UPDATING AGRICULTURAL LOAN DATA

by Gene D. Sullivan

The dearth of current data has always hampered up-to-date analyses of bank loans for agriculture in the Southeast. To hurdle this barrier, the Federal Reserve Bank of Atlanta has recently employed a potentially effective technique. This article explains this method and presents the results of its implementation.

In the past, agricultural loan data from commercial banks in the Sixth Federal Reserve District have been available only from the semi-annual Report of Call or from irregular special surveys.[1]

More recently, beginning in March 1976, the quarterly Call Report includes agricultural loans. However, these data are not available for detailed analysis until five months or more after the date of the report.

A weekly report of 32 large commercial banks in this District provides detailed information, including that related to agricultural loans. But these large banks only account for less than five percent (about $75 million) of the total volume of agricultural loans extended by all commercial banks. As a result, this information is a poor indicator of agricultural loan activity throughout the District.

Every member bank reports data on total loans and deposits weekly; however, detailed categories of loans are not given. But the detailed information in each bank's Report of Call does allow calculation of the proportion or ratio of agricultural to total loans as of a specific Call Report date.[2]

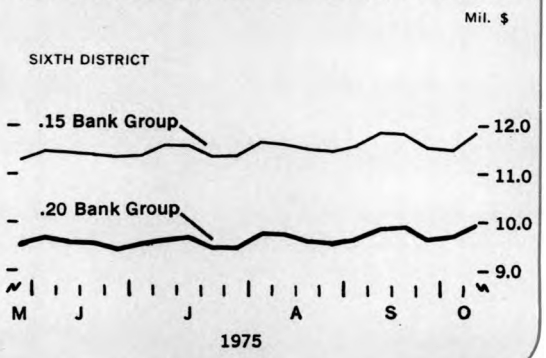
Weekly reports by banks with relatively high proportions of agricultural loans should, we theorized, be useful current indicators of agricultural credit conditions. So we identified 62 member banks with agricultural loans of at least 20 percent of total loan volume, and we compiled weekly reports of loans and deposits beginning in May 1975. Although 20

[1]The Sixth Federal Reserve District includes all of Alabama, Florida and Georgia and parts of Louisiana, Mississippi and Tennessee.

[2]Agricultural loans refer to the sum of loans made to farmers and loans secured by farm real estate.

Figure 1

TOTAL LOANS-AVERAGE PER BANK FOR GROUPS HAVING AGRICULTURAL LOAN RATIOS OF .15 OR ABOVE AND .20 OR ABOVE



percent may seem like a low figure, it is not an accurate indication of the importance of agricultural lending. By categorizing loans as strictly agricultural, many loans which can fall into other categories are disguised. For example, banks make loans to merchants selling farm supplies and equipment and to purchasers, processors and shippers of agricultural products. These are classified as business loans, but these businesses depend primarily on local agricultural activity. When added to the farm loan volume, the sum could easily account for more than half of all loans at such banks.

A majority of the loans specifically identified as agricultural were made by banks with agricultural loan ratios of .15 or higher, according to our analysis. That list included 93 member banks, compared to 62 with ratios of .20 or higher. We expected agricultural activity to exert less influence on the weekly loan volume reported by the lower ratio (.15) banks. Nevertheless, the advantages of a larger sample that had broader geographic coverage of the District attracted us to explore its use. Data from the two bank groups (i.e., 62 banks and 93 banks) were compared to determine what differences were evident in loan and deposit trends during the period extending from May 28 through October 8, 1975.

Figure 1 compares the two groups of banks on the basis of the average loan volume per bank. That average was approximately $2 million higher for the 93-bank group, showing that the larger banks had lower agricultural loan ratios. Nevertheless, movements in loan volume from week to week were similar.[3]

[3]Trend analysis of loan volume for each group yielded the following equations:

$$YATL_{93} = \underset{(211.50)}{11{,}341} + \underset{(4.35)}{19.471T} \qquad R^2 = .4854$$

$$YATL_{62} = \underset{(186.83)}{9{,}516.3} + \underset{(3.4419)}{14.635T} \qquad R^2 = .3634$$

where $YATL_{93}$ and $YATL_{62}$ = weekly average volume of total loans of the 93- and 62-bank groups, respectively;

T = the time variable, which takes the value of 1 during the first week and a successively higher number for each additional week through the 20 weeks of the test;

R^2 = the adjusted coefficient of determination, or the percent of the variation in average total loans explained by the time variable;

Numbers in parentheses below the coefficients are T-statistics. Generally, T-values of 2.0 or higher signify statistically significant relationships among variables.

