

THE COMPETITION FOR TRANSACTION ACCOUNTS

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The 1980 enactment of legislation extending authority to offer interest-bearing checking instruments to all depository institutions has brought intensified competition for consumers' transaction balances. The rise in market interest rates over the last decade, moreover, has induced nonbank financial institutions to compete aggressively for transaction deposits—once the sole domain of commercial banks. Banks have had to face the possibility that they can no longer rely on noninterest-bearing deposits as a major source of funds. Through the first three-quarters of 1981, for example, U. S. commercial banks experienced a reduction of nearly \$50 billion in traditional demand deposit accounts. These developments, which adversely affect bank costs and profitability, have forced depository institutions to devote increased attention to strategies for attracting deposits.

After a brief historical review of government restrictions on interest payments on deposits and their effects on commercial bank behavior, this article describes current competitive strategies and deposit experiences of banks and thrift institutions. Special attention is devoted to the deposit pricing decision, the impact of interest-bearing checking accounts on the marginal cost of funds, and implications for competition among depository institutions.

Deposit Interest Restrictions: Cause and Effect

The Banking Act of 1933, passed in the midst of the nation's most serious financial crisis, was intended to restore confidence and financial stability to the banking industry. In addition to establishing deposit insurance for participating banks, the legislation included provisions restricting the payment of interest on bank deposits—a practice that was widely blamed for the industry's problems. In an effort to end what was termed "destructive" interest rate competition, interest on demand deposits was totally prohibited and the Federal Reserve System was given authority to set maximum rates payable on time and

savings deposits for its member banks. The Banking Act of 1935 subjected nonmember banks to similar legislation under the authority of the Federal Deposit Insurance Corporation.¹

The practice of paying interest on demand deposits can be traced far back in U. S. financial history. Concern over the possibly harmful effects of such payments first arose around the middle of the nineteenth century. The original concern was not with interest on personal demand deposits so much as the large New York banks' practice of paying interest on balances held with them by other banks throughout the country. These interbank balances were maintained as payment for correspondent banking services but also served as liquid earning reserves of smaller banks. As a consequence of these interbank ties, it was commonly believed that the health of the nation's banking system was too dependent on the New York banks.

A series of financial panics occurred over the latter half of the 1800s and early 1900s. These crises took place when many country banks drew down their demand balances with New York banks while tight credit conditions hampered the liquidation of call loans. Since country banks deposited liquid funds with the largest banks to earn interest, many believed the elimination of interest payments on such accounts to be an obvious solution to the frequent crises.

After the establishment of the Federal Reserve System in 1913, member banks could borrow at the Federal Reserve's discount window to relieve short-term liquidity pressures. Once the discount window was available, banks utilized it with increasing frequency.² Meanwhile, rural banks continued to hold

¹ The interest prohibition on demand deposits is still in effect. The authority to set interest ceilings on time and savings deposits, under provisions of the Depository Institutions Deregulation and Monetary Control Act of 1980, has been transferred to the Depository Institutions Deregulation Committee and is to be totally phased out by 1986.

² The percentage of member banks using the window grew from 25 percent in 1915 to 76 percent in 1921. [4, p. 38]

interest-earning interbank deposits with city correspondents.

The willingness and ability of members to borrow from the Federal Reserve weakened the "financial crises" argument for restricting interest payments on deposits. However, bankers and regulators continued to believe that there was a relationship between the payment of interest on demand deposits and unsound banking practices contributing to bank failures. The "unsound banking" argument for restricting the payment of interest on deposits was based on the belief that banks were forced to increase the riskiness of their investments in order to pay interest on deposits. This argument, together with the occurrence of mass bank failures in the 1930s, led to the enactment of interest controls on deposits.

The argument has since been utilized to support the continuation of deposit interest controls in spite of mounting evidence that it is an inaccurate description of bank behavior and, moreover, that deposit interest controls have had harmful effects on individual sectors of the economy. George Benston, for example, tested the validity of the unsound banking argument and its implications for bank behavior. His results indicate that banks act to maximize profits by equalizing the marginal interest cost of a dollar of deposits with the marginal earnings from a dollar of deposits. He rejects the argument that banks are forced to increase the riskiness of investments in order to pay a market rate on deposits. Benston concludes that "the interest rate on deposits offered by a bank is a function of the investment possibilities (and their associated risks) available to the banker, rather than the reverse."

Interest restrictions had little if any impact on banks until after World War II. Until then, market interest rates were so low that banks could pay an implicit competitive return on deposits by providing banking services below cost. Moreover, following the bank failures of the 1930s, banks reduced their holdings of interbank balances and held large amounts of liquid cash reserves. In the 1950s, as market rates of interest rose, development of the Federal funds market as both a source of funds and an investment outlet for excess reserves provided a way for banks to bypass the prohibition of interest on interbank balances.

In recent decades, as market rates fluctuated, banks slowly adjusted their implicit payments to customers by providing new financial services, additional conveniences (e.g., branch locations, drive-up windows, extra tellers, etc.), and even lower rates on loans to

their best customers. These devices have been, in the words of Friedman, a "highly effective though not perfect substitute for the explicit payment of interest on demand deposits."³ Banks, however, have been either unable or unwilling to raise these implicit interest payments as much or as quickly as market rates have risen. Perhaps this is because many depositor services are already offered "free" and it takes considerable time and expense to offer additional services and facilities.

As market rates eventually rose above the implicit payments on demand accounts and interest ceilings on time and savings deposits, the opportunity cost of holding balances in these accounts increased. In response, an organized effort by firms—often in cooperation with their banks—developed to speed the collection of payments and minimize the level of funds held in accounts yielding interest in implicit forms. The increased opportunity cost of holding idle cash balances and the improvement in cash management techniques resulted in reduced demands for non-interest-bearing bank deposits. Corporate treasurers moved increasingly into liquid money market instruments bearing market interest rates. Large money center banks especially felt the loss of corporate demand deposits since they relied more heavily on this source of funds than smaller banks. In response, these banks utilized a series of new liability instruments paying market rates to retain corporate funds throughout the 1960s and 1970s (e.g., negotiable certificates of deposit, repurchase agreements, and Eurodollar deposits).

Deposit alternatives for smaller customers developed more slowly. The authorization of telephone transfers in the 1960s and pre-authorized transfer accounts in the 1970s increased the liquidity of interest-bearing savings accounts at banks and thrifts to some extent. Interest-bearing transaction account substitutes for customers developed further following the introduction of Negotiable Order of Withdrawal (NOW) accounts in Massachusetts in 1972 and credit union share drafts and money market funds

³ [10, p. 24] An extensive literature has developed testing the effectiveness of deposit interest controls. Klein [14], for example, found that the postwar demand for money experience suggests that the interest prohibition was ineffective. Startz [25] concludes that banks implicitly pay approximately 50 percent of the explicit interest that would be paid in the absence of the interest prohibition. Rush [23], using recent New England data, argues that Startz's estimates of the implicit interest paid by banks is biased downwards and cites evidence supporting the "competitive rate hypothesis"—i.e., that banks (implicitly) pay competitive rates of interest.

(with limited check-writing privileges) in 1974. The NOW experiment was subsequently extended to other northeastern states. In late 1978, commercial banks nationwide received regulatory permission to pay interest on savings accounts that could be used for making third party payments. These automatic transfer savings (ATS) accounts, as well as NOWs and share drafts are direct substitutes for demand deposits. These deposit instruments, however, remain subject to deposit interest ceilings. The recent development of the retail repurchase agreement has facilitated the payment of market-level interest rates on portions of consumers' liquid balances and enhanced the ability of depository institutions to retain these funds.

New England NOW Competition

The introduction of NOWs by savings banks in Massachusetts in 1972, followed shortly by thrifts in New Hampshire, made it possible for these institutions to pay explicit interest on what, in effect, are checking accounts. Commercial banks, on the other hand, were not initially allowed to offer interest-bearing transaction accounts in these states. The commercial banks, as a result, were threatened with large losses of consumer deposits. Relief was provided in August of 1973, however, when Congress authorized all commercial and savings banks, S&Ls, and cooperative banks in New Hampshire and Massachusetts to offer NOWs.

The New England evidence indicates that explicit interest payments were frequently accompanied by the pricing of transaction services that were previously provided free.⁴ The early pricing strategies used for these accounts were varied. Massachusetts savings banks, for example, initially paid 5¼ percent interest on NOWs with a 15 cent fee typically imposed on each draft written. New Hampshire thrifts, on the other hand, began paying 4 percent interest and charging no service fees on NOW accounts to customers. Many commercial banks also initially offered NOW accounts without fees. During 1974, however, commercial banks began imposing minimum balance requirements with associated penalty fees to discourage low balance demand deposit customers from shifting into NOW accounts. Thrifts meanwhile, typically moved in the opposite direction by offering free NOWs. As a result, average bal-

ances in NOW accounts at commercial banks were considerably larger than those at thrifts. The average balance in Massachusetts commercial banks in 1976 was \$2,149, for example, compared to \$826 at S&Ls, and \$901 at savings banks.

In March 1976, Congress permitted all depository institutions in New England to market NOWs. These accounts quickly received widespread acceptance by consumers. In Massachusetts, for example, three-quarters of the households owned NOW accounts by 1977. In 1978 and 1979, respectively, New York and New Jersey were added to the list of states where NOWs were legal.

The spread of NOW accounts in New England was not uniform across states. One study used the number of NOW accounts per 100 households to compare NOW growth experiences. It found the proportion of households owning NOW accounts to be positively correlated both with the proportion of financial institutions in each state offering NOWs and with the proportion of financial institutions which offer them free, and negatively related to the average minimum balance requirement. How extensively NOW accounts spread, therefore, depends importantly upon both the pricing and availability of the accounts. For example, in Massachusetts and New Hampshire minimum balance requirements were low, a high percentage of institutions provided free NOWs, and a high proportion of institutions offered the accounts. Consequently, a large percentage of households shifted to NOWs. By contrast, fewer institutions in Maine and Vermont offered NOWs and only a small percentage were free of service charges. As a result, fewer households acquired NOWs in these states.

Bank and thrift market shares depended upon the same factors that influenced the overall growth of NOWs within states, i.e., the availability of NOW accounts and pricing factors. In Massachusetts, for example, the number of banks initially offering NOWs was lower relative to thrifts than in other states. As a result, the commercial bank market share of NOW accounts was below that in other states. Also, thrifts realized larger NOW shares in states where the disparity between bank and thrift pricing was the greatest.

Since NOW accounts are direct substitutes for checking accounts, demand for regular checking accounts fell when NOWs became available. The data from New England indeed show that total outstanding personal checking accounts fell while NOW balances grew an average of 8 percent per month for

⁴ This section draws heavily upon the work of Kimball. [12, 13]

the two years following the introduction of NOW accounts.⁵ It is difficult, however, to estimate what percentage of the growth in NOWs came from demand deposits and what percentage was derived from other sources. Previous research suggested that between 60 and 80 percent of NOW funds were moved from regular demand deposit accounts, with the rest coming from time and savings accounts and from other sources.

The success of the experience with NOWs in the northeastern United States combined with high market interest rates to increase political support for extending NOW accounts to the rest of the country. The Depository Institutions Deregulation and Monetary Control Act of 1980 authorized NOW accounts for banks and thrifts nationwide effective December 31, 1980. At the same time, ATS accounts for all depository institutions and share drafts at credit unions were authorized. Experience through the first three quarters of 1981 shows rapid growth in NOW balances both nationwide and in the Fifth Federal Reserve District.

