AUTOMATIC TRANSFERS FROM SAVINGS TO CHECKING: PERSPECTIVE AND PROSPECTS*

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On May 1, 1978, the Board of Governors of the Federal Reserve System amended its Regulation Q to allow member banks to transfer funds from a customer's savings account to his checking account automatically under certain stipulated conditions.[1] Such transfers must be preauthorized by the customer. Specific arrangements for the transfers will be the subject of an agreement between a customer and his bank and will presumably vary from bank to bank and from customer to customer. In general, however, once a customer has contracted for the service, transfers will be triggered automatically and without any further authorization whenever the customer's checking balance falls below some agreed minimum level.[2] The amendment became effective November 1, 1978.

The amendment is generally regarded as one of the more important developments in retail banking in recent years. While it is impossible at this time to gauge the impact of the amendment with a high degree of certainty, it is safe to say that it has potentially significant implications with respect to (1) the relationship between banks and their household customers, (2) competitive relationships between commercial banks and nonbank depository institutions, (3) the earnings of banks and other financial institutions that offer the service, and (4) the conduct of monetary policy. This article will show that the authorization of automatic transfers is not a radical regulatory development but rather the latest event in a longer run evolution affecting all depository institutions. The article will describe this evolution and indicate the relationship of automatic transfers to it. It also summarizes the detailed provisions of the amendment, and speculates on some of the amendment's major potential implications.

I. A BRIEF PERSPECTIVE

To understand where the automatic transfer service stands in relation to other recent developments in banking, it is necessary to recognize its most important feature. Specifically, the service will enable some depositors—the exact number depending on the terms under which the service is offered—to reduce their demand balances. Therefore, the amendment authorizing automatic transfers can be properly viewed as the latest in a series of events over the last decade or so that have increased the extent to which the public has been able to use interest-earning deposits for purposes previously requiring non-interest-earning demand balances.[3] The important events in this evolution are outlined in the Box. The initial development occurred in 1970 when the Federal Home Loan Bank Board authorized federally chartered savings and loan associations to make preauthorized non-negotiable transfers from savings accounts to third parties for recurring household-related expenditures. Subsequent developments have included (1) the introduction and extension of negotiable order of withdrawal (NOW) accounts at thrift institutions[4] and commercial banks in New England and more recently New York, (2) the introduction of share draft accounts at federally chartered credit unions, (3) the proliferation of auto-

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[1] The FDIC has adopted a similar amendment. Consequently, the authority to make automatic transfers has been extended to all insured commercial banks and all mutual savings banks insured by the FDIC. A lawsuit challenging the authority of the agencies to issue the amendment was denied by the U. S. District Court for the District of Columbia, **United States League of Savings Associations v. Board of Governors of the Federal Reserve System,** et al., Civil No. 78-0878 (D.D.C., filed October 31, 1978).

[2] Therefore, the automatic transfer service will differ from such currently permitted services as the payment of regularly recurring bills from savings accounts and services where the customer is able to order, by telephone, individually specified transfers from his savings account to his checking account or to third parties.

[3] As a result of these developments, some economists now use the term "transaction balances" to designate all balances in all types of accounts that are held against anticipated current expenditures as opposed to balances held to meet longer term or emergency contingencies.

[4] Throughout this article the term "thrift institution" will refer to nonbank depository institutions such as mutual savings banks, savings and loan associations, and credit unions.

Box

RECENT DEVELOPMENTS ENABLING DEPOSITORS TO USE INTEREST-EARNING BALANCES FOR PURPOSES PREVIOUSLY REQUIRING NON-INTEREST-EARNING DEMAND BALANCES

September 1970 The Federal Home Loan Bank Board permitted federally chartered savings and loan associations to make preauthorized nonnegotiable transfers from savings accounts to third parties for household-related expenditures.

June 1972 State-chartered mutual savings banks in Massachusetts began offering NOW accounts following a favorable ruling of the Massachusetts Supreme Court. NOW accounts are functionally equivalent to interest-bearing checking accounts.

September 1972 State-chartered mutual savings banks in New Hampshire began offering NOW accounts.

January 1974 Federal legislation authorized all depository institutions except credit unions in Massachusetts and New Hampshire to offer NOW accounts.

January 1974 First Federal Savings and Loan of Lincoln, Nebraska, installed customer-bank communications terminals in two supermarkets enabling customers to withdraw funds from their savings accounts to pay for items purchased from the stores.

Early 1974 Money market mutual funds became widespread. These funds permit shareholders to redeem shares either by checks drawn on designated commercial bank accounts, by wire transfer, by telephone or by mail.

August 1974 The National Credit Union Administration permitted Federal credit unions to issue share drafts which, like NOW accounts, are functionally equivalent to interest-bearing checking accounts.

November 1974 Commercial banks were authorized to accept savings deposits from state and local governments.

April 1975 Commercial banks were authorized to transfer funds from a savings deposit to a checking account upon receipt of a depositor's telephone order.

April 1975 The Federal Home Loan Bank Board extended its 1970 action by permitting federally chartered savings and loan associations to make preauthorized transfers from savings accounts to third parties for any purpose.

September 1975 Commercial banks were permitted to make preauthorized nonnegotiable transfers from savings accounts to third parties for any purpose.

November 1975 Commercial banks were authorized to accept savings deposits from partnerships and corporations operated for profit, limited to $150,000 per customer per bank. In conjunction with telephone-ordered transfers, this authority made it possible for small businesses to earn interest on funds that can be readily used for transactions.

February 1976 Federal legislation extended NOW account authority to all New England States.

October 1978 Federal legislation extended NOW account authority to New York State.

November 1978 Commercial banks were authorized to offer automatic transfers from savings deposits to demand deposits.

Source: Board of Governors of the Federal Reserve System [10, pp. 30-32].

mated teller machines and similar facilities, (4) the authorization of banks to accept corporate savings accounts, and (5) the authorization of banks to make telephone-ordered transfers from savings accounts to checking accounts.

Perhaps more interesting than the specific developments in the evolution are the underlying forces propelling them. These changes have occurred simultaneously with the flowering of the consumer movement, and it is probable that this coincidence accounts in part for the political support accorded such innovations as NOW accounts. The steady rise in market interest rates, which has increased the opportunity cost of holding non-interest-bearing deposits, has also undoubtedly been a factor. Further, some of the developments have been a direct outgrowth of technological advances associated with the emergence of electronic funds transfer systems.

In addition to these factors, the evolution also appears to reflect important changes in the condition of the thrift industry and in competitive relationships between thrifts and commercial banks over the last 10 to 12 years. In the immediate post-World-War II period and during the 1950's housing demand was strong due to wartime construction postponements and rising family formations. As a result, thrift institutions, particularly savings and loan associations, grew rapidly throughout the first two postwar decades.[5] Moreover, with a relatively steep upward-

[5] According to the Hunt Commission Report [11, pp. 34-35], between 1945 and 1965 the total assets of savings and loan associations and mutual savings banks increased at compound annual rates exceeding 14 percent and 6 percent, respectively. The rate for commercial banks was 4 percent. During this same period the commercial bank share of total assets held by all depository institutions declined to 67 percent from 86 percent.

sloping yield curve in place during this period, the juxtaposition of generally long-term mortgage-dominated asset portfolios and predominantly short-term time and savings deposit liabilities on thrift balance sheets produced no significant structural difficulties. On the contrary, thrift operations were highly profitable.

Conditions changed rather dramatically, however, in the late 1960's. Spreads between short- and long-term interest rates were narrower on the average during this period than in earlier years, reflected in a flatter and sometimes downward-sloping yield curve. Given the maturity structure of thrift assets and liabilities, this development squeezed thrift profit margins. These difficulties were compounded by stronger competition from commercial banks for household time and savings deposits.[6] Moreover, virtually all thrifts suffered sharp reductions in deposit growth during the periods of restrictive monetary policy in 1966 and 1969-1970.

This change in the fortunes of the thrifts troubled the industry itself, its regulators, and others concerned about the politically sensitive longer run prospects for housing finance. The Hunt Commission Report, issued in 1971, addressed this problem among others. One of its major recommendations was that thrifts be allowed a broader range of activities in order that they might break out of the bind imposed by the structure of their balance sheets.[7] The Commission proposed that the lending and investing powers of savings and loan associations and mutual savings banks be extended and that these institutions be allowed to offer third-party payment services, including ordinary checking accounts, to nonbusiness customers.

The Hunt Commission Report has led to the introduction of several comprehensive legislative programs in the Congress to "reform" depository institutions and markets and their regulators. The sweeping scope of these proposals has produced to date enough anxiety in all quarters to prevent passage of the Commission's principal recommendations. Faced with political inertia at the national level, some elements within the thrift industry have sought to expand their powers by other means. Of specific relevance to this article, some thrifts, particularly the mutual savings banks in the Northeast and the emerging credit unions, have worked vigorously to gain and promote third-party payment services in order to compete more effectively with commercial banks.[8] Several of the most important innovations listed in the accompanying Box were initiated by thrifts, including NOW accounts, credit union share drafts, and the installation of point-of-sale terminals in supermarkets.

Among the various initiatives of the thrifts to expand their deposit service powers, the most important in terms of its potential longer run effects on all depository institutions was probably the introduction of NOW accounts in Massachusetts and New Hampshire in 1972 at the instigation of the Consumer Savings Bank of Worcester, Massachusetts, a mutual savings bank.[9] At that time, savings banks in the New England States did not have the power to offer ordinary demand deposits, and earlier efforts to obtain that authority by state legislation in Connecticut, New Hampshire, and Massachusetts had failed. The NOW innovation circumvented this restriction by tying third-party payment powers to savings accounts, which the savings banks were empowered to offer. But this action introduced a new and highly significant element into the picture, because NOW accounts, although legally a form of savings account, are for all practical purposes equivalent to a checking account that bears explicit interest. The growth of the NOW instrument in New England and the subsequent introduction of the similar share draft account by credit unions elsewhere has forced an extensive reconsideration of the 45-year-old prohibition of interest payments on demand deposits in the Congress, regulatory agencies, and the banking and thrift

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[6] In testimony during the hearings on the FINE "Discussion Principles," the National Association of Mutual Savings Banks presented data drawn from the Federal Reserve flow of funds accounts indicating that the savings and loan association share of the growth of household time and savings deposits declined from 46.9 percent in the 1946-1956 period to 34.1 percent in the 1966-1974 period. The mutual savings bank share declined from 23.2 percent to 11.9 percent, while the commercial bank share increased from 29.9 percent to 54.0 percent. U. S. Congress, House, Committee on Banking, Currency and Housing, **Financial Institutions and the Nation's Economy (FINE) "Discussion Principles," Hearings,** before a subcommittee of the Committee on Banking, Currency and Housing, House of Representatives, 94th Cong., 1st and 2nd sess., 1975, p. 865.

[7] For general background on the Hunt Commission prepared by the co-directors of the Commission's professional staff, see [6, pp. 9-20].

[8] The savings and loan industry has been generally less interested in obtaining third-party payment powers than the mutual savings banks and credit unions, fearing such powers would result in loss of the interest rate ceiling differential on time and savings deposits. The Federal Home Loan Bank Board, however, which regulates federally chartered associations, has strongly favored the extension of full third-party payment powers to thrifts. See Federal Home Loan Bank Board, **A Financial Institution for the Future,** (Washington, D. C.: Office of Economic Research, Federal Home Loan Bank Board, 1975), pp. 27-33.

[9] For a summary of the early history of NOW accounts see [4].

industries. Indeed, legislation that would have extended NOW account authority nationwide, a development that would have substantially reduced the force of the prohibition, was introduced and debated although not passed by Congress in 1977.[10] The reconsideration has received added impetus from technological developments such as automated teller machines and similar devices that have made it much easier and less costly for individual depositors to transfer funds from savings to checking.

It is against this background that the amendment permitting automatic transfers from savings accounts to checking accounts must be evaluated. Far from an isolated regulatory development, the amendment is a natural step in what increasingly appears to be an inexorable sequence of events, driven by technological developments and changing competitive forces affecting depository institutions, that is steadily increasing the ability of households to use interest-earning accounts for many of the purposes for which non-interest-earning balances were previously required.

II. THE PROVISIONS OF THE AMENDMENT

The amendment authorizing automatic transfers was originally proposed by the Board of Governors in March 1976. This initial proposal elicited little response from the general public and largely negative comments from banks and other financial institutions. In retrospect this lack of interest is understandable since the terms of the proposal were quite restrictive. Depositors would have been required to forfeit 30 days' interest on amounts transferred, and transfers would have had to be made in $100 units. To the extent they were aware of the proposal, potential users of the service apparently did not find these conditions attractive, and banks evidently concluded they could not offer the service profitably subject to these restrictions. In the light of this reaction, the Board did not implement this initial proposal.

The proposal was revived in early 1978, but with important revisions. The interest forfeiture penalty was softened,[11] and the $100 unit requirement for transfers was dropped. The response to this second proposal was quite different, both quantitatively and qualitatively. The number of responses received by the Board set a record for proposals of this nature. The proposal had received some attention in the general press, which may account for the large number of letters—many of them handwritten—sent by individuals. A majority, approximately 52 percent, of the responses favored adoption.

The amendment finally enacted by the Board reflects the second round of public comments and therefore itself differs from the revised proposal. The amendment has seven major provisions:[12]

(1) In offering the automatic transfer service banks may either agree to make the transfers necessary to maintain some prearranged minimum nonzero balance in the depositor's checking account, or they may agree to maintain a zero checking balance, i.e., to transfer funds continuously as required to cover checks as they are written.

(2) Banks offering the service will not be *required* to impose either an interest forfeiture or a service charge on transfers. (They are free to impose either if they so choose.) This provision constitutes the major departure from the Board's revised proposal. In commenting on the revised proposal a large number of financial institutions had suggested that the required interest penalty be eliminated.

(3) The service may be offered to individuals only.

(4) The service may be offered beginning November 1, 1978, six months after the date of the amendment's adoption. The delay was provided to allow ample start-up time to banks planning to offer the service.[13]

(5) The service is entirely voluntary both for banks and bank customers and can be made only with the prior consent of the customer. (Consent in the case of automatic transfers, of course, is to the service, not to individual transfers.)

(6) A bank offering the service must "disclose prominently and call to the attention of depositors" that it reserves the right to require not less than 30 days' advance notice of withdrawals from savings accounts subject to transfer just as it has

[10] Ironically, the legislation's defeat was due largely to thrift opposition arising from fear that Congress would couple the extension with the abolition of the interest rate ceiling differential.

[11] Only the interest actually accrued on the funds transferred during the 30 days prior to the transfer would have had to be forfeited.

[12] The provisions listed here paraphrase those set forth in the Board's formal announcement of the amendment's adoption in the May 1978 **Federal Reserve Bulletin**, pp. 424-425.

[13] A request of the Independent Bankers Association of New York to delay the beginning date still further was denied by the Board on September 13, 1978.

reserved this right for ordinary savings accounts in the past.

(7) Banks may arrange with thrift institutions to offer jointly automatic transfers from savings accounts at thrifts to checking accounts at banks.

These provisions are subject to change as experience with automatic transfers accumulates. In its announcement the Board stated that it will monitor the effects of the amendment on competitive conditions and flows of funds in depository markets in order to make whatever modifications seem appropriate.

As presently written, the amendment's central feature is the high degree of flexibility it offers to banks in packaging the service and to customers in using it. Banks can set whatever conditions they wish with respect to such details as the frequency and amounts of transfers, minimum balance requirements, and account maintenance fees and other charges. Presuming there is at least moderate variety in bank offerings in a given local market, an individual customer might be able to use the service to avoid overdrafts and overdraft charges, to maintain a specified minimum checking balance to avoid ordinary checking account service charges, or to maintain a zero checking balance, in accordance with his characteristics and needs.

III. SOME POTENTIAL IMPLICATIONS

This section will speculate on some of the potential repercussions of automatic transfers. The service has important potential implications, ranging from transitory effects on banks and their depositors to more lasting effects on the functioning of the nation's payments system. It must be emphasized, however, that while it is important for both banks and the general public to be aware of the potential impact of automatic transfers, it is not possible to predict either the magnitude or the timing of these effects with high confidence.

