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**DELIVERY OF CREDIT TO AGRICULTURE VIA
COOPERATIVE AND COMMERCIAL ROUTES**

Jeffrey D. Calvert and Fredrick C. Meltzer

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**FINANCIAL MARKETS FOR AGRICULTURE:
MACRO, INSTITUTIONAL, AND POLICY ISSUES**

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DELIVERY OF CREDIT TO AGRICULTURE VIA COOPERATIVE AND COMMERCIAL ROUTES

Jeffrey D. Calvert and Fredrick C. Meltzer

The success of agriculture in this country stands as testimony to the efficient delivery of credit by both cooperative and commercial lenders. The efficient delivery system, in turn, has depended to a significant degree on the dynamic nature of the interaction between the two types of lenders. This dynamism can best be appreciated in a brief review of their respective lending roles. The cooperative lender to agriculture is the Farm Credit System (FCS) which operates under a Congressional mandate to improve the income and well-being of U.S. farmers and ranchers by providing financial services to credit-worthy borrowers during both favorable and unfavorable times. The dominant commercial lender to agriculture is commercial banks which, unlike the FCS, are free to lend to any industry they wish. In many commercial banks, lending decisions are guided by the overriding objective of any for-profit entity - to maximize the value of stockholders' equity. Consequently, under certain conditions, commercial banks may shy away from agricultural lending. Their investment in agriculture can depend on the following factors: the current phase of the business cycle, the level of interest rates, the shape of the yield curve, the credit needs of agriculture and the rest of the economy, and the impact of deregulation within the financial services industry. This paper presents preliminary results on how each of these factors have generally affected the availability of credit to agriculture from both cooperative and commercial sources since 1952. The paper begins, however, by examining the issues pertaining to the valuation of stockholders' equity.

Valuing Stockholder Equity

Van Horne states that a firm's primary objective should be to "choose that combination of investment, financing, and dividend decisions that will maximize its value to shareholders." The shareholders of commercial banks can range from a relatively small group of individuals to a wide assortment of individuals and institutions via national equity exchanges. Stockholders who invest using national markets are interested only in yielding the highest possible return on their investment. Van Horn calculates the yield on common stock as follows:

The authors are Economist and Vice President/Director of Research, respectively, at the Federal Farm Credit Banks Funding Corporation. The paper was presented at the annual meeting of the Regional Research Committee NC-161 (Evaluating Financial Markets for Agriculture) on October 31, 1984.

$$y = \frac{(P_1 - P_0) + D}{P_0}$$

Where: P_0 = the purchase price of the stock
 P_1 = the selling price of the stock
 D = dividends earned while owning the stock

The equation indicates that stockholders are interested in dividend payments as well as price appreciation. Van Horne goes on to assert that dividends form the foundation for the valuation of common stock. Maximizing the amount of dividends paid, therefore, is the best way for a widely held commercial bank holding company (BHC) to maximize its value to shareholders. Furthermore, analysis of selected BHCs indicates that the return on equity plays an important role in determining the annual dividend payments.

Fifteen BHCs were selected from a group of BHCs whose common stock is actively traded on major exchanges. The 15 BHCs were selected because of their involvement in agricultural lending. All 15, for example, have commercial-bank subsidiaries which placed in the top 40 among commercial banks lending to agriculture as of December 31, 1983. Included in the group are eight of the ten largest BHCs as measured by total assets at the end of 1983. Analysis of the group's financial data indicate that the annual change in dividends does indeed move in concert with return on equity (see Table 1). In every year since 1975, for example, the percent change in dividends increased as the return on equity increased and vice versa.

Shareholders in the FCS, on the otherhand, are not as interested in the maximization of return on equity. Because shareholders in the FCS consist only of the farmers, ranchers, and farmer-owned cooperatives who borrow from the FCS, their return on investment must be measured in terms of the value of a continuous source of credit and financially related services. Similarly, there are many small rurally located commercial banks who have as stockholders individuals actively engaged in farming or in activities related to farming. In these cases, maximization of stockholder equity may also be consistent with a continuous presence in local agricultural lending at the expense of potentially more lucrative nonlocal business.