Nationwide NOW Experience

Table 1 shows that NOW deposits at banks and thrifts and credit union share drafts totalled \$12.3 billion nationally on December 31, 1980. Since that date, NOWs have experienced explosive growth—expanding over five-fold to \$54 billion by the last week in September 1981. Seventy-eight percent of this increase occurred in the first three months of the year. While growth tapered off considerably in the second and third quarters, NOWs still grew at a relatively strong 42 percent annual rate over the period.

Surveys of depository institutions conducted early in 1981 indicated that most commercial banks and savings and loan associations offer NOW accounts to their customers. A nationwide survey of all banks and S&Ls conducted by Madison Financial Corporation, for example, found that 97 percent of all banks and 86 percent of S&Ls responding to the survey offered NOWs during the first quarter of 1981.

Significant differences exist between banks and S&Ls in NOW pricing and marketing strategies. Although all depository institutions uniformly tend to pay the 5¼ percent maximum allowable interest

on these accounts and require either minimum or average balances to avoid monthly account fees, balance requirements are generally much lower at S&Ls than at banks. The Madison survey, for example, found minimum balance requirements at commercial banks averaged \$976 in the first quarter of 1981, more than twice the \$434 requirement at S&Ls. Similarly, banks required customers to satisfy an average balance requirement of nearly \$1,500 compared to below \$700 for the S&Ls. As a result, the actual average NOW balance at banks was nearly \$6,000, almost four times as large as the \$1,500 average balance at S&Ls.

Initial evidence suggests that, through more liberal NOW prices, thrifts have succeeded in attracting deposit customers away from banks. Watro found that differences in NOW pricing between banks and thrifts in local markets influenced the relative proportions of NOW deposits held by each type of institution. Generally, thrifts gained a larger share of NOWs in those markets where they established the greatest pricing advantages.

The Madison survey indicates that the size of the minimum balance requirement influences the percentage of new funds flowing into NOW accounts. The pricing differential has helped S&Ls to report an average of 46 percent of NOW deposits as new funds. Commercial banks, on average, reported only 7 percent new money among its NOW deposits, with the rest being transferred from existing bank accounts. The proportion of new funds, moreover, varies inversely with balance requirements within each type of depository institution. Commercial banks with minimum balance requirements below \$500, for example, experienced higher proportions of new money flowing into their NOWs than banks with higher requirements. On the other hand, S&Ls requiring minimum balances in excess of \$1,000 realized a lower proportion of new funds in NOWs than associations with lower balance requirements.

Table 1 suggests that most NOW balances come from existing accounts at depository institutions. Demand deposits held at banks by individuals, partnerships, and corporations (IPC) experienced a net reduction of nearly \$50 billion through September 1981, amounting to 15 percent of these demand balances in banks at the end of 1980.⁶ Reductions in

⁵ [13, 22] Kimball estimates that 13 percent of demand deposits were converted to NOW accounts in the first year after the introduction of NOW accounts and nearly 40 percent were switched by the end of the fourth year.

⁶ These data are not seasonally adjusted. Demand deposits typically experience seasonal peaks during the Christmas season and seasonal troughs during the first quarter of each year. Approximately half of the demand deposit reduction in the first quarter may be attributed to seasonal trends.

Table 1
DEPOSITS OF UNITED STATES COMMERCIAL BANKS AND THRIFT INSTITUTIONS¹

(\$ millions)

Depository Institutions	I.P.C. Demand (1)	A.T.S.	Telephone Pre-Authorized Transfer (3)	NOW/Share Drafts	Total NOW/ATS/Share Drafts		Total Transaction Accounts		Personal Savings	
					Amount (5)	Market Share	Amount (1+3+5)	Market Share	Amount	Market Share
Commercial Banks										
December 1980 ²	331,636.9	13,359.1	6,722.8	8,136.7	21,495.8	79.5	359,855.5	96.5	153,038.8	47.6
March 1981	292,084.6	8,994.7	5,490.6	38,360.3	47,355.0	83.4	344,931.0	95.5	147,664.0	47.1
June 1981	293,797.0	8,455.1	5,038.8	42,157.2	50,612.0	82.4	349,448.0	95.2	143,761.8	47.2
September 1981	282,813.1	8,217.1	4,496.8	45,502.1	53,719.2	81.9	341,029.1	95.0	138,700.1	47.5
Mutual Savings Banks										
December 1980 ²	1,708.8	165.3	712.1	1,493.3	1,658.6	6.1	4,079.5	1.1	51,164.8	15.9
March 1981	1,563.4	134.8	696.4	1,631.2	1,766.0	3.1	4,025.0	1.1	50,108.1	16.0
June 1981	1,671.6	127.0	620.8	1,722.0	1,848.0	3.0	4,141.0	1.1	48,175.1	15.8
September 1981	1,709.9	121.7	542.2	1,859.9	1,981.6	3.0	4,233.7	1.2	46,183.4	15.8
Savings and Loans										
December 1980 ²	576.4	165.2	3,084.0	1,041.9	1,207.1	4.5	4,867.5	1.3	99,892.5	31.1
March 1981	585.2	123.3	2,362.6	4,733.3	4,856.0	8.6	7,804.0	2.2	98,242.2	31.4
June 1981	604.1	127.8	2,091.5	5,935.9	6,064.0	9.9	8,759.0	2.4	94,967.6	31.2
September 1981	645.0	126.8	1,727.1	6,783.7	6,910.5	10.5	9,282.6	2.6	89,671.7	30.7
Credit Unions										
December 1980 ²	46.6	1,023.8	1,335.3	1,641.1	2,665.0	9.9	4,047.0	1.1	17,194.4	5.4
March 1981	42.7	983.0	1,513.3	1,839.2	2,823.0	5.0	4,379.0	1.2	17,354.3	5.5
June 1981	48.2	885.8	1,585.5	2,045.7	2,932.0	4.8	4,566.0	1.2	17,516.0	5.8
September 1981	59.0	830.0	1,582.5	2,122.9	2,952.9	4.5	4,594.4	1.3	17,726.1	6.1
Totals										
December 1980 ²	333,968.7	14,713.4	11,854.2	12,313.0	27,026.5	100.0	372,849.5	100.0	321,290.5	100.0
March 1981	294,275.9	10,235.8	10,062.9	46,564.0	56,800.0	100.0	361,139.0	100.0	313,368.6	100.0
June 1981	296,120.9	9,595.7	9,336.6	51,860.8	61,456.0	100.0	366,914.0	100.0	304,420.5	100.0
September 1981	285,227.0	9,295.6	8,348.6	56,268.6	65,564.2	100.0	359,139.8	100.0	292,281.3	100.0

Source: Report of Transaction Accounts, Other Deposits, and Vault Cash (FR 2900).

¹ These data are reported weekly to the Federal Reserve Banks by commercial banks and thrifts with at least \$15 million in total deposits. Since smaller institutions do not report weekly, these data are understated slightly.

² NOW deposits are as of December 31, 1980. All other data are averages for the last week in each month.

personal savings of over \$14 billion at banks and \$15 billion at thrifts were also experienced. While these deposit categories were major sources of NOW funds, perhaps large amounts were also withdrawn for investment in high yielding certificates of deposit and money market funds. ATS accounts at banks fell over \$5 billion during the period as many banks automatically converted these funds to NOW accounts. Telephone and pre-authorized transfer accounts also lost substantial funds (presumably to NOWs) at banks, S&Ls, and mutual savings banks.

Commercial banks have captured the lion's share of NOW deposits in spite of the more liberal pricing strategy of thrifts. Banks have apparently been very successful in inducing high balance demand deposit customers (who have little difficulty meeting bank balance requirements) to crossover to the bank's

NOW account. By the end of the first quarter of 1981, banks controlled over 82 percent of the total NOW/share draft accounts. This figure dropped below 81 percent by the end of September, however, as NOW growth at S&Ls was particularly rapid, expanding to \$6.8 billion, or over twelve percent of these deposits.

Commercial banks continued to dominate the market for transaction deposits, with their market share for all such accounts combined falling only slightly to 95 percent in September 1981. Since this figure includes commercial demand balances, however, it actually overstates the commercial bank share of total consumer transaction accounts. The Demand Deposit Ownership Survey conducted quarterly by the Federal Reserve System has estimated a relatively stable share of total IPC demand deposits

held by individuals of around one-third in recent years. This estimate, however, fell below 31 percent in March 1981 and below 30 percent in September following the large conversions of personal demand deposits to NOW accounts. Using these quarterly estimates to exclude nonpersonal accounts, commercial banks' share of household transaction deposits was approximately 91 percent in December 1980, 90 percent in March 1981, and 88 percent at the end of September. In nine months time, therefore, commercial banks lost approximately three percent of total consumer transaction accounts held in depository institutions.

Fifth District NOW Experience

Since nationwide figures include the northeastern states where conversions to NOW accounts have occurred for several years, NOW growth in regions of the country where these accounts were just recently authorized might be expected to outpace the national average. This is true for growth in NOW accounts within the Fifth Federal Reserve District. Table 2 shows that commercial banks, S&Ls, and savings banks in the Fifth District accumulated \$3½ billion in NOW accounts by September 1981. In addition, credit union share drafts in the District increased to \$229 million over this period.

Only six commercial banks in the Fifth District (less than one percent of total District banks) and 39 S&Ls (ten percent of the associations) reported NOW balances as of December 31, 1980, the first day these accounts were available to the public. By the end of September 1981, 97 percent of the reporting commercial banks and 85 percent of the S&Ls offered NOWs with \$3 billion and \$500 million, respectively, in these accounts. As in the nationwide experience, it appears that most of the NOW growth came in the year's first quarter and was funded by conversions from demand and personal savings deposits. IPC demand deposits fell by over \$3½ billion during the first three months of the year alone while personal savings were reduced by nearly \$500 million. Though total NOW growth has slowed since the first quarter, percentage increases remain impressive—especially at S&Ls where NOW deposits doubled from March through September. Commercial bank NOW accounts, in comparison, increased 26 percent over the same period. The deceleration in bank NOW growth largely reflects the

slowdown in demand deposit conversions to NOWs since March. The erosion in personal savings deposits at depository institutions has, however, continued.

Conversions from ATS accounts at banks appear to have played a fairly minor role in the District's NOW growth as banks have experienced a small net reduction in ATS deposits since December 1980. Though many banks in the District dropped their ATS accounts in favor of NOW accounts, a large number continue marketing ATS and some offer both instruments. ATS and telephone and pre-authorized transfer accounts at credit unions, on the other hand, experienced big declines in the first three quarters of 1981, as have telephone and pre-authorized transfers at S&Ls.

Transaction accounts at Fifth District credit unions have fallen over \$400 million from the beginning of the year. Most of these funds apparently shifted to other accounts within credit unions, as several of the largest credit unions in the District imposed transaction restrictions on these funds and reclassified them as personal savings for deposit reporting and reserve requirement purposes. Consequently, the credit unions' market share of total transaction deposits was cut in half to only 1.4 percent. This development permitted commercial banks in the District to maintain their transaction account market share over 95 percent despite a net deposit loss of nearly \$850 million. S&Ls, on the other hand, more than tripled their transaction accounts through September and increased their deposit share to almost three percent.

The most dramatic shift in relative market shares occurred in the NOW/ATS/share draft category. Savings and loan associations increased their share of these deposits to nearly ten percent in September 1981. Surprisingly, commercial banks also increased their share of these accounts through September by nearly five percent, although this percentage fell in the third quarter. These gains in market shares were at the expense of credit unions which accounted for less than six percent of these checkable deposits in September.