Apart from the possibility of future modification of the amendment, the significance of automatic transfers—especially during the first year following their promulgation—will depend largely on how aggressively banks promote the service and how favorably the service is received by the public. Neither factor can be foreseen with much certainty. For these reasons, what follows should not be regarded as a set of predictions but rather as illustrations of what might occur under certain specific hypothetical conditions. The first part of the section will discuss some of the immediate implications of the amendment for banks and bank customers with the aid of Table I. The latter part will speculate on some of the broader and more permanent effects.[14]

Appeal to Depositors Sections I and II of Table I present information that might help determine the appeal of automatic transfers to depositors at a typical medium-sized or large bank in an urban or suburban area. Section I lists the assumptions underlying the analysis. Lines I.B and I.C show the various assumed charges and interest rates faced by the depositor before and after the introduction of automatic transfers, respectively. In both cases an attempt was made to specify what might be regarded as median or "typical" service charges.[15] As anyone familiar with the banking industry knows, however, there is extraordinary variation in both the form and level of such charges across banks. Therefore, the assumptions are a rough approximation at best.

Banks will apparently offer automatic transfers in two basic forms: (1) as overdraft protection and (2) as what might be called "interest maximization" accounts.[16] The latter appear to be the more important and are the only type considered in the remainder of this article. These accounts will generally involve a linked checking account and savings account. The bank will agree to maintain a very low balance (for many banks zero) in the checking account, transferring any surplus funds to savings

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[14] On October 16, 1978, when this article was in the late stages of preparation, Congress unexpectedly extended the authority to offer NOW accounts to all federally chartered commercial banks and thrifts in New York State. Prior to the passage of this legislation, banks and thrifts in the State had been preparing to offer automatic transfers. Since NOW accounts and the most important forms of automatic transfer accounts are in some respects substitutes from the standpoints of both offering institutions and depositors, the legislation renders the effects of the automatic transfer amendment even less certain in New York than elsewhere. This article does not attempt to take account of this late development.

The legalization of NOW's in New York increases the probability that NOW account authority will be extended nationwide at an early date. In that event automatic transfers would probably serve as a transition step to NOW's. Even so, automatic transfers may not be hastily abandoned because larger banks have already invested sizable sums in preparing the operational mechanisms and promotional programs to support transfers. Support requirements for NOW accounts are different.

[15] By mid-October 1978, a sizable number of larger banks had announced preliminary prices for automatic transfer services. Many of these announcements were reported in the **American Banker** newspaper in August, September, and October.

[16] The main difference between the two forms of service relates to the anticipated frequency of transfers. Overdraft protection accounts are designed to accommodate relatively infrequent transfers, whereas interest maximization accounts are intended to handle more frequent transfers.

Table I

SOME POTENTIAL IMPLICATIONS OF AUTOMATIC TRANSFERS: AN ILLUSTRATION

(Based in Part on 1977 Federal Reserve Functional Cost Analysis Data)[1]

I. ASSUMPTIONS

A. Analysis focuses on depositors and profits at a typical large (greater than $200 million) member bank

B. Pre-automatic transfer checking and savings deposit terms

1. Checking account service charge: $.10 per check
2. Interest rate on savings accounts (daily compounding): 5.13%

C. Automatic transfer (AT) terms

1. Zero balance checking account tied to 5% savings account
2. Account maintenance charge: $3.50 per month ($42.00 per year)
3. Activity charge: $.15 per transfer
4. No charges if minimum balance of $3500 maintained

II. EFFECT ON DEPOSITORS

A. Depositors with pre-AT minimum combined checking and savings account balance greater than $3500:

—all of these depositors would gain by transferring their entire checking balance to AT savings account

B. Depositors with pre-AT minimum combined checking and savings account balance less than $3500:

—incentive to shift to AT will depend on comparison of (1) additional savings interest and (2) net increase in service charges

Net Annual Increase in Service Charges at Various Activity Levels

(1)	(2)	(3)	(4)	(5)	(6)
			AT Charges		
Checks Per Month	Checks Per Year	Current Annual Service Charge (2) × $.10	Annual Activity Charge (2) × $.15	Total Annual Charge (4) + $42 maint. charge	Net Annual Increase (5) − (3)
5	60	$ 6	$ 9	$ 51	45
10	120	12	18	60	48
15	180	18	27	69	51
20	240	24	36	78	54
25	300	30	45	87	57
30	360	36	54	96	60
35	420	42	63	105	63
40	480	48	72	114	66

Pre-Tax Interest on Checking Balance Transferred to AT Savings Account

(1) Current Checking Balance	(2) Annual Interest (nearest dollar)
$ 250	$ 13
500	26
750	38
1,000	51
1,500	77
2,000	103
2,500	128
3,000	154
4,000	205
5,000	257

III. FIRST YEAR EFFECT ON PROFITS OF AN AVERAGE LARGE FCA BANK ($ thousands)

Estimate of Additional Interest Expense	A. Average personal demand deposits	$59,038.6
	B. First year conversions from demand deposits to AT savings (Line III.A × .20 conversion rate[2])	11,807.7
	C. Additional interest expense (Line III.B × .0513 effective yield)	607.7
Estimate of Net Loss of Service Charges	D. Pre-AT demand deposit service charges (assumes average account activity of 15 checks per month at $.10 per check/some high balance accounts not paying service charges)	81.0
	E. Post-AT service charges (assumes average account activity of 15 checks per month/assumes 20% of the number of converting accounts have to pay service charges)	13.8
	F. Net service charges lost (Line III.D − Line III.E)	67.2
Estimate of Gain from Earnings on Required Reserves Released	G. Marginal reserve requirement on demand deposits	11.75%
	H. Reserve requirement on savings deposits	3.0%
	I. Pre-AT required reserves on converting deposits (Line III.B × .1175)	1,387.4
	J. Post-AT required reserves on converting deposits (Line III.B × .03)	354.2
	K. Required reserves released by conversion (Line III.I − Line III.J)	1,033.2
	L. Earnings on released required reserves (Line III.K × .065 assumed average bank asset yield)	67.1
	M. Net reduction in earnings (Line III.C + Line III.F − Line III.L)	607.8
	N. Earnings before Federal taxes[3]	11,207.5
	O. Percent reduction in pre-tax earnings (Line III.M ÷ Line III.N × 100)	5.4%

[1] See [3, especially Tables 7.2, 7.7, and 8.2].

[2] The assumed conversion rate, expressed as a ratio to total personal demand deposits, is based on a separate analysis using FCA data on the size distributions of demand and savings deposits. Ibid., Tables 7.2 and 8.2.

[3] Ibid., Table 1. As indicated in the document, FCA earnings data are adjusted to remove factors such as large, nonrecurring expenditures that distort interbank comparisons. It should be noted that the personal demand deposit total in Line III.A was derived from a subsample of banks within the FCA large bank sample. The earnings figure in Line III.N was estimated from the full sample.

on a regular basis. Checks will then be covered by transfers from the savings account, typically for the exact amount of the check. A majority of the banks intend to impose a fixed monthly maintenance charge for this service and an additional fee per check. A number of banks also plan to offer the service without charge to depositors who maintain minimum combined balances exceeding some specified amount.[17] The prices assumed in Lines I.C2 and I.C3 appear to lie somewhere between the relatively liberal terms announced by several large West Coast banks and the more stringent terms likely to prevail in the East.

Section II of the table attempts to suggest what kinds of households, as indexed by their checking and savings account balances and account activity levels, might find this "typical" automatic transfer offer attractive. Since it is assumed the service will be offered free to depositors who maintain a minimum balance exceeding $3500, all households holding minimum combined checking and savings balances over this level before the introduction of automatic transfers would benefit from the service. The amount of the gain for these depositors would increase with the depositor's average checking balance and his account's activity (the latter because he is assumed to be paying $.10 currently for each check written). Although all depositors in this class would gain from the service, it is unlikely that all would use it even where it were conveniently available. Depositors with relatively small and inactive checking accounts before automatic transfers might not consider the small gain worth the trouble of opening new accounts. Further, surveys of consumer attitudes toward the service have suggested that many potential users fear it might compromise the integrity of the savings account by making it easier to indulge in unintended spending out of funds originally set aside as longer term savings.

Depositors with a combined minimum balance below $3500 in this example would be charged. Section II.B of the table attempts to indicate the conditions under which depositors in this class might find automatic transfer accounts advantageous. As indicated, this determination would require a comparison of (1) the gain from interest paid on funds formerly held idle in a non-interest-bearing checking account that could now be held in an interest-bearing savings account and (2) the net increase in service charges. The data in the two numerical tables permit such a calculation for a variety of account behavior characteristics. Column (6) of the upper table presents the net increase in service charges for accounts at several different activity levels.[18] In general, the increase is a rising function of activity. Column 2 of the lower table shows the approximate gross interest on funds transferred to savings at various checking balance levels. Together the two tables indicate that depositors who normally write 15 to 20 checks a month would have to be currently holding an average checking account balance in the $1500-$2000 range to gain from the service, and even at this level the gain would be nominal.[19]

If the various terms assumed are at all representative, it is obvious that the service will appeal mainly to the minority of depositors who maintain relatively high balances in their checking accounts. Many of the larger banks are planning to emphasize this point as candidly as possible in promoting the service.

Effects on Bank Profits During the Transition

It is probable that the introduction of automatic transfers will have some effect on commercial bank profits. It is even more likely that the magnitude and timing of this effect will vary widely from bank to bank, reflecting differences in the competitive conditions faced by individual banks.

Section III of Table I presents a simplified example of the possible effect of automatic transfers on the before-tax earnings of a Federal Reserve member bank with total deposits in the $600-700 million range during the first year the service is offered. The analysis is based on a set of specific, hypothetical assumptions regarding such factors as (1) the percentage of eligible household demand deposit balances shifted to savings accounts subject to transfer and (2) service charge policy before and after the inauguration of automatic transfers. Most of the data on which the analysis is based were taken from the

[17] In the case of zero checking balance arrangements, the minimum combined balance by definition refers to the minimum balance in the savings account.

[18] For simplicity, the service charge assumption in Line I.B1 in the table ignores the common current practice in some markets of providing free checking services for relatively modest minimum balances. The net service charge increases shown in the table understate the increases that depositors able to take advantage of these current programs would experience.

[19] The interest gains shown in the table are on a before-tax basis. The after-tax benefit would be smaller. Also, most checking account customers presently earn "implicit interest" in the form of free services or service charges that are below the costs the bank incurs in providing checking services. Unlike explicit interest, implicit interest is not taxed. Therefore, to the extent that automatic transfers substituted explicit for implicit interest, this tax benefit would be lost. Hence the tables probably understate the checking balance levels at which automatic transfers would be advantageous. For a discussion of implicit interest, see [9].

Federal Reserve System's Functional Cost Analysis Report for 1977. This Report provides balance sheet and income statement data for "average" banks in three size classifications based on information provided by 846 member banks throughout the nation. *It must be stressed that the analysis is* not *a prediction of the actual transitional effects of automatic transfers on the earnings of most member banks.* No such estimate is possible in the face of the wide variety of prices and price policies contemplated by individual banks. The aim of the example is to provide a suggestive benchmark estimate under specific assumed conditions. Individual banks might then alter the conditions and the estimate to fit their individual situations. The specific conditions assumed include the pre- and post-automatic transfer price and interest rate terms in Section I of the table along with the additional assumptions noted in Section III of the table. Therefore, as in the preceding section of the article, the focus is on zero-balance automatic transfer accounts offered without charge to depositors with minimum balances over $3500.

The analysis takes account of three of the major factors likely to affect member bank earnings during the transition to automatic transfers.[20] These are: (1) the increased interest expense due to shifts in deposits from demand to savings accounts (Lines III.A to III.C); (2) the net gain or loss from service charges (Lines III.D to III.F); and (3) additional earnings that result from the lending or investment of required reserves released as a result of shifts from demand to savings deposits (Lines III.G to III.L). The principal factors omitted from the analysis are the potential impacts of automatic transfers on (1) bank non-interest costs (in this example mainly accounting and computer expenses) and (2) overdraft fees. Information that would have permitted estimation of these effects was not readily available.

The estimate of additional interest expense (an increase of $607,000 in this example) essentially follows from the assumption (Line III.B) that 20 percent of the bank's dollar volume of household demand deposits would be converted to savings balances during the first year automatic transfers are available. This estimate is based on a separate estimate of the *joint* distribution of demand and savings deposits by account size using Federal Reserve Functional Cost Analysis data on the *individual* size distributions of demand and savings deposits, respectively.[21] This separate analysis suggested that perhaps as much as 60 percent of the dollar volume of the "average" large bank's household demand deposits might be presently lodged in accounts that would benefit from being shifted to savings deposits subject to transfer, reflecting the surprisingly high percentage of household demand and savings balances in high balance accounts.[22] It was somewhat arbitrarily assumed that 40 percent would actually convert over a three-year transition period, with 20 percent converting during the first year. This estimate is close to the first year conversion factors estimated and publicly announced by some large banks.

Lines III.D to III.F estimate the net change in service charge revenues using the stated activity level assumptions in conjunction with the before and after charge schedule in Section I of the table. Underlying these calculations are data on the *number* of personal demand accounts in various size categories at an average large bank. These data were also developed in the separate analysis mentioned above. As indicated, the bank in this example would experience a moderate net reduction in service charge revenue. This follows directly from (1) the assumption that the bank would offer automatic transfers free for a minimum balance of $3500 and (2) an estimate based on the separate analysis that fully 80 percent of converted balances would be in accounts that qualify for the free service. Obviously, this percentage would be sensitive to the minimum balance level for free service, if any, set by an individual bank.

Lines III.G to III.L suggest that the return on the investment of released required reserves would provide a modest offset to the additional interest expense shown on Line III.C. The offset would be larger for banks having a higher marginal required reserve requirement ratio on demand deposits and lower for banks having a lower ratio.

The final line suggests that the bank in this example might experience a reduction of before-tax earnings on the order of 5½ percent during the initial year of the transition to automatic transfers. It should be emphasized again that this estimate re-

[20] The methodology employed here is straightforward and follows the procedures used in several recent estimates of the similar potential effect of nationwide NOW accounts on bank profits. See [5, 10].

[21] See [3, Tables 7.2 and 8.2]. Table 7.2 shows the distribution of total demand balances including nonpersonal balances. This distribution served as a benchmark for an estimate of the distribution of personal demand balances.

[22] The analysis indicated that the major portion of the funds would be shifted from checking accounts with average balances that currently exceed $3000. Functional cost data indicate that between 60 and 65 percent of household demand balances are in such accounts.

flects the assumptions from which it was derived. It does not take account of differences in competitive conditions or differences in individual depositor characteristics faced by different banks. Some banks will experience little or no reduction. Others will probably experience greater reductions. The most striking result of the analysis is its suggestion that due to the existing size distribution of personal account balances, banks offering the service without charge for minimum balances in the $3500 range or less will not receive an offset to their increased interest expense from higher service charge revenue. On the contrary, they might anticipate some net decline in these revenues.

Economic Efficiency The two preceding sections described two of the more immediate potential effects of automatic transfers. This section and the next section deal briefly with two of the possible longer run ramifications. It should be noted that the points made below are not uniquely relevant to automatic transfers but would be associated with any regulatory or technological change tending to increase the extent to which depositors are able to use interest-bearing deposits for purposes previously requiring non-interest-bearing demand balances.

Economists have argued that removal of the current prohibition of explicit interest on demand deposits would increase the efficiency of the nation's payments mechanism in two ways.[23] First, it would reduce the wasteful shifting of funds between demand and savings deposits that results from the efforts of depositors to maximize the return on their transaction balances. Second, it would improve the allocation of economic resources in the aggregate. The logic of the second claim runs along the following lines. Most household depositors currently earn an "implicit" return on their demand balances in the form of a remission of service charges.[24] Obviously, this implicit return can only be realized in the form of checking services, thereby severely restricting the depositor's use of the return. If the return were paid in the form of explicit money interest, many households would probably use it to consume other goods or services. Resource allocation would then more nearly reflect consumer preferences.

The first of these two arguments is less relevant to automatic transfers than to the outright removal of the ban on explicit interest on demand accounts or to NOW accounts because automatic transfers require the continued maintenance of distinct checking and savings accounts. Resources must still be used to shift funds back and forth between the accounts, although—depending again on how banks price the service—the burden may be shifted to some extent from depositors to banks or to those who borrow from banks.

The second argument *is* relevant to automatic transfers, but only under certain conditions. The essence of this argument is that if explicit interest were permitted, efficiency would increase because explicit, pecuniary interest would be *substituted* for implicit interest. Because implicit interest is simply the provision of payments services to depositors free or at fees below the value of the resources used in producing the services, the existence of implicit interest invites excessive use of these services and therefore virtually guarantees a misallocation of resources. If banks used automatic transfers to reduce implicit interest payments, efficiency in the use of resources to carry out payments transactions would probably increase, even though the precise magnitude of this benefit might be difficult to measure.[25] On the other hand, if banks offer automatic transfers either without charge or at a low fee on a widespread basis, implicit interest payments would not be eliminated. Indeed, they might not even be significantly reduced. In these circumstances efficiency gains would be small or nonexistent.

