

SEASONAL BORROWING AT THE FEDERAL RESERVE DISCOUNT WINDOW

by

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ABSTRACT

The Federal Reserve Board has permitted member banks to borrow at the discount window in the amount by which their normal seasonal outflow exceeds 5 percent of their average deposits. This seasonal borrowing privilege is potentially significant to many agriculturally oriented banks. Yet small banks which comprise a large share of the potentially qualifying users were underrepresented in 1973. Several factors are explored which affect seasonal borrowings.

Keywords: Federal Reserve Board, agricultural banks, seasonal borrowing privilege.

Commercial banks that are members of the Federal Reserve System may borrow funds for short periods of time at the "discount windows" of the Federal Reserve Banks. During the postwar years, a policy question with respect to such borrowing has been whether it should be used to meet normal seasonal needs, which typically have a longer duration than other short-term adjustment problems.

When the Federal Reserve Board conducted a major review and revision of its discount regulations in 1955, the question of seasonal borrowing by member banks was raised and resolved in the context of the prevailing environment. Liquid assets such as U.S. Treasury bills and demand deposits in other banks comprised a large proportion of bank investment portfolios. Thus, banks could meet seasonal drains by selling U.S. Treasury bills, for example, during the season of net fund outflow and then reinvesting the subsequent seasonal inflow of funds in U.S. Treasury bills that were held until the next seasonal cycle. Since most seasonal swings in loans and deposits could therefore be covered internally, the 1955 regulation limited the use of the

Federal Reserve discount window to seasonal needs of unusual proportions.

In the decade that followed, loan demands on commercial banks rose much faster than bank deposits, thus drawing down the liquid asset holdings that had previously been available to meet seasonal swings in loans and deposits. Large banks were able to turn to national money markets for funds to meet their seasonal needs, but a Federal Reserve committee [7, pp. 15-16] in the mid-1960's found that:

"Because of size, structure, and location, banks in small towns are often at a relative disadvantage in obtaining credit from other external sources, such as the issuance of large-denomination certificates of deposit . . ."

Thus the committee concluded that:

"Seasonal fluctuations in loans and/or deposits create asset-and-liability-management problems which many smaller banks seem unable to accommodate without impairing in one way or another the quality and adequacy of banking service they offer to their communities.

. . . Under these circumstances, it has become appropriate to modify present seasonal lending practices at the discount window to provide

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increased assistance to member banks in accommodating seasonal demands upon them."

Therefore, the committee proposed:

"... a 'seasonal borrowing privilege,' renewable from one year to the next... to provide reasonably assured credit access to banks with definable and relatively substantial seasonal pressures for the approximate duration of such pressures, normally expected to be several months, but possibly ranging up to as much as 9 months in exceptional cases."

Beginning in April 1973, the Federal Reserve Board has permitted member banks that do not have reasonably reliable access to national money markets to borrow at the discount window in the amount by which their normal seasonal outflow exceeds 5 percent of their average deposits.

The Problem

Several comparisons show that the impact of the seasonal borrowing privilege is potentially greatest in rural areas. For example, while all banks qualifying for seasonal borrowing hold 8 percent of total member bank loans, agriculturally oriented qualifying banks hold 59 percent of the total loans at all agriculturally oriented member banks. Farm lending capability is particularly likely to be enhanced since the potential seasonal borrowers hold 27 percent of all member bank agricultural loans.

In addition, table 1 shows that while a fourth of the member banks with little or no agricultural loans qualify for seasonal borrowing, two-thirds qualify among the banks at which agricultural loans constitute at least one-half of their outstanding loans. Furthermore, the seasonal borrowing privilege could be relatively more important to these qualifying agriculturally oriented member banks. Over the year, the funds obtained could average 4.7 percent of loan funds outstanding as compared to 2.5 percent at qualifying member banks with little or no agricultural loans. In their individual peak month of borrowing, the agriculturally oriented banks might borrow funds averaging 12 percent of their loans, again a substantially higher percentage than at other banks.