These rurally located agricultural banks hold a majority of commercial bank agricultural loans. Data from a nationwide survey conducted in 1981, for example, suggest that agricultural banks which operated in farming areas held an estimated 59 percent of the

Table 1

Financial Data of 15 Selected Bank Holding Companies*

	<u>Return on Equity</u>	<u>Percent Change in Dividends</u>
1974	12.65%	5.32%
1975	13.09	4.04
1976	12.80	2.91
1977	13.41	8.49
1978	14.86	11.30
1979	16.01	14.84
1980	14.88	10.88
1981	13.86	9.82
1982	12.14	7.26
1983	11.45	5.21

* Bank holding companies include Bank America Corp., Chemical New York Corp., Citicorp, Continental Illinois Corp., Crocker National Corp., First Chicago Corp., First Interstate Bancorp, Manufacturers Hanover Corp., J.P. Morgan & Co., Inc., Norwest Corporation, Rainier Bancorp, Republic Bank Corporation, Security Pacific Corp., Valley National Corp., and Wells Fargo & Co.,

agricultural loans in all commercial banks (Calvert and Barry).¹ The rural bank domination of commercial bank agricultural lending was evident even though they represented only about 27 percent of the number of insured commercial banks and had an average size in assets estimated at only \$39 million.

All commercial banks, in turn, form the single most important source for agricultural production credit, with a much smaller but still significant role in the provision of farm real estate credit. Table 2 highlights the market shares in total agricultural lending as of the end of 1983.

While commercial banks are extremely important purveyors of credit to agriculture, they also serve a wide variety of nonagricultural borrowers. Nonfinancial corporate businesses, in fact, form the single largest set of borrowers from domestically chartered commercial banks (Table 3). Even the rurally located agricultural banks do not rely solely on agricultural loans. Farm loans, for example, represented only about 28.8 percent of their combined loan portfolio (Calvert and Barry). Diversity of credit risk across different industries forms an important strength for most commercial banks. More importantly, diversity of stockholder interest appears to serve as an important determinant of a commercial bank's approach to credit extension.

Credit Availability During the Business Cycle

The overall level of business activity in this country tends to move in a cyclical fashion. Since the end of the Korean War there have been seven recessions and the economy is currently experiencing its seventh expansion. During recessions, the number of delinquent loans at commercial banks tends to rise as some borrowers experience cash-flow difficulties. Consequently, stockholders who wish to maximize profits, demand that commercial banks follow more conservative guidelines when making loans. Indeed, during the recessionary periods since the Korean War, commercial bank loan growth averaged 3.7 percent annually, while growth during expansionary periods averaged 11.4 percent annually.

Table 4 presents a breakdown of those loan growth averages for commercial bank farm loans, FCS loans and total farm loans. This data indicates that growth in commercial bank farm loans was slower than growth in total commercial bank loans during expansions and faster than

¹ For that survey, agricultural banks were those banks with \$2.5 million or more in farm loans (real estate plus nonreal estate) or those banks with 50 percent or more of their total loans devoted to farm loans. As of the end of 1980, 4900 federally insured banks met that definition. One question in the survey asked the agricultural banks if farming is the major source of income in its loan market. 81.4 percent answered yes. Among those answering yes, farm loans totalled an average of \$5.9 million per bank. Consequently, total farm loans at those banks can be estimated at \$23.5 billion ($4900 \times .814 \times 5.9$) or about 59 percent of the \$40 billion in farm loans at commercial banks in early 1981.

Table 2

Market Shares in Total Agricultural Lending

	December 31, 1983
Farm Credit System	31.4%
Commercial Banks	22.6
Life Insurance Companies	5.9
Farmers Home Administration	11.2
Commodity Credit Corporation	5.0
Individuals and Others	<u>23.9</u>
Total	100.0

Source: Agricultural Databook - Melichar and Balides

Table 3

Loan Portfolio of Domestically
Chartered Commercial Banks

	December 31, 1983
Nonfinancial Corporate Business	38.2%
Nonfarm Mortgages	28.9
Consumer Credit	19.5
Farm	4.4
Other	9.0
Total	<u>100.0</u>

Source: Seasonally adjusted Flow of Funds data, Federal Reserve Board.

Table 4

Average Annual Growth
During Recessions and Expansions
1954 - 1984

	<u>Expansions</u>	<u>Recessions</u>
Total Commercial Bank Loans	11.4%	3.7%
Commercial Bank Farm Loans	8.6%	4.9%
Farm Credit System Loans	12.4%	11.6%
Total Farm Loans	9.5%	6.8%

Source: Seasonally adjusted Flow of Funds data, Federal Reserve Board

total loan growth during recessions. Consequently, the percentage of commercial bank loans devoted to agriculture rose during recessions and fell during expansions.