The charge schedules announced for automatic transfers to date by individual banks suggest that the substitution of explicit for implicit interest will proceed slowly. As time passes, however, the existence of automatic transfers and the additional costs associated with providing them may gradually increase the incentives for banks to raise customer fees for checking and other payments services, thereby reducing implicit interest and the inefficiencies arising from it. Increasingly conservative pricing policies have characterized the NOW account experience in New England.[26]

Implications for the Conduct of Monetary Policy In addition to their potential consequences in the areas already discussed, automatic transfers may

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[23] The term "efficiency" is used here in its technical economic sense: i.e., the efficiency with which basic labor and capital resources are allocated among competing uses.

[24] See footnote 19 above and the article by Klein cited there.

[25] At the time this article was prepared a few banks had indicated they planned to review all of their service charges in conjunction with the introduction of automatic transfers.

[26] See Kimball [8, pp. 34-38].

have some important repercussions on the implementation of monetary policy. Economists have long recognized that the prohibition of explicit interest on demand deposits and, by extension, the progressive erosion of the force of that prohibition due to technological developments and other changes raises major theoretical and practical questions regarding the definition of the money supply and the stability of the demand for money, however defined, with respect to interest rates and income.[27] If automatic transfers lead to substantial shifts from demand to savings deposits, their introduction might produce the kinds of effects contemplated by those concerned with these broader questions. It was suggested above that any such shifting might be small initially, in which case the practical importance of these effects may not be very great in the immediate future.

Nonetheless, the initiation of automatic transfers is likely to create some problems of interpretation at an early date for both Federal Reserve policymakers and others who monitor monetary policy. The procedures currently used in implementing monetary policy include setting both longer run targets and short-run tolerance ranges for the growth rates of various monetary aggregates. Automatic transfers may temporarily complicate the use of these procedures, particularly the interpretation of short-run growth rates of the various aggregates. Specifically, shifts of funds from demand deposits to savings deposits to take advantage of the transfers will tend to depress the growth rate of the narrowly defined M_1 aggregate (which includes demand but not savings deposits) while leaving the growth of the boarder M_2 aggregate (which includes both) little changed.[28] Because neither the magnitude nor the timing of the shifts induced by automatic transfers can be confidently predicted, and since complete data on the shifts will not be available on a current basis,[29] it may be difficult during the transition to determine whether changes in one- or two-month growth rates are being caused by changes in underlying economic conditions or by the spread of automatic transfers or both. Since M_2 should not be strongly affected by automatic transfers, it might be helpful during the transition to evaluate M_1 data in the light of what is happening to M_2. But this procedure is by no means foolproof since M_2 growth rates are themselves continuously buffeted by a variety of adventitious forces in the short run.

The interpretative difficulties introduced into the monetary policy process by the transition to automatic transfers will probably be short-lived. But more than the usual degree of uncertainty might surround short-run policy actions during the early weeks of the transition. Experienced Fed policy watchers recognize the potential confusion. Their awareness should limit any disruption.

IV. CONCLUSION

This article began by considering automatic transfers in an evolutionary context. It was suggested that the amendment to Regulation Q allowing the service was the latest in a lengthy series of events over the last decade or so that have made it increasingly easy for the public to achieve with interest-bearing balances certain ends that previously required non-interest-bearing demand balances. The latter part of the article summarized some of the potential effects of the amendment under given assumptions. On the basis of the pricing policies announced through mid-October 1978, it seems likely that the service will appeal primarily to depositors with large checking balances who will apparently be offered the service without charge or for a small fee by many of the larger banks. For this reason, the analysis in the preceding section suggested that (1) the earnings of a typical large bank offering the service might be reduced somewhat during the transition since service charge income might not offset the increased interest expense and (2) the potential improvement in the efficiency of resource usage in the payments system might not be forthcoming initially because many banks are not planning to take advantage of the introduction of the service to reduce implicit interest payments significantly. It was also suggested that the shifting of balances from demand to savings accounts might complicate the conduct of monetary policy in a mechanical way during the transition.

Despite these reservations, automatic transfers will probably be useful both to banks and the general public as a part of the longer run transformation of the nation's payments mechanism currently in progress. Whatever the prospects for continuation of the legal prohibition of explicit interest on demand de-

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[27] These issues are well beyond the scope of this article, but an extensive literature is available. For a brief summary see [1, pp. 72-89]. For a comprehensive survey of these and related current issues in monetary research, see [2].

[28] This statement does not take account of possible shifts of deposits from thrift institutions to banks. Such shifts would tend to raise the growth rate of M_2.

[29] The Federal Reserve will, however, conduct a telephone survey of a sample of banks to estimate the order of magnitude of shifts during the transition. The survey is described in **American Banker**, October 26, 1978, p. 1.

posits, the force of the prohibition is bound to be weakened and eventually reduced to insignificance as continued development and refinement of electronic payment facilities make it ever more convenient and less costly to transfer funds from one account to another. Moving gradually in this direction through such partial steps as automatic transfers is preferable to an abrupt and possibly disruptive transition later.

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REGULATION Q AND THE BEHAVIOR OF SAVINGS AND SMALL TIME DEPOSITS AT COMMERCIAL BANKS AND THE THRIFT INSTITUTIONS

Timothy Q. Cook

The behavior of small time and savings deposits at commercial banks, savings and loan associations, and mutual savings banks is a matter of widespread interest for a number of reasons. Part or all of these deposits are included in various monetary aggregates, which are widely viewed as important determinants of economic activity and play an important role in the formulation of monetary policy under current Federal Reserve operating procedures. In addition, many observers feel these deposits have a significant impact on the performance of the housing industry. Finally, the behavior of these deposits directly affects the financial health of savings and loan associations and mutual savings banks.

This article examines the behavior of savings deposits and small time deposits of less than $100,000 at commercial banks and the thrift institutions (savings and loan associations and mutual savings banks) in recent years. Savings deposits are time deposits on which 30 days' notice may be required prior to withdrawal. In practice, however, such notice is seldom enforced and these deposits can be withdrawn on demand without penalty. Other small time deposits have maturities ranging up to several years and are subject to substantial interest forfeiture penalties if withdrawn prior to maturity.

The Federal Reserve Board sets interest rate ceilings on these deposits at member banks under Regulation Q of the Federal Reserve Act. The Federal Deposit Insurance Corporation and the Federal Home Loan Bank Board—in coordination with the Federal Reserve Board—set Federal ceilings on deposits at federally insured nonmember banks, savings and loan associations, and mutual savings banks. As will be shown in detail later in the article, the movement of small time and savings deposits is closely related to movements in market interest rates around these ceilings. In particular, when market interest rates rise above Regulation Q ceilings, the growth rate of small time and savings deposits falls sharply as many investors withdraw funds out of the deposit institutions to invest in market instruments. Such behavior is widely referred to as "disintermediation."

A Brief History of Regulation Q Because of the importance of Regulation Q as a determinant of the volume of small time and savings deposits, a short review of the history of this regulation may be useful. Deposit interest rate ceilings under Regulation Q originated with the Banking Act of 1933 and initially applied only to rates paid on commercial bank time and savings deposits. The purpose of the ceilings was to prevent "excessive" rate competition for deposits that might encourage risky loan and investment policies and lead to bank failures.

Until the 1960's Regulation Q was of little significance in U. S. banking. There were two main reasons for this. First, between 1933 and 1960 commercial banks showed little or no interest in competing for time and savings deposits, leaving the so-called "thrift deposit" market to other types of institutions. In the second place, market interest rates through most of this period were below the legal ceilings and market instruments posed no serious threat to the ability of banks or other institutions to attract thrift deposits. Only in 1957, after a gradual but steady updrift in market rates, did market instruments begin to compete with thrift institution deposits. In that year, the legal ceiling was raised from 2½ percent to 3 percent. The only previous adjustment in the ceiling was a reduction from 3 percent to 2½ percent in 1935.

For reasons associated mainly with a continuing updrift in interest rates and its impact on the ability of commercial banks to raise funds, this situation changed dramatically in the 1960's. Early in that decade commercial banks began to compete, with increasing aggressiveness, for both thrift deposits and money market funds. Through 1961 and 1962, when

interest rates were low following a recession trough, they were able to do so effectively. But as the business recovery progressed and market interest rates rose, the Regulation Q ceiling, at a maximum of 3 percent, hampered banks in their efforts to raise funds. At the same time, the philosophy of bank regulation, which between 1933 and the late 1950's focused on limiting competition, was evolving in a direction that placed emphasis on increasing competition, not only among commercial banks but also between the various types of depository institutions. In this new environment, the maximum Regulation Q ceiling was raised to 4 percent, and then to 4½ percent in 1964 and 5½ percent in late 1965.

The rising interest rates in the early and middle 1960's affected banks and thrift institutions differently, mainly because of differences in the asset composition of the two types of institutions. For thrift institutions a large imbalance existed between the long-term maturity of their assets (primarily mortgages) and the short-term maturity of their liabilities. As a result, it was difficult for them to compete for deposits at current market levels without experiencing poor or negative cash flows. In order to discourage rate competition for deposits among savings and loan associations in these circumstances, the Federal Home Loan Bank Board (FHLBB) in 1964 and 1965 refused to make advances to institutions that paid above a specified yield on deposits. Due to the value of FHLBB advances to savings and loan associations in this period, this action by the FHLBB constituted de facto rate control.[1]

The average maturity of commercial bank assets is much shorter than that of the thrift institutions. Consequently, banks were better able to compete for deposits on a rate basis when market interest rates rose in 1965 and 1966. As the rate paid on deposits at banks rose relative to that paid at the thrift institutions, the growth rate of deposits at the thrift institutions in 1965 and much of 1966 fell relative to the growth rate at commercial banks.[2] This experience provoked strong protest from the thrift institutions. There was also a widespread belief at the time that the decline in the relative growth rate of thrift versus bank deposits was having an adverse effect on mortgage markets and the housing industry. Congress reacted to these concerns in September of 1966 by passing the Interest Adjustment Act.

The Interest Adjustment Act expanded the coverage of deposit interest rate ceilings to the thrift institutions. The purpose of this expanded coverage was to prevent "excessive" competition between banks and the thrift institutions. By setting rate ceilings on *both* banks and the thrift institutions, it was reasoned, loss of funds from the latter to the former could be prevented in periods of rising interest rates. This, however, would not prevent withdrawal of savings and time deposits from both institutions for investment in market instruments that carried yields above the Regulation Q ceilings.

A second feature of the Interest Adjustment Act was the establishment of a "differential" between the ceiling rates that banks and thrifts could pay on deposits, which allowed the thrifts to pay a higher rate. The rationale underlying the differential was that banks had an inherent competitive advantage over thrifts because of the wider array of services they could offer customers. In order to offset this competitive advantage, it was argued, thrifts needed to be able to pay higher deposit rates. The ceiling rates on savings deposits were initially set at 4.00 percent for banks and 4.75 percent for the thrift institutions, a differential of 75 basis points. The ceiling rate for time deposits at banks was rolled back from 5½ to 5 percent while the ceiling rate for the thrift institutions was set at 5¼ percent, a differential of 25 basis points. These rates were below comparable maturity market interest rates at the time.

Since the passage of the Interest Adjustment Act, there have been major revisions of Regulation Q ceiling rates on savings and small time deposits in 1970, 1973, and 1978.[3] Each revision was a reaction to declining deposit growth resulting from rising market interest rates. The first revision occurred in January 1970 following the sharp rise in market interest rates in 1969. The 1970 revision established three separate maturity categories of small time de-

[1] The actions taken by the FHLBB to control dividend rates are described in [9].

[2] In 1963 and 1964 the growth rates of time and savings deposits at the thrift institutions were 12.0 percent and 11.1 percent respectively, while the growth rates at banks were a comparable 11.8 percent and 10.0 percent. In 1965, however, the growth rate of deposits at the thrift institutions was 8.3 percent while the growth rate of deposits at banks was a much greater 14.7 percent. Similarly, in the first three quarters of 1966 the annualized growth rate of deposits at the thrift institutions was 3.8 percent, while the growth rate at banks was 10.7 percent.

[3] It should be emphasized that this discussion applies only to **small** time deposits less than $100,000. The Regulation Q ceilings on large time deposits greater than $100,000 were removed in June 1970 for maturities from 30 to 90 days and removed in May 1973 for longer maturities. Also, this discussion ignores some minor changes in ceiling rates on small time and savings deposits. Revisions of Regulation Q ceiling rates are summarized in the **Federal Home Loan Bank Board Journal** and the **Federal Reserve Bulletin.**

posits. Ceiling rates for banks were set at 5 percent for time deposits of maturity up to a year, 5½ percent for 1- to 2-year maturities, and 5¾ percent for maturities of 2 years and over. The goal of this graduated rate structure was to lengthen the average maturity of deposits at banks and the thrift institutions, in order to reduce the potential for large scale withdrawals in periods of rising interest rates.

The ceiling rate for bank savings deposits was raised to 4½ percent. The ceiling for thrifts was set at 5 percent, thereby reducing the savings deposit differential to 50 basis points. The differential in all time deposit categories was maintained at 25 basis points.

When interest rates rose sharply and deposit growth rates plummeted in 1973, Regulation Q was again revised. Although the design of the July 1973 revision followed the lines of the 1970 revision, the changes were more substantial. The 1973 revision raised the commercial bank interest ceiling on passbook savings from 4½ percent to 5 percent and raised the ceiling rate on time deposits with maturities of 90 days to 1 year from 5 to 5½ percent. The 1- to 2-year category was changed to 1 to 2½ years and its ceiling rate was raised from 5½ to 6 percent. In addition, two new categories were established to replace the "greater-than-two" year category. These new categories were 2½ to 4 years and 4 years or more. The 2½- to 4-year category was allowed a 6½ percent ceiling rate while the 4-year category initially carried no ceiling at all. Deposits in the latter category were widely dubbed "wildcard" deposits.

Because the wildcard deposits had no ceiling rate, banks and the thrift institutions could compete for them freely. This fact, in conjunction with the declining growth rate of deposits at the thrift institutions during this period, fostered the belief that the wildcard deposits were responsible for a massive shift in deposits from the thrift institutions to the banks.[4] As a result, in November of 1973 ceiling rates of 7¼ percent at banks and 7½ percent at the thrift institutions were placed on these deposits.

The differential on all time deposit categories was left at 25 basis points in the 1973 revision of Regulation Q, with the exception of the 1- to 2½-year category, whose differential was set at 50 basis points. The savings deposit rate ceiling at the thrift institutions was raised only to 5.25 percent, thereby further reducing the savings deposit rate differential from 50 to 25 basis points.

In December 1974 yet another maturity category was established, for deposits with a maturity of 6 years or more. The ceiling rate for such deposits was set at 7½ percent at banks and 7¾ percent at the thrift institutions. A final revision, in 1978, will be discussed later in this article.

This brief history of Regulation Q raises a number of questions. For example, how do Regulation Q ceiling rates affect the growth of small time and savings deposits at banks and the thrift institutions? How successful was the substantial 1973 revision of Regulation Q in diminishing the threat of disintermediation? How has the rate differential affected the relative growth of deposits at banks and the thrift institutions?

Table Ia

PERCENTAGE OF BANKS PAYING CEILING RATES ON NEW DEPOSITS

	Savings	180 Days to 1 Year	1 to 2½ Years	2½ to 4 Years	4 to 6 Years	6 Years or More
July 31, 1973	63.9	67.3	80.3	86.3		
October 31, 1973	76.1	81.2	92.3	95.4		
January 31, 1974	79.0	87.1	95.8	96.4	56.6	
April 30, 1974	80.8	89.5	96.6	97.6	62.1	
July 31, 1974	82.7	89.5	97.1	97.7	69.8	
October 31, 1974	83.7	90.5	97.4	97.9	74.5	
January 31, 1975	84.9	93.0	97.8	98.0	78.5	96.8
April 30, 1975	85.5	91.4	94.9	97.5	79.7	93.6
July 31, 1975	86.4	92.7	96.5	98.1	81.7	95.1
October 31, 1975	87.8	93.2	96.5	97.7	82.7	93.9
January 31, 1976	88.5	91.7	97.2	98.7	83.5	95.9
April 30, 1976	89.1	92.3	97.4	98.3	83.2	94.8
July 28, 1976	86.6	92.6	96.1	97.6	85.4	91.5
October 27, 1976	84.7	91.6	96.3	97.1	84.3	95.2
January 26, 1977	83.9	89.2	94.5	97.1	80.0	91.7
April 27, 1977	84.4	87.0	91.9	92.6	77.6	87.4
July 27, 1977	84.6	91.2	95.6	94.7	79.3	93.9
October 26, 1977	86.1	92.2	95.4	97.2	81.9	91.8
January 25, 1978	86.0	91.1	96.9	97.5	86.1	93.3
April 26, 1978	86.3	91.8	96.9	95.7	85.9	93.8

Notes: (1) Prior to the April 1975 survey the data are for "percent paying highest 50 basis point bracket" rather than "percent paying ceiling rates." However, the difference between the two series is generally less than 2 percentage points.