Perhaps the most telling comparison of the relative importance of the seasonal borrowing privilege to agriculturally oriented member banks, however, is that potential seasonal borrowing on an average annual basis amounts to 2.74 percent of their total loans. This is substantially greater than the 0.21 percent recorded for all member banks.

Importantly, however, the proportion of qualifying member banks using the seasonal borrowing privilege in 1973 was *lower* in rural areas. To

translate potential into actual use, agriculturally oriented banks must acquire an understanding of the seasonal borrowing privilege and develop an ability to recognize whether and when the privilege can be usefully employed.

Objectives

The objective of this article is to provide some of the information that agricultural finance specialists should have before undertaking either educational or analytical roles with regard to the seasonal borrowing mechanism. Initially, this article describes the design of the privilege. An empirical analysis of factors hypothesized to influence potential seasonal borrowing is next presented. Finally, the article assesses the factors that affected seasonal borrowing in 1973.

Design of the Seasonal Borrowing Privilege

For the banking system as a whole, total loans and deposits tend to move up or down *together*. The Federal Reserve System, through its purchases or sales of Government securities, supplies or absorbs reserves as necessary to accommodate aggregate seasonal swings in loans and deposits as well as in currency. A study of loans and deposits at individual banks, however, has shown their quarterly movements to be largely independent of each other. In any given quarter, an outflow of funds through an increase in loans, for instance, might either be offset or aggravated by the concurrent change in deposits. Loan and deposit drains frequently coincide. For example, a liquidity squeeze caused by a drop in deposits while loans rose was experienced in the second quarter of 1963 by 42 percent of member banks [5, p. 102].

Therefore, to take simultaneous account of both loan and deposit movements the seasonal borrowing privilege focuses on a bank's "net fund availability." This series is simply defined as deposits minus loans. When bank loans are being repaid and deposits are increasing, as during farm harvest seasons, the level of net fund availability rises. During the spring production season, however, loans to farmers increase rapidly. Importantly, these funds apparently leave rural communities as they are expended for purchases of farm production inputs. Thus, net fund availability sinks to its lowest level of the year. If the swing in loans and deposits recurs at about the same time each year, it is considered seasonal in nature.

To ascertain the presence and size of seasonal swings in loans and deposits at each member bank, net fund availability was calculated on a monthly average basis over the 1968-72 period. A standard seasonal adjustment procedure was then used to project the seasonal variation in net fund availability

Table 1—Estimated potential seasonal borrowing

Farm loans as percentage of total loans at bank	Member banks, June 1973	Qualifying banks as percentage of all member banks												Seasonal borrowing as percentage of total loans at borrowing banks		
		Annual total	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual average	Peak month
	<i>Number</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
No farm loans	863	29	10	14	15	12	13	14	13	13	13	13	15	15	2.7	7.8
1 to 4	1,671	22	6	10	11	10	12	12	11	12	12	10	10	8	2.2	6.5
5 to 24	1,585	27	5	9	12	13	17	18	15	15	14	11	8	6	2.3	7.1
25 to 49	979	44	6	16	23	27	35	36	30	28	25	18	12	7	3.5	9.4
50 and over	658	68	15	24	37	47	56	56	45	36	31	29	24	20	4.7	12.0
All member banks.....	5,756	34	7	13	17	19	23	24	20	19	17	14	12	10	2.6	7.6

at each bank in 1973.² These estimates were used by the Federal Reserve discount officers as a tentative indication of the seasonality at each bank, and they also serve as the data for this report.³

For a majority of the member banks, these calculations indicated that the seasonal dip in net fund availability, measured from its seasonal peak to its seasonal low, is not particularly large. At only one-third of the member banks does it exceed 5 percent of average annual deposits over a period of at least 2 consecutive months. These are the levels that the Federal Reserve Board decided to set as qualifying thresholds for the seasonal borrowing privilege. In a given month, seasonal borrowing at the discount window is permitted in the amount by which net fund