The data also indicate, however, that regardless of the current phase of the business cycle, average growth in commercial bank farm loans did not keep pace with the average growth of total farm loans. Consequently, the market share in farm loans by commercial banks declined throughout the period. Furthermore, the market share fell faster during recessions. During expansions the difference between the growth rates on commercial bank farm loans and total farm loans was 0.9 percentage points (9.5 - 8.6), while during recessions the difference was 1.9 percentage points (6.8 - 4.9). Further analysis supports the conclusion. During recessions the market share for commercial banks fell by 0.46 percentage points per year, while during expansions the decline was 0.28 percentage points per year.

The FCS, on the other hand, saw its market share increase since the Korean War and, because of Farm Credit's mandate to provide credit to agriculture at all times, FCS experienced larger increases in market share during recessions. During recessions the market share for FCS rose by 1.14 percentage points per year, while during expansions the increase averaged 0.52 percentage points per year.

Credit Extension and Interest Rates

A closer analysis of the commercial banks' loan portfolio provides further insight into their approach to farm lending. The record from 1952 to mid-1984 reflects an important change on the part of commercial banks with respect to agricultural lending on the one hand and lending to nonfinancial corporate businesses (hereafter referred to as businesses) on the other. Moreover, the behavior of interest rates over the period appears to be an important contributing factor.

Specifically, an analysis of the degree of comovement between the shares of total commercial bank loans devoted to farm loans and business loans was conducted. The data used in the analysis was obtained from the Federal Reserve Board's Flow of Funds data base and is seasonally adjusted at quarterly intervals. The degree of comovement was measured by correlation coefficients. The results suggest that a change in commercial bank lending priorities occurred around 1965. From 1952-to-1965, the share of commercial bank loans devoted to agriculture moved roughly in concert with the share devoted to businesses. This comovement is suggested by the presence of a positive correlation coefficient (.451). From 1966-to-mid-1984, however, the respective shares of commercial bank loans devoted to agriculture and businesses moved in opposite directions. This is reflected in a negative correlation coefficient (-.812). Graphs of the two shares indicate more clearly why the correlation coefficients changed (see Figures 1 and 2). During the 1952-to-1965 period, both the shares were trending downward. In 1965, however, the business loan share troughed and rose erratically through 1984 while the farm loan share continued to trend downward.

This analysis of a commercial bank's loan portfolio is not totally conclusive. The results, of course, could be misleading because of the

