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Abstract

CORRESPONDENT BANKING IN AGRICULTURAL FINANCE:
AN ANALYSIS OF PROFIT REQUIREMENTS AND PRICING PROCEDURES

Peter J. Barry

The principles of customer profitability analysis are applied to overline participation in farm loans by correspondent banks. A simulated borrowing situation is used to measure the level of participation and profit requirements on overline farm loans of a sample of correspondent banks with implications drawn for rural bank management.

Peter J. Barry is an Associate Professor of Agricultural Economics at Texas A&M University.

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This paper reports selected results of research investigating factors that influence the supply of and demand for overline farm loan participations by correspondent banks in Texas [Boondiskulchok]. Emphasis is given to understanding the procedures correspondent banks use in evaluating the profitability and risk of overline loan participations. A simulated borrowing situation is used to measure the responses of a sample of correspondent banks to overline loan requests and to identify factors influencing the profitability of overline loans. Implications are then developed for strategies rural banks might consider in more effectively accommodating overline loan requests and using correspondent services.

Valuing Correspondent Services

Correspondent banking refers to the provision of a host of services by larger banks to smaller banks. The services range over check clearing, currency exchange, computer and broker services, safekeeping and others, and may include loan participations as well. Generally the rural bank compensates its correspondents for these services by holding sufficiently large demand balances on account at the correspondent banks. Periodically (generally monthly) the correspondent uses a procedure called Account Analysis to determine whether the rural bank's average collected balances are indeed large enough to compensate the correspondent for nonloan participation services. The essential idea is to compare the costs of providing correspondent services with the earnings provided from balances maintained by the rural bank.

The profitability of loan participations is evaluated in a similar manner;

however, before explaining this procedure, it will be useful to briefly characterize the need for loan participations. The need for loan participations is most urgent in unit banking states. Smaller unit banks located in rural areas often encounter serious liquidity problems associated with seasonal loan-deposit flows and they may also experience large loan requests from some farmers and other borrowers that exceed the bank's legal loan limit.^{1/} To accommodate such overline loan requests, the rural bank generally arranges an overline loan participation with one of its city correspondents. Both rural and correspondent bank will carry portions of the loan, each receiving interest on their respective shares. The correspondent also values the balances held on deposit by the borrower in determining the profitability of the loan. However, in the case of farm loan participations, farmers generally do not maintain balances at city correspondents. Compensating balances must, therefore, be in the form of demand balances maintained by the rural bank. Moreover, relatively few rural banks appear to pass along or otherwise require compensating balances of farmers (Barry, Greathouse and Boondiskulchok).

Results of a recent survey (Boondiskulchok) of rural Texas banks indicated that about 43 percent of the responding banks actually required overline participations during 1973 and 1974. The total value of these participations were \$33,152,000 in 1973 and \$36,273,000 in 1974 -- averages of \$829,000 and \$877,000 per credit-using bank in each of these years. Loans for cattle and crops dominated the overlines and those banks using overline participations indicated an average of about four overline customers per bank. While these overline requests are relatively few in number, they are large in terms of loan volume with significant profit implications for the rural banks.

Average interest rates on the overlines were 8.63 percent in 1973 and 9.47 percent in 1974 -- the 1974 rate being considerably below rates correspondent

banks could earn on other loans. Only 16 percent of the responding rural banks indicated that their correspondents required additional balances for overline participations and only 24 percent indicated that correspondents stipulated a general level of compensating balance for all correspondent services. Most rural banks were left free to use their own judgment in determining their level of correspondent balances -- and most appear to hold excess balances that overcompensate the correspondent for services rendered.

Typically rural banks have little difficulty gaining their correspondent's participation in easier monetary periods with relatively low interest rates. However, rural bankers tend to exhibit greater concern over the availability and cost of overline loan participations when monetary conditions tighten and interest rates are rising. It is then that many correspondents are referred to as fair-weather friends who seem to have little familiarity with agricultural lending. Are these concerns and claims justified? Or, could they reflect a lack of awareness of the pricing procedures and profit features of overline participations in comparison with other uses of the correspondent's funds. The issues are treated in the procedures of Customer Profitability Analysis.

Customer Profitability Analysis

Customer Profitability Analysis (CPA) is a relatively new tool that is used by an increasing number of city banks. It is applicable to any borrowing situation but is restricted here to overline participations. CPA combines analysis of the profitability of providing correspondent services with the profitability of providing loan services. As outlined earlier, the profitability of providing correspondent services is analyzed through Account Analysis. Hence, CPA integrates the profitability of overline participation with Account Analysis.