A detailed breakdown of the 1981 transaction deposit experiences of banks and thrifts in each Fifth District state is presented in the Appendix. Tables 4-9 reveal significant variations in relative market shares of banks and thrifts across states. At the same

Table 2
DEPOSITS OF FIFTH DISTRICT COMMERCIAL BANKS AND THRIFT INSTITUTIONS¹
(\$ millions)

Depository Institutions	I.P.C. Demand (1)	A.T.S.	Telephone Pre-Authorized Transfer (3)	NOW/Share Drafts	Total NOW/ATS/Share Drafts		Total Transaction Accounts		Personal Savings		Number of Institutions	Number Offering NOW/Share Drafts	Number Offering A.T.S.
					Amount (5)	Market Share	Amount (1+3+5)	Market Share	Amount	Market Share			
Commercial Banks													
December 1980 ²	22,460.4	1,399.5	401.8	126.0	1,525.5	79.1	24,387.7	95.8	12,578.6	54.1	596	6	274
March 1981	19,099.2	1,321.2	330.5	2,365.8	3,687.0	84.9	23,116.7	96.0	12,080.8	53.0	516	486	170
June 1981	19,360.0	1,321.7	327.7	2,709.0	4,030.7	86.0	23,718.4	96.2	11,823.5	52.8	511	493	149
September 1981	18,888.7	1,367.0	314.4	2,975.9	4,342.9	84.4	23,546.0	95.6	11,369.9	53.4	526	511	150
Mutual Savings Banks													
December 1980 ²	60.3	0	27.4	0	0	0	87.7	.3	782.0	3.4	3	0	0
March 1981	57.4	0	27.6	8.0	8.0	.2	93.0	.4	780.0	3.4	3	3	0
June 1981	59.5	0	26.3	9.7	9.7	.2	95.4	.4	772.0	3.4	3	3	0
September 1981	60.7	0	23.0	10.8	10.8	.2	94.5	.4	725.2	3.4	3	3	0
Savings and Loans													
December 1980 ²	12.3	2.5	183.5	10.7	13.2	.7	209.0	.8	7,908.8	34.0	374	39	3
March 1981	14.8	3.1	153.5	256.1	259.2	6.0	427.5	1.8	7,624.6	33.5	369	312	4
June 1981	14.1	3.2	132.9	355.7	358.9	7.7	505.9	2.1	7,384.0	33.0	365	313	5
September 1981	12.8	3.1	119.4	496.3	499.4	9.7	631.6	2.6	6,912.6	32.4	386	326	5
Credit Unions													
December 1980 ²	15.1	208.2	356.5	182.2	390.4	20.2	762.0	3.0	1,979.1	8.5	59	51	13
March 1981	12.1	184.8	45.1	202.2	387.0	8.9	444.2	1.8	2,288.9	10.1	60	53	11
June 1981	12.1	63.1	44.3	224.4	287.5	6.1	343.9	1.4	2,408.4	10.8	60	55	10
September 1981	11.3	65.5	43.8	229.1	294.6	5.7	349.7	1.4	2,303.5	10.8	69	61	11
Totals													
December 1980 ²	22,548.2	1,610.2	969.2	318.9	1,929.1	100.0	25,446.4	100.0	23,248.5	100.0	1,032	96	290
March 1981	19,183.5	1,509.1	556.7	2,832.1	4,341.2	100.0	24,081.4	100.0	22,774.3	100.0	948	854	185
June 1981	19,445.7	1,388.0	531.2	3,298.8	4,686.8	100.0	24,663.6	100.0	22,387.9	100.0	939	864	164
September 1981	18,973.5	1,435.6	500.6	3,712.1	5,147.7	100.0	24,621.8	100.0	21,311.2	100.0	984	901	166

Source: Report of Transaction Accounts, Other Deposits, and Vault Cash (FR 2900).

¹ These data are reported weekly to the Federal Reserve Banks by commercial banks and thrifts with at least \$15 million in total deposits. Since smaller institutions do not report weekly, these data are understated slightly. Data exclude six West Virginia counties located in the Fourth Federal Reserve District.

² NOW deposits are as of December 31, 1980. All other data are averages for the last week in each month.

time, the results closely resemble experiences observed in other regions of the country. In general, the ability of thrifts to capture significant market shares of checkable deposits is directly related to the relative strength of thrifts in deposit markets at the beginning of the period.

Relative pricing strategies for these deposits also affect the relative market shares of banks and thrifts. A review of the New England NOW experiment concluded that the monopoly position that commercial banks previously enjoyed in the provision of third party payment accounts contributed heavily to the early success of banks in marketing NOWs. In the long run, however, the commercial bank share of NOW deposits will depend chiefly upon the ability of banks to attract new NOW deposits. In recent years, commercial banks in most of the New England states have experienced significant erosion in their NOW market shares. Kimball cites the NOW pricing differential as an important explanation for this trend. It therefore follows that in other areas of

the country where significant pricing differentials between banks and thrifts persist erosion in bank shares of NOW deposits is likely. In the Fifth District, commercial banks in each state have seen reductions in their market shares of total balances held in NOW/share drafts since the first quarter of 1981.

The key question is whether this trend will continue, i.e., will S&Ls continue to undercut banks in the pricing of NOWs? Specifically, will lower balance requirements at thrifts persist? Or will S&Ls be forced by cost considerations to price NOWs more like banks after they analyze their initial experience? Some observers have suggested that S&Ls have priced NOWs as a "loss leader" in an attempt to capture consumer business from banks and that thrifts can be expected eventually to raise their balance requirements on NOW accounts. Regardless of the validity of this particular point, the pricing decisions of banks and thrifts will certainly play a critical role in the future competition for household transaction accounts.

Despite the importance of the pricing decision, there exists surprisingly little analysis of NOW pricing.⁷ This is unfortunate. For before one can explain the price differential between banks and thrifts and predict the future course of those prices, one needs to specify the determinants of NOW prices. Accordingly, the remaining sections of this article will (a) employ microeconomic price theory to examine the deposit pricing decision, (b) explain the NOW pricing differential on the basis of calculations of the marginal cost of NOW deposits at banks and thrifts, and (c) theorize on what the analysis implies for future competition for interest-bearing transaction accounts.

Microeconomics of Pricing Deposits

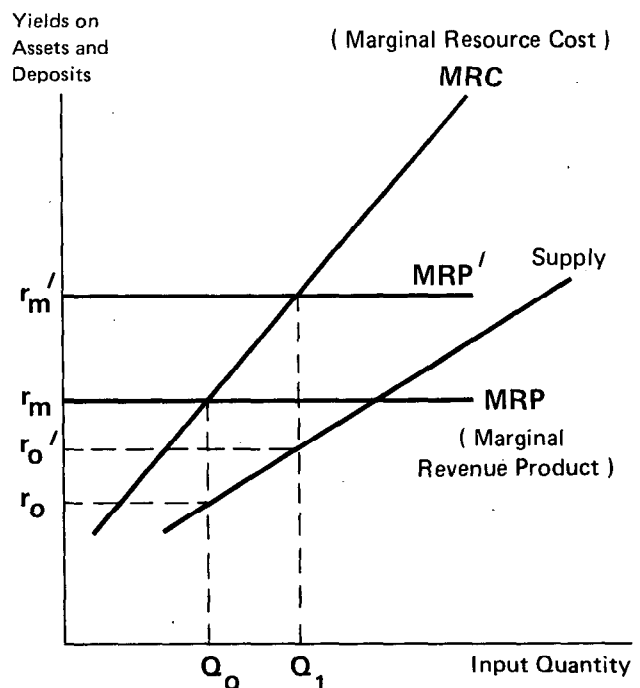
Price theory provides guidance to the firm in its decision to employ variable inputs. To maximize profits, each firm should employ additional units of each factor of production until the addition to total resource cost equals the additional revenue gained from the increased output produced by the extra resources.⁸ If it is necessary for the firm to increase its factor payment to attract additional inputs, the firm will face a positively sloped resource supply curve, as illustrated in Exhibit A. But if the supply curve is positively sloped, the marginal resource cost (MRC) curve will also be upward sloping and will lie above the supply curve. The upward sloping MRC curve lies above the supply curve because the higher payment for additional units of the input must be paid to all (both additional and previously employed) units. The profit maximizing employment level will occur at input usage Q_0 , where the marginal revenue product and marginal resource cost curves intersect. The factor input will, in turn,

receive compensation equal to r_0 . At this rate, each input unit employed, up to Q_0 , will add more to the firm's revenue than to its costs, thus increasing its profits.

This analysis can be applied to bankers' decisions to purchase funds to finance the acquisition of earning assets. To maximize profits, each institution should acquire deposits and other liabilities until the marginal cost of each source is equal to the marginal revenue derived from its employment. Since the marginal revenue from a dollar employed in a bank is the same regardless of the dollar's source, profits will be maximized where marginal revenue equals marginal cost and the marginal cost of each liability source used is the same.

For simplicity, the marginal revenue of bank deposits can be treated as perfectly elastic or horizontal at the market-determined yield on financial assets (r_m in Exhibit A). This assumes both that banks are "yield takers" and cannot influence the yield on investments (e.g., in securities markets) and that each dollar of bank deposits is equally productive in generating additional earning assets. To attract additional household transaction balances (e.g., via NOW

Exhibit A
PRICING AND EMPLOYMENT OF DEPOSITS



⁷ One exception is offered by Simonson and Marks. [24] Their analysis, however, estimates the effect of the introduction of NOW accounts on the weighted average cost of total bank funds when all NOW balances are derived from existing demand and regular savings deposits within the bank. The present article will use survey results of the sources of bank and thrift NOW balances, respectively to estimate the net marginal cost to the institutions of new funds attracted to the firm through NOWs, taking into consideration the cost effects of internal deposit shifts. For a thorough discussion of the marginal cost of funds concept in banking, see Watson. [27]

⁸ In technical language, this requires equating the marginal resource cost (MRC) to marginal revenue product (MRP). The marginal revenue product curve is the firm's resource demand curve. It will be negatively sloped if either (a) the firm sells its product under less than perfectly competitive market conditions or (b) the firm's production function is characterized by diminishing marginal productivity.

accounts) banks must offer higher yields on deposits. Banks, therefore, face upward sloping supply and marginal resource cost curves for transaction balances. Given these positively sloped curves, it follows that the transfer of noninterest-bearing demand deposits to NOWs results in a significant increase in interest expense for balances already employed by the bank. The marginal cost of the *additional* transaction deposits attracted to NOWs, therefore, is higher than the yield paid on NOW balances. Consequently, the bank will pay a deposit yield (r_d) below r_m , the marginal return on assets.

With this framework, one can observe the bank's behavior in response to a change in the market return on assets. If the yield on bank investments increases to r_m' , for example, the marginal revenue to be derived from additional deposits exceeds the marginal cost of funds at Q_0 . To maximize profits, therefore, the bank should bid up the yield on deposits in an attempt to increase deposits to Q_1 . In deposit markets where institutions are prohibited from increasing explicit interest payments, increased yields must take implicit forms.

The foregoing analysis is consistent with observed bank deposit pricing behavior. For, as noted above, the prohibition of explicit interest on demand deposits led banks to increase implicit yields on balances as market interest rates rose. Conversely, the authorization of explicit interest payments on NOW and ATS accounts (together with associated balance requirements and fees) has apparently induced banks to reduce the implicit interest paid on these deposits. This response is to be expected if, as argued below, the marginal cost of NOW deposits at banks is higher than alternative sources of funds. If this is indeed the case, profit maximizing behavior requires the bank to reduce the total yield paid on NOW accounts. This reduction could be accomplished either by charging explicit fees on bank services associated with these accounts or by encouraging depositors to hold higher average balances; both methods drive down the average implicit interest paid.