BUSINESS LOAN SHARE OF COMMERCIAL BANK LOANS

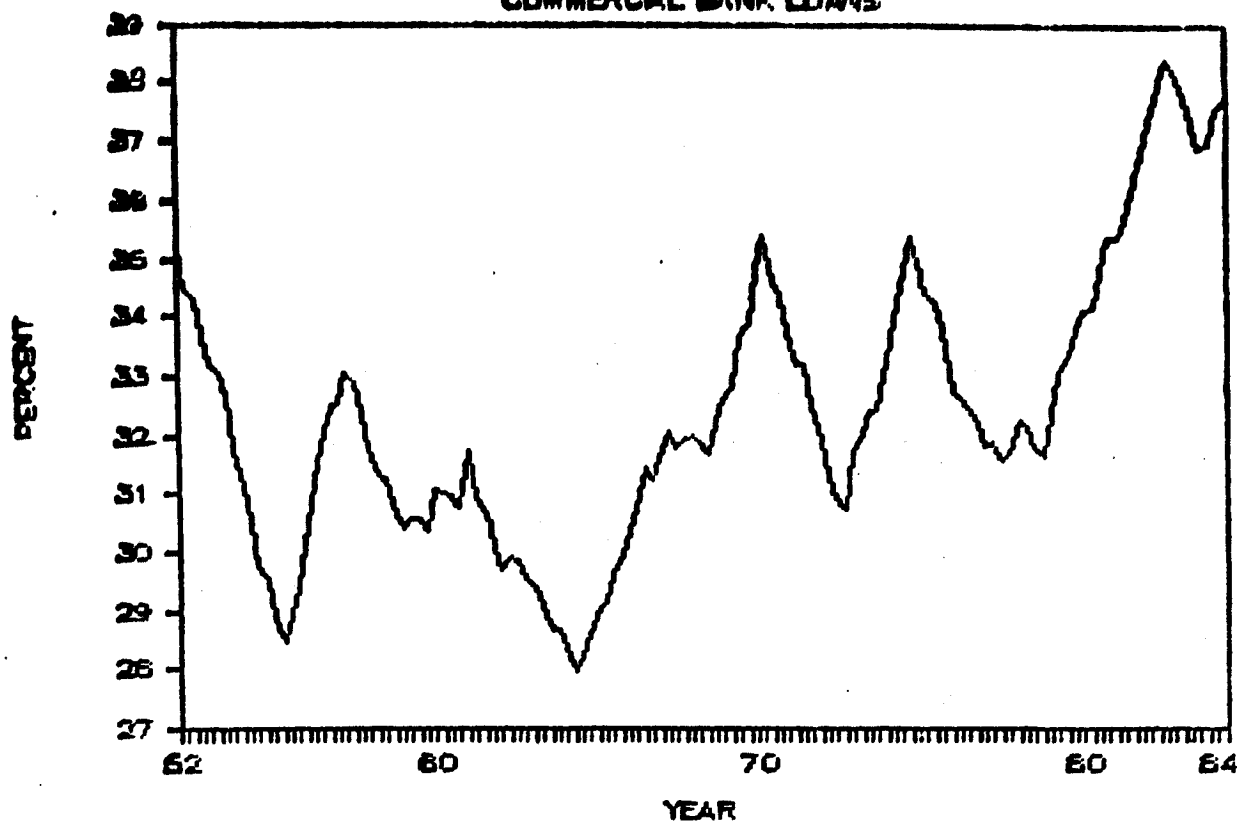


Figure 1

FARM LOAN SHARE OF COMMERCIAL BANK LOANS

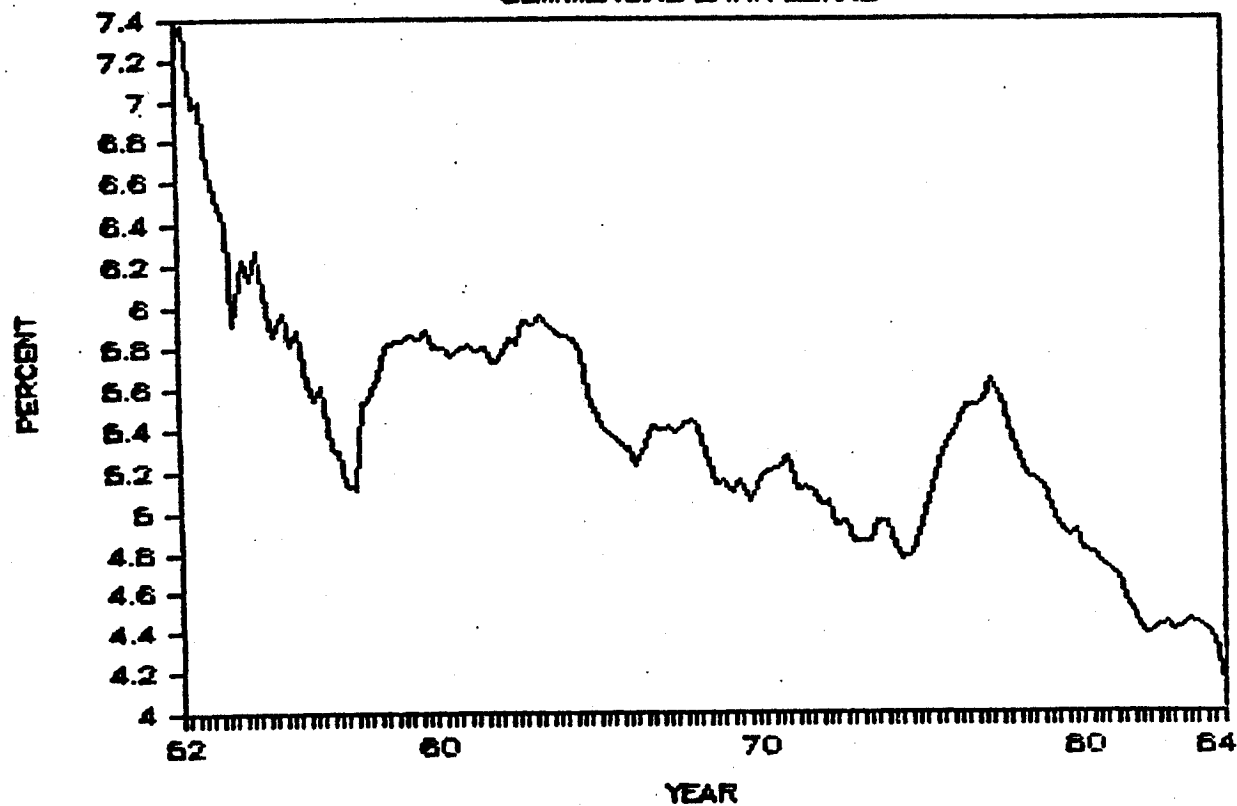


Figure 2

overall loan demand of the farm and business sectors. If, for example, the comovement between the total credit needs by businesses and farms changed drastically following 1965, the above mentioned correlation coefficients would not accurately reflect a change in lending priorities. This is not the case as growth in total farm loans and growth in total business borrowings comoved roughly in concert during both periods. The correlation coefficient was .218 during the 1952 to 1965 period and .328 during the 1966 to mid-1984 period. It appears, therefore, that since 1965 the credit needs of businesses appear to have been met by commercial banks at the expense, to some extent, of agricultural borrowers. Only during the 1974-to-1977 period, when farming was experiencing record inflation-adjusted incomes, did agricultural credit receive increased attention relative to business credits.

Commercial banks must operate in a fashion consistent with maximizing stockholder equity. It would appear that commercial banks feel the substitution of business credits for agricultural credits at different stages of the business cycle may be desirable. This does not explain, however, the absence of such behavior prior to 1965. Clearly, some other factor is influencing commercial bank behavior towards substitution. One important element not yet considered is the effect of interest rates.