(2) In the July 1976 survey the sampling technique was changed. These changes are described in the December 1976 issue of the Federal Reserve Bulletin.

(3) Prior to the July 1976 survey all data are for "individuals, partnerships and corporations (IPC)." Subsequently, the savings category shown is for "individuals and nonprofit organizations" while all other categories are for "other than domestic government units."

Source: Federal Reserve Bulletin.

[4] In retrospect, there appears to be little evidence that the wildcard deposits resulted in a significant shift of small time deposits from the thrifts to banks. See Kane [6].

Some Survey Results Since the 1973 revision of Regulation Q, the FHLBB has conducted semi-annual surveys on the amounts outstanding of and the rates paid on the various categories of savings and small time deposits at savings and loan associations. Similar surveys, on a quarterly basis, of commercial banks have been conducted by the Federal Reserve since 1967. The information provided in these surveys is useful in answering the questions posed above. The survey data, collected from various issues of the *Federal Home Loan Bank Board Journal* and the *Federal Reserve Bulletin,* is presented below.

The Rates Paid The first set of survey information is the rates paid on the various categories of small time and savings deposits. The percent of banks paying the Regulation Q maximum rate is shown in Table Ia and the percent of savings and loan associations is shown in Table Ib.[5] Table Ia shows that most banks have paid the ceiling rates on all categories of small time and savings deposits since the new ceilings were instituted in 1973. For some banks, however, there was a lag before the high market rates of 1974 induced them to move to the new ceiling rates. In 1976 and 1977 some banks moved away from the ceiling rates in reaction to lower market interest rates, but most remained at the ceilings. When market interest rates moved higher in the second half of 1977 and the beginning of 1978, those banks that had lowered their rates returned to the ceiling rates.

The rate-setting behavior of savings and loan associations, shown in Table Ib, has been similar to that of banks. Most savings and loan associations have paid the ceiling rates in all maturity categories, except the 90-day to 1-year category. On average only 40 percent have paid the maximum rate on that category. As in the case of banks, some savings and loan associations moved away from the ceiling rates on longer term maturities when market interest rates declined in 1976 and 1977, and then returned to the ceiling rates when market rates subsequently rose.

Because the majority of both thrifts and banks paid the maximum rates on the various categories of small time and savings deposits throughout the 1973-1978 period, these rates can be used as a measure of the yields available on such deposits during that period. Chart 1 shows the differentials between the ceiling rates on small time deposits at banks and

Table Ib

PERCENTAGE OF SAVINGS AND LOAN ASSOCIATIONS PAYING CEILING RATES ON NEW DEPOSITS

	Savings	90 Days to 1 Year	1 to 2½ Years	2½ to 4 Years	4 to 6 Years	6 Years or More
September 30, 1973	86.9					
March 31, 1974	90.7	37.8	72.3	80.2	66.2	
September 30, 1974	92.5	38.5	77.3	82.8	90.8	
March 31, 1975	93.7	39.7	81.2	84.0	88.4	58.8
September 30, 1975	94.0	40.8	82.6	85.0	91.1	60.9
March 31, 1976	94.7	41.1	83.8	85.2	87.7	59.2
September 30, 1976	95.3	41.2	84.8	85.4	85.7	56.1
March 31, 1977	94.9	37.4	80.3	81.2	72.3	44.7
September 30, 1977	95.7	40.0	84.7	84.3	84.7	55.1
March 31, 1978	96.8	43.3	88.3	87.2	93.6	77.7

Source: Federal Home Loan Bank Board Journal.

rates on Treasury securities of comparable maturity. The chart illustrates that the attractiveness of a particular maturity category can change greatly over time. In addition, the relative attractiveness of the various categories of small time and savings deposits varies substantially as the yield curve on market instruments changes. Finally, the chart shows that the yield on the 4-year or over category has been the most attractive relative to market rates ever since it was created in 1973.

Movement in the Deposit Categories Tables IIa and IIb summarize the information from the surveys on the amounts of the various categories of small time and savings deposits outstanding at banks and savings and loan associations. Table IIa shows the amounts outstanding and percentage of the total for five categories of bank deposits, namely savings deposits and time deposits with original maturities of 30 days to 1 year, 1 to 2½ years, 2½ to 4 years, and 4 years or more.

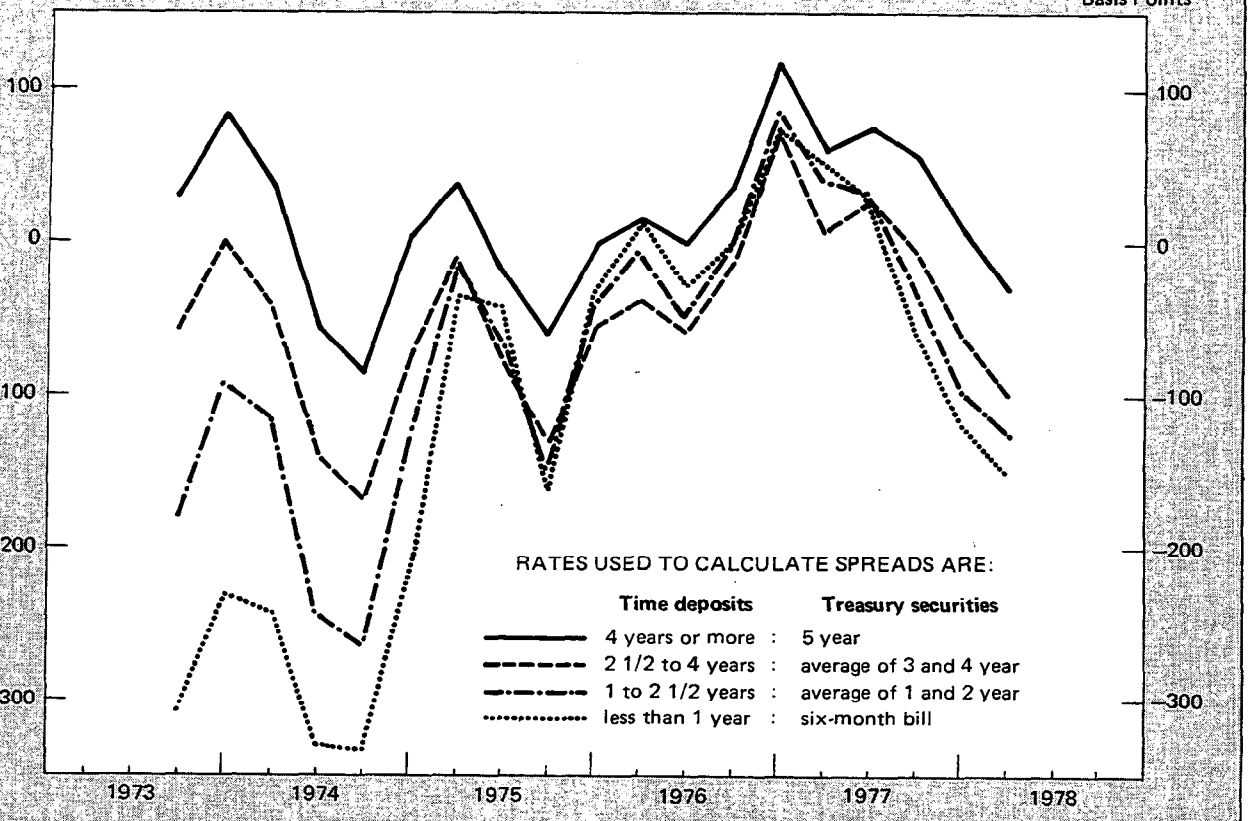
Charts 2 and 3 use the bank survey data from Table IIa to plot the quarterly movements of (1) savings deposits plus time deposits of less than 1-year maturity and (2) time deposits of maturity of 4 years or more. (Together these constituted 86 percent of total bank small time and savings deposits in the April 1978 survey.) The movement of the differentials between Regulation Q ceiling rates and market interest rates shown in Chart 1 is helpful in understanding the behavior of these deposits.

Chart 2 compares the spread between the bank ceiling rate on 90-day to 1-year deposits and the 6-month Treasury bill rate to the movement in

[5] Survey data are also collected on percent of deposits paying the maximum rate. The comments in this section would also apply if the data were shown on that basis rather than on the basis of percent of banks.

Chart 1

SPREADS BETWEEN CEILING RATES ON SMALL TIME DEPOSITS AT BANKS AND RATES OF TREASURY SECURITIES OF SIMILAR MATURITY



Note: All yields in this and subsequent charts are calculated on an effective annual basis. Effective bank ceiling rates are calculated under the assumption of daily compounding. Quarterly figures are averages of monthly data.

Sources: Federal Reserve Bulletin; Salomon Brothers, An Analytical Record of Yields and Yield Spreads.

savings plus time deposits less than 1-year at banks. The chart shows that quarterly movements in these deposits have varied over a wide range of —$1 billion to +$14 billion primarily in response to wide swings in short-term market interest rates around the Regulation Q ceiling rate. A noteworthy aspect of the behavior of the short-term deposits shown in Chart 2 is the sharp drop in the growth that accompanied a relatively small negative spread in late 1977. This sharp drop can be attributed to the run-off of highly interest sensitive short-term funds that had accumulated over the previous year-and-a-half when short-term yields on money market instruments fell below Regulation Q ceilings.

As shown in Chart 3, time deposits of maturity of 4 years or more have also varied with the attractiveness of that category's yield spread, although the variation has been much narrower than for short-term deposits. The sharp decline in inflows of the 4-year maturity during the July-October 1977 period can be attributed to the run-off of the wildcard deposits issued four years earlier. A large amount of these wildcard certificates at banks were shifted to the thrift institutions in response to the 25 basis point differential available at those institutions.[6]

The survey data in Table IIa is also useful in tracking trends in the overall composition of small time and savings deposits. The table shows that the percentage of total small time and savings deposits with an original maturity of 4 years or more rose from 1.4 percent in July 1973 to 19.1 percent in April 1978. The proportion in 2½- to 4-year deposits changed little over the 1973-78 period while the proportions in 1 to 2½ years and 30 days to 1 year declined. The proportion of the total in savings

[6] About $27 billion of the wildcard deposits were sold in 1973. Of these, about one-third were issued by banks.

Table IIa

ORIGINAL MATURITY OF SMALL TIME AND SAVINGS DEPOSITS AT COMMERCIAL BANKS

($ millions)

	Savings		Less Than 1 Year		1 to 2½ Years		2½ to 4 Years		4 Years or Over		
	Amount	% of Total	Amount	% of Total	Amount	% of Total	Amount	% of Total	Amount	% of Total	Total
July 31, 1973	124,086	54.4	42,963	18.8	48,170	21.1	9,841	4.3	3,203	1.4	228,263
October 31, 1973	124,217	54.1	38,944	16.9	45,543	19.8	11,576	5.0	9,506	4.1	229,786
January 31, 1974	126,175	53.4	38,638	16.4	45,037	19.1	13,262	5.6	12,954	5.5	236,066
April 30, 1974	129,928	53.6	37,592	15.5	42,670	17.6	14,391	5.9	17,592	7.3	242,173
July 31, 1974	131,701	53.6	36,107	14.7	41,006	16.7	15,326	6.2	21,364	8.7	245,504
October 31, 1974	132,449	53.7	34,621	14.0	38,744	15.7	15,865	6.4	24,895	10.1	246,574
January 31, 1975	135,856	53.5	34,628	13.6	37,240	14.7	17,365	6.8	28,752	11.3	253,841
April 30, 1975	144,250	53.9	36,329	13.6	36,203	13.5	18,568	7.0	32,450	12.1	267,800
July 31, 1975	151,965	54.1	37,443	13.3	35,872	12.8	19,500	6.9	35,956	12.8	280,736
October 31, 1975	154,282	54.0	37,262	13.0	35,397	12.4	20,318	7.1	38,603	13.5	285,862
January 31, 1976	165,470	54.7	38,424	12.7	36,006	11.9	20,453	6.8	42,070	13.9	302,423
April 30, 1976	178,190	55.7	40,019	12.5	36,093	11.3	19,357	6.0	46,399	14.5	320,058
July 28, 1976	180,698	56.2	39,773	12.3	33,008	10.3	18,690	5.8	49,281	15.3	321,450
October 27, 1976	187,506	55.8	41,761	12.4	34,002	10.1	18,402	5.5	54,098	16.1	335,769
January 26, 1977	199,028	56.5	42,620	12.1	33,979	9.6	17,646	5.0	59,090	16.8	352,363
April 27, 1977	206,416	56.5	43,062	11.8	34,077	9.3	18,119	5.0	63,556	17.4	365,230
July 27, 1977	210,081	56.4	43,895	11.8	34,207	9.2	18,768	5.0	65,804	17.7	372,755
October 26, 1977	211,928	56.9	41,492	11.1	34,601	9.3	18,539	5.0	66,132	17.7	372,691
January 25, 1978	213,184	56.7	41,296	11.0	33,977	9.0	18,463	4.9	68,864	18.3	375,782
April 26, 1978	216,622	56.6	39,743	10.4	34,075	8.9	19,181	5.0	72,948	19.1	382,569

Notes: (1) Data exclude domestic government units.

(2) In the July 1976 survey the sampling technique was changed. This created a discontinuity in the quantity data. The effect on the "percent of total" calculations, however, appears negligible.

Source: **Federal Reserve Bulletin.**

Table IIb

ORIGINAL MATURITY OF SMALL TIME AND SAVINGS DEPOSITS AT SAVINGS AND LOAN ASSOCIATIONS

($ millions)

	Savings		90 Days to 2½ Years		2½ to 4 Years		4 Years or Over		
	Amount	% of Total	Amount	% of Total	Amount	% of Total	Amount	% of Total	Total
September 30, 1973	103,451	49.3	95,996	45.8	2,740	1.3	7,504	3.6	209,691
March 31, 1974	104,600	47.4	82,724	37.5	6,680	3.0	26,782	12.1	220,786
September 30, 1974	102,763	46.0	65,679	29.4	9,351	4.2	45,702	20.4	223,495
March 31, 1975	109,399	45.7	52,306	21.9	11,671	4.9	65,789	27.5	239,165
September 30, 1975	116,819	45.1	47,921	18.5	13,774	5.3	80,678	31.1	259,192
March 31, 1976	124,557	44.0	48,956	17.3	14,046	5.0	95,501	33.7	283,060
September 30, 1976	129,885	42.9	49,778	16.4	13,485	4.5	109,824	36.2	302,972
March 31, 1977	136,813	41.5	52,748	16.0	14,061	4.3	126,145	38.3	329,767
September 30, 1977	142,457	40.3	54,494	15.4	14,562	4.1	141,549	40.1	353,062
March 31, 1978	146,252	39.3	53,996	14.5	14,942	4.0	157,085	42.2	372,275

Note: The FHLBB collects the deposit data on the basis of rate paid rather than term-to-maturity. The assumptions used to construct this table are that certificates with a rate equal to or less than a 6.50 percent rate are in the 90-day to 2½-year category; certificates with a rate from 6.51 to 6.75 are in the 2½- to 4-year category; and certificates with a rate greater than 6.75 are in the 4-year or over category. Because of the way in which the data are collected, no attempt was made to separate the 90-day to 1-year and 1- to 2½-year categories.

Source: **Federal Home Loan Bank Board Journal.**

deposits rose slightly on net from mid-1973 through early 1978.

Table IIb shows roughly the same breakdown for small time and savings deposits at savings and loan associations. Time deposits with an original maturity of 90 days to 1 year and 1 to 2½ years are combined in one category because of the way the data are collected by the FHLBB.[7] The table shows that the trends in the composition of small time and savings deposits have been similar to those at banks, although there are some significant differences. The savings component of total savings and loan association deposits fell from 49.3 percent in the September 1973 survey to 39.3 percent in the March 1978 survey. Another difference is that time deposits with an original maturity of 4 years or more had risen to 42 percent of total small time and savings deposits by March 1978.