Marginal Cost of NOW Deposits at Banks and Thrifts

The previous section argues that, given the marginal return on assets, the prime determinant of yields on NOWs is the marginal cost of these deposits to depository institutions. Several factors determine this marginal cost. Perhaps the most critical is the source of funds flowing into NOWs.

The calculations shown in Table 3 demonstrate the extreme dependence of the marginal cost estimate on the composition of the source of NOW balances. In general, the marginal cost of NOW accounts (1) varies inversely with the percentage of NOW balances that represent new funds to the institution and (2) for banks, varies directly with the proportion shifted from demand deposit accounts within the same institution. It will be shown that a wide divergence in the source of NOW balances provides S&Ls with the cost advantage they presently enjoy over commercial banks in the competition for NOW accounts. Other factors influencing the marginal cost estimates include the maximum interest rates payable on transaction and savings accounts, the level of market interest rates, and the implicit yield decisions of each institution.

Survey results indicate the present sources of NOW funds for banks and S&Ls. These provide a representative example of the effects of the introduction of NOW accounts on the marginal costs of funds in each type of institution. Exhibit B details the assumptions and calculations made for each institution in the marginal cost calculations presented in Table 3. Assume each institution experiences a \$1 million increase in 5¼ percent NOW deposits. If banks and thrifts pay interest on collected balances,⁹ the gross interest expense on the NOW balances is \$48,300 and \$46,200, respectively. Several adjustments are required, however, to arrive at the net cost of the additional funds attracted to the institutions. First, since savings have shifted to NOWs, the commercial bank will experience a reduction of \$13,125 in its savings account interest expense (using the passbook savings rate) while savings interest at the S&L will fall by \$27,500. The net increase in explicit interest, therefore, is \$35,175 for the bank and \$18,700 for the S&L.

Secondly, deposit shifts will affect the level of implicit payments at banks and thrifts in substantially different ways. Data for member banks that participate in the Federal Reserve Functional Cost Analysis program indicate that the net operating expense (total operating expense less service and handling charges) per dollar deposited in NOW accounts is lower than that incurred on demand deposits. The bank may realize operational savings, therefore, on the funds transferred from demand deposits to

⁹ If either or both institutions paid interest on the full \$1 million, the interest expense would, of course, be \$52,500. This would only slightly increase the marginal cost estimates and would not alter the results that follow.

NOWs. Increased operating expenses, however, are associated with the new funds in NOWs. Table 3 indicates that banks experience a net reduction in implicit interest expense of \$11,000. S&Ls, on the other hand, incur increased net operating expenses associated with the servicing and maintenance of transaction accounts. This incremental expense is estimated at \$30,000 in Table 3.¹⁰

Adjustments must also be made for changes in reserve requirements and uncollected balances resulting from deposit shifts since these factors will alter the amount of funds actually available for investment. The calculations in Table 3 assume banks are subject to a 12 percent marginal reserve requirement on transaction accounts while a 3 percent reserve ratio is used for S&Ls.¹¹ Under these assumptions, required reserves on funds shifted from demand deposits to bank NOW accounts will not change.¹² Deposits shifted from personal savings accounts (with zero reserve requirements), as well as new funds at banks and thrifts are subject to the respective reserve ratios on NOW balances. Due from balances at each institution were assumed to represent 10 percent of transaction deposits while cash items in process of collection (CIPC) were 8 percent at banks and 12 percent at S&Ls.¹³ Under these

¹⁰ The magnitude of increased net operating expenses (implicit interest paid) on NOWs by S&Ls is uncertain at this point. For comparative purposes, Functional Cost Analysis data [9] for commercial banks were used to estimate the increased implicit payments of S&Ls. Since average NOW balances at S&Ls are closer in size to personal checking accounts at banks rather than to NOW balances, the increased expenses were estimated using net operating expenses per dollar in personal checking accounts. This assumes, therefore, that thrift NOW accounts are twice as expensive to service (4 percent per dollar) as bank NOWs (2 percent).

¹¹ We believe this is justified for two reasons. First, S&Ls are much less likely than banks to have exceeded the \$25 million base for transaction accounts subject to the 3 percent reserve ratio. In addition, even if a large S&L has exceeded the \$25 million base, under the provisions of the reserve phase-in established in the Monetary Control Act, it presently holds one-fourth of the fully phased-in reserves.

¹² Member and nonmember institutions, of course, are affected differently by deposit shifts during the reserve phase-in period. Specifically, required reserves for some large member banks could fall as funds move from demand deposits to NOWs. On the other hand, nonmember banks' required reserves increase as demand deposit balances shift to NOWs.

¹³ Due from balances most often represent correspondent balances on which banks receive compensation (in the form of services). No opportunity cost on these funds is, therefore, incurred. Due from balances and CIPC as a proportion of bank transaction accounts vary with bank size. The proportion of due froms generally declines with bank size while CIPC increases. In addition, insti-

assumptions, total required reserves and uncollected balances increase by \$42,440 for the bank and by \$83,400 for the S&L. Since these funds are non-earning assets, the institutions incur opportunity costs of \$7,215 and \$14,178, respectively (assuming a 17 percent return on assets).

The net marginal cost to the bank of the additional \$100,000, therefore, is \$31,390 or 31.4 percent per *new* dollar employed.¹⁴ The cost figure for many banks may even be higher. Individual banks experiencing smaller proportions of new funds flowing into NOWs, for example, will have substantially higher marginal cost estimates. Also, the implicit interest savings on funds transferred from demand deposits may be less than the two percent figure used in Table 3.¹⁵ If these savings are reduced to one percent, the marginal cost of NOWs increases by \$6,500. On the other hand, if a bank experiences a larger proportion of new funds and fewer demand deposits shifting into NOWs, the marginal cost estimate drops rapidly. The Addendum to Table 3, for example, estimates 17.5 percent marginal cost when 25 percent of NOWs are new funds.

Regardless of the precise figure, these initial estimates indicate that NOW deposits represent an expensive source of funds to commercial banks. Banks may be experiencing marginal NOW costs that exceed both the cost of funds from alternative money market sources and the marginal revenue from investing NOW deposits. This situation, of course, implies reduced profits for banks.

tutions that are members of the Federal Reserve System have lower proportions of due from balances and higher CIPC than nonmembers. [15, p. 22] Knight's data for member banks with total deposits between \$50 million and \$100 million indicate that due froms averaged approximately 10 percent of demand deposits while CIPC averaged near 8 percent. Due from balances at Virginia S&Ls were proportionally much larger than 10 percent in June 1981. This figure, however, includes S&Ls' own commercial demand deposits at banks and cannot all be considered correspondent balances. Virginia S&Ls' CIPC averaged slightly over 12 percent of total transaction balances in June 1981.

¹⁴ The calculations in Table 3 assume, for the moment, that institutions would not lose additional deposits if NOW accounts were not offered.

¹⁵ In particular, depositors with larger than average balances in their personal checking accounts have accounted for most of the funds transferred to commercial bank NOW accounts. Banks may have previously incurred less than the average 4 percent implicit expense on each dollar in these demand deposits. Longbrake [18], for example, found that holders of small checking accounts receive greater implicit rates of interest than holders of large checking balances. When large balance deposits shift to NOW accounts, therefore, banks' implicit interest savings may be less than 2 percent.

Table 3

**MARGINAL COST OF NOW ACCOUNTS
COMMERCIAL BANKS AND SAVINGS AND LOAN ASSOCIATIONS**

Expense Item	Commercial Banks		Savings and Loan Associations	
1. Source of NOW Deposit (\$1 million)	(\$650,000 DDA, \$250,000 SA, \$100,000 New)		(\$500,000 SA, \$500,000 New)	
2. Interest Expense, Collected NOW Balances (@5.25%)		\$48,300		\$46,200
3. Less: Reduced Interest, Savings Accounts	(@5.25%)	<u>\$13,125</u>	(@5.5%)	<u>\$27,500</u>
4. Net Explicit Interest Expense		\$35,175		\$18,700
5. Plus: Net Change in Implicit Interest				
a. Reduced Implicit Payment on Funds Shifted from DDAs	(@-2%)	-\$13,000		0
b. Increased Implicit Payment on Funds Shifted from Savings		0	(@2%)	\$10,000
c. Implicit Payment on New Funds	(@2%)	<u>\$ 2,000</u>	(@4%)	<u>\$20,000</u>
6. Net Change in Implicit Interest		<u>-\$11,000</u>		<u>\$30,000</u>
7. Net Explicit and Implicit Interest Expense		\$24,175		\$48,700
8. Adjustments Due to Increase in Nonearning Assets:				
a. Increased Reserves, Transaction Accounts	(@12%)	\$34,440	(@3%)	\$23,400
b. Increased Uncollected Balances, CIPC	(@8%)	<u>\$ 8,000</u>	(@12%)	<u>\$60,000</u>
9. Net Increase in Nonearning Assets:		\$42,440		\$83,400
10. Plus: Opportunity Cost on Nonearning Assets (@17%); [@11%]		<u>(\$ 7,215) [\$ 4,668]</u>		<u>(\$14,178) [\$ 9,174]</u>
11. Marginal Cost of NOW Accounts (@17%); [@11%]		(\$31,390) [\$28,843]		(\$62,878) [\$57,874]
12. Marginal Cost per Dollar of New Funds		(31.4%) [28.8%]		(12.6%) [11.6%]
ADDENDUM: Alternative Source of NOW Deposit:	(\$500,000 DDA, \$250,000 SA, \$250,000 New)		(\$750,000 SA, \$250,000 New)	
Marginal Cost of NOW Accounts (@17%); [@11%]		(\$43,775) [\$38,975]		(\$37,379) [\$34,757]
(Per Dollar of New Funds)		(17.5%) [15.6%]		(15.0%) [13.9%]

Economic theory predicts that the firm in this situation will reduce its employment of the high cost factor of production in an effort to reduce costs and maximize profits. Consistent with that theory, it does appear that banks have attempted to limit their marginal expenses somewhat by discouraging demand deposit conversions with high minimum balance requirements and penalty fees. Still the question remains: Why have banks offered NOWs to their deposit customers at all if these funds are so expensive? The decision appears to be a defensive strategy in an effort to minimize bank losses.

If a bank does not offer NOWs, it runs an increased risk of losing deposits to its competitors (other banks, thrifts, money market funds, etc.). These deposit losses would have to be replaced at market rates of interest. For example, in Table 3, the entire \$650,000 in demand deposit accounts (DDAs)

could be withdrawn from the bank. If this occurred, the increased interest expense of retaining these funds through purchased liabilities would be approximately \$78,000.¹⁶ Freed reserves from this alternative source of funds could be invested, however, increasing revenue by \$13,260,¹⁷ leaving a net expense of approximately \$65,000. To the bank, this would represent a deadweight loss since no new funds are flowing into the bank. In this example, the bank is better off by offering NOW accounts even though its marginal cost may exceed money market rates. Bank profits will be higher by purchasing NOW deposits than by replacing lost deposits with purchased funds.

¹⁶ This is calculated by multiplying the lost DDA funds times 12 percent—i.e., the difference between the assumed rate on purchased funds (16 percent) and the net implicit payment on DDAs (4 percent).