²Monthly average loans and deposits at each bank were calculated from daily reports of deposits and weekly reports of total loans submitted by each member bank, which were available at the Federal Reserve Board in usable form for years after 1967. During over 2 years of intensive work on the specific rules to be used in implementing a seasonal borrowing privilege, the calculation and seasonal adjustment process was repeated three times as time passed and additional data became available. Thus, the effect of alternative rules was first tested on data for 1968-70, then on 1968-71 data, and finally on averages covering 1968-72. Each repetition increased analysts' confidence that seasonal variations had been successfully isolated from cyclical and other influences on deposit and loan movements at each bank.

³In bank reports, holdings of certain money market instruments and short-term investments, such as sales of Federal funds and purchases of commercial paper, are classified as loans rather than investments. On the other hand, seasonal loans to local governments are classified as securities rather than as loans. Some banks also may have used seasonally surplus funds to purchase loans from other banks, or may have sold their own seasonal loans. Federal Reserve Bank discount officers take these and similar factors into account in making a final determination of a

availability normally dips below its seasonal peak, less 5 percent of the bank's deposits. These calculations are illustrated in table 2.

Finally, the Federal Reserve Board decided to restrict the seasonal borrowing privilege to those banks that "lack reasonably reliable access to national money markets," thus indicating its primary concern that banking services not be impaired simply because some banks are not able to compete effectively for external short-term funds. Significant access to money markets is indicated by the bank's ability to: (a) issue large-denomination certificates of deposit at reasonable rates and ease, (b) purchase short-term funds directly, or (c) acquire funds readily through other money market arrangements. Such access appears to be related to bank size. Most banks with deposits exceeding \$250 million are either already making significant use of the money market as a source of funds or could easily do so. Therefore, they are generally not eligible for the seasonal borrowing privilege. On the other hand, few banks with deposits below \$100 million have been consistently able to raise significant amounts of funds through money market activities. Banks in this size category are therefore presumed eligible. In the intermediate size range, access to money markets appears to depend upon additional factors such as the geographical location of the bank. In these cases, determination of eligibility is made by Federal Reserve discount officers after a study of the bank's individual circumstances and history of money market activities.

bank's qualification for seasonal borrowing. In practice, such adjustments have usually increased the degree of seasonality in "loans" and thus in net fund availability. Estimates of potential seasonal borrowing shown in this report are therefore probably conservative.

Table 2—Illustration of a bank's potential seasonal credit need

Month	Seasonal pattern		Net fund availability		Potential seasonal borrowing ¹
	Average deposits	Average loans	Total (deposits less loans)	Difference from peak month	
	Million dollars	Million dollars	Million dollars	Million dollars	Million dollars
January	\$10.1	\$5.7	\$4.4	\$0.1	\$0.0
February	10.1	5.7	4.4	.1	.0
March	9.9	5.4	4.5	.0	.0
April	9.9	5.5	4.4	.1	.0
May	9.8	5.9	3.9	.6	.1
June	9.7	6.1	3.6	.9	.4
July	9.8	6.1	3.7	.8	.3
August	9.6	6.2	3.4	1.1	.6
September	9.9	5.9	4.0	.5	.0
October	10.1	5.7	4.4	.1	.0
November	10.2	5.7	4.5	.0	.0
December	10.2	5.8	4.4	.1	.0

¹ Difference in net fund availability between peak availability month and specified month, less 5 percent of average deposits for the preceding year, and subject to possible adjustments.

Source: *Business Review*, Federal Reserve Bank of Dallas, May 1973, p. 8.

Factors Affecting Potential Seasonal Borrowing

As noted, the amount of potential seasonal borrowing in 1973 was estimated for each member bank. Thus, it was possible to perform a multiple regression analysis to learn how factors such as the size, location, and relative farm lending involvement of banks tended to affect the potential borrowing. Two dependent variables were studied: first, the probability that a bank had sufficient seasonality to qualify; and second, for qualifying banks only, the ratio of the potential seasonal borrowing to the total loans outstanding at the bank.