The correlation between the weekly loan volume of the two groups was an extremely high .9539, where 1.0 represents perfect correlation. So, the group with the lower agricultural loan ratio covered more of the total loan volume from a broader geographic area and retained the pattern of loan movement displayed by the smaller sample.

Figure 2 compares average total deposits between the two groups of banks. Average deposits of the 93-bank sample are approximately $3 million above the smaller group, once again showing the larger size of the lower ratio banks.[4] Relatively speaking, however,

[4]Trend analysis of total deposits yielded the following equations:

$$YATD_{93} = \underset{(237.77)}{18{,}216} + \underset{(5.4520)}{34.867T} \qquad R^2 = .6019$$

$$YATD_{62} = \underset{(222.96)}{15{,}391} + \underset{(4.5161)}{26.024T} \qquad R^2 = .5312$$

where $YATD_{93}$ and $YATD_{62}$ represent total deposits per bank in thousands of dollars for the 93-bank group and the 62-bank group, respectively, and where all other variables are the same as described in footnote 3.

Figure 2

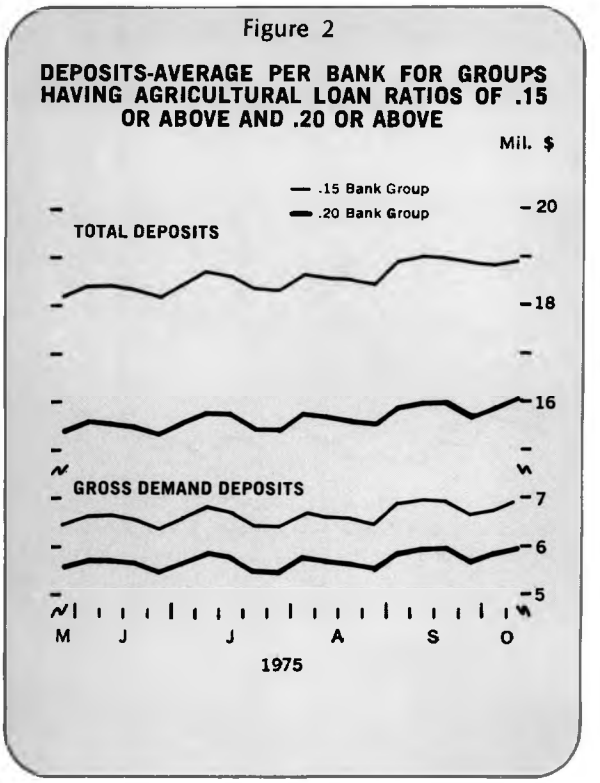
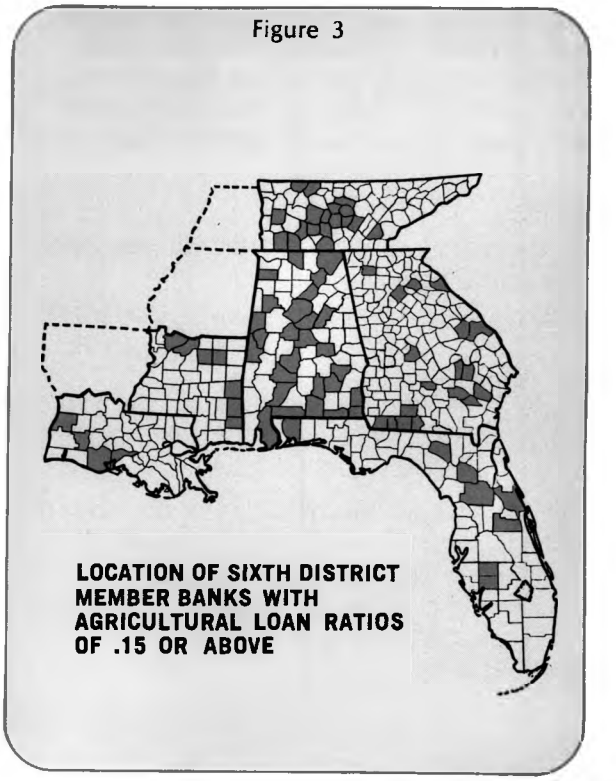


Figure 3



there is less difference between their average deposits than between their average loan volumes. (The correlation of total deposits per bank of the two groups was .9839.) The 93 banks evidently had higher total loan-to-deposit ratios than did the group of 62.

