half or more of the time for FICB funding to be more profitable under the interest rate environment of the last decade.

Conclusions

A survey of New York commercial banks indicates that the primary factor limiting bank lending to agriculture is inability to compete on an interest rate basis rather than a lack of available funds per se. However, neither an agricultural loan funding intermediary like the

Table 11. Profitability Using FICB Funding, 1974-83

Scenario	Number of Quarters	Total Spread	Annual Advantage of FICB
Liquidity	26	-26.2	-1.0
Illiquidity	13	14.4	1.1
Total	39	-11.8	-.3

MASI program used in the Midwest or use of Federal Intermediate Credit Bank funds through an agricultural credit corporation provided significant rate advantage compared to currently available funding alternatives.

With the characteristics of New York loans, the level of operating costs currently experienced by the existing MASI system and the 0.25 percent fee, the likely minimum northeastern area required to have a viable MASI-like intermediary would include the New England states and New York, Pennsylvania, New Jersey, Maryland, Delaware and Ohio. Only under the most optimistic assumptions could New York and the New England states alone support such a program.

During periods of illiquidity over the 1974-83 period, MASI costs were 0.4 and 0.6 percent more expensive than loan participations or large bank CDs, respectively. During periods of liquidity, the return on alternate investments available to banks make use of a MASI-like alternative unprofitable. The disadvantage of MASI-like funding during liquid periods with an average MASI cost of 11.72 and a loan loss rate of 0.9 was 1.24, 1.10 and .64 percent when alternate investments were CDs, Federal Funds and three-year Treasury Notes, respectively. Only banks unable to use loan participations and with high CD costs could be expected to find a MASI-like alternative profitable.

The FICB loan discounting program offers little potential for improving the competitive position of commercial banks in agricultural lending competitiveness because strict qualification requirements severely limit the program's availability. The profitability analysis of the FICB program found that even for the few banks meeting the FICB's criteria, use of this funding alternative would have been more expensive than the option of using loan participation funds.

Only seven New York banks could potentially meet the qualifications established by the Farm Credit Banks for FICB funding. These banks represent only 16 percent of the volume of agricultural loans made by New York State banks.

During periods of illiquidity FICB funding provided a definite interest rate advantage to banks. Costs were reduced by 1.1 percent compared to participations and 0.4 percent compared to CDs. During periods of liquidity FICB funding resulted in a disadvantage of 1.0, 1.1 or 1.2 percentage points depending on

whether released funds were invested in CD's, three-year Treasury Notes or Federal Funds, respectively.

Combining the liquid and illiquid periods over the 1974-83 period resulted in a net disadvantage of 0.3 percent for FICB funding. Illiquid periods would have to equal or exceed 50 percent of the time for FICB funding to improve the competitive position of agricultural banks.

References

- Board of Governors of the Federal Reserve System. Report of Income and Report of Condition. Magnetic Tapes, December 31, 1982.
- Carraro, Kenneth. *Two Alternative Methods of Funding Agricultural Loans for Commercial Banks in New York State*. Unpublished M.S. Thesis, Cornell University, 1984.
- Carraro, Kenneth and Eddy LaDue. *An Economic Evaluation of Alternative Sources of Funding for Agricultural Lending By Commercial Banks*. Department of Agricultural Economics Research Bulletin 84-87. Cornell University, 1985.
- LaDue, Eddy. Influence of the Farm Credit System Stock Requirement on Actual Interest Rates. *Agricultural Finance Review*. Vol. 43, 1983.
- LaDue, Eddy, Jerry Moss and Robert Smith. "The Profitability of Agricultural Loans by Commercial Banks." *Journal of the Northeastern Agricultural Economics Council*. Vol. 7, No. 1, April 1978.
- Melichar, Emanuel and Paul Balides. *Agricultural Finance Databook*. Washington, DC: Division of Research and Statistics, Board of Governors of the Federal Reserve System, various dates.