The explanatory (independent) factors were represented by dummy variables for each of their classes (such as each Federal Reserve District within the variable "area") or class intervals (such as deposit size class intervals). Though each explanatory factor was represented by a set of dummy variables in each regression equation, measures of the relative importance and statistical significance of the net effect of each factor can be calculated through special procedures.⁴

The first analysis examined the probability that an eligible member bank qualified for seasonal borrowing (for this study, only banks with deposits under \$250 million were considered eligible). The dependent variable was therefore assigned the value of 1 if the bank qualified for borrowing, and 0 if it did not. Of the 5,477 eligible member banks, 1,931 qualified for seasonal borrowing. Thus, the national average probability of qualifying was 0.353. The regression equation was specified so that the constant term in the equation would necessarily take on this national average as its value; therefore, the coefficient estimated for each independent variable represented the net deviation from that average attributable to that variable. To further assist the reader in assessing the results, each estimated coefficient was expressed as a percentage of the national average and the result charted in figure 1.

Finally, the relative importance and statistical significance of each factor were calculated and presented in table 3.⁵

⁴For a discussion of the advantages of this regression method, see "Factors Related to Farmers' Use of Credit: Least-Squares Analysis of Sample Survey Data," by Emanuel Melichar, in the *Journal of Farm Economics*, Vol. 47, December 1965, pp. 1468-1473. References to standard econometric texts and specific procedures for estimating equations and calculating measures of importance and significance were given by the same author in "Least-Squares Analysis of Economic Survey Data," 1965 *Proceedings of the Business and Economic Statistics Section*, American Statistical Association (copies available from author upon request).

⁵The "net percentage influence" charted in figures 1 and 2 is a multiple regression coefficient that indicates the net impact of the specified characteristic, when the impacts of the other characteristics listed are simultaneously taken into account. It is *not*, therefore, the average probability or

As expected, a high farm loan ratio had a marked effect on qualification for seasonal borrowing. Ratios over 25 percent tended to increase the probability of qualifying, and if farm loans comprised one-half or more of a bank's total loan volume, the probability was increased by 66 percent.

The geographic location of the bank (as indicated by Federal Reserve District) had a pronounced influence even after the impact of varying farm loan ratios and bank sizes had been taken into account. Evidently, seasonality in banking varies significantly across the Nation for reasons beyond the impact of farm lending and the inherent reduced ability of smaller banks to diversify their loans. Banks in New England and the South and West exhibited the most seasonal variation, while those in the Mideastern and Central regions were the least seasonal.

Deposit size in itself did not explain much of the variation in seasonality among banks. However, the results shown in figure 1 indicate that small size did tend to increase seasonality, probably because small banks are more often associated with a single community and therefore apt to reflect whatever seasonality is present in its economic activity.

The right side of figure 1 and table 3 show the results obtained from extending the same analytical process to examining the factors affecting variation, among the qualifying banks only, in the ratio of the annual average potential seasonal borrowing to the total loan volume. The national average for this ratio was 3.8 percent, with 79 percent of the qualifying banks having a ratio of under 5 percent. Approximately 13 percent of the qualifying banks had a ratio of average potential seasonal borrowing

ratio for the banks in the specified class, which would instead have been indicated by simple tabulations such as in table 1.

Because they are multiple regression coefficients, the "net percentage influences" can be used to obtain an estimated probability or ratio for an individual bank with a specified combination of the various characteristics listed. This is done by obtaining the total of the percentages applying to that bank and then multiplying that sum by the national average probability or ratio. For example, in the probability analysis shown in figure 1, a bank in the Dallas District (+21.3%) with deposits under \$5 million (+31.2%) and with over one-half of its portfolio in farm loans (+66.0%) is estimated to have a probability of qualifying which is 118.5 percent higher than the national average of 0.353, or 0.771.