Interest rates during the period from 1952 to 1965 were generally quite docile and, by today's standards, very low (see Figures 3 and 4). Since 1965, however, interest rates have displayed a highly volatile nature reaching progressively higher peaks in 1970, 1974 and 1981. Table 5 illustrates how commercial banks and the Farm Credit System reacted to the level of interest rates during the two periods. Once again, an analysis of comovement was performed. In the earlier period, it appears that commercial banks devoted a smaller share of their loan portfolio to businesses when interest rates were rising. This is highlighted by the negative correlation coefficients for both three-month and 20-year yields. The relationship changed during the 1966-to-mid-1984 period as evidenced by the positive correlation coefficients. Commercial-bank devotion to farm lending, on the other hand, was inversely related to the level of interest rates throughout the entire period.

In the farm lending market, the commercial bank share was also inversely related to the level of interest rates, while the FCS share moved in concert with interest rates. These relationships are not surprising for two reasons. One is Farm Credit's propensity to price loans based on the average costs of funds and the tendency by commercial banks to price on a marginal cost basis. The other is that the average maturity of Farm Credit's sources of funds is much longer than a commercial bank's. As interest rates rise, therefore, Farm Credit's lending rate would not rise as fast as a commercial bank's lending rate. Under these conditions, commercial banks would have trouble competing with the FCS and would therefore lose some of the share of farm loans to the FCS. Conversely, when interest rates decline, the FCS lending rates also tend to lag declining commercial bank rates.

In addition to the volatility and level of interest rates, another characteristic important to financial intermediaries is the relationship between long-term interest rates and short-term interest rates. Because of their dependence on short-term deposit money, high short-term rates