¹⁷ \$650,000 x .12 (reserve ratio) x .17 (market yield) = \$13,260.

ASSUMPTIONS AND CALCULATIONS FOR TABLE 3

Assumption	Commercial Banks	Savings and Loan Associations
1. Each institution experiences an increase of \$1 million in NOWs. 1981 survey results used as basis for source of funds.	65% NOWs transferred from demand deposits, 25% NOWs transferred from savings accounts, 10% NOWs represent new funds to institutions.	50% NOWs transferred from savings accounts, 50% NOWs represent new funds to institutions.
2. Institutions pay interest on collected funds; 8% of bank NOWs and 12% of S&L NOWs are in process of collection (CIPC). See footnote 13 for source of ratios.	$\$1 \text{ m.} \times (1 - .08) \times .0525 = \$48,300$	$\$1 \text{ m.} \times (1 - .12) \times .0525 = \$46,200$
3. Interest payments reduced on savings accounts. Funds transferred from passbook accounts.	$\$250,000 \times .0525 = \$13,125$	$\$500,000 \times .055 = \$27,500$
4. (2 - 3)	---	---
5. 1980 Functional Cost Analysis data for commercial banks used to estimate changes in implicit payments due to deposit shifts.		
a. (Net operating expense (N.O.E.) per dollar in NOWs minus N.O.E. per dollar in DDAs) times funds shifted to NOWs from DDAs.	$(.02 - .04) \times \$650,000 = -\$13,000$	No funds shifted from demand deposits.
b. Banks: (N.O.E. per dollar in NOWs minus N.O.E. per dollar in regular savings accounts) times funds shifted to NOWs from savings.	$(.02 - .02) \times \$250,000 = 0$	
S&Ls: (N.O.E. per dollar in personal checking account minus N.O.E. per dollar in regular savings) times funds shifted to NOWs from savings.		$(.04 - .02) \times \$500,000 = \$10,000$
c. Banks: N.O.E. per dollar in NOWs times new funds.	$.02 \times \$100,000 = \$2,000$	
S&Ls: N.O.E. per dollar in personal checking times new funds.		$.04 \times \$500,000 = \$20,000$
6. (5a + 5b + 5c)	---	---
7. (4 + 6)	---	---
8. a. Increased transaction accounts are subject to reserve requirements. Institutions, however, may deduct demand balances due from depository institutions and cash items in process of collection in calculating reserves.	Reserve requirement = 12% Due from balances = 10% CIPC = 8% $[\$350,000 \times (1 - (.10 + .08))] \times .12 = \$34,440$	Reserve requirement = 3% Due from balances = 10% CIPC = 12% $[\$1 \text{ m.} \times (1 - (.10 + .12))] \times .03 = \$23,400$
b. A proportion of new funds attracted to transaction accounts is uncollected and not available for investment. Funds transferred from savings maintain their savings characteristics and do not result in increased uncollected balances.	$\$100,000 \times .08 = \$8,000$	$\$500,000 \times .12 = \$60,000$
9. (8a + 8b)	---	---
10. Increased cash assets not invested experience an opportunity cost at the market return on assets. Alternative market rates of (17%) and [11%] considered.	$(\$42,440 \times .17 = \$7,215);$ $[\$42,440 \times .11 = \$4,668]$	$(\$83,400 \times .17 = \$14,178);$ $[\$83,400 \times .11 = \$9,174]$
11. (7 + 10)	---	---
12. Marginal cost of attracting each dollar of new funds to institutions.	Item 11 \div \$100,000	Item 11 \div \$500,000

A bank's estimate of the proportion of deposits that would flow out of the bank in the absence of NOW accounts is the key determinant in the decision to offer NOWs. This estimate, in turn, depends upon the competitive environment in which each bank conducts its business. If a bank is in a highly competitive market with readily available deposit substitutes at higher yields, a relatively large proportion of deposits may leave the bank if NOWs are not

offered. This tends to influence the decision for such banks in favor of offering NOWs. On the other hand, a bank with a near-monopoly position in a market with limited deposit substitutes may believe it faces limited deposit loss and, therefore, decide against offering NOW accounts. Of course deposit losses will be cumulative over time, weighting the decision toward providing NOWs. In Table 3, the "break-even" deposit-loss ratio is roughly 22 percent

when market rates are 17 percent.¹⁸ In other words, banks expecting total attrition of more than 22 percent of DDAs would benefit from offering NOWs. Those anticipating smaller deposit losses might decide not to offer NOW accounts.¹⁹

The net marginal cost of NOW balances at savings and loan associations is estimated in Table 3 to be approximately \$63,000 or 12.6 percent for each *additional* dollar of deposits employed by the firm. This estimate suggests that the marginal cost of NOWs to thrifts is somewhat below the assumed marginal cost of alternative purchased liabilities (16 percent) and lower than the assumed marginal return on assets (17 percent). As demonstrated in the Addendum to Table 3, this relationship holds for thrifts experiencing only 25 percent new funds in NOWs.

What does this reveal about the 1981 NOW pricing decisions of thrifts? Most importantly, it indicates that their low balance requirements and free services are consistent with profit maximizing behavior. Any thrift institution experiencing marginal NOW cost below the marginal return on assets can increase profits by increasing yields on NOWs and attracting additional deposits. Presently, the only available method to increase NOW yields is through implicit payments.

Savings and loan associations' income positions have been under severe pressure in recent years. In large degree this is because funds purchased at high market interest rates replaced low cost sources of funds in S&L liability structures. Concurrently, the dominance of long-term, fixed rate (low interest) mortgages in S&L asset portfolios has resulted in the virtual elimination of profit margins.

¹⁸ The "break-even" deposit loss ratio (d) is found by setting the net marginal costs of the alternative actions equal (so that the effect on profits will be identical):

$$[\$650,000 \times d \text{ (deposit-loss ratio)} \times .12 \text{ (increased interest expense)}] - [\$650,000 \times d \times .12 \text{ (reserve ratio)} \times .17 \text{ (market yield)}] = \$31,390 \text{ (Table 3, item 11)} - [.17 \text{ (market yield)} \times \$100,000 \text{ (new funds)}].$$

Solving for d yields $d = .22$. At lower market interest rates, the break-even deposit-loss ratio increases (i.e., fewer banks might find it optimal to provide NOWs).

¹⁹ An alternative decision-making technique would be possible if institutions knew the demand and savings deposit losses likely to result from a decision not to offer NOW accounts. An estimate of the deposit replacement costs that were avoided (saved) by providing NOWs could then be incorporated into the marginal cost calculations—reducing the marginal cost estimates for each institution. If this analytical technique were possible, banks and S&Ls would maximize profits by providing NOW accounts to customers as long as NOW marginal costs (including the cost savings estimates) were equal to or below the marginal return on assets.

The above analysis on the impact of NOW accounts on the marginal cost of funds at S&Ls suggests NOWs have not been a contributing factor to the financial problems currently faced by the industry. To the contrary, NOWs may have reduced associations' cost of funds and improved earnings. S&Ls' profit experience, in other words, might have been worse without the authorization of NOW accounts. For example, without NOWs the outflow of savings accounts from thrifts to money market alternatives could have been even worse than experienced, forcing S&Ls either to replace those additional funds at higher interest or to liquidate assets.

Implications for NOW Competition Between Banks and Thrifts

Savings and loan associations apparently have a substantial marginal cost advantage over commercial banks in the competition for NOW accounts. This advantage has allowed S&Ls to market and price the new deposits more aggressively than commercial banks. Of course, the maximum explicit interest S&Ls can pay on NOWs is limited by regulation to the same rate offered by banks. Enjoying lower marginal costs than banks, however, thrifts have additional flexibility to "bid up" the implicit payments on NOW accounts.

What do these conclusions imply for the form and direction of future NOW competition between banks and thrifts? As long as Regulation Q interest ceilings on NOWs remain in effect, competitive strategies will likely be expressed through implicit interest payments. The analysis in the previous section indicates that S&Ls have a profit incentive to increase implicit interest payments on NOW accounts as long as their marginal cost remains below the marginal return on investments. Early indications are that many S&Ls, indeed, plan to lower their NOW balance requirements. A follow-up survey of banks and S&Ls conducted by Madison Financial Corporation in July 1981, found that 20.4 percent of the responding S&Ls were contemplating a price change in the near future. A significant proportion (19.4 percent) of the S&Ls stated that they would price their NOW accounts lower if they had it to do all over again while only 2.5 percent indicated they would increase their price. Furthermore, S&Ls anticipated minimum balance requirements for their associations averaging \$317 by the end of 1981, compared to \$435 during the first quarter.

Commercial banks, on the other hand, express satisfaction in their present NOW prices and foresee little change in minimum balance requirements. If the marginal cost of NOW deposits for banks is indeed above the marginal return on assets and marginal cost of other sources of funds, liberalization of bank NOW prices should not be anticipated. A continuation or widening of the pricing differential, in turn, is expected to result in a steady erosion in commercial bank shares of transaction accounts. This does not, however, preclude some individual banks from eventually reducing NOW account prices. This response is possible for banks facing especially strong thrift competition or where individual banks enjoy a significant inflow of new funds into NOW accounts.

As interest ceilings on time and savings deposits and interest-bearing checking accounts are phased out, the marginal cost of NOW accounts will increase at both commercial banks and thrift institutions. It is anticipated that banks will competitively raise their explicit interest payments on NOWs while further lowering implicit payments. Reduced implicit payments will probably be facilitated by explicit fees for transaction services. If the marginal cost of NOW accounts for thrifts, however, remains below the available return on assets, thrifts are more likely than banks to maintain implicit subsidies on services related to transaction accounts while paying competitive explicit interest.

If market interest rates fall, the marginal cost of NOWs to depository institutions will also drop as the opportunity costs on nonearning cash assets (reserves and uncollected balances) fall. The marginal cost of NOWs, however, may not fall by as much as market interest rates. Table 3 provides alternative

estimates for banks and S&Ls when the marginal return on assets is reduced to 11 percent. Holding the source of funds constant results in reductions of nearly three percent and one percent in marginal costs of NOWs at banks and S&Ls, respectively, compared to the six percent drop in market rates. Despite reduced costs, therefore, the relative attractiveness of employing NOWs (instead of other sources of funds) would deteriorate at both institutions and reduced implicit payments might result.

A larger reduction in marginal NOW costs is possible, however, as market interest rates fall. The proportion of new funds flowing into NOW accounts, for example, might increase as the yield on NOWs becomes more attractive to consumers relative to rates on money market instruments. If this occurs, the marginal cost of NOWs could fall more rapidly than market rates. In Table 3, for example, the combined effects of (1) a reduction in market interest from 17 percent to 11 percent and (2) an increase in the proportion of new funds flowing into NOWs at banks from 10 percent to 25 percent will reduce the marginal cost of NOWs at banks by nearly 16 percent (from 31.4 percent to 15.6 percent).

Summary

The analysis in the preceding sections has offered a framework for explaining and anticipating alternative deposit pricing decisions of commercial banks and thrift institutions. Initial experience with NOW accounts confirms the theoretical conclusion that competition among depository institutions for interest-bearing transaction accounts is determined by factors affecting the marginal costs of employing alternative sources of funds. The future course for financial institutions should also depend upon these factors.