Because a linear model was used, probabilities thus estimated for individual banks may be negative or greater than one. In these cases, an appropriate interpretation is that the bank has a very small, or very large, probability of qualifying, respectively. For excellent and helpful discussions of the linear probability model, the authors recommend these papers by Orley Ashenfelter of Princeton University: "A Note on the Use of Dichotomous Dependent Variables in Multiple Regression" (mimeo.), and "Some Statistical Difficulties in Using Dummy Dependent Variables," in *The Economics of Labor Force Participation*, by William G. Bowen and T. Aldrich Finegan, Princeton University Press, 1969, pp. 644-648.

Figure 1

Net influence of farm loan ratio, area, and size of bank on potential qualification for seasonal borrowing in 1973

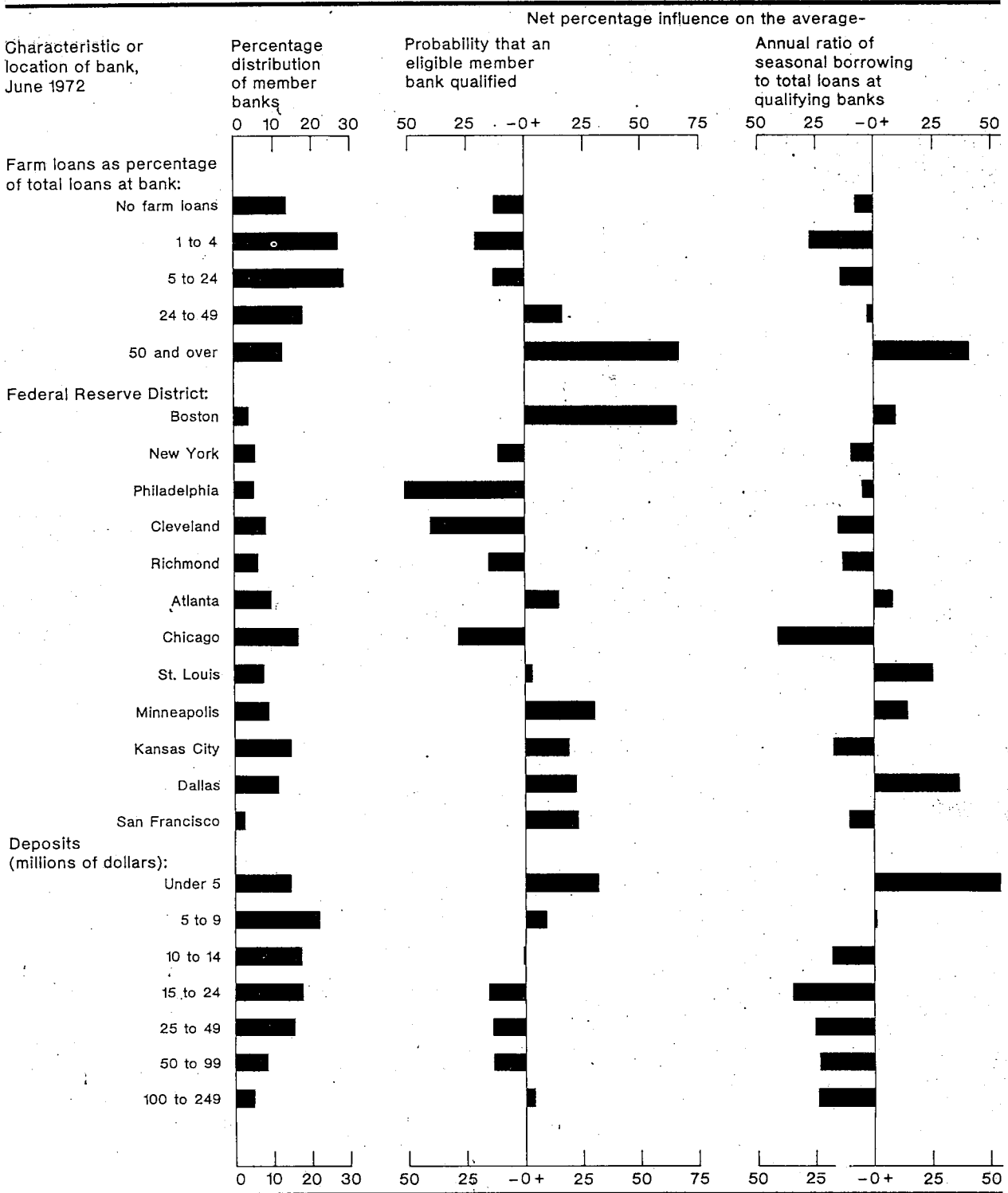


Table 3—Factors affecting potential qualification for and importance of the seasonal borrowing privilege

Characteristic or location of bank, June 1972	Summary measures of net effect of factor on—			
	Probability that a bank qualified for seasonal borrowing in 1973		Potential seasonal borrowing in 1973 as a percentage of bank's loans in June 1973	
	Relative importance (Partial R ²)	Statistical significance (F-ratio)	Relative importance (Partial R ²)	Statistical significance (F-ratio)
Farm loan ratio .....	.031	43.19***	.011	5.21***
Deposit size .....	.013	12.07***	.021	6.84***
Area (F.R. District) .....	.046	24.13***	.016	2.75***
	R ² = .141 R̄ ² = .138 F = 42.67*** (d.f. = 21 and 5,455)		R ² = .071 R̄ ² = .061 F = 6.92*** (d.f. = 21 and 1,896)	

***Significant at 1 percent probability level.

to total loan volume of between 5 and 9 percent, with the remaining 8 percent of the qualifying banks having a ratio greater than 10 percent.