A comprehensive review of alternative CPA approaches for commercial banks is contained in a set of articles by Knight. He points out, and our research verifies, that the specific forms of CPA vary widely among large banks; however, the basic concepts are similar in all these variations. The approach cited here is to derive the net rate of return on capital committed by the bank to support the particular loan activity. This return on capital can be expressed as:

$$(1) \quad RC = \frac{[(B - A) (1 - p)] E_r + [rL_o] - [L_o(1 - c) C_f]}{cL_o}$$

where

RC = The rate of return on capital.

B = The average collected demand balances held by the rural bank at the correspondent bank.

A = The demand balance required to compensate for correspondent services other than loan participation.

p = The rate of reserve requirement.

E_r = The earning rate on investable demand balances.

r = The interest rate on the overline loan.

L_o = The average overline loan balance.

c = The percent of overline loan covered by bank capital.

C_f = The average cost of noncapital funds.

The rate of return on capital expresses the net returns associated with the overline as a percent of capital committed to the overlimes. Three items comprise net returns. First is the rate of earnings on the rural bank's collected demand balances reduced by the balance needed to compensate for nonoverline correspondent services and by the reserve requirement. The balance needed to compensate for nonoverline services is determined through the Account Analysis activity. The second item is the interest earned on the overline loan.

The third item reduces returns by the cost of noncapital funds committed to the overlines. Capital reflects the correspondent's assignment of some portion of the overline as the average capital required to cover the average loan balance. Ten percent ($c = .10$) is a common figure. The rest of the funds required to support the loan relationship $L_o (1 - .10)$ is assumed to be borrowed funds. Hence, for a capital commitment of .10 and a reserve requirement of 17.5 percent, equation (1) is modified to

$$(2) \quad RC = \frac{[(B - A) (1 - .175)] E_r + [rL_o] - L_o (1 - .10) C_f}{L_o (.10)}$$

Furthermore, to express an after-tax rate of return on capital (NRC), the numerator is multiplied by .52, assuming a corporate tax rate of 48 percent. After additional modification, equation (2) can be expressed as

$$(3) \quad NRC = \frac{B - A}{L_o} (4.29) E_r + 5.2r - 4.68 C_f$$

Finally, the absolute profitability of the overline participation is expressed as net after tax income (ATI) and is the product of the net return on capital, the average loan balance, and the proportion of loan balance supported by bank capital

$$(4) \quad ATI = (NRC) (L_o) (c)$$

The net rate of return on capital derived for various overlines can be compared to required rates of return in assessing the overline's acceptability. Moreover, overlines can be ranked in terms of their rates of return. Hence the CPA tool is useful in a bank's overall portfolio management and it is useful in negotiating loan terms -- i.e., combinations of interest rate and compensating balance -- that are needed to achieve specified rates of return on capital.

Analyzing Profitability of Overline Participations

Analysis of a correspondent's profitability and pricing procedures for

overline loan participations requires empirically based estimates of the variables contained in equation (3) -- namely, the average loan balance, the compensating balances for overline and nonoverline services, rates of interest for the overline loan, the earnings on compensating balances, the cost of loan funds, and required rates of return on bank capital. To gain responses on some of these variables a sample of nine correspondents in major Texas cities were asked to evaluate a case loan request from a model rural bank with the interviewer simulating the manager of the rural bank. The model bank was formulated and described in terms of its size, legal lending limit, loan deposit ratio, nonoverline credit services, quality of management, and other measures of bank performance. In addition the model bank was assumed to need overline participation on 15 of its loans ranging over a variety of purposes and totaling \$4.06 million. The number of overline loan requests was set high enough to anticipate the correspondent's rejection and designed for deletion of individual requests until loan approval was obtained. Hence, the total overline capacity of the rural bank could be measured.