APPENDIX

Tables 4-9 report deposit figures for depository institutions in the District of Columbia and each state within the Fifth District. These data reveal that commercial banks in each state experienced significant net reductions in demand deposit accounts over the course of 1981. The tables show that North Carolina banks lost \$1,225 million in these accounts through the end of the third quarter, while Virginia banks lost \$755 million, and those in Maryland \$526 million. On a percentage basis, demand deposit outflows within the District ranged from a low of 12 percent of the December 1980 figure in Maryland to a high of 20 percent in North Carolina. ATS accounts fell in every state except Virginia, which experienced an increase of over \$150 million. ATS deposits in District of Columbia credit unions and telephone and pre-authorized transfer accounts at Virginia credit unions fell precipitously in the first and second quarters as most of these funds were re-categorized as personal savings. Commercial banks and savings and loan associations in each state experienced losses in personal savings accounts through the year, as did mutual savings banks in Maryland.

NOW deposits in depository institutions grew rapidly throughout the District, totalling \$995 million in North Carolina, \$619 million in Maryland, \$614 million in Virginia, \$573 million in South Carolina, \$371 million in the District of Columbia, and

\$355 million in West Virginia at the end of September. Commercial banks in North Carolina, Virginia, and West Virginia (where thrift competition, as measured by 1980 market shares of personal savings accounts, was less significant than in other states) were especially successful in garnering large proportions of NOW deposits. Banks in each of these states captured over 90 percent of funds in NOW/ATS/share draft accounts by September and continued to constitute near monopolies in total transaction accounts. Faced with stronger thrift competition, banks in South Carolina, the District of Columbia, and Maryland collected 84 percent, 71 percent, and 65 percent, respectively, of NOW/ATS/share draft deposits. Banks in these latter states continued their dominance of total transaction accounts, however, holding over 90 percent of state totals at the end of the third quarter.

Savings and loan associations in Maryland and South Carolina held 23 percent and 13 percent, respectively, of NOW/ATS/share drafts by the end of the third quarter. It should be pointed out, however, that S&Ls in these states held relatively large portions of personal savings prior to 1981 while commercial banks held less than half of these deposits. S&Ls and credit unions in the District of Columbia, which combined to control 76 percent of personal savings in December 1980, held 29 percent of total NOW/ATS/share drafts by September.

Table 4
DEPOSITS OF DISTRICT OF COLUMBIA COMMERCIAL BANKS AND THRIFT INSTITUTIONS¹
(\$ millions)

Depository Institutions	I.P.C. Demand (1)	A.T.S.	Telephone Pre-Authorized Transfer (3)	NOW/Share Drafts	Total NOW/ATS/Share Drafts		Total Transaction Accounts		Personal Savings		Number of Institutions	Number Offering NOW/Share Drafts	Number Offering A.T.S.
					Amount (5)	Market Share	Amount (1+3+5)	Market Share	Amount	Market Share			
Commercial Banks													
December 1980 ²	2,331.7	69.4	46.1	0	69.4	24.5	2,447.2	90.0	701.4	24.1	17	0	6
March 1981	2,016.4	23.5	.1	282.2	305.8	56.8	2,322.3	89.2	720.2	24.9	14	14	3
June 1981	2,015.6	20.6	.1	313.9	334.5	72.4	2,350.1	93.3	688.0	23.4	14	14	3
September 1981	1,963.7	14.2	.1	328.6	342.8	70.8	2,306.6	92.8	679.0	24.6	16	16	3
Savings and Loans													
December 1980 ²	1.9	.3	49.6	1.3	.5	.2	52.1	1.9	1,447.8	49.7	17	3	1
March 1981	5.0	.3	37.2	22.0	22.3	4.1	64.6	2.5	1,426.4	49.2	14	13	1
June 1981	1.7	.4	32.8	28.3	28.7	6.2	63.2	2.5	1,381.3	46.9	13	12	1
September 1981	.8	.3	29.1	42.5	42.8	8.9	72.7	2.9	1,247.3	45.2	12	12	1
Credit Unions													
December 1980 ²	1.6	138.1	3.7	80.1	214.0	75.4	219.4	8.1	763.9	26.2	16	13	2
March 1981	2.2	124.8	4.2	85.8	210.6	39.1	217.0	8.3	751.4	25.9	16	13	2
June 1981	2.6	3.5	4.4	95.0	98.5	21.3	105.5	4.2	874.2	29.7	16	15	1
September 1981	2.2	3.0	4.6	95.9	98.9	20.4	105.7	4.3	835.6	30.3	18	17	1
Totals													
December 1980 ²	2,335.2	207.8	99.4	81.4	283.9	100.0	2,718.7	100.0	2,913.1	100.0	50	16	9
March 1981	2,023.6	148.6	41.5	390.0	538.7	100.0	2,603.4	100.0	2,898.0	100.0	44	40	6
June 1981	2,019.9	24.5	37.3	437.2	461.7	100.0	2,518.8	100.0	2,943.5	100.0	43	41	5
September 1981	1,966.7	17.5	33.8	467.0	484.5	100.0	2,485.0	100.0	2,761.9	100.0	46	45	5

Source: Report of Transaction Accounts, Other Deposits, and Vault Cash (FR 2900).

¹ These data are reported weekly to the Federal Reserve Banks by commercial banks and thrifts with at least \$15 million in total deposits. Since smaller institutions do not report weekly, these data are understated slightly.

² NOW deposits are as of December 31, 1980. All other data are averages for the last week in each month.

Table 5
DEPOSITS OF MARYLAND COMMERCIAL BANKS AND THRIFT INSTITUTIONS¹
(\$ millions)

Depository Institutions	I.P.C. Demand (1)	A.T.S.	Telephone Pre-Authorized Transfer (3)	NOW/Share Drafts	Total NOW/ATS/Share Drafts		Total Transaction Accounts		Personal Savings		Number of Institutions	Number Offering NOW/Share Drafts	Number Offering A.T.S.
					Amount (5)	Market Share	Amount (1+3+5)	Market Share	Amount	Market Share			
Commercial Banks													
December 1980 ²	4,264.3	93.9	23.7	0	93.9	50.5	4,381.9	95.2	3,144.9	48.3	81	0	37
March 1981	3,764.2	76.7	21.2	337.1	413.7	70.8	4,199.2	93.4	3,072.0	48.0	76	68	21
June 1981	3,831.8	76.1	20.0	396.9	472.9	69.4	4,324.8	92.9	3,031.8	48.0	76	70	19
September 1981	3,738.6	76.1	17.0	433.2	509.3	64.8	4,264.9	91.6	2,888.5	48.6	75	71	19
Mutual Savings Banks													
December 1980 ²	60.3	0	27.4	0	0	0	87.7	1.9	782.0	12.0	3	0	0
March 1981	57.4	0	27.6	8.0	8.0	1.4	93.0	2.1	780.3	12.2	3	3	0
June 1981	59.5	0	26.3	9.7	9.7	1.4	95.4	2.1	772.0	12.2	3	3	0
September 1981	60.7	0	23.0	10.8	10.8	1.4	94.5	2.0	725.2	12.2	3	3	0
Savings and Loans													
December 1980 ²	4.3	0	38.2	2.5	3.7	2.0	42.5	.9	2,159.1	33.2	73	10	0
March 1981	1.8	2.7	35.7	69.2	71.9	12.3	109.4	2.4	2,124.3	33.2	71	59	1
June 1981	2.1	2.8	30.2	102.3	105.1	15.4	137.4	3.0	2,091.5	33.1	69	59	1
September 1981	1.8	2.6	28.4	174.6	177.2	22.5	207.4	4.5	1,933.7	32.6	73	61	1
Credit Unions													
December 1980 ²	.1	49.4	2.0	38.6	88.2	47.5	90.3	2.0	424.2	6.3	15	12	5
March 1981	.2	49.9	2.1	40.7	90.6	15.5	92.8	2.1	421.1	6.6	15	13	5
June 1981	.1	48.9	2.1	44.8	93.7	13.8	95.9	2.1	425.0	6.7	15	13	5
September 1981	.2	46.9	1.7	41.7	88.6	11.3	90.5	1.9	392.4	6.6	15	13	5
Totals													
December 1980 ²	4,329.0	143.3	91.3	41.1	185.8	100.0	4,602.4	100.0	6,510.2	100.0	172	22	42
March 1981	3,823.6	129.3	86.6	455.0	584.2	100.0	4,494.4	100.0	6,397.7	100.0	165	143	27
June 1981	3,893.5	127.8	165.2	553.7	681.4	100.0	4,653.5	100.0	6,320.3	100.0	163	145	25
September 1981	3,801.3	125.6	70.1	660.3	785.9	100.0	4,657.3	100.0	5,939.9	100.0	166	148	25

Source: Report of Transaction Accounts, Other Deposits, and Vault Cash (FR 2900).

¹ These data are reported weekly to the Federal Reserve Banks by commercial banks and thrifts with at least \$15 million in total deposits. Since smaller institutions do not report weekly, these data are understated slightly.

² NOW deposits are as of December 31, 1980. All other data are averages for the last week in each month.

Table 6
DEPOSITS OF NORTH CAROLINA COMMERCIAL BANKS AND THRIFT INSTITUTIONS¹

(\$ millions)

Depository Institutions	I.P.C. Demand (1)	A.T.S.	Telephone Pre-Authorized Transfer (3)	NOW/Share Drafts	Total NOW/ATS/Share Drafts		Total Transaction Accounts		Personal Savings		Number of Institutions	Number Offering NOW/Share Drafts	Number Offering A.T.S.
					Amount (5)	Market Share	Amount (1+3+5)	Market Share	Amount	Market Share			
Commercial Banks													
December 1980 ²	6,114.0	445.7	289.3	117.8	563.5	95.9	6,966.8	98.9	2,658.4	55.2	67	3	45
March 1981	4,899.6	421.6	271.5	696.6	1,118.2	93.8	6,289.4	98.2	2,540.0	54.7	62	60	26
June 1981	5,019.4	403.7	271.5	776.5	1,180.1	91.9	6,470.9	97.9	2,500.5	55.2	61	60	23
September 1981	4,888.8	406.4	261.4	891.7	1,298.1	90.6	6,448.3	97.4	2,401.2	55.0	60	59	21
Savings and Loans													
December 1980 ²	.9	2.2	37.9	2.4	4.6	.8	43.4	.6	1,859.3	38.6	137	10	2
March 1981	1.3	2.2	30.3	46.1	48.3	4.1	79.9	1.3	1,785.0	38.4	137	113	2
June 1981	1.3	2.0	25.1	70.0	72.0	5.6	98.3	1.5	1,712.5	37.8	137	115	3
September 1981	.9	.1	22.9	102.9	103.0	7.2	126.8	1.9	1,659.2	38.0	148	121	3
Credit Unions													
December 1980 ²	13.0	1.0	4.4	18.6	19.6	.3	37.0	.5	296.9	6.2	5	5	1
March 1981	8.6	1.4	4.6	23.9	25.3	2.1	38.5	.6	321.7	6.9	6	6	1
June 1981	8.3	1.6	4.7	29.5	31.1	2.4	44.2	.7	317.2	7.0	6	6	1
September 1981	6.9	1.6	4.8	30.7	32.3	2.3	44.0	.7	302.1	6.9	8	7	1
Totals													
December 1980 ²	6,127.9	448.9	331.6	138.8	587.7	100.0	7,047.2	100.0	4,814.6	100.0	209	18	48
March 1981	4,909.5	425.2	306.4	766.6	1,191.8	100.0	6,407.8	100.0	4,646.7	100.0	205	179	29
June 1981	5,029.0	407.3	301.3	875.9	1,283.2	100.0	6,613.4	100.0	4,530.2	100.0	204	181	27
September 1981	4,896.6	408.1	289.1	1,025.3	1,433.4	100.0	6,619.1	100.0	4,362.5	100.0	216	187	25

Source: Report of Transaction Accounts, Other Deposits, and Vault Cash (FR 2900).