The first analysis of the probability of qualifying was equivalent to examining the probability that the seasonal dip in net fund availability exceeded the required qualifying threshold of 5 percent of the previous year's average deposits for at least 2 consecutive months. The excess over that threshold, measured as an annual average, is the amount of potential seasonal borrowing used in the ratio examined in this second analysis. It is not surprising therefore to find that bank characteristics for the most part have a similar influence on both the probability of qualifying and the relative amount of seasonal borrowing among the banks that qualified, since the latter simply reflects the degree to which the bank crossed the qualifying threshold.

Seasonal Borrowing in 1973

Of the 220 banks that used the seasonal borrowing privilege in 1973 after its implementation on April 19, 159 were among the 1,849 banks for which the preceding study had indicated potential seasonal borrowing during April to December. Thus, 8.6 percent of the potentially qualifying banks actually used the privilege.

It was hypothesized that the likelihood of a qualifying bank using the privilege in 1973 would be directly related to (1) its relative seasonal need, measured by the ratio of potential borrowing to loans; (2) its overall need for funds, as indicated by its loan-deposit ratio; and (3) the management's relative sophistication and experience with borrowing from the Federal Reserve, as indicated roughly by the bank's size and geographic location. Given the focus of this paper, the farm loan ratio was included to see if it appeared to have any influence after these other factors had been taken into account.

In a previous analysis of the proposed seasonal borrowing privilege, Melichar had hypothesized that whether a qualifying bank actually borrowed would depend to a great extent on whether it had additional lending opportunities to which it could respond after being given access to outside funds, and that the relative presence of this condition would be indicated by a liquidity measure such as the bank's loan-deposit ratio [4, pp. 54-56]. This hypothesis appears to have been verified by experience in 1973. When it comes to the probability that a qualifying bank actually borrowed, the loan-deposit ratio exerted a far greater net influence than any of the other factors considered, as is shown in table 4.