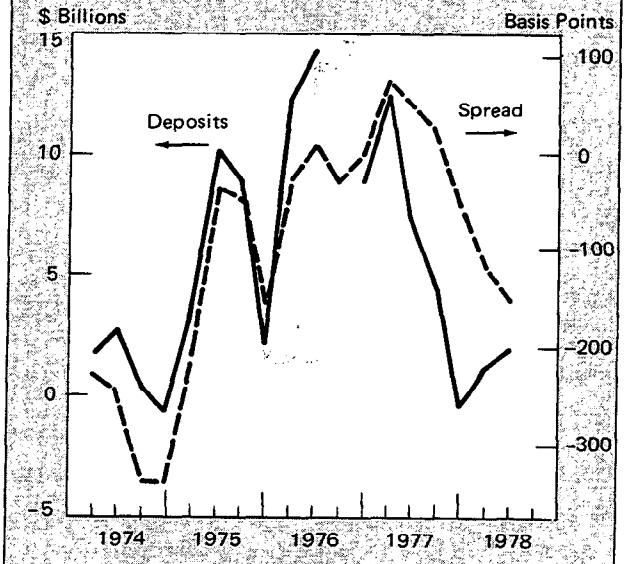
[7] See note, Table IIb.

Table IIb also demonstrates that the pattern of movement of the categories at S&L's as market interest rates have changed has been similar to the pattern at banks.

The Maturity Profiles The survey data in Tables IIa and IIb are on the basis of original maturity. The FHLBB also collects data on current time-to-maturity of outstanding deposits at savings and loan associations. These data, summarized in Table III, provide the best information on the impact of the 1973 Regulation Q revision on the maturity of outstanding deposits. Table III shows that in the first half of the five-year period there was a steady decline in the proportion of deposits highly vulnerable to disintermediation, i.e., savings deposits plus time deposits maturing in less than 1 year. When short-term rates fell below Regulation Q ceiling rates in 1976 and 1977, however, the resulting huge inflow of short-term deposits had the effect of actually raising the overall proportion of deposits especially vulner-

Chart 2

CHANGES IN SAVINGS PLUS TIME DEPOSITS LESS THAN ONE YEAR AT BANKS COMPARED TO YIELD SPREAD



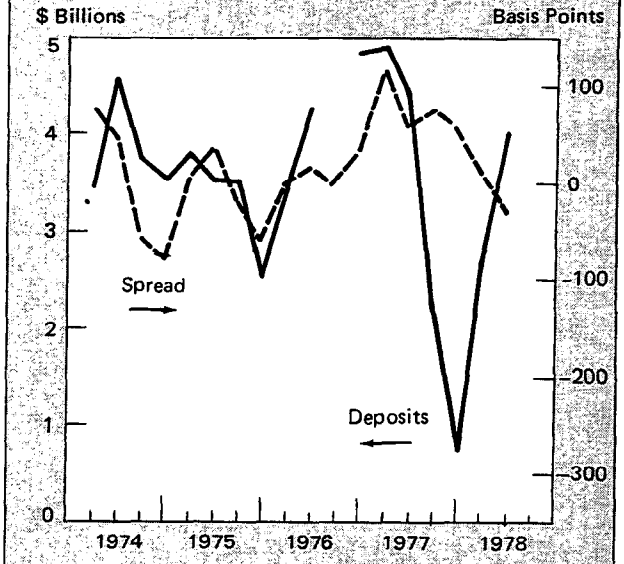
Notes: (1) Spread shown is the ceiling rate on three-month to one-year deposits less the six-month Treasury bill rate.

(2) Deposits are not plotted for July 1976 because the sampling technique was changed as of that survey.

Sources: Federal Reserve Bulletin; Salomon Brothers, An Analytical Record of Yields and Yield Spreads.

Chart 3

CHANGES IN TIME DEPOSITS OF FOUR YEARS OR MORE AT BANKS COMPARED TO YIELD SPREAD



Notes: (1) Spread shown is the ceiling rate on 4 to 6 year time deposits less the yield on five-year Treasury securities.

(2) Deposits are not plotted for July 1976 because the sampling technique was changed as of that survey.

Sources: Federal Reserve Bulletin; Salomon Brothers, An Analytical Record of Yields and Yield Spreads.

able to disintermediation. This shows up clearly in Table III. The ratio of savings and small time deposits maturing in less than a year to total small time and savings deposits dropped steadily from 74.7 percent in the March 1973 survey to 63.2 percent in the September 1975 survey. Subsequently, however, the ratio rose to 66.7 percent in the September 1977 survey. The March 1978 survey shows a drop back to 63.6 percent in this ratio following the withdrawal of interest sensitive short-term deposits from S&L's in reaction to rising market interest rates.

The Federal Reserve surveys do not collect data on the current maturity of outstanding deposits. However, it was shown earlier that the proportion of total bank small time and savings deposits with an original maturity of at least 4 years had risen only to 19.1 percent by April 1978. Furthermore, it was shown that the proportion in savings deposits actually rose slightly over the period covered in Table IIa. Consequently, it can safely be concluded that the bank ratio of savings plus small time and savings deposits maturing in less than a year to total small time and savings deposits declined significantly less over this period than did the S&L ratio.

Table III

MATURITY OF OUTSTANDING SMALL TIME AND SAVINGS DEPOSITS AT SAVINGS AND LOAN ASSOCIATIONS

(Percentages)

	Savings	Maturing Within 1 Year	Maturing in 1 to 2 Years	Maturing After 2 Years	Savings + Maturing Within 1 Year
March 31, 1973	50.4	24.5	21.4	3.7	74.7
September 30, 1973	48.8	27.8	16.2	7.2	76.6
March 31, 1974	46.5	27.8	9.8	15.8	74.3
September 30, 1974	46.0	23.5	7.9	22.6	69.5
March 31, 1975	45.7	18.7	6.8	28.8	64.4
September 30, 1975	45.1	18.1	7.6	29.3	63.2
March 31, 1976	44.0	17.5	13.3	25.2	61.5
September 30, 1976	42.9	19.0	15.7	22.4	61.9
March 31, 1977	41.5	24.3	13.6	20.6	65.8
September 30, 1977	40.3	26.4	10.6	22.6	66.7
March 31, 1978	39.2	24.4	7.9	28.5	63.6

Source: **Federal Home Loan Bank Board Journal.**

The Impact of the Ceiling Rate Differential The survey data are also useful in assessing the impact of the differential between the ceiling rates at thrifts versus banks. From the September/October 1973 surveys to the March/April 1978 surveys, savings deposits at banks rose $92.4 billion, while savings deposits at S&L's only rose $42.8 billion, despite the 25 basis point differential favoring S&L's. As a result, the proportion of savings deposits at banks to total savings deposits at banks and S&L's rose from 54.6 to 59.7 percent. Over the same period, however, small time deposits of original maturity of 4 years or more rose $63.4 billion at banks and $149.6 billion at S&L's. Consequently, the percentage of small time deposits of 4 years or more at banks to the total of those deposits at banks and S&L's combined was only 31.7 percent at the end of the period. While small time deposits of original maturity of less than 4 years declined at both banks and S&L's over the period, the proportion of the total at banks rose from 49.3 to 57.4 percent.

As noted, the rationale for the differential favoring S&L's is that it is necessary to offset the inherent competitive advantage that banks have in offering a wide variety of financial services. On the one hand, the survey data appear to support this rationale with respect to regular savings accounts, which typically involve several transactions over time. In fact, the survey data indicate that the 25 basis point differential has been insufficient to offset the advantage banks have in competing for savings deposits. On the other hand, the survey data clearly do not support the need for a 25 basis point differential on the ceiling rate for small time deposits of 4 years or more, which involve only one transaction at the beginning of a four- or six-year period. The differential has apparently induced most savers to place these deposits at the thrift institutions.

The survey data is ambiguous concerning the impact of the differential on competition for small time deposits of original maturity of less than 4 years. As indicated, the banking sector's share of these deposits has risen over the survey period. A large percentage of S&L's, however, has not paid the maximum rate on small time deposits of less than 1 year. (See Table Ib.) Therefore, the increased bank share of these deposits can not necessarily be attributed to an insufficient ceiling rate differential.

Summary of the Survey Data Before turning to the aggregate data, it may be useful, as a preliminary, to summarize the major conclusions of the Federal Reserve and FHLBB surveys:

(1) Most banks and S&L's kept their rates at the Regulation Q ceiling rates throughout the 1973-78 period. However, the proportions of banks and S&L's paying the ceiling rates varied somewhat in response to movements in market interest rates.

(2) Since the 1973 revision of Regulation Q, the fastest growing category of small time and savings deposits at both banks and S&L's has, on average, been deposits of 4 years or more in original maturity.

(3) When short-term money market rates fall to or below Regulation Q ceiling rates, the depository institutions experience large inflows of highly interest sensitive short-term funds, which are subsequently withdrawn when market rates rise. Consequently, movements of market interest rates above and below the Regulation Q ceilings (especially ceilings for short-term maturities) have continued to cause wide swings in inflows of small time and savings deposits.

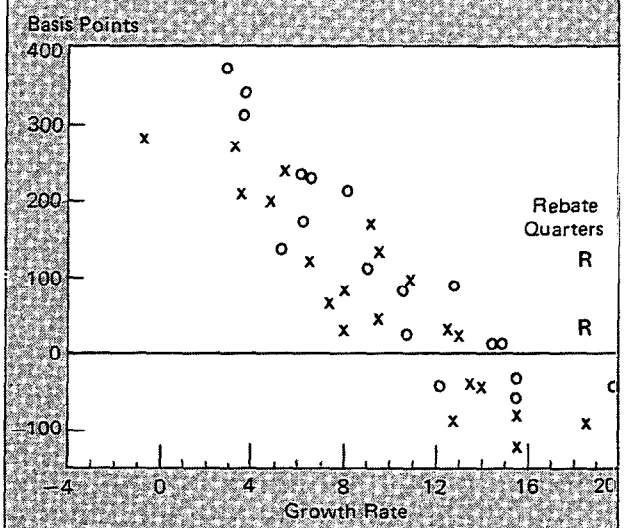
(4) Since the 1973 revision of Regulation Q, there has been a moderate decline in the proportion of small time and savings deposits at S&L's maturing within 1 year. While survey data on current maturity are not collected in the Federal Reserve surveys, it appears that the proportion of small time and savings deposits at banks maturing within 1 year has declined significantly less than at S&L's.

(5) The 25 basis point differential that the thrift institutions can pay on small time and savings deposits has not offset the advantage of banks in the competition for savings deposits. The differential has, however, given the thrifts a competitive advantage in the sale of long-term certificates.

The Aggregate Data Chart 4 compares the quarterly growth rates of total small time and savings deposits at both banks and thrift institutions to the spread between the six-month bill rate and the ceiling rate on 90-day to 1-year deposits.[8] The "X's" show the growth rates from 1968 II through 1973 II, while the "O's" show the growth rates from 1973 III through 1978 II. Over the period shown in Chart 4, there was a fairly stable linear relationship between the growth rate of small time and savings deposits and the yield spread. A demand equation based on this relationship is estimated in the Appendix to this

Chart 4

GROWTH RATE OF TOTAL SMALL TIME AND SAVINGS DEPOSITS COMPARED TO YIELD SPREAD



Notes: (1) Spread is the six-month Treasury bill rate less the ceiling rate on 90-day to one-year time deposits.

(2) Deposit growth rates are seasonally adjusted annual rates.

Sources: Board of Governors of the Federal Reserve System; Federal Home Loan Bank Board; Salomon Brothers, **An Analytical Record of Yields and Yield Spreads.**

article. A major exception to the relationship occurred in the second and third quarters of 1975, when the tax rebates boosted deposit growth rates to higher levels than would have been expected given the behavior of market interest rates at the time. These quarters are indicated on the chart.

Chart 4 shows that yield spreads in favor of deposits have resulted in very large quarterly growth rates. Conversely, large yield spreads (as high as 3 percentage points) in favor of money market instruments have resulted in a negative growth rate of small time and savings deposits only once during the period. To appreciate this aspect of the behavior of the growth rate of total small time and savings deposits, it is useful conceptually to divide depositors into two groups, those who are sensitive to interest rate movements and those who are not. There is evidence that the two groups correspond roughly to large savers and small savers.[9] Investors in the

[8] The aggregate commercial bank small time and savings deposit series used in this section was calculated by subtracting a series on large time deposits greater than $100,000 constructed by the Board of Governors from total time and savings deposits. The aggregate small time and savings deposits series for the thrift institutions includes all time and savings deposits, because data on large time deposits at S&L's are not available prior to 1976. As of the end of 1977, however, large time deposits constituted only 2.4 percent of total S&L deposits. Consequently, the bias in comparing the movement in the two series is quite small.

[9] Evidence supporting this view is provided in an article by Goldman [4] based on a survey of the behavior of savings balances by size at 25 S&L's during the 1974 period of disintermediation.

latter group have not been interest sensitive primarily because they have had limited access to money market instruments.

When yield spreads are favorable to small time and savings deposits, there is a large inflow of funds, especially short-term, from interest rate sensitive investors. Hence, relatively modest positive spreads between Regulation Q rates and Treasury bill rates have generally resulted in high growth rates of small time and savings deposits. On the other hand, when the spreads turn negative, interest sensitive funds return to the market. However, investors who are not interest sensitive continue to put money into deposits. As a result, the growth rate of small time and savings deposits has almost always been positive despite the behavior of the interest sensitive group of depositors.

Impact of the 1973 Regulation Q Revision Chart 4 provides no indication of a decrease in the sensitivity of small time and savings deposits to movements in short-term interest rates following the 1973 revision of Regulation Q. That is, the relationship between the growth rate of small time and savings deposits and the spread between the bill rate and the Regulation Q ceiling rate appears very similar in the 1968 II - 1973 II and 1973 III - 1978 II periods. This is consistent with the survey data, which showed only a small decline in the latter period in the proportion of small time and savings deposits maturing within one year. Furthermore, the regression equation reported in the Appendix provides additional support for this observation. Therefore, it is reasonable to conclude that at least through 1978 II, the 1973 revision of Regulation Q did not reduce the sensitivity of the growth rate of small time and savings deposits to movements in short-term market rates relative to Regulation Q ceiling rates.

Disintermediation: Banks Versus Thrift Institutions The FHLBB and Federal Reserve survey data reviewed earlier showed that, compared to banks, thrift institutions have a larger proportion of their total small time and savings deposits in long-term certificates and a smaller proportion in savings deposits. Accordingly, the percentage of small time and savings deposits especially vulnerable to disintermediation was somewhat lower at the thrifts than at banks. In view of the survey data, one might expect total small time and savings deposits to hold up better at the thrifts than at banks in periods of rising interest rates. Do the aggregate data support this expectation?

This question is difficult to resolve for several reasons. First, there were several other events in recent years affecting the relative growth rates of small time and savings deposits at banks and thrift institutions. Foremost among these were the sale of the wildcard deposits in 1973, two-thirds of which were sold by the thrift institutions, and the maturing of these wildcard deposits in 1977. A large part of the maturing wildcard deposits at banks were shifted to the thrift institutions and, perhaps, to other investments. As a result, the growth of small time and savings deposits at banks, compared to thrifts, declined in the second half of 1977.

The second problem in comparing the interest sensitivity of demand for small time and savings deposits at the two sectors is that over the earlier part of the period the large commercial bank time deposit data, used to construct the small time deposit series, are probably not of very high quality.[10] A third relatively minor problem is that while large time deposits greater than $100,000 have been removed from the bank data, a small amount of large time deposits remains in the thrift data.