City correspondents were asked to respond for monetary conditions that existed during two recent time periods. Case 1 represented the tight money period of 1974 and Case 2 represented the easier monetary conditions existing in 1975. Assumptions were made for some of the items in equation (3) to reflect market rates existing at those times and to simplify the response situation for the correspondents. Interest rates (r) on farm overline loans were designated as 10 percent and 8.5 percent for 1974 and 1975 respectively. The average federal funds rate reported for these time periods in the Federal Reserve Bulletin was used to approximate the city correspondent's cost of funds (C_f). This rate was 10.51 percent in 1974 and 5.96 percent in 1975. The earnings rate (E_r) on investable balances is closely tied to the cost of funds

rate and assumed here to be .25 percent below it. Hence the earnings rate was designated as 10.26 percent in 1974 and 5.71 percent in 1975. The reserve requirement was 17.5 percent and average capital required to support the loan was ten percent.

Each correspondent was then asked to indicate their preferred level of participation with the model bank and their requirements on rates of return and/or compensating balance. Two kinds of responses occurred. Four correspondents (numbers 1, 5, 7, and 9 in Table 1) used CPA and responded in terms of the net return on capital required for overline participation. These rates of return are reported in lines 3 and 6 of Table 1 for the two time periods. Those correspondents not using CPA responded in terms of the level of compensating balances required for participation. These compensating balances are reported in lines 2 and 5 of Table 1. Moreover, a direct relation appeared to exist between correspondents using CPA and their willingness to fully participate in \$4.06 million of participations. Assuming that the credit is good and the net returns on capital are acceptable, the correspondents using CPA were all willing to participate up to \$4.06 million. Others were willing to participate only in amounts less than \$4.06 million (line 1).

Only five of the correspondents could effectively estimate the collected balances needed to compensate for all nonoverline services. The largest estimate (\$316,000) was chosen for use in calculating the profitability and overline balances needed for the nine correspondents.

The measures in parentheses in lines 2 and 5 of Table 1 are the compensating balances that would be needed to yield the designated required rates of return on capital for the two time periods, given measures on other variables in equation (3). For example, in case one conditions correspondent 1 would require a 45.9 percent compensating balance in order to achieve a 23 percent

net rate of return on capital when its overline loan balance is \$4.06 million, the balance required for nonoverline services is \$316,000 and rates of interest on the overline, costs of funds and earnings on investable balances are ten percent, 10.51 percent and 10.26 percent respectively. Similarly the measures in parenthesis in lines 3 and 6 are the rates of return on capital that would be realized for the two time periods resulting from the designated compensating balances, given estimates on the other variables in equation (3). Finally, lines 4 and 7 provides estimates of after tax net income as measured by equation (4).

Implications of the Correspondent's Credit Responses

The assertion by rural bankers and others that overline participations are often not available from correspondent banks probably overlooks some important points governing the supply of loan participations. With one exception the correspondent's credit responses indicated that the total overline capacity for the model bank was at least \$2 million. Furthermore, four city correspondents were willing to fully meet the model bank's overline requests of \$4.06 million. However, their willingness to participate rested on the ability of the participations to meet the rate of return standards stipulated by the correspondent. These standards fluctuate somewhat with changing financial market conditions but tend to remain high thereby reflecting the correspondent's perception of risk in farm loan participations. While the farm loans requiring overline participation are generally "prime" to the rural banker, they are generally not "prime" to the correspondent bank. Therefore, the effective yield requirement on overline farm loans is higher than on prime loans to reflect the higher risk.^{2/}

In addition, the tendency to use compensating balances as a method of yield

adjustment on overline participations places a significant burden on rural banks to generate the necessary balances. As Table 1 indicates, relatively wide fluctuations in interest rates in the financial markets together with rather limited adjustments in rates on farm loans cause great fluctuations in compensating balances required by the correspondent to meet their profit standards. If, for example, the correspondent requires a 20 percent net return on capital, the necessary compensating balance would change from about 15 percent for 1975 conditions to about 40 percent for 1974 conditions. These wide swings in balance requirements may be difficult to anticipate and often reach levels that are quite costly to the rural banks, thereby reducing their incentive for arranging overline participations. Nonetheless, as indicated earlier, many rural banks do appear to hold excess balances that tend to overcompensate their correspondents for the services being provided.

What are some of the alternatives for overcoming the pricing problems associated with overline loan participations? One is for the rural banker to refer the overline farm customers directly to the correspondent for loan servicing. Rural bankers are reluctant to take this route fearing the loss of the farmer's deposits. Another possibility is to let the correspondent originate the loan and then sell a portion back to the rural bank. The deposit function and loan servicing could be retained in the rural bank leaving the balance requirements to be resolved by the borrower and the correspondent. Still another possibility is for the rural bank to retain the farmer's deposit function but arrange for financing through local offices of Farm Credit System lenders or through other nonlocal sources [Board of Governors].