Table 4—Factors affecting whether a potentially qualifying bank actually borrowed in 1973

Characteristic or location of bank, June 1973	Relative importance (Partial R ²)	Statistical significance (F-ratio)
Farm loan ratio .....	.005	2.24*
Deposit size .....	.021	6.49***
Area (F.R. District) .....	.034	5.78***
Loan-deposit ratio .....	.043	26.96***
Potential borrowing/loans .....	.006	2.70**
	R ² = .107 R̄ ² = .093 F = 7.77*** (d.f. = 28 and 1,820)	

***Significant at 1 percent probability level.

**Significant at 5 percent probability level.

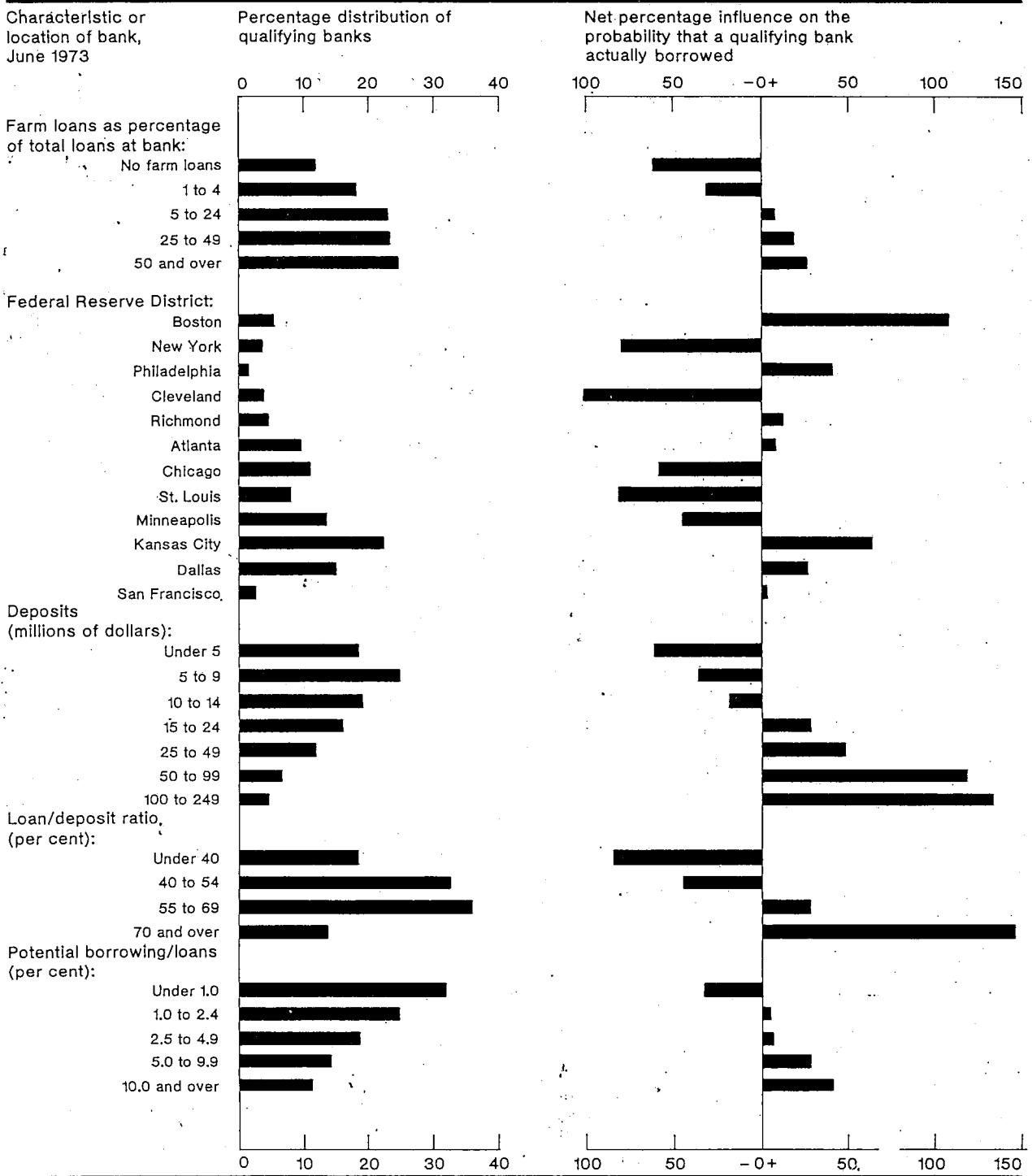
*Significant at 10 percent probability level.