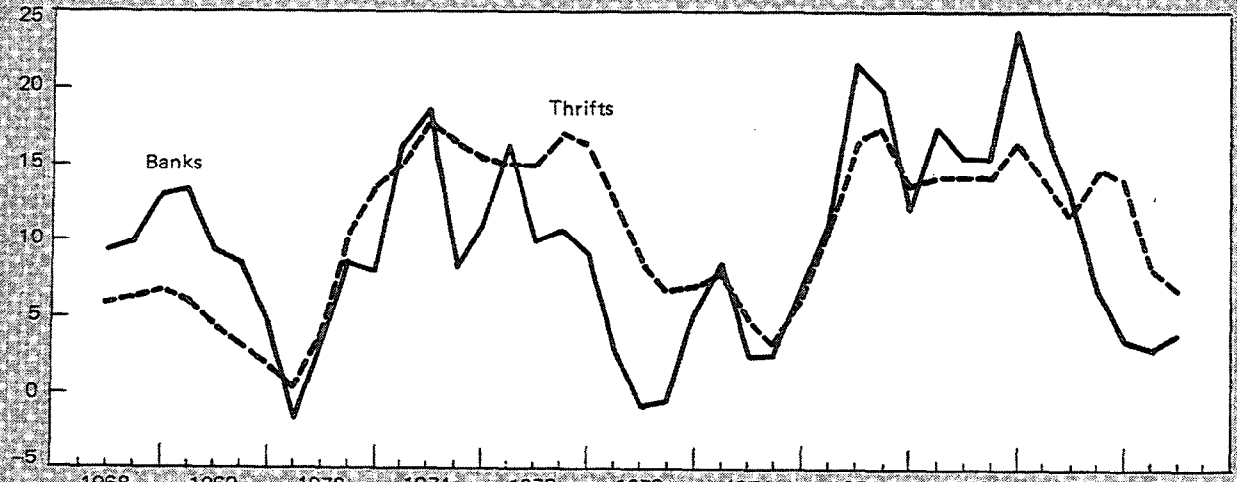
Chart 5 compares the growth rates of small time and savings deposits at commercial banks and the thrift institutions. Clearly, the growth rates have moved together over the past ten years. There appears, however, to be some tendency for the thrift growth rate to fluctuate less in response to changing interest rates in the latter half of the period. From 1973 through 1978 the growth rate of small time and savings deposits at banks varied over a —0.9 to 24.2 percent range, while the comparable range at the thrift institutions was only 3.7 to 17.4 percent. Therefore, short of a firm conclusion, the aggregate data appear to support the view that the growth rate of small time and savings deposits at the thrifts has been slightly less interest sensitive over the last five years than the growth rate at commercial banks. In any case, the similarity in the behavior of the two growth rates is much more striking than the difference.

The 1978 Revision of Regulation Q and the Emergence of Money Market Funds In 1977 and early 1978 market interest rates rose to levels equaling or surpassing Regulation Q ceilings. At a result, the growth rate of small time and savings deposits

[10] The large time deposit data used in this study is based on actual survey data beginning in 1973. From 1968 through 1972, however, it is constructed on the assumption that the ratio of large time deposits to negotiable CD's at weekly reporting banks was stable. The Board of Governors is in the process of constructing a new large time deposit series using some survey data in the earlier period.

Chart 5

GROWTH RATES OF SMALL TIME AND SAVINGS DEPOSITS AT BANKS AND THRIFT INSTITUTIONS



Note: Growth rates are seasonally adjusted annual rates.

Sources: Board of Governors of the Federal Reserve System; Federal Home Loan Bank Board.

declined sharply. The regulatory response was predictable: Regulation Q ceilings were again adjusted. Two changes were made as of the beginning of June 1978. The first change established a new category of time deposits having a maturity of 8 years or longer. The ceiling rates on this category were set at 7¾ percent for banks and 8 percent for the thrift institutions.

The second and more dramatic change in Regulation Q was the introduction of 6-month "money market certificates" with ceiling rates tied to the average return in the weekly auction of 6-month Treasury bills. Banks are allowed to offer the average auction rate on these certificates. The thrifts are allowed to pay ¼ of a percentage point higher, the usual differential.[11] The minimum denomination for the new certificates is $10,000, the same as the minimum denomination of bills at the weekly Treasury auctions.

In the past, Treasury securities have been the major investment alternative for those depositors whose demand for small time and savings deposits has been sensitive to the movement in market interest rates. By providing this group of savers with the alternative of receiving a yield competitive with the Treasury bill rate, money market certificates should work to raise the growth rate of total small time and savings deposits consistent with any given market rate.

Money Market Mutual Funds While the introduction of money market certificates is a development that should decrease disintermediation, another recent development should work to *increase* disintermediation. This development is the emergence of the money market mutual fund as a major financial market institution. Money market mutual funds were established in reaction to the high interest rates of 1973-74. Many small investors were prevented from obtaining high market yields during that period because they lacked sufficient funds to meet the minimum purchase requirement for Treasury bills, let alone the much larger minimum requirements typical of other money market investments.[12]

As of mid-1978 there were over 50 money market mutual funds offering shares in portfolios of various types and combinations of money market instruments. Because the assets of these funds are short-term, the yield on shares in them tends to follow the yield on current money market instruments with a fairly short lag. Minimum purchase requirements

[11] For a detailed description of the actual yield calculation for the money market certificates see Kasriel [7].

[12] According to two recent studies, Pyle [8] and Hendershott [5], the loss in interest to the small saver as a result of binding Regulation Q ceilings in the three-year period 1973-75 was $6 to $9 billion.

are frequently only $2500 and sometimes as low as $1000. Consequently, money market mutual funds offer the opportunity to obtain money market yields to those small investors who previously were unable to purchase money market instruments. As market interest rates in the latter part of 1977 and in 1978 rose relative to Regulation Q ceilings, the purchase of money market mutual fund shares expanded sharply. About $1 billion were purchased every two months during the first eight months of 1978. The level outstanding as of August was $7.9 billion.

Implications for Deposit Growth The net effect on disintermediation of money market certificates and money market mutual funds cannot be assessed with certainty. However, in view of the huge amount of funds that have shifted from the deposit institutions into the Treasury market in past periods of high interest rates, it seems likely that the positive effect of money market certificates will dominate the negative effect of money market funds. If so, the growth rate of total small time and savings deposits will be less variable than in the past. One conclusion that can be made with a fair amount of certainty is that without the 1978 revision of Regulation Q, the rapid growth of money market mutual funds would have caused the growth of small time and savings deposits to fall even more in periods of rising market rates than it had in the past.

What is likely to be the relative impact of the money market certificates on the behavior of small time and savings deposits at banks versus the thrift institutions? On the basis of the survey data examined earlier, it can be expected that, due to the 25 basis point differential, these certificates will have a greater impact on deposits at thrifts than at banks. The very limited amount of data available as of this writing supports this expectation. Federal Reserve data indicate that in the three months following the introduction of the certificates, commercial banks sold $7.8 billion, while savings and loan associations and mutual savings banks sold $14 billion and $5 billion, respectively. The net impact on the growth rate of small time and savings deposits was also clearly greater at the thrift institutions. The average annual rate of growth of small time and savings deposits at the thrift institutions was 7.4 percent in the six months ending May 1978. In the following three months the annualized growth rate at these institutions rose to 11.4 percent. The growth rate at banks, however, only rose from 5.1 to 5.3 percent in the same period.

The expectation that thrifts will benefit more than banks from the money market certificates assumes that the thrifts will offer them at the maximum rate. It is possible that at certain market interest rate levels many thrifts, because of the long-term maturity of their assets, would no longer be willing to offer the ceiling rate. In such a case, the relative impact of the certificates on banks versus thrifts may well shift toward banks.

Large Time Deposits as a Response to Disintermediation Total time deposits include large time deposits, defined as those greater than $100,000, as well as the smaller time and savings deposits that have been discussed to this point. Regulation Q ceilings on these large deposits were suspended in June 1970 for maturities of 30 to 90 days and in May 1973 for all other maturities. The surveys discussed earlier showed S&L's with only $10.8 billion of these large time deposits in March 1978, while commercial banks had $164.9 billion in April of that year.

Since the early 1970's, sales of large time deposits by banks in periods of high interest rates have more than offset declines in inflows of small time and savings deposits.[13] In fact, while there is a strong negative correlation from 1972 through early 1978 between the growth rate of small time and savings deposits and spreads between market rates and Regulation Q ceilings, there is actually a positive correlation between the growth rate of *total* time and savings deposits and market rates and those spreads.

Until recently the thrift institutions had not raised a significant amount of funds through large time deposits. Recent FHLBB surveys, however, show that from September 1977 through March 1978, S&L's raised $2.2 billion dollars, or 10.5 percent of their net increase of total deposits, through large time deposits. This was the highest percentage on record and indicates that some thrift institutions are increasing the use of large time deposits not subject to Regulation Q ceilings as a response to disintermediation.

Regulation Q and the Monetary Aggregates To the extent that the 1978 revision of Regulation Q decreases the interest sensitivity of small time and savings deposits at banks and thrift institutions, the

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[13] The inverse relationship between the growth of small time and savings deposits and the growth of large time deposits is shown in Cook [3].

[14] The correlation coefficient between the growth rate of small time and savings deposits and the spread between the 6-month bill rate and the ceiling rate on 6-month certificates was −.69 from 1972 I through 1978 I. The correlation coefficient between the growth rate of total time and savings deposits and the spread was +.26 over the same period.

relative growth rates of the monetary aggregates in periods of high market interest rates will be affected. In particular, the growth rates of the broader aggregates will be higher relative to the growth rate of M_1. Consequently, a given M_1 policy rule will result in a more rapid growth rate of the broader aggregates in expansionary periods. This has become a cause of concern among those who believe the broader aggregates are more appropriate intermediate targets for monetary policy than M_1.

Even among the broader aggregates, relative growth rates are likely to be affected by the money market certificates. In particular, in periods of high market rates, the certificates probably will raise the growth rate of M_5 relative to the growth rate of M_4 and also the growth rate of M_3 relative to M_2.[15] This will occur because M_5 and M_3 include small time and savings deposits at both banks and the thrift institutions, while M_2 and M_4 only include those deposits at banks. Hence, small time and savings deposits are a larger component of M_3 than of M_2 and a larger component of M_5 than of M_4.[16]

Summary This article has examined the impact of Regulation Q ceiling interest rates on the behavior of small time and savings deposits at banks and the thrift institutions. It has attempted to show the close relationship that exists between movements in market interest rates around these ceilings and movements in small time and savings deposits. This relationship shows up clearly in the Federal Reserve and Federal Home Loan Bank Board survey data as well as in the aggregate deposit data. The relationship between the aggregate growth rate of small time and savings deposits and movements in short-term interest rates relative to Regulation Q ceiling rates appears quite stable over the 1968-78 period. In particular, there appears to have been no decrease in the sensitivity of the demand for small time and savings deposits to movements in short-term interest rates following the 1973 change in Regulation Q.

The 1978 revision of Regulation Q introducing money market certificates should work to decrease the sensitivity of total small time and savings deposits to market interest rates. However, other recent developments, especially the emergence of money market mutual funds, should have the opposite effect. While the net impact of these developments is uncertain, the evidence to date suggests that the growth of small time and savings deposits following the introduction of the money market certificates has been greater than in past periods of comparable spreads between money market rates and Regulation Q ceilings. To the extent that the money market certificates affect the interest sensitivity of total small time and savings deposits, the relative growth rates of the monetary aggregates in periods of rising interest rates will be different than in the past.

[15] M_2 equals M_1 plus small time and savings deposits at banks plus large time deposits at banks other than negotiable CD's at weekly reporting banks; M_4 equals M_2 plus those large time deposits not included in M_2, about half of the total; and M_3 equals M_2 plus time and savings deposits at the thrifts plus credit union shares. M_5 equals M_3 plus negotiable CD's at weekly reporting banks.

[16] Specifically, the interest elasticity (a measure of the responsiveness to a change in interest rates) of any of the monetary aggregates equals a weighted average of the elasticity of its components, where the weight assigned each component is its proportion of the total aggregate. If the impact of the money market certificates on the interest elasticity of small time and savings deposits at banks and the thrift institutions is the same, then the interest elasticity of M_3 would decrease relative to that of M_2 simply because the share of small time and savings deposits in M_2 is less than that in M_3. If the interest elasticity of small time and savings deposits drops more at thrifts than at banks as a result of the certificates, then the interest elasticity of M_3 would decrease even more relative to M_2.

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APPENDIX

THE DEMAND FOR SMALL TIME AND SAVINGS DEPOSITS

This Appendix first estimates a demand equation for total small time and savings deposits. The equation is subsequently used to test the hypothesis that the introduction of longer maturity time deposits in 1973-74 succeeded in reducing the interest sensitivity of the demand for small time and savings deposits. The following stock adjustment model was specified in logarithmic form:

$$(1)\quad \log STSD - \log STSD_{-1} = \lambda(\log STSD^* - \log STSD_{-1})$$

where STSD is the actual level of small time and savings deposits at banks and the thrift institutions and STSD* is the public's desired level. The change in STSD in any period is specified as a function of the difference between the desired and actual levels of STSD and the speed of adjustment parameter λ.

The desired level of small time and savings deposits is specified as a function of the spread between the six-month bill rate and the maximum rate on three- to twelve-month certificates at banks (SPR) and GNP (Y):

$$(2)\quad STSD^* = ae^{bSPR}Y^c$$

Substituting for STSD* in the stock adjustment equation, we get

$$(3)\quad \log STSD = \lambda \log a + b\lambda SPR + c\lambda \log Y + (1-\lambda)\log STSD_{-1}$$

This specification, which was chosen on the basis of the information in Chart 4, constrains the growth rate of small time and savings deposits to be a linear function of the yield spread. The coefficient, c, is an estimate of the income elasticity of the demand for small time and savings deposits.

The regression results are reported in the Table. Equation (A) is the basic equation (3) above, Equation (B) adds dummy variables for the temporary impact of the tax rebates, REB, in mid-1975 on the holdings of small time and savings deposits. The equations are estimated using ordinary least squares. The coefficients all have the expected signs and are significant at the 5 percent level. In particular, the interest rate spread variable exerts the expected negative influence on the demand for small time and savings deposits and has a very high t-statistic. The speed of adjustment and income elasticity estimates will be discussed below.

The hypothesis that the interest sensitivity of the demand for small time and savings deposits changed in the latter half of the period was tested by adding the following variable to the equation:

$$Q = DUM \cdot SPR,$$

where DUM = 0 1968 II to 1973 II
= 1 1973 III to 1978 I

If the coefficient of Q is positive and significantly different from zero, then the conclusion can be made that the interest sensitivity of the demand for small time and savings deposits is less in the latter half of the period. Equation (C) in the Table adds Q to Equation (B). The regression results show a coefficient of Q that is positive, but very small and not

REGRESSION RESULTS: THE DEMAND FOR SMALL TIME AND SAVINGS DEPOSITS

Dependent Variable	Constant	SPR	log Y	log STSD$_{-1}$	REB	REB$_{-1}$	Q	$\bar{R}^2$	SE	h
(A) log STSD	−.4152	−.0089	.2250	.8144				.9997	.0052	1.45
	(5.11)	(12.81)	(5.02)	(21.07)						
(B) log STSD	−.2866	−.0085	.1569	.8716	.0096	.0169		.9998	.0045	1.42
	(3.66)	(14.10)	(3.65)	(23.66)	(1.99)	(3.48)				
(C) log STSD	−.2659	−.0090	.1489	.8775	.0098	.0167	.0008	.9998	.0045	1.45
	(3.18)	(10.59)	(3.34)	(23.15)	(2.02)	(3.42)	(.74)			

Note: The spread is expressed in percentage points and the variables are measured in billions; t-statistics are in parentheses. The Treasury bill and deposit rates are both calculated on an effective annual basis.

significantly different from zero. Hence, they offer no support for the view that the 1973 changes in Regulation Q reduced the sensitivity of the demand for small time and savings deposits to movements in short-term rates relative to Regulation Q ceiling rates.

The speed of adjustment implied by the coefficients of $STSD_{-1}$ are .186 in Equation (A), .128 in Equation (B), and .122 in Equation (C). The estimates of the income elasticity (the coefficient of Y divided by the estimate of λ) are within a narrow range of 1.21 to 1.23. The estimates of the speed of adjustment and the income elasticity should be viewed with caution since they are determined by the coefficients of log $STSD_{-1}$ and log Y. These two variables are highly correlated over the period.

The last column in the Table reports Durbin's h-statistic, which is used to test for serial correlation in the presence of a lagged dependent variable. The hypothesis of zero autocorrelation can not be rejected at the 5 percent significance level. It can, however, be rejected at the 10 percent level. The equations in the Table were re-estimated using the Cochrane-Orcutt procedure. The coefficients all were very close to those reported in the Table. In particular the coefficient of Q was little changed.

CORRESPONDENT SERVICES, FEDERAL RESERVE SERVICES, AND BANK CASH MANAGEMENT POLICY

Bruce J. Summers

An earlier article published in this *Review* [4] discussed the operational and legal factors that determine bank holdings of cash assets. It showed that smaller sized nonmember banks in the Fifth Federal Reserve District have operating cash requirements that exceed by a substantial margin the legal reserve requirements to which they are subject. Conversely, smaller sized member banks are subject to legal reserve requirements that cause them to hold more cash assets than needed purely for operating purposes. Accordingly, legal reserve requirements for nonmember banks, which are established by the various states, are described as nonbinding. On the other hand, reserve requirements for member banks, which are set by the Federal Reserve within limits established by Congress, are described as binding.