¹ These data are reported weekly to the Federal Reserve Banks by commercial banks and thrifts with at least \$15 million in total deposits. Since smaller institutions do not report weekly, these data are understated slightly.

² NOW deposits are as of December 31, 1980. All other data are averages for the last week in each month.

Table 7
DEPOSITS OF SOUTH CAROLINA COMMERCIAL BANKS AND THRIFT INSTITUTIONS¹

(\$ millions)

Depository Institutions	I.P.C. Demand (1)	A.T.S.	Telephone Pre-Authorized Transfer (3)	NOW/Share Drafts	Total NOW/ATS/Share Drafts		Total Transaction Accounts		Personal Savings		Number of Institutions	Number Offering NOW/Share Drafts	Number Offering A.T.S.
					Amount (5)	Market Share	Amount (1+3+5)	Market Share	Amount	Market Share			
Commercial Banks													
December 1980 ²	2,602.4	124.3	33.7	8.1	132.4	79.7	2,768.5	97.1	859.6	44.2	57	2	34
March 1981	2,264.8	79.5	29.4	395.3	464.7	84.3	2,768.9	95.4	820.2	44.8	51	51	15
June 1981	2,345.7	74.5	28.4	454.8	529.3	83.9	2,903.4	95.2	824.7	46.0	49	49	12
September 1981	2,187.5	68.8	25.3	488.4	557.2	83.6	2,770.0	94.8	794.7	46.4	51	51	13
Savings and Loans													
December 1980 ²	1.6	0	17.3	2.7	2.7	1.6	21.6	.8	926.5	47.6	64	5	0
March 1981	1.7	0	15.0	61.6	61.6	11.2	78.3	2.7	846.3	46.2	64	51	0
June 1981	1.6	0	14.3	76.5	76.5	12.1	92.4	3.0	802.7	44.8	64	51	0
September 1981	1.5	0	12.7	84.2	84.2	12.6	98.4	3.4	752.1	44.0	64	52	0
Credit Unions													
December 1980 ²	.1	14.3	29.4	16.8	31.1	18.7	60.6	2.1	159.7	8.2	8	8	3
March 1981	0	6.0	29.2	18.8	24.8	4.5	54.1	1.9	164.6	9.0	8	8	2
June 1981	0	6.1	28.2	18.9	25.0	4.0	53.1	1.7	164.0	9.2	8	8	2
September 1981	.1	5.8	27.9	19.4	25.2	3.8	53.2	1.8	164.2	9.6	9	9	2
Totals													
December 1980 ²	2,604.1	138.6	80.4	27.6	166.4	100.0	2,850.7	100.0	1,945.8	100.0	129	15	37
March 1981	2,266.5	85.5	73.6	475.7	551.1	100.0	2,901.3	100.0	1,831.1	100.0	123	110	17
June 1981	2,347.3	80.6	70.9	550.2	630.8	100.0	3,048.9	100.0	1,791.4	100.0	121	108	14
September 1981	2,189.1	74.6	65.9	592.0	666.6	100.0	2,921.6	100.0	1,711.0	100.0	124	112	15

Source: Report of Transaction Accounts, Other Deposits, and Vault Cash (FR 2900).

¹ These data are reported weekly to the Federal Reserve Banks by commercial banks and thrifts with at least \$15 million in total deposits. Since smaller institutions do not report weekly, these data are understated slightly.

² NOW deposits are as of December 31, 1980. All other data are averages for the last week in each month.

Table 8

DEPOSITS OF VIRGINIA COMMERCIAL BANKS AND THRIFT INSTITUTIONS¹

(\$ millions)

Depository Institutions	I.P.C. Demand (1)	A.T.S.	Telephone Pre-Authorized Transfer (3)	NOW/Share Drafts	Total NOW/ATS/Share Drafts		Total Transaction Accounts		Personal Savings		Number of Institutions	Number Offering NOW/Share Drafts	Number Offering A.T.S.
					Amount (5)	Market Share	Amount (1+3+5)	Market Share	Amount	Market Share			
Commercial Banks													
December 1980 ²	5,387.7	634.4	5.6	0	634.4	94.8	6,027.7	93.9	3,462.3	67.4	197	1	108
March 1981	4,678.2	708.6	5.3	420.5	1,129.1	93.3	5,812.6	97.9	3,297.8	62.9	160	146	70
June 1981	4,744.2	736.2	5.3	493.7	1,229.9	92.4	5,979.5	97.7	3,214.1	63.3	158	149	59
September 1981	4,633.0	791.3	5.2	539.8	1,331.1	92.0	5,969.3	97.5	3,093.9	63.5	164	157	59
Savings and Loans													
December 1980 ²	1.8	0	37.2	.9	.9	.1	39.9	.6	1,342.6	26.1	64	7	0
March 1981	3.9	0	32.7	45.1	45.1	3.7	81.7	1.5	1,315.8	25.1	64	56	0
June 1981	6.4	0	27.5	62.0	62.0	4.7	95.9	1.6	1,239.1	24.4	64	57	0
September 1981	6.2	0	23.9	74.0	74.0	5.1	104.1	1.7	1,174.5	24.1	70	61	0
Credit Unions													
December 1980 ²	0	5.4	316.9	28.2	33.6	5.0	350.5	5.5	334.4	6.5	15	13	2
March 1981	1.1	2.6	5.0	33.0	35.6	2.9	41.7	.7	630.0	12.0	15	13	1
June 1981	1.1	2.9	4.9	36.2	39.1	2.9	45.1	.7	628.0	12.4	15	13	1
September 1981	1.8	2.9	4.8	38.7	41.6	2.9	48.2	.8	604.8	12.4	18	14	1
Totals													
December 1980 ²	5,389.5	639.8	359.7	29.1	668.9	100.0	6,418.1	100.0	5,139.3	100.0	276	21	110
March 1981	4,683.2	711.2	43.0	498.6	1,209.8	100.0	5,936.0	100.0	5,243.6	100.0	239	215	71
June 1981	4,751.7	739.1	37.7	591.9	1,331.0	100.0	6,120.5	100.0	5,081.2	100.0	237	219	60
September 1981	4,641.0	794.2	33.9	652.5	1,446.7	100.0	6,121.6	100.0	4,873.2	100.0	252	232	60

Source: Report of Transaction Accounts, Other Deposits, and Vault Cash (FR 2900).

¹ These data are reported weekly to the Federal Reserve Banks by commercial banks and thrifts with at least \$15 million in total deposits. Since smaller institutions do not report weekly, these data are understated slightly.² NOW deposits are as of December 31, 1980. All other data are averages for the last week in each month.

Table 9

DEPOSITS OF WEST VIRGINIA COMMERCIAL BANKS AND THRIFT INSTITUTIONS¹

(\$ millions)

Depository Institutions	I.P.C. Demand (1)	A.T.S.	Telephone Pre-Authorized Transfer (3)	NOW/Share Drafts	Total NOW/ATS/Share Drafts		Total Transaction Accounts		Personal Savings		Number of Institutions	Number Offering NOW/Share Drafts	Number Offering A.T.S.
					Amount (5)	Market Share	Amount (1+3+5)	Market Share	Amount	Market Share			
Commercial Banks													
December 1980 ²	1,942.1	33.6	4.0	2.1	35.7	95.5	1,981.8	99.6	1,989.9	87.1	201	1	50
March 1981	1,615.5	12.9	3.3	262.2	275.1	94.8	1,893.9	99.0	1,850.2	86.9	172	166	40
June 1981	1,538.9	12.2	2.7	306.3	318.5	94.1	1,860.1	98.7	1,782.9	86.9	172	170	38
September 1981	1,619.1	11.8	5.8	332.9	344.7	91.8	1,969.6	98.2	1,728.5	86.8	180	177	40
Savings and Loans													
December 1980 ²	2.0	0	3.3	1.0	1.0	2.7	6.3	.3	271.7	11.9	24	5	0
March 1981	1.5	0	3.1	14.2	14.2	4.9	18.7	1.0	256.8	12.1	23	22	0
June 1981	1.5	0	3.5	18.8	18.8	5.6	23.8	1.3	246.6	12.0	23	22	0
September 1981	1.6	0	3.2	22.0	22.0	5.9	26.8	1.3	237.3	11.9	25	24	0
Credit Unions													
December 1980 ²	0	0	0	.7	.7	1.9	.7	.0	21.8	1.0	1	1	0
March 1981	0	0	0	.8	.8	.3	.8	.0	21.9	1.0	1	1	0
June 1981	0	0	0	1.2	1.2	.4	1.2	.1	22.5	1.1	1	1	0
September 1981	0	5.3	0	3.9	9.2	2.4	9.2	.5	25.9	1.3	2	2	1
Totals													
December 1980 ²	1,944.1	33.6	7.3	3.8	37.4	100.0	1,988.8	100.0	2,283.4	100.0	226	7	50
March 1981	1,617.0	12.9	6.4	277.2	290.1	100.0	1,913.4	100.0	2,128.9	100.0	196	189	40
June 1981	1,540.4	12.2	6.2	326.3	338.5	100.0	1,885.1	100.0	2,052.0	100.0	196	193	38
September 1981	1,620.7	17.1	9.0	358.8	375.9	100.0	2,005.6	100.0	1,991.7	100.0	207	203	41

Source: Report of Transaction Accounts, Other Deposits, and Vault Cash (FR 2900).

¹ These data are reported weekly to the Federal Reserve Banks by commercial banks and thrifts with at least \$15 million in total deposits. Since smaller institutions do not report weekly, these data are understated slightly. Data for the entire state are included in the table.² NOW deposits are as of December 31, 1980. All other data are averages for the last week in each month.

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THE FEDERAL RESERVE'S ROLE IN THE PAYMENTS MECHANISM AND ITS COMMUNICATION PLANS

Statement by

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Board of Governors of the Federal Reserve System

*Before the Subcommittee on Government Information and Individual Rights
of the*

Committee on Government Operations

U. S. House of Representatives

October 22, 1981

Introduction I am pleased to be able to discuss with your Subcommittee the role of the Federal Reserve in the provision of payments mechanism services, particularly those that are often referred to as electronic fund transfer services (EFTS).

In addition, I will explain why the Federal Reserve's operation of a highly secure and flexible network is needed to carry out the System's monetary policy and payments mechanism responsibilities, and why technological obsolescence has made it necessary to replace the current network. This replacement project, incidentally, isn't at all remarkable—the System has upgraded its communications facilities every 10 to 20 years since 1915.

The Federal Reserve, as the nation's central bank, has a number of diverse, but highly interrelated, responsibilities—for monetary policy, bank supervision and regulation, and payments system operations. Our basic responsibility for the efficiency and integrity of the nation's payments mechanism dates from the Federal Reserve Act of 1913, and was confirmed by the Congress only last year with the passage of the Monetary Control Act of 1980. This legislation makes it clear that the Federal Reserve should participate in the payments mechanism in ways that will promote competition, contribute toward greater efficiency, and ensure an adequate level

of payments services nationwide. This is accomplished by requiring the System to make available its payment services to all depository institutions and over the long run to charge for such services at their full cost. This is a major development in the evolution of the payments mechanism, and I will discuss its implications later on in my statement. First, however, a brief history of the Federal Reserve's role in the payments mechanism may be helpful.