Figure 2 also compares gross demand deposits between the two bank groups. There is considerably more movement from week to week when time deposits are netted out of the total. However, the pattern of movement appears more closely related between the two bank groups than is the total deposit series.[5]

[5]Trend analysis of gross demand deposits yielded the following equations:

$$\hat{YAGD}_{93} = 6485.7 + 15.161T \quad R^2 = .2226$$
$$(90.630) \quad (2.5378)$$
$$\hat{YAGD}_{62} = 5578.1 + 12.698T \quad R^2 = .1791$$
$$(83.172) \quad (2.2681)$$

where $\hat{YAGD}_{93}$ and $\hat{YAGD}_{62}$ represent gross demand deposits per bank for the 93- and 62-bank groups, respectively, and where all other variables are the same as described in footnote 3.

The correlation of gross demand deposits between the two groups of banks is .9842. Thus, in the case of both loans and deposits, we concluded that the selection could be expanded to include all member banks with agricultural loan ratios of .15 or higher, ensuring broader coverage of the agricultural area while giving up little of the agricultural character of the data obtained.

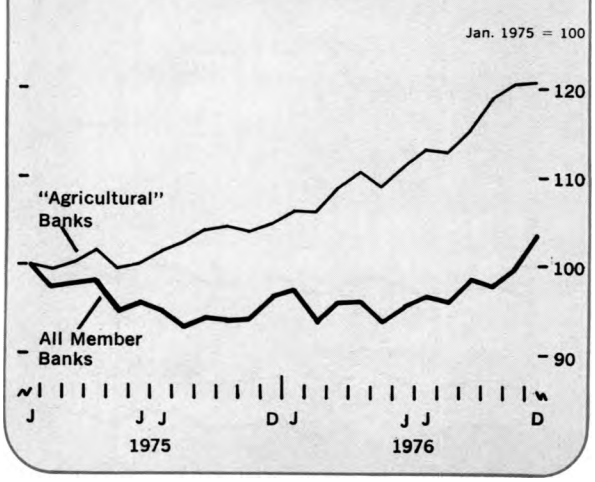
In January 1976, we updated the selection of banks to reflect entries or exits from the list that reported agricultural loan ratios of .15 percent or higher in two out of the past three years (1973, 1974 and 1975). A few banks were removed from the sample because the volume of agricultural loans as a percentage of total loans fell below the acceptable level, but the number of new banks meeting the selection criteria more than offset the reduction. The new list included 96 member banks. Figure 3 shows their dispersion throughout the Sixth District.

We compared tabulations of weekly loan and deposit data reported by the 96-bank group with the year-ago levels since January 1976 (see Appendix table). Were loan

movements different from that of all member banks? Figure 4 shows total loan volume of the 96-bank group plotted in index form and compared with a similar plot of total loans of all member banks.[6] Evidence shows loan growth at the sample banks throughout the period from January 1975 through December of 1976. In contrast, the total loan volume of all member banks declined initially and showed extremely slow growth during most of 1976. (Note the negative coefficient of the time variable in the equation estimating total loans of all member banks in footnote 6.)

Figure 4

INDEX OF TOTAL LOANS



[6]A trend analysis of total loan volume yielded the following equations:

$$YINX_{MEB} = 99.972 - .95120T + .040267T^2$$
$$(106.33) \quad (4.8321) \quad (4.6338)$$
$$R^2 = .5170$$
$$YINX_{96B} = 99.403 + .12885T + .029291T^2$$
$$(151.59) \quad (.93853) \quad (4.8328)$$
$$R^2 = .9700$$

where $YINX_{MEB}$ and $YINX_{96B}$ = the index of total loans of all member banks and of 96 sample member banks, respectively; T^2 = the squared term of the time variable; all other variables are the same as described in footnote 3.