The key difference between state and Federal reserve requirements leading to differences in nonmember and member bank cash asset ratios centers around the definition of eligible reserve assets. State requirements allow banks to count several types of cash balances, including balances held with correspondent banks, as eligible reserves. Federal requirements allow vault cash and deposits with the Federal Reserve, but not correspondent balances, as eligible reserve assets. In general, correspondent balances are held by both nonmember and member banks to compensate private correspondent banks for services received. For nonmember banks such balances serve a double purpose since they also count toward satisfying the legal reserve requirement. Many smaller member banks hold compensating balances with correspondent banks in addition to holding reservable assets as specified by Federal legal requirements.

The conclusion that member bank, but not nonmember bank, reserve requirements are binding is an empirical finding based on comparisons of average cash assets for the two groups. Smaller member banks on average hold more cash assets than their nonmember counterparts. But it cannot automatically be concluded from this that individual member banks *must* hold such excess balances. The Federal Reserve System makes available to member banks a number of correspondent type services free of explicit charge. To the extent that member banks substitute Federal Reserve services for those of private correspondent banks they may be able to operate with smaller correspondent balances and hence with lower levels of total cash assets than otherwise. Indeed, it may be possible that, through intensive use of Federal Reserve services, smaller member banks may reduce their total cash requirements to levels comparable with, or even below, those of similarly situated nonmembers.

This article examines how use of Federal Reserve System services affects member bank cash management policy. The first section reviews the types of correspondent services that are important to banks. The second section describes the services made available to member banks by the Federal Reserve and indicates the extent to which those services are utilized by member banks in the Fifth Federal Reserve District. In the third section, cash asset positions of member banks using System services heavily are compared with cash asset positions of other member and nonmember banks of similar size located in the same state. Conclusions are summarized in the fourth section.

Importance of Correspondent Services In mid-1976 the American Bankers Association sponsored a survey to determine the relative importance of different correspondent services to respondent banks [1]. Over 200 correspondent banks participated in the survey. They were asked to evaluate 39 specific services in terms of how important they were to respondent bank customers. The survey participants rated each of the services on a scale of 5 to 1, where a rating of 5 indicates "very important," a rating of 3 "slightly important," and a rating of 1 "not at all important." Table I ranks in descending order of importance the 20 services receiving the highest average scores on the survey.

Table I

CORRESPONDENT SERVICES RANKED IN ORDER OF IMPORTANCE

AMERICAN BANKERS ASSOCIATION SURVEY

Type of Service	Average Score[1]	Percent of Correspondent Banks Offering Service
1. Overline and liquidity loan participation assistance	4.68	97
2. Handling check collection for respondent banks	4.55	100
3. Offer EDP services to respondent banks	4.42	80
4. Regularly sell Federal funds to respondent banks	4.26	90
5. Purchase Federal funds from respondent banks other than for own needs	4.25	94
6. Offer fund transfers	4.24	98
7. Participate in term loans originated by respondent banks	4.03	92
8. Provide security safekeeping services to respondent banks	4.00	93
9. Offer loans to directors and officers of respondent banks, including bank stock loans	3.99	93
10. Offer a systematic portfolio analysis service to respondent banks	3.99	55
11. Actively buy and sell U. S. Govt. and agency securities to respondent banks	3.98	78
12. Offer access to ACH services to respondent banks	3.96	75
13. Assist respondent banks in raising capital or meeting capital adequacy standards	3.95	72
14. Actively buy and sell municipal securities to respondent banks	3.94	72
15. Actively deal in commercial paper, bankers' acceptances, negotiable CD's, RP's, etc., for respondent banks	3.83	77
16. Sell loans or participations in pools of loans to respondent banks for investment purposes	3.82	65
17. Provide currency and coin to respondent banks	3.74	98
18. Offer respondent bank customers point-of-sale transfer services	3.71	19
19. Assist respondent banks by revising or improving their procedures	3.65	83
20. Assist respondent banks in a full range of international banking transactions	3.46	63

[1] Average of 220 correspondent bank responses, each of which ranked the services on a scale of 5 to 1 in descending order of importance to their respondent bank customers.

Source: Clark [1].

Correspondent banks rate overline credit and liquidity loan participations as the most important service they offer. The importance to banks of a source of liquidity is indicated by more than the number one ranking given overlines and loan participation services, however. Two other services, regular Federal funds sales to respondent banks (number four) and participation in term loans originated by respondent banks (number seven), also receive high scores and are directly related to respondent bank liquidity needs. These results suggest that immediate credit availability to meet both temporary funds deficiencies and longer term loan demands is of foremost importance to respondent banks. Liquidity services are widely available, with at least 90 percent of all correspondent banks participating in the survey offering each of these services.

In addition to liquidity requirements, certain service requirements relating to bank operations also receive high ranking. Check collection is the most important of these operating services, as indicated by its number two ranking and by the fact that 100 percent of correspondent banks offer it. Also highly ranked are data processing services (number three), fund transfers (number six), and security safekeeping services (number eight). Automated clearinghouse services and currency and coin services are of somewhat lesser importance. Correspondent banks also act as agents for their respondents in the purchase and sale of U. S. Government and municipal securities, and money market instruments such as commercial paper, bankers' acceptances, and negotiable CD's.

A third general category of services that seems significant is management advice. Portfolio advice ranks tenth in importance in Table I, although only 55 percent of the correspondent banks offer such advice. More commonly offered is assistance in meeting capital needs (number thirteen) and advice in improving operating procedures (number nineteen).

Respondent banks reimburse their correspondents for the types of services listed in Table I primarily by holding compensating demand deposit balances. Data processing services are an exception to this general rule, however, with fees being more important than compensating balances. Among the banks reporting in the 1976 ABA survey, 63.5 percent derived less than 5 percent of their total correspondent income from fees while 85 percent derived 20 percent or less from fees [1, p. 44]. Correspondent banks expect to receive an increasing proportion of their income in the form of fees in future years.

Indications are, however, that any movement towards substitution of direct charges for compensating balances is quite gradual. It seems clear, therefore, that compensating balances remain the dominant form of reimbursement for correspondent services.

The Federal Reserve System offers services to member banks that can be considered full or at least partial substitutes for five of the twenty services listed in Table I. The discount window is a source of temporary liquidity similar to overline credits offered by correspondent banks. In periods of extreme credit stringency, however, the discount window may be more reliable than credit lines with private correspondent banks. Federal Reserve check clearing, wire transfer, security safekeeping, and currency and coin services are available to meet respondent bank operating requirements. These five services can be directly compared to the private correspondent services ranked, respectively, first, second, sixth, eighth, and seventeenth in importance in Table I. In addition to these five services, the Federal Reserve also administers a standardized cost accounting system, called Functional Cost Analysis, that is available to member banks. This is comparable to a private correspondent budgeting service ranked twenty-seventh in importance on the ABA survey.

Clearly, the range of correspondent type services offered to member banks by the Federal Reserve is not nearly as wide as that offered by private correspondent banks. Nonetheless, System services are among the most important types demanded by respondent banks. Indeed, the Federal Reserve offers four services that rank among the top ten in the ABA survey. Another essential service, provision of currency and coin, probably receives a relatively low ranking from correspondent banks participating in the survey because of its wide availability through Federal Reserve banks. It would appear, therefore, that member banks have the opportunity to substitute use of Federal Reserve System services for some important private correspondent services.

Description of Federal Reserve System Services

The availability of correspondent type services from the Federal Reserve System is essentially the same in all Federal Reserve districts. Nevertheless, some regional differences exist as a result of attempts by Reserve banks to tailor their services to the operating patterns of commercial banks in the areas they serve. The descriptions of System services that follow can be taken as broadly representative of such services available on a nationwide basis. Some details, however, may be unique to the operating procedures of the Federal Reserve Bank of Richmond.

A survey of System service use by all commercial banks in the Fifth Federal Reserve District was conducted over the two month period December 1977-January 1978. Survey results on the use of these services by member banks with less than $100 million in deposits are summarized below, with accompanying descriptions of the major services.

Discount Window Borrowings by member banks from the Federal Reserve are governed by Regulation A, "Extensions of Credit by Federal Reserve Banks." While the discounting of eligible paper is a valid method of making funds available to member banks, in actual practice virtually all member banks' borrowings take the form of credit advances secured by the pledging of collateral. Acceptable collateral includes U. S. Government or Federal agency obligations, eligible paper, mortgages on one-to-four family residential property, and municipal securities. Extensions of credit to member banks are of three basic types: (1) short-term adjustment credit; (2) seasonal credit; and (3) emergency credit.

Short-term adjustment loans are made to assist member banks in adjusting their reserve positions to unanticipated deposit withdrawals or unexpected credit demands. Such loans may technically be made for periods of up to 90 days, but normally are made for much shorter periods. Banks that have filed a borrowing resolution and lending agreement with the Federal Reserve bank can execute borrowings quickly and conveniently by telephone. Seasonal credit is available for longer periods of time to assist member banks that experience distinctive seasonal patterns in deposit flows and credit demands that give rise to expected needs for funds. The prevailing discount rate is charged on all short-term adjustment and seasonal loans secured by U. S. Government or Federal agency obligations, eligible paper, or one-to-four family residential mortgages. The rate charged on loans secured by municipal obligations and other types of collateral, e.g., customer paper that does not meet eligibility requirements, must be at least one-half of 1 percent higher than the discount rate.

Emergency credit is available to member banks encountering financial difficulties that may involve an extended need for funds. Emergency loans to member banks may be made at a special rate established by the Reserve banks subject to review and determination by the Board of Governors. Currently, the emergency loan rate is set 1 percentage point above the discount rate. The special emergency rate is not applied in those instances where the emergency arises as a result of some natural disaster.

Use of the discount window by member banks is tied closely to movements in money market rates. For much of 1977 the discount rate was above the Federal funds rate, and this discouraged borrowing. Only 51 of all Fifth District member banks less than $100 million in deposit size borrowed from the Federal Reserve in 1977. By contrast, this number increased to 74 through the first nine months of 1978.

Check Collection Federal Reserve banks accept for collection as cash items from member banks checks drawn on other domestic banks that remit at par. Checks are accepted from nonmembers if these checks are drawn on banks located within the nonmembers' Regional Check Processing Center territory. The Reserve banks also accept as cash items U. S. Government checks, postal money orders, and food stamps. The check clearing operations of Reserve banks are governed by Regulation J, "Collection of Checks and Other Items by Federal Reserve Banks." The Federal Reserve check clearing system is primarily intended to facilitate check collections both regionally and nationally. Commercial banks using this system are encouraged to exchange cash items payable at other local banks on a direct basis.

Credit for checks presented for clearing is made through entries to member bank reserve accounts according to a schedule published in the various Federal Reserve bank operating circulars. Immediate credit is given for all qualified regional items and one-day or two-day deferred credit is given for items payable at banks located in Federal Reserve districts outside the Federal Reserve district where presentment is made. In many cases, delivery of cash letters to Federal Reserve offices can be made using the Federal Reserve Transportation System. All checks presented to Reserve banks for clearing must be Magnetic Ink Character Recognition (MICR) encoded with ABA routing symbols and dollar amounts. Moreover, banks with large check clearing volume must sort checks by location category in order to receive the earliest possible availability of credit. Any bank having a daily average number of collection items not exceeding 5,000 items payable outside the city in which it is located is, however, exempted from this sorting requirement. Such banks may send one unsorted cash letter to the Federal Reserve. However, banks choosing this unsorted option lose one day's availability on immediate credit items.

Approximately one-third of Fifth District member banks less than $100 million in deposit size deposit checks for clearing directly with the Federal Reserve. These banks had a daily average volume of check clearings of regular items, i.e., checks payable through other commercial banks, of 2,220 during the December 1977-January 1978 sample period. Member banks clearing with the Federal Reserve have the option of charging debits and credits arising from check clearings to their own reserve account or to a member correspondent bank's reserve account. Nonmember banks, however, are required to charge their activity to a member correspondent bank's reserve account. A survey of banks in the Eighth Federal Reserve District found that many smaller members clearing checks through the Federal Reserve remit for cash letters using a correspondent bank's reserve account [2]. In the Fifth District, however, this is an uncommon practice. Almost all member banks clearing through the Federal Reserve charge clearing activity to their own reserve accounts.

Wire Transfer Member banks have access to the Federal Reserve System communications network for the electronic transfer of funds between reserve accounts. Transfers in any amount over $1,000 are made free of charge, while a service charge of $1.50 is levied on transfers in amounts less than $1,000. Transfer requests can be made by telephone and advice of the transactions is made on the member bank's daily summary reserve statement. Member banks receive detailed statements each morning for the preceding days reserve account activity. Transfers of funds are consummated on the business day requested when such requests are received before 3:00 p.m. local time. Member banks with large electronic funds transfer requirements can arrange to access the Federal Reserve communications network directly with on-line computer equipment.

About 72 percent of Fifth District member banks less than $100 million in deposit size originated wire transfers totaling three or more per month during the survey period. These banks initiated an average of eighteen transfers per month.

Security Safekeeping Federal Reserve banks will hold for safekeeping both U. S. Government and eligible Government agency securities in book-entry form and other securities in paper form, called definitive securities, that are solely owned by member banks. In addition, Reserve banks will hold book-entry securities for customers of member banks, where the member banks act as agents for their customers.

Interest payable on book-entry securities or the proceeds of maturing book-entry securities is credited to the reserve account of the bank for which the securities are held. For definitive securities, the

safekeeping service includes cutting and collecting coupons, receiving securities for deposit to safekeeping accounts, withdrawing and delivering securities held in safekeeping accounts, and collecting maturing securities.

The security safekeeping service is widely used by Fifth District member banks. During the survey period over 80 percent of smaller Fifth District member banks held either book-entry, or definitive, or both types of securities in safekeeping with the Federal Reserve Bank of Richmond and its branches.

Transportation of Currency and Coin The Federal Reserve banks have been responsible for meeting the currency and coin requirements of all commercial banks, member and nonmember alike, since the 1920's. Member banks have the choice of privately contracting for transportation of cash or of using transportation services arranged and paid for by the Reserve bank supplying their needs. Nonmember banks must pay for their own transportation requirements. Moreover, nonmembers must pay a fee to the Federal Reserve for preparation of currency and coin shipments.[1]

Member banks in the Fifth District can receive free currency and coin transportation to their main office and to one-third of their branch offices in each town where branches are located. Armored carrier is the usual method used for transporting currency and coin, although mail delivery is also used to a much lesser degree. Transportation service is provided once each week, although in areas where there is unusual cash movement more frequent service is provided.

Over 80 percent of smaller Fifth District member banks utilize this service, and all but a few have their own reserve accounts charged for cash transactions.

System Service Use and Bank Cash Asset Positions What effect does utilization of Federal Reserve System services have on bank cash asset positions? The benefits of these services to commercial banks can best be measured by examining differences between cash asset ratios of banks using the services and similar banks not using the services. In fact, smaller banks vary greatly in the intensity with which they use System services [2, 3]. If banks using System services are shown to have significantly lower cash asset ratios than banks not using the services, then there would appear to be a beneficial effect. This effect can be approximated by the potential earning power of the differential. This potential can be calculated roughly by multiplying the corresponding dollar amount of the reduction in the ratio of cash assets to total deposits by the average earnings rate on funds invested.

An analysis of this type has implications for the question of the cost or burden of Federal Reserve System membership. Commercial banks generally bear an opportunity cost by virtue of being Federal Reserve System members that is equal to the income foregone on cash balances required under Regulation D that are in excess of operating needs. Yet member banks have direct access to System services at zero variable cost, potentially allowing them to substitute free services for those obtained from private correspondents and paid for with compensating balances. It is likely, however, that some trade-off exists for member banks between receiving services from the Federal Reserve or from correspondent banks. This trade-off arises in cases where System services are not available in the quantity and/or quality demanded by member banks but are available from private correspondents. It is also possible that some member banks view System services as being inaccessible, due to, for example, geographic distance from a Reserve bank.