The U. S. Payments Mechanism: A Brief History Prior to 1800, exchange of currency (and gold) was the primary method used to transfer funds. Paper checks became widely used in the mid-1800s, and they have played a dominant role in the U. S. payments mechanism ever since. With over 30 billion checks per year moving through the economy and the cost of labor and transportation increasing, electronic payment systems are being developed to supplement the check system. Electronic fund transfers, which are only in their infancy, have the potential to improve greatly the security, efficiency, and reliability of the money transfer system.

Prior to the creation of the Federal Reserve, checks were cleared, and funds transferred, through a network of interbank correspondent balances. In order for one bank's check to be cleared when de-

posited at another bank, the check moved through one or more correspondent banks. The number of correspondent banks involved in clearing a check depended on many factors including the distance between the two banks. This process led to pyramiding of correspondent balances and a slow collection system.

The establishment of the Federal Reserve in 1913 altered the U. S. payments system in at least two important respects. First, it reduced the need for banks to maintain a complex network of correspondent balances to clear checks and other payments. Instead, Federal Reserve member banks could transfer funds by wire using a single reserve account balance. Indeed, the Federal Reserve Act directed that reserve accounts be used to clear payments transactions among depository institutions. Today correspondent balances are still used to clear payments of primarily smaller depository institutions. Book-entry accounting using reserve accounts, however, has all but eliminated the need to ship currency between banks to settle payments flows between geographic regions of the United States.

The second change in the payments system was the establishment of a national wire transfer network to provide access to these centralized reserve accounts. In 1915 the wire network was a telegraphic communication system. It has evolved into a high speed, computerized network. Besides its role in the payments mechanism, the wire network is a vital element in the conduct of monetary policy and the operation of the government securities market.

Despite the changes in the mechanism used to carry out these responsibilities, however, the basic central banking role performed by the Federal Reserve has not changed since 1913.

Federal Reserve Wire Transfer and Settlement Operations The 12 Federal Reserve District Banks and their 25 branches maintain reserve accounts and clear directly and indirectly with all depository institutions in the nation. A depository institution wishing to transfer funds from its reserve balance to another depository institution uses the Federal Reserve's wire transfer system. Reserve balances are transferred by depository institutions to purchase or sell Federal funds, (that is, to make interbank loans), to move correspondent bank bal-

ances from one institution to another, and to send funds to another bank on behalf of its customers. The Treasury Department and Federal agencies maintain accounts at Federal Reserve offices and they use these accounts and the wire transfer system extensively to disburse and collect monies. In 1980, 43 million reserve balance transfers took place, involving an aggregate of \$78 trillion.

The settlement of funds transfers and reserve account maintenance functions of the wire transfer system contribute to an efficient payments mechanism. Settlement through the Federal Reserve, with the full force and power of a central bank behind it, substantially reduces the risk of settlement failure which could result in serious disruptions in financial markets.

The Wire Transfer Network and Monetary Policy Depository institutions must have access to their reserve accounts to adjust them in response to fluctuations in their reservable liabilities. One way this access is provided is by the wire transfer system. This system is also used by the Federal Reserve, the Treasury, and depository institutions to transfer U. S. government and agency securities. It is also through this network that Federal Reserve open market operations are facilitated. Open market operations are the primary method used to expand or contract the money supply. The wire transfer system improves the efficiency of open market operations by promoting a large, secure, and liquid market for government securities. This arrangement not only facilitates the marketing of government debt but also results in lower cost to the Treasury.

Other Uses of the Federal Reserve's Communication System The Federal Reserve's communication network is also used for two other principal purposes. First, it is used to transmit timely bank deposit data to the Federal Reserve Board for day-to-day monetary policy purposes. These data include daily deposit information on 14,000 depository institutions. Secondly, it is used to transfer small dollar value recurring payments such as direct deposit of payroll and bill payments among automated clearing houses. The ACH was established jointly by the banking industry and the Federal Reserve as a vehicle to clear and settle certain types of electronic

payments. In 1980 about 60 million commercial and 160 million Treasury payments were processed through the ACH. Incidentally, over 30 percent of the social security recipients in the United States have elected to have their benefits sent through the ACH mechanism.

The ACH, we believe, has the potential to offer significant benefits to the public in terms of decreased cost, increased convenience, and greater security for certain types of payments. This judgment is shared by the financial industry, the Federal government, which is the largest user of the ACH, and by the National Commission on Electronic Fund Transfers (NCEFT). The NCEFT further concluded that Federal Reserve involvement in the operation of ACHs was necessary because the private sector was not yet able to operate ACH facilities economically without this assistance.

A Description of the Federal Reserve's Communication Network The Federal Reserve uses data processing and communications to receive, process, and deliver payments. The computers used are general data processing machines of the type used by most large multipurpose organizations, both public and private. Our need to transmit data among the Federal Reserve offices, the Board, and the Treasury is accomplished through the use of three communications networks. The networks include the Inter-district Fedwire, the Interdistrict Bulk Data, and the Local District Networks.

On the Fedwire more than 175,000 messages containing wire transfers of funds and securities, along with administrative information, are being communicated each day among the Federal Reserve Banks through a central store-and-forward message switch in Culpeper, Virginia. This network, including its extensions from head offices to branches and offices, was installed between 1969 and 1974 and replaced an antiquated semi-automated network that was installed in 1953.

A bulk data network, which uses high-speed switched circuits to connect the 12 Federal Reserve Banks and the Board of Governors, was implemented in 1976. This network is used to transmit bank deposit data and ACH payments.

Each Federal Reserve Bank has also implemented its own local network between the head office and its

branches. These facilities are used to move accounting data and other local traffic within the District.

The New Federal Reserve Communications System As it has done on the average of every 10 to 20 years, the Federal Reserve System is now replacing its communications network. The current upgrading is needed because the present system and its technology are 10 years old, and more cost-effective and reliable technologies are available. Moreover, the present system relies in large part on an AT&T service that will terminate in 1983, and its central switch is maintained by a vendor that will cease its maintenance responsibilities in 1985. Within the Federal Reserve, the replacement project is known by the acronym FRCS-80 (Federal Reserve Communications System for the Eighties). Conceptual planning for FRCS-80 began in late 1975 on the assumption that a more efficient communications technology would be available in the 1980s and that the Federal Reserve System would be making its payment services available to all depository institutions. These assumptions have proven correct with the development of packet switching technologies and the passage of the Monetary Control Act of 1980.

The new system will be a general-purpose data communications network that will satisfy the Federal Reserve's internal communications requirement of providing services to the financial community, the Treasury, and other government agencies. FRCS-80 will be used for the transmission of the same data that is sent over the current network.

The functions of the existing separate communications networks will be consolidated into a single network providing better service at less cost. Historically, as the need for new data communications applications emerged, the most frequent solution was the implementation of independent data communications systems tailored to a single application. With FRCS-80, new communications requirements can be met without additional networks or major design changes.

FRCS-80 will:

- Improve the reliability and efficiency of the Federal Reserve's communications operations.
- Reduce the total cost of System communications through a more efficient use of circuits.

- Increase security of data moving within the Federal Reserve System.

The conceptual design of FRCS-80 is that of a distributed "packet-switched" network. No single central switching site, such as the current switch in Culpeper, Virginia, will be required to coordinate the operation of the network. Rather than revolve around a computerized hub, as does the current Fedwire, FRCS-80's computer power will be distributed among the Federal Reserve offices.

As part of the process of selecting a new communications network, the Federal Reserve compared two network approaches: A public access network and a private network. The private network approach was chosen because of security risks involved in using a public network and the lack of control over the flexibility of the public network. Flexibility is critical because the Federal Reserve must respond to rapid legislative or monetary policy changes.

After evaluating proposals from several vendors, the Federal Reserve awarded a \$10 million contract to Northern Telecommunications, Inc. to provide hardware, software, and install the network on a turn-key basis. Recently a factory acceptance test was completed and equipment is now being installed in the Federal Reserve offices. The network is expected to be fully operational in early 1983.

Pricing of Federal Reserve Services The Monetary Control Act of 1980 required the pricing of certain Federal Reserve services. These services include all payments mechanism services, such as check processing, wire and securities transfers, settlement, and ACH transactions. We are now charging for all financial services except cash transportation. Charges for cash transportation are scheduled to commence in early 1982. Over the long run, the revenues derived from the sale of financial services will cover all Federal Reserve costs in providing them, including an amount to reflect private sector costs not incurred by the Federal Reserve, such as taxes and financing costs. As a result, services will be offered competitively, allowing the private sector adequate opportunity to enter or expand their share of the market for payments mechanism services.

Even before pricing began, significant competition already existed in check processing. Large money

center correspondent banks and private service bureaus clear a substantial proportion of total checks written. Bankwire, CHIPS,¹ and SWIFT² are private-sector competitors for domestic and international large dollar funds transfers.

ACH operations, because of their economies of scale and potential for improving the efficiency of certain types of funds transfers, is being priced temporarily based on long-run costs to encourage its development. In the near future ACH services will be priced based on actual costs and as ACH volume grows we expect competitors to enter this market.

The Role of the Federal Reserve in Point-of-Sale (POS) It is our understanding that certain parties are concerned that FRCS-80 is being designed to accommodate point-of-sale switching capabilities. The National Commission on Electronic Fund Transfers in 1977 reported to Congress on the role of the Federal government in EFT. The Commission recommended "that the Federal government not be involved operationally, at present or in the foreseeable future, in POS switching and clearing facilities except for the provision of net settlement among depository institutions." The design of FRCS-80 does not contemplate any point-of-sale switching activities, and the Federal Reserve has no intention of getting involved in such activities.

Privacy Considerations Before I conclude my remarks this morning, I would like to explain briefly the Federal Reserve policy on retention and disclosure of electronic payment records containing data on individuals. I will focus on our ACH policy since data identifying an individual is rarely part of a wire transfer.

While the ACHs do not process enough information to serve as a privacy threat, the Federal Reserve

¹ The Clearing House Interbank Payments System (CHIPS) is a nongovernmental facility that clears international transactions for its 100 members. It is operated by the New York Clearing House Association, which has as its controlling members the 12 largest New York City commercial banks.

² The Society for Worldwide Interbank Financial Transactions (SWIFT) is a cooperative company located in Belgium that operates a communications network to exchange payment instructions among its over 800 members.

has taken affirmative steps to insure the privacy of data in our possession. Various ACH records contain individual and business names, bank account numbers, and social security and other individual identification numbers. Such transaction data are retained by Federal Reserve Banks only for the limited time needed to fulfill operational requirements. Records maintained on computer media are retained no longer than 30 business days following settlement of the transaction. Microfiche historical records containing individual transaction data are retained for 60 business days following settlement. Microfiche historical records not containing individual transaction data are retained for one year. At the end of their respective retention periods all records are destroyed.

The Federal Reserve data disclosure policy pertains to all payments services, including the ACH. The Federal Reserve Banks will not disclose indi-

vidual transaction data except to parties that are part of the transfer, such as the originating and receiving financial institutions or when a grand jury subpoena or an order of a court with proven jurisdiction is presented.

Conclusion The Subcommittee's invitation for the Board to testify at this hearing requested the Federal Reserve to comment on what it believed its appropriate role to be in the provision of telecommunications services. As I have explained today, the Federal Reserve offers payments services to the banking industry and uses telecommunications for its internal operations. The Federal Reserve clears, delivers, and settles inter-bank payments. In doing so, we use computer and telecommunications equipment and facilities, and we appreciate the Subcommittee's concern that the provision of these facilities occurs in a competitive environment.