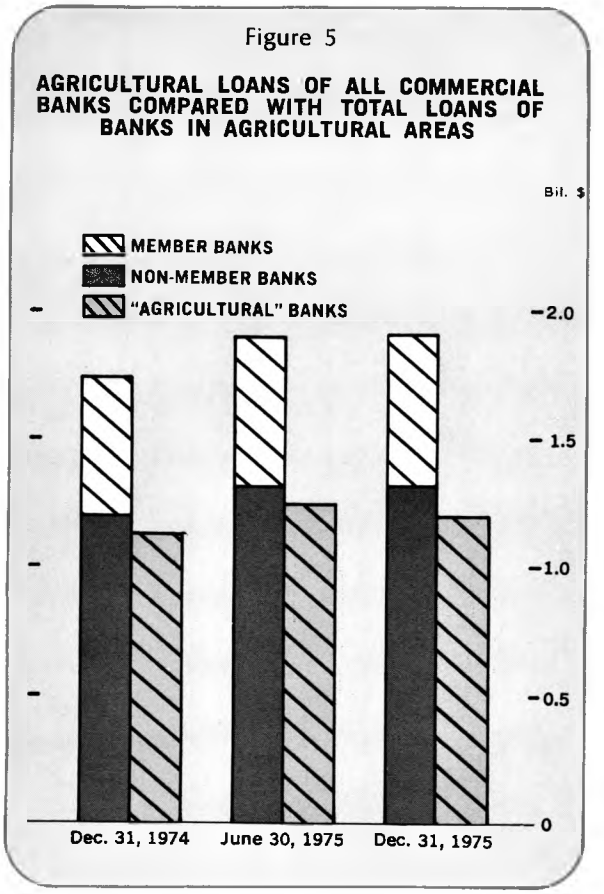
The total loan volume of all member banks and of the 96-bank group had a correlation coefficient of −.0104, a relationship consistent with our expectations. Recession in the national economy affected general loan activity in 1975, and sluggish growth in business loans lingered into 1976. However, agriculture in the District did not generally share the recession, and lending activity increased briskly, particularly during 1976, as agricultural production expanded. So, the 96-bank sample reveals unique behavior in loan volume that is apparently related to continued vigorous agricultural activity in this District.

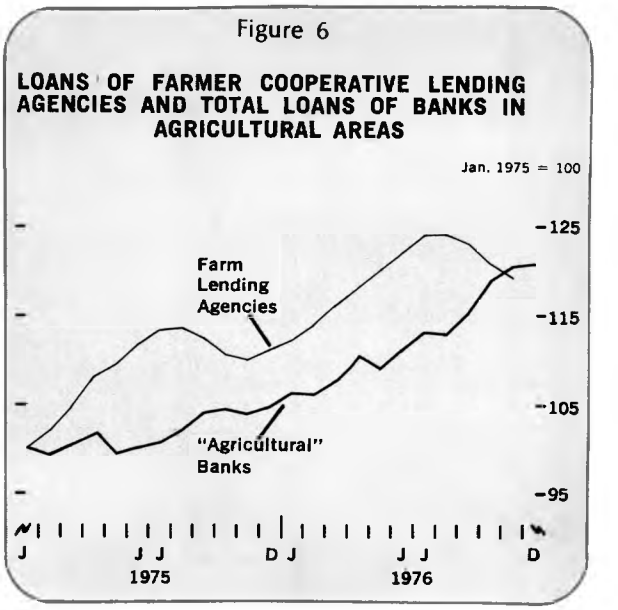
How accurate has this new loan series been as an indicator of the actual agricultural lending activity reported by all banks? We compared loan data compiled from the 96-bank sample with the agricultural loan volume taken from semiannual Call Reports during the coincident period. Since there were only three relevant Call Reports, starting with December 1974, the comparison is limited.

Figure 5 shows that total loans of the banks in agricultural areas are similar to the total volume of agricultural loans of **all** commercial banks. The relationship seems closest to the changes in agricultural loans reported by nonmember banks. If that relationship were stable, the new series as an indicator would be more valuable since nonmembers extend most of the bank credit for agriculture in the Sixth District. However, it is still too early to tell just how reliable the indicator will be.

We attributed the increase in loans at sample banks to greater activity in agriculture. But, was that consistent with other agricultural lenders? Did lending activity of other agencies verify that there was brisk agricultural activity in this District? Our research says yes.

Federal Land Banks and production credit associations are cooperatively-owned agricultural lending agencies that presently account for over 40 percent of the total volume of





agricultural credit in Sixth District states ($3 billion in 1974). Figure 6 compares the monthly loan volume (in index form) of these agencies with that of the sample banks since January 1975. Month-to-month fluctuations in loan volume between the two groups do not precisely coincide, and the loan pay-down period (fall and winter months) results in a more extreme fluctuation in volume outstanding for cooperative lenders. Yet, for the period we observed, the upward trend in loan volume is similar.

The index of total loan volume of these cooperative farm credit agencies and of the 96 member banks had a correlation coefficient of .8764. This is a relatively high figure and emphasizes that the growth in loan volume at the 96 sample banks, during the period when total loans of all member banks barely grew at all, reflected the behavior of total agricultural loan volume within the District. We will continue to make further comparisons to determine if this similarity is true when conditions in the farm sector change.

This new loan series promises to be a useful, quickly available indicator of agricultural credit flowing through the commercial banking sector of the Southeast. If it performs as well in the future as it has already, it could substantially reduce the lag in detailed knowledge of developments in bank agricultural lending that continues to exist even though banks have recently begun making quarterly reports. ■