THREE-MONTH T-BILL YIELD

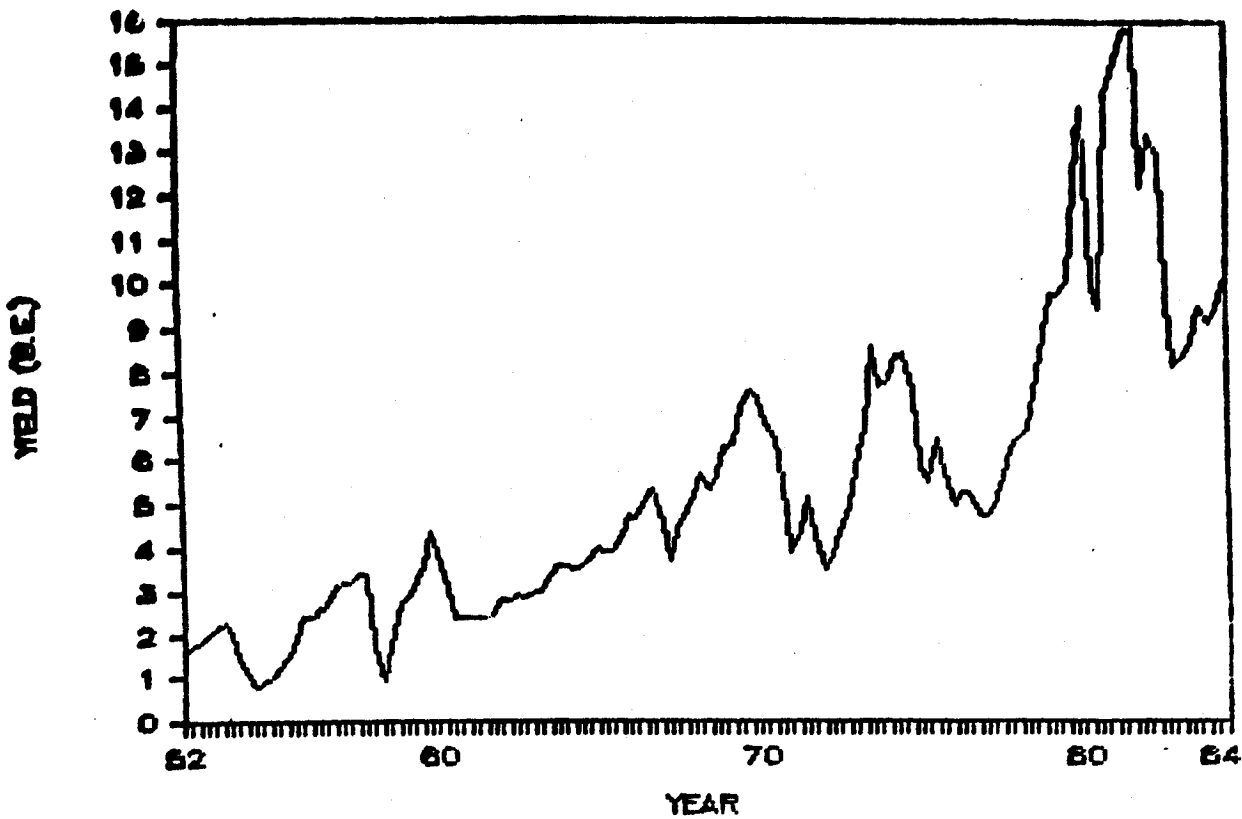


Figure 3

TWENTY-YEAR T-BOND YIELD

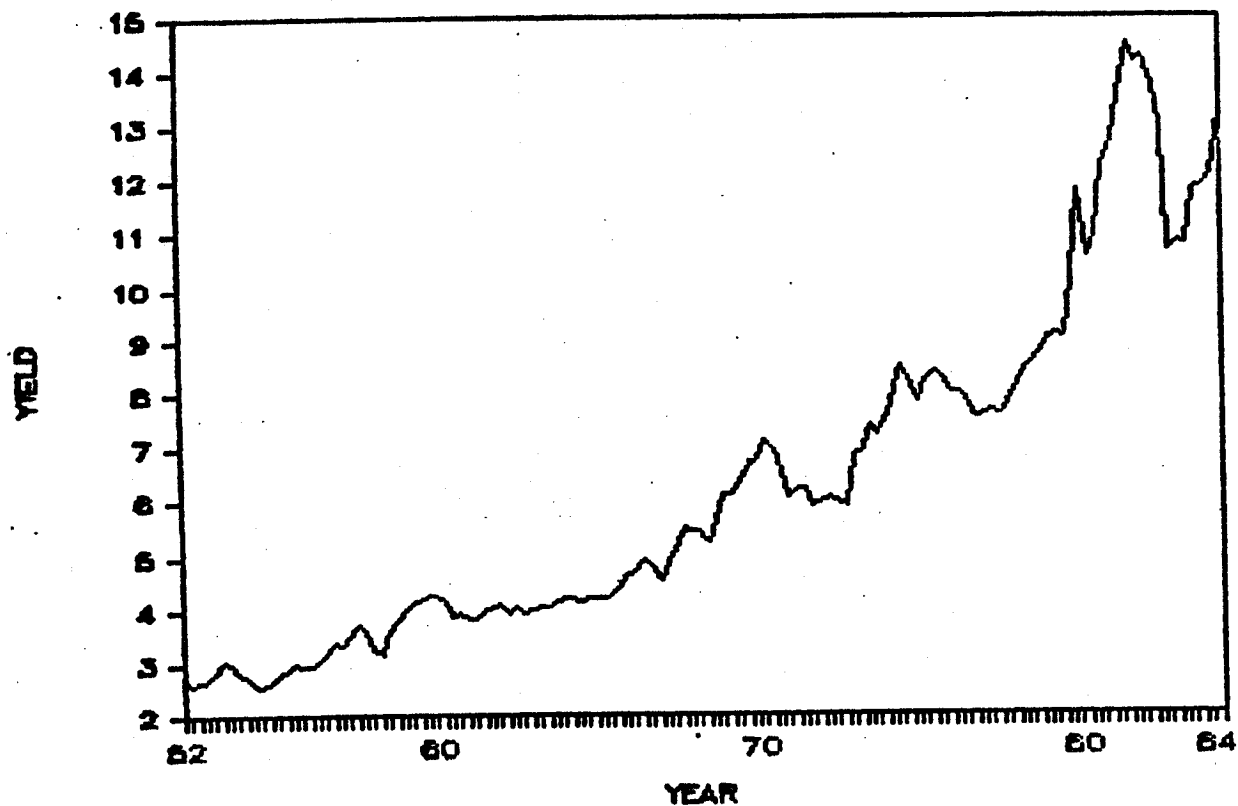


Figure 4

Table 5

Correlation Coefficients
Yields on Treasury Securities Versus

Share of Commercial Bank Loans Devoted to:	1952-65		1966-84	
	3-month	20-year	3-month	20-year
Business Lending	-.308	-.494	.639	.810
Farm Lending	-.503	-.537	-.717	-.792

Share of Total Farm Lending to:

Commercial Banks	-.286	-.444	-.815	-.924
Farm Credit System	.694	.948	.703	.928

relative to long-term rates pose significant hazards for commercial banks. When money costs exceed the return on longer-term assets, commercial bank earnings suffer. Under these conditions, loan extensions tend to be only for short periods of time at rates to the borrower that reflect a positive spread over short-term money costs. Figure 5 illustrates the ratio of long-term yields to short-term yields on a quarterly basis since 1952. The long-term yield is represented by the yield on the 20-year Treasury bond, while the short-term yield is represented by the bond-equivalent yield on the three-month