Inasmuch as the question of the burden of Federal Reserve membership is purely one of relative costs, it is important to consider to what extent, if any, nonmember banks have access to System services. If System services allow member banks to economize on correspondent balances, the same would hold for nonmembers to the extent that they are granted access to these services. In fact, the Federal Reserve, as part of its continuing effort to improve the nation's payments mechanism, has adopted a policy that extends limited payments services to nonmember banks: nonmembers are granted Regional Check Processing Center (RCPC) area clearing privileges on the same terms as are member banks, except that they must settle through a member correspondent's reserve account. Basically, each Fifth District state is an RCPC area, an arrangement that gives nonmembers clearing privileges for most items drawn on banks in their state.[2] For small banks generally, intra-RCPC clearings probably dominate their total clearings.

[1] This fee paid by nonmember banks to the Federal Reserve is a cost that does not appear in compensating balances. The compensating balances of nonmembers receiving cash service directly from the Federal Reserve, therefore, somewhat understate their total payments for services received.

[2] There is one exception to this rule. The Baltimore RCPC includes not only Maryland and the District of Columbia, but also seven northeastern West Virginia and four northern Virginia counties.

Therefore, nonmember bank access to RCPC's is a potentially important factor in offsetting the relative advantage to member banks of using Federal Reserve clearing services.

Method of Analysis Information on the use of five Federal Reserve services over the two month period December 1977-January 1978 has been collected for all Fifth District member and nonmember banks operating on June 30, 1977. Adjustment for mergers and conversions out of the Federal Reserve System leaves 681 banks with total deposits less than $100 million. Four possible combinations of membership and System service utilization are defined using this survey information:

1. member fully using Fed services (MU);
2. member not fully using Fed services (MN);
3. nonmember using RCPC services (NU); and
4. nonmember not using RCPC services (NN).

Member users are defined as those member banks that clear checks in volume through the Federal Reserve and that use two additional services from the group including money transfer, security safekeeping, and wire transfer. Member nonusers include all other member banks. Nonmember users are nonmember banks depositing directly with the Federal Reserve for RCPC area clearing. Nonmember nonusers are all other nonmember banks. The number of banks falling into the MU, MN, NU, and NN categories are 107, 227, 56, and 291, respectively.

Mean values of adjusted cash assets to total deposits are computed for the banks in each of these four categories by state and within each of three deposit size groups. The size groupings are: $0-25 million; $25-50 million; and $50-100 million. Larger banks are not considered in the analysis inasmuch as there is a tendency for correspondent banking activity to increase with size.[3] Differences in mean cash asset ratios are examined for three comparison groups: (1) member users versus member nonusers (MU — MN); (2) member users versus nonmember nonusers (MU — NN); and (3) member users versus nonmember users (MU — NU).[4] Analysis of these differences will help determine whether use of System services is significant in allowing member banks to economize on cash balances, and whether use of System services allows member banks to offset the opportunity costs of membership. Readers who are not interested in the detailed results can skip to the concluding section of the article for a summary.

Empirical analyses conducted by state and within size groups test the hypothesis that there is no statistically significant difference between sample means. If the difference between sample means is statistically significant, the hypothesis is rejected. It can then be concluded that the membership-service use combinations being compared have differing influences on bank cash asset positions. Two different adjusted cash asset to total deposit ratios are evaluated. Differences in means and t-statistics[5] for ratios having demand balances due from U. S. banks, currency and coin, and deposits with the Federal Reserve in the numerator are listed in Table II. This measure, however, tends to overstate the cash asset ratios of banks clearing through private correspondents relative to banks clearing through Reserve banks to the extent that private correspondents grant immediate book credit for cash items presented for collection. These items represent uncollected funds carried on respondents' books as correspondent balances. Such an overstatement would bias downward the differences between the user and nonuser ratios.

A reliable measure of the proportion of collected to total correspondent balances for Fifth District banks is not available. Nonetheless, the possible downward bias of the differences shown in Table II can be corrected by adding cash items in process of collection to the calculations. Differences in means and t-statistics for ratios having the same numerator as those in Table II, except for the addition of cash items in process of collection (CIPC), are listed in Table III. Table III is intended to adjust for possible overstatement in the correspondent balances of banks that clear checks through correspondent banks. This adjustment is not perfect since, for member and nonmember bank users of Federal Reserve clearing services, it includes CIPC resulting from correspondent clearing activity [4]. To the extent that smaller banks using System check clearing services act as correspondent clearing banks, the ratios including CIPC bias upward the differences between the user and nonuser banks. Therefore, careful joint inter-

[3] Large banks acting as correspondents are likely to maintain cash balances for different reasons than do smaller, noncorrespondent banks. This could lead to variability between banks alike in all respects except degree of correspondent activity and thus invalidate comparisons aimed at finding the influence of System service use on cash positions.

[4] More detailed comparisons are available in [3].

[5] The statistic $t = (D - \Delta_H)/S_D$, where D is the difference between the two sample means; Δ_H is the hypothetical difference between sample means, or zero; and S_D is the estimated standard error of the difference between the two means.

pretation of the results from Tables II and III is necessary to gain insight into the differences between cash asset ratios of user and nonuser banks.

Empirical Results The results shown in Table II support the idea that use of System services by member banks less than $50 million in deposit size leads to economies in cash balances. In all eight of the comparisons with member nonusers, the member user category has a lower mean cash asset ratio. The differences are statistically significant at the .20 level or above in four of the cases. In each of the three cases tested for the $50-100 million deposit size classification, however, the member users have higher cash asset ratios than the member nonusers.

Comparison of the MU — MN and MU — NN differences provides insight into the effects of System service use on the costs of membership. For example, Table II shows that Maryland member users in the $0-25 million deposit size group have a cash asset to total deposit ratio .95 percentage points less than that of the member nonusers. The member user ratio is also 1.58 percentage points greater than that for the nonmember nonusers. These results suggest that member users have higher opportunity costs than nonmember nonusers, but that this cost, expressed in terms of cash asset to total deposit ratios, is .95 percentage points lower than that experienced by the member nonuser group. The lower opportunity cost in dollar terms for member users compared to member nonusers can be approximated using the method described earlier. Assume a member user bank in Maryland has $25 million in deposits. If this bank maintains an average cash asset to total deposit ratio that is .95 percentage points lower than that of a similar bank not using System services, then the MU has available for investment $237,500 more than the comparison MN bank ($25 million $\times$ .0095). This amount invested at 5.27 percent interest (the average 3-month Treasury bill rate for 1977) yields additional before tax revenue of $12,500.

Applying this type of analysis to the $0-25 million size groups in other states shows for users of System services an elimination of the burden in two states (South Carolina and Virginia), reduction of the burden in one state (West Virginia), and enhancement of an already advantageous position in another state (North Carolina) when comparison is made with nonmember nonusers of the RCPC area clearing service.

Comparison with nonmember users, however, gives a somewhat different picture. In four states (Maryland, South Carolina, Virginia, and West Virginia) there is some indication of a moderation in the relative gains made by member users, as shown by the greater differences in the MU — NU compared to the MU — NN category. This suggests that nonmember users of the RCPC service in these states are able to achieve cash economies.

For member banks in the $25-50 million deposit classification, there is a reduction of the membership burden for users of System services in two states (Virginia and West Virginia) when comparison is made with nonmember nonusers. This result is also suggested in Maryland, although less strongly. The small number of member banks in the $25-50 million group prevents as complete an analysis for North Carolina and South Carolina. Table II shows, however, that the member user ratio is higher than the nonmember nonuser ratio in North Carolina and lower in South Carolina. Comparing the MU — NN and MU — NU differences suggests that nonmember users have higher ratios than nonmember nonusers in three states (Maryland, North Carolina, and Virginia). In South Carolina, however, the nonmember nonusers have a higher ratio than the nonmember users. While the evidence suggests that South Carolina member users experience no burden compared to nonmember nonusers, the relative burden is substantial and significant when the comparison is made with nonmember users of the RCPC area clearing service.

This evidence, which is based on comparisons of mean cash asset ratios that exclude CIPC, is not completely consistent with evidence in Table III based on cash asset ratios that include CIPC. In the eight cases tested in Table III for banks less than $50 million in deposit size, the member user group mean cash asset ratio is less than the member nonuser group mean in only five instances. Of these five negative differences, only one is statistically significant.

For member user banks $0-25 million in deposit size, the results in Table III support those in Table II suggesting a reduction of the membership burden in Maryland and West Virginia and elimination of the burden in South Carolina. In North Carolina and Virginia, Table III shows larger mean cash asset ratios for the member users than for the member nonusers. This is due to the large CIPC ratios maintained by these member user groups. The small North Carolina member user banks have a ratio of CIPC to total deposits of .0413 compared to .0104 for the member nonuser banks. The small Virginia member user banks have a ratio of CIPC to total deposits of .0320 compared to .0078 for the member

nonuser banks. If these high ratios result from a high dollar volume of clearing activity, then these banks should not be considered disadvantaged compared to the nonusers.

The results from comparison of $25-50 million deposit member user and nonuser mean cash asset ratios that include CIPC are about the same as the results based on ratios that exclude CIPC. An exception, however, is Virginia: no reduction in the membership burden is apparent when CIPC is included in the analysis of $25-50 million deposit size banks.

The evidence from Tables II and III is consistent for banks above $50 million in deposit size: member users of System services maintain higher cash asset ratios than do member nonusers. When CIPC is included, however, the member user ratios are even higher. This combined evidence from Tables II and III suggests that member user banks above $50 million in deposit size are acting as correspondents.

This analysis offers some support for the idea that member banks less than $50 million in deposit size are able to economize in their cash balances by using System services. It is reasonable to expect, therefore, that these banks generate more revenue than similar banks not using System services. In order to test this proposition, the tax equivalent gross return on loans and investments as a percent of total assets

Table II

DIFFERENCES BETWEEN MEAN VALUES OF CASH ASSET TO TOTAL DEPOSIT RATIOS

(Excluding CIPC)[1]

THREE MEMBERSHIP-SERVICE USE COMBINATIONS BY STATE AND SIZE GROUP

FIFTH DISTRICT STATES

CALCULATED FROM JUNE 30, 1977 CALL REPORT

Deposit Size (millions of dollars)	Maryland	North Carolina	South Carolina	Virginia	West Virginia
	Member User minus Member Nonuser				
0-25	−0.0095 (−0.4879)	−0.0127 (−1.0039)	−0.0388 (−2.0936)**	−0.0178 (−2.4043)***	−0.0090 (−0.9242)
25-50	−0.0195 (−1.4445)*	2	2	−0.0106 (−1.3834)*	−0.0161 (−1.2416)
50-100	0.0185 (1.2026)	2	2	0.0166 (1.4321)*	0.0031 (0.2485)
	Member User minus Nonmember Nonuser				
0-25	0.0158 (0.8567)	−0.0144 (−1.2342)	−0.0125 (−0.7912)	−0.0125 (−1.3220)*	0.0066 (0.6244)
25-50	−0.0002 (−0.0132)	0.0070 (0.4142)	−0.0111 (−0.6433)	0.0091 (0.9759)	0.0124 (1.4747)*
50-100	0.0186 (0.9308)	2	2	2	2
	Member User minus Nonmember User				
0-25	0.0222 (0.7248)	−0.0150 (−0.8693)	−0.0117 (−0.7821)	0.0090 (0.4385)	0.0095 (0.5740)
25-50	−0.0498 (−4.3899)****	−0.0029 (−0.2196)	0.0381 (2.6987)***	−0.0078 (−0.3958)	2
50-100	0.0228 (1.0516)	2	2	−0.0311 (−1.0802)	0.0431 (3.2370)****

[1] Numerators of ratios exclude CIPC. t-statistics are in parentheses.

[2] Number of observations in at least one group less than two.

* significant at the .20 level

** significant at the .10 level

*** significant at the .05 level

**** significant at the .01 level

is computed for the groups of member banks examined above.[6] The calculations are based on operating income data from the December 1977 Report of Income and total asset data from the June 1977 Report of Condition.

The average tax equivalent gross return on assets of member user banks less than $25 million in deposit size in the five states is 7.76 percent versus 7.70 percent for member nonuser banks.[7] This implies that a member user bank $25 million in asset size has $15,000 more in tax equivalent revenue than a similar nonuser bank ($25 million × .0006). The average tax equivalent gross return on assets of member user banks $25-50 million in deposit size in the five states is 8.09 percent, versus 7.89 percent for member nonuser banks.[8] Again, this implies that a member user

[6] The tax equivalent return is used in order to adjust for possible differences in bank investments in tax free municipal securities. In computing the adjustment, interest income from municipal securities is multiplied by factors ranging from 1 (for banks with zero before tax income) to 1.9231 (for banks with before tax income of greater than $400,000).

[7] The t-value for a test of significance for the difference in mean returns is 0.5334, which is not statistically significant.

[8] The t-value for a test of significance for the difference in mean returns is 1.7932, which is statistically significant at the .10 level.

Table III

DIFFERENCES BETWEEN MEAN VALUES OF CASH ASSET TO TOTAL DEPOSIT RATIOS (Including CIPC)[1]

THREE MEMBERSHIP-SERVICE USE COMBINATIONS BY STATE AND SIZE GROUP

FIFTH DISTRICT STATES

CALCULATED FROM JUNE 30, 1977 CALL REPORT

Deposit Size (millions of dollars)	Maryland	North Carolina	South Carolina	Virginia	West Virginia
	Member User minus Member Nonuser				
0-25	−0.0122 (−0.5949)	0.0181 (0.8793)	−0.0301 (−1.6515)*	0.0065 (0.9426)	−0.0031 (−0.3232)
25-50	−0.0097 (−0.6863)	2	2	0.0002 (0.0187)	−0.0174 (−1.1363)
50-100	0.0199 (1.6166)*	2	2	0.0306 (3.5698)****	0.0108 (0.8676)
	Member User minus Nonmember Nonuser				
0-25	0.0146 (0.8015)	0.0257 (1.8736)**	−0.0061 (−0.3850)	0.0163 (1.6456)*	0.0113 (1.0252)
25-50	0.0005 (0.0292)	0.0033 (0.2167)	−0.0013 (−0.0741)	0.0254 (2.5875)***	0.0140 (1.6749)*
50-100	0.0282 (1.6037)*	2	2	2	2
	Member User minus Nonmember User				
0-25	0.0004 (0.0270)	0.0188 (0.9555)	−0.0055 (−0.3858)	0.0303 (0.9531)	0.0149 (0.9952)
25-50	−0.0402 (−3.0725)***	−0.0028 (−0.2470)	0.0432 (2.9287)***	0.0107 (0.5062)	2
50-100	0.0153 (0.8916)	2	2	−0.0124 (−0.4958)	0.0459 (3.5699)****

[1] Numerators of ratios include CIPC. t-statistics are in parentheses.

[2] Number of observations in at least one group less than two.

* significant at the .20 level

** significant at the .10 level

*** significant at the .05 level

**** significant at the .01 level

bank $50 million in asset size has $100,000 more in tax equivalent revenue than a similar nonuser bank ($50 million × .0020).

Conclusions Private correspondent banks supply a large variety of services to other banks. The most important such services satisfy commercial bank liquidity requirements, both temporary (overline services) and longer term (loan participation services). Services relating to bank operations, however, are also very important.

The Federal Reserve System offers member banks several services at zero variable cost that appear to be close substitutes for private correspondent bank services. In fact, four Federal Reserve services are among the ten most important types of correspondent services listed in a recent nationwide survey of correspondent banks. These include the availability of temporary credit through the discount window, check collection, wire transfer of funds, and safekeeping of securities. There is reason to believe, therefore, that member banks heavily using System services might be able to economize on compensating balances held with private correspondent banks. If so, then members heavily using System services might be able to reduce the opportunity costs associated with membership in the Federal Reserve.

Analysis of Fifth District bank cash asset ratios indicates that member bank users of Federal Reserve System services less than $50 million in deposit size generally maintain lower cash asset ratios than do member nonusers. Moreover, these member bank users also earn a higher tax equivalent gross return on assets than nonusers. The higher return is especially strong for member user banks in the $25-50 million deposit size range, implying $100,000 more in annual tax equivalent revenue for a $50 million member user than a nonuser bank.

The analysis also suggests that use of System services can lead to a reduction or elimination of the membership burden when comparison is made to nonmember nonusers of the RCPC area clearing service. There is some indication, however, that the relative gains made by member users are moderated when comparison is made to nonmember users of the RCPC area clearing service. Also, available evidence suggests that among member banks greater than $50 million in deposit size, users of System services maintain higher cash asset ratios than do nonusers.

The empirical results presented in this article thus support the conclusion that use of Federal Reserve System services can help reduce the opportunity costs of membership for some small commercial banks. All member banks pay for these services by virtue of holding required reserves, although relatively few fully use System services. Among the smaller member banks in the Fifth Federal Reserve District, it is primarily the nonusers of System services that suffer burdens of membership.

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