For the present system of correspondent overline participation, several strategies for managing demand balances and interest rates emerge for consideration by rural bankers. One strategy is to simply learn more about the correspondent's methods of evaluating participations so as to more accurately estimate

the level of balances needed to pay for correspondent services. Then, a second strategy could be to hold excess balances at one or more correspondents so as to more easily attract overline participations when needed. The reserve balances would have to be large enough to absorb the kinds of changes in financial market conditions described earlier.

A third strategy can be described as a "pay as you go" method of managing balances. In this case the rural bank would only provide additional balances when needed to compensate for correspondent services, including overline participations. This strategy is likely more demanding in terms of cost accounting and liquidity management for both rural and correspondent banks; however, it would promote more efficient uses of funds and sounder business operation.

A fourth strategy is to alter the pricing procedure letting interest rates play a more dominant and responsive role in the overline arrangement. Using variable interest rates, for example, on the overline portion of the farm loan would reduce substantially, if not completely, the need for variation in compensating balance requirements. The rate on the overline could be set at the correspondent's prime rate plus a fixed premium (e.g., two percent) plus a fixed compensating balance (e.g., 20 percent). The interest rate would then fluctuate with changes in the correspondent's prime rate which are in turn induced by changes in other market interest rates. The rural bank would have greater certainty on the size of balances to maintain at the correspondent and greater confidence in the pricing procedure while the correspondent would still meet its profit requirements. Several correspondents indicated that they have encouraged rural banks to use variable interest rates on overlines with some degree of success. Clearly there is opportunity for more success along these lines.

Table 1. Summary of Correspondent Responses to Simulated Overline Loan Requests

	City Bank									
	1	2	3	4	5	6	7	8	9	
1. Overline participation (\$1,000)	4,060	1,575	2,505	2,505	4,060	2,155	4,060	2,155	4,060	
<u>CASE I</u> (1974 conditions)										
2. Compensating balance required (%)	(45.9)	30	35	35	(39)	30	(39)	30	(39)	
3. Net return on capital required (%)	23	(16.0)	(18.2)	(18.2)	20	(16.0)	20	(16.0)	20	
4. Net after tax income (\$)	93,380	40,125	45,638	45,638	81,200	34,519	81,200	34,519	81,200	
<u>CASE II</u>										
5. Compensating balance required (%)	(15.1)	10	20	20	(15.1)	15	(15.1)	10	(15.1)	
6. Net return on capital required (%)	20	(18.8)	(21.2)	(21.2)	20	(19.9)	20	(18.8)	20	
7. Net after tax income (\$)	81,200	29,531	53,131	53,131	81,200	43,057	81,200	40,406	81,200	

Footnotes

1/ The maximum loan a national bank can make to an individual borrower is limited to ten percent of the bank's capital and surplus (except for livestock loans which carry a 25 percent limit). The limits for state banks vary among states, generally falling in the range of 15 to 25 percent of capital and surplus.

2/ Many correspondents assign their loans to different grades or risk classes each requiring different rates of return on capital. As an example one major correspondent used three grades with grade 1 loans (prime loans) requiring a 16 percent return, grade 2 requiring a 20 percent return, and grade 3 requiring a 24 percent return. The required rates were flexible depending on current financial market conditions. Most overline farm loans were classed in grades 2 and 3.

References

- Barry, Peter J., G. J. Greathouse and K. Boondiskulchok. Country Bank Management of Yield, Risk and Liquidity on Agricultural Loans. Dept. Info. Rep. No. 74-7. Texas Agr. Exp. Sta. College Station, Tx. 1974
- Board of Governors of the Federal Reserve System. Improved Fund Availability at Rural Banks. June 1975.
- Boondiskulchok, Kamol. Economic Analysis of Correspondent Banking As a Source of Funds to Texas Agriculture. Unpublished Ph.D. Thesis. Texas A&M University. 1976.
- Knight, R. E. "Customer Profitability Analysis Part I: Alternative Approaches Toward Customer Profitability." Monthly Review, Federal Reserve Bank of Kansas City. April 1975.
- Knight, R. E. "Customer Profitability Analysis Part II: Analysis Methods at Major Banks." Monthly Review Federal Reserve Bank of Kansas City. Sept.-Oct. 1975.