Treasury bill. From 1952 to 1965, long-term interest rates were almost always higher than short-term rates. Since 1965, short-term rates have achieved levels above those on long-term instruments on several occasions. Such was the case through much of the period from late 1978 until late 1981.

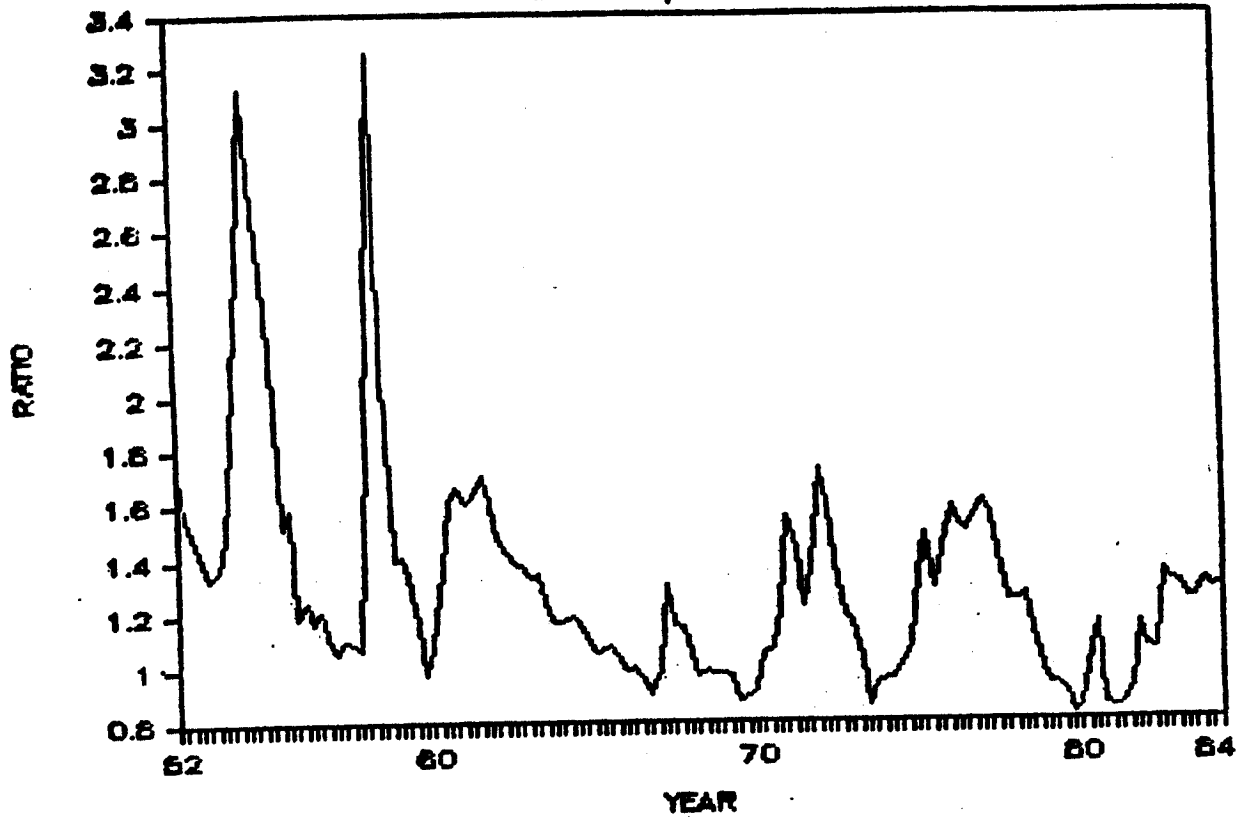
Since bank loans to businesses tend to be for shorter periods of time when compared to bank loans to agriculture, the flatter yield curve since 1965 may help explain why business loans as a percent of total commercial bank loans increased during the period. Conversely, when long-term rates are high relative to short-term rates, commercial banks can profit from a wider interest margin by providing for the longer-term credit needs of agriculture. This relationship appears to be corroborated by an analysis of the comovement between the ratio of long-term rates to short-term rates shown in Figure 5 and the percentage of commercial bank loans devoted to agriculture. The correlation coefficient is .262 during the 1952-to-1965 period and .204 during the 1966-to-mid-1984 period.