Figure 2 illustrates the degree of specific influences. Above-average loan-deposit ratios increased the probability that borrowing occurred, and a ratio of 70 percent or higher raised that probability by 146 percent over the national average of 0.086. Large deposit size also had a marked stimulative effect, with deposit size above \$100 million tending to

Figure 2

Net influence of farm loan ratio, area, size of bank, and loan/deposit ratio on the probability that a bank potentially qualifying for seasonal borrowing actually used the privilege

April-December 1973



increase the probability of borrowing by 134 percent. The coincidence of large size and high loan-deposit ratio—a fairly typical combination—thus increased the probability that a qualifying bank actually borrowed by 280 percent or, other things equal, to 0.33 (3.80×0.086).

Thus, the banks that used seasonal borrowing in 1973 tended to have the larger size and greater need also known to be associated with use of the discount window for other adjustment credit. A check proved that the similarity was more than coincidental, in that 73 percent of the seasonal borrowers also used other adjustment credit in the March-December period of 1973, and some of the rest had undoubtedly used the discount window during their seasonal periods in previous years. In contrast, only 31 percent of all member banks used the discount window at any time during 1973. Thus, seasonal borrowers tended to come from among regular users of the discount window. The only districts in which a majority of seasonal borrowers were not also users of other adjustment credit during the period cited were Dallas and San Francisco. Nearly all of the seasonal borrowers in the Boston, Richmond, and Atlanta districts also used other adjustment credit.

This information implies that the district variations, illustrated in figure 2, have little economic significance. After a bank-by-bank examination of the borrowing records of all qualifying banks, it is clear that this variation is mainly due to large differences among districts in the proportion of qualifying banks that frequently used the window during their periods of seasonal need. An alternative explanation, that Federal Reserve Banks varied in the degree to which they guided borrowing banks into the seasonal privilege when this was appropriate, did not appear to be a significant factor.

The important finding is that the 1973 record of seasonal borrowing was largely posted by the

relatively small group of qualifying banks already making use of the discount window. The privilege did not reach many of the banks that were not already being accommodated to some degree.⁶ Thus, it remains to be seen whether the privilege will become an important response to the concerns that prompted its adoption. Given the 1973 experience, it appears that a patient and persistent effort will be required to demonstrate that banks can employ the privilege to benefit their communities. Simultaneously, the Federal Reserve Banks will have to demonstrate to bankers that they constitute a reliable source of seasonal funds in practice as well as in theory. Banks that have previously never or rarely incurred debt may then be led to consider whether seasonal borrowing would be useful in serving the unique needs of their individual communities.

In summary, these analyses have several implications for agricultural finance specialists. First, the seasonal borrowing privilege is potentially significant to many agriculturally oriented banks, more so than to most other groups of banks. Second, the potential among all groups of banks substantially exceeds actual 1973 use. Finally, the relatively small banks with deposits under \$15 million that comprise 62 percent of potentially qualifying banks were significantly underrepresented among actual 1973 users, and special attention to this group—which on the whole is not familiar with use of the discount window—appears imperative in view of the rationale underlying the seasonal privilege.

⁶An analysis prepared by Margaret E. Bedford for the June 1974 issue of the *Monthly Review* of the Federal Reserve Bank of Kansas City indicates, however, that banks borrowing under the new seasonal privilege in general obtained a much greater volume of funds than they had borrowed in previous tight money years.

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A definitive bibliography on the seasonal borrowing privilege is available from the authors upon request.