Credit Extension and Deregulation

The outlook for credit extension behavior is dominated by the process of financial deregulation. Deregulation of the financial services industry derives from a realization of a need in the economy for a more efficient delivery of credit and investment services. Up until now, deregulation has focused primarily on the relaxation of interest-rate ceilings placed on deposits at depository institutions. This action has provided for a more efficient flow of funds at the local level as commercial banks can better meet loan demand during times when interest rates are relatively high. In the past, when market interest rates rose above the deposit ceilings, commercial banks had difficulty attracting funds from individual savers desiring market returns on their savings. In exchange for having the opportunity to compete for those funds, however, commercial banks are even more susceptible to volatile interest rates. This has prompted banks to seek methods which would minimize the adverse financial effects of wide swings in interest rates. Such methods would include floating interest rates on loans, matching maturities on loans with maturities on liabilities, risk pricing, cost accounting and customer profitability analysis. Effectively administering those methods requires additional capital for many banks; capital that can be more readily obtained in the financial markets via bank holding companies. Indeed, evidence indicates that multi-bank holding companies and branch banks are more likely to perform those methods than small, rural, single-unit banks (Calvert and Barry).

Deregulation, therefore, has promoted a restructuring of the banking industry towards the formation of multi-bank holding companies and large branch banking networks. In Ohio, for example, the number of commercial

Figure 5
YIELD CURVE RATIO
20-YEAR/3-MONTH



banks has declined from 587 in 1960 to 340 in 1983 while the number of banking offices has more than doubled from 1,226 to 2,616 (Austin and Life). In addition, bank holding companies in Ohio controlled about 85 percent of the assets held by all commercial banks in 1983, compared to about 67 percent in 1977. As a result, the make-up of the stockholders at banks serving rural areas may become less homogenous, thus causing such banks to become more aware of maximizing stockholder equity through share appreciation and higher dividends, rather than through the value of services provided to the local community.

This behavior would extend a pattern, evident since 1965, of commercial banks moving from one borrower group to another, in response to maximum rewards. By so doing, commercial banks hope to maximize the monetary return on bank capital by matching the bank's resources to the needs of borrowers, irrespective of the borrower's line of business. This suggests that the process of change in the attitudes of commercial banks to credit extension, evident since 1965, will continue to accelerate. Should this prove to be the case, then both cooperative and commercial lenders will need to continue to complement each other so as to ensure that sufficient credit is available to finance American agriculture throughout the business cycle.

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