

# THE IMPLICIT DEPOSIT RATE CONCEPT: ISSUES AND APPLICATIONS

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## I. INTRODUCTION

On June 16, 1933, President Roosevelt signed into law the Banking Act of 1933, Section 11 of which specified that "No bank shall, directly or indirectly, by any device whatsoever, pay an interest on any deposit which is payable on demand." In spite of the 45 years existence of the law, the concept of an "implicit" demand deposit interest rate paid by banks to their depositors is used with increasing frequency by economists in a variety of different contexts.<sup>1</sup>

The determinants of the demand for money have been one of the most intensively researched issues in economics. The well known IS-LM model of the macroeconomics literature suggests a relationship between the effectiveness of monetary and fiscal policy on the one hand and the nature of the demand for money function on the other. Some recent work in this area has attached central importance to the role of the implicit deposit rate in the demand for money function and, in the process, has significantly enhanced understanding of both the nature of this function and its implications for policy-making.

The use of the concept is by no means restricted to money demand theory and its implications for macroeconomic theory and policy. How efficient is the U. S. payments system and to what extent is that efficiency affected by the prohibition? If the prohibition were relaxed or removed entirely, what would be the effect on bank costs and how would this effect be transmitted to the banks' depositors and borrowers? Would removing the prohibition lead to a profound alteration of the competitive position of banks vis-à-vis non-bank depository institutions such as S&L's and mutual savings banks?

It would be presumptuous indeed to assert that economists have arrived at anything like definitive

answers to these questions. But it is manifest that the concept of an implicit deposit rate is an important ingredient in securing at least approximate answers. The extent to which the spirit, if not the letter, of the 1933 Banking Act has been circumvented by the payment of an implicit deposit rate affects, in a significant way, economists' responses to the above questions.

The next section of this article examines several approaches to the measurement of the implicit deposit rate. This is followed by a discussion of recent research on the demand for money function—research that makes extensive use of the implicit deposit rate concept. Finally, some implications of the substitution of explicit for implicit interest payments are examined. The development of the NOW account and the Federal Reserve Board's recent proposal to pay interest on member bank reserves are two dramatic examples of this substitution. The article concludes with a discussion of some limitations of the implicit deposit rate concept.

## II. MEASURES OF THE IMPLICIT DEMAND DEPOSIT RATE

As administrators of the nation's payments mechanism, commercial banks provide an important flow of services to the general community. The provision of these payments services is costly both to the banking system and to society because real resources are allocated to their production; resources that have an economic opportunity cost measured by the value of the other goods and services which we forego in order to produce payments services. Yet the revenue that a bank receives from these services is rarely equal to the cost to a bank of providing them.

The explanation is well known: demand deposit funds can be used to make loans and purchase other interest-bearing assets the revenues from which are a major source of commercial bank income. Competition for these funds cannot take the form of an explicit interest rate and must, therefore, seek alternative outlets. Perhaps the most obvious alternative is for a bank to reduce its charges to depositors for

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<sup>1</sup> The background of this legislation as well as an appraisal of some of the arguments used to justify the prohibition are discussed in [3, Chapter 2].

Table I

**BALANCES, INCOME, EXPENSES, AND  
IMPLICIT INTEREST COST PER PERSONAL  
CHECKING ACCOUNT, BY SIZE OF BANK**

1975

	Deposits up to \$50M	Deposits \$50-200M	Deposits over \$200M
Average balance per account	\$783.00	\$967.00	\$1,021.00
Income from service and penalty charges (per year)	14.80	11.28	14.56
Expenses (per year)	46.29	49.87	62.59
Implicit interest payment	31.49	38.59	48.03
Implicit interest rate	4.02%	3.99%	4.70%
Implicit interest rate adjusted for reserve requirements	4.43%	4.49%	5.48%

Source: Federal Reserve Board [3, p. 22].

the use of bank payments services below the cost to the bank of providing those services.

A recent study by the Federal Reserve Board staff [3] attempted to quantify this dimension of the implicit demand deposit rate using data from the Federal Reserve's Functional Cost Analysis Program. The program is designed to estimate the costs and revenues associated with various bank functions. Table I summarizes the Board's estimates for participating banks in 1975.

Implicit deposit rates were calculated by deducting annual service charge income per account from expenses per account and dividing the remainder by the average dollar balance per account. These estimates appear in the next to last row. The final row adjusts the interest rate for demand deposit reserve requirements. Since banks must hold non-interest-bearing reserves equal to a minimum percentage of their demand deposits, the cost to a bank for acquiring funds *available for lending* is correspondingly increased.

It is important to understand that these calculations take account of only one easily quantifiable method of circumventing the prohibition: the remission of service charges. In some circumstances such calculations may significantly understate total implicit interest payments. For example, using the above methodology the Board staff study calculated the implicit deposit rate paid to *commercial* demand deposit customers. The estimated rates after adjustment for reserve requirements were 1.60, 1.32, and 1.42 percent for the three size classifications of banks

listed in order of increasing size. The estimated interest rates on commercial accounts were, therefore, only approximately one-third of the rates on personal accounts. Yet it is well known, and recognized by the Board study, that banks use devices other than the remission of service charges to compensate business depositors. A wide variety of cash management services at subsidized rates is made available by banks to business firms. In addition to the provision of transactions services, depositor-borrowers may be given preferential lending treatment in the form of reduced loan interest rates or superior nonprice lending terms. These and other elements of the complex relationship between a bank and its depositors may be more difficult to quantify but are not, for that reason, any less important than the more easily quantifiable remission of service charges.

The results of three different approaches to the estimation of implicit interest rates are presented in Table II. The first two columns provide time series for the estimated demand deposit interest rate whereas the third column presents estimates of the rate of interest on  $M_1$ , which includes currency as well as demand deposits, for the 1960-68 period. The reader will undoubtedly be struck by the differences in the magnitudes of these estimates. It is to be remembered, however, that no comprehensive data source exists and very different conceptual approaches were used by the authors of the three studies.

The rates shown in column 1, from William Becker's study [2], were derived by taking *all* non-interest expenses of a bank, subtracting service

Table II

**ESTIMATED DEMAND DEPOSIT INTEREST RATES  
(PERCENT) FROM THREE STUDIES  
1960-1968**

Year	Study		
	W. Becker [2] (1)	Barro-Santomero [1] (2)	B. Klein [13] (3)
1960	2.64	1.72	2.38
1961	2.75	1.72	1.74
1962	2.89	1.72	1.94
1963	2.95	1.77	2.12
1964	2.98	1.80	2.40
1965	3.25	1.93	2.68
1966	3.32	2.12	3.46
1967	3.54	2.26	3.11
1968	3.74	2.42	3.70

Note: Estimates reported in column 3 are weighted averages of the interest rate on demand deposits and the assumed zero rate of return on currency.

charges, and dividing the difference by the level of demand deposits. Federal Reserve data on the income and expenses of member banks were used and since all non-interest bank expenses are attributed to the demand deposit function, the series is almost certainly biased upward to a significant extent.

In contrast, the Barro-Santomero study [1] is based on the authors' own survey of 23 commercial banks. The figures presented are simply average remission rates on personal accounts. A remission rate of \$0.10 per month per \$100, for example, would be stated as an interest rate of 1.2 percent per year. Since remission of service charges based on minimum balances is only one method by which banks subsidize their depositors' use of the payments mechanism, actual implicit rates were undoubtedly higher than those appearing in column 2.

Conceptually, Benjamin Klein's [13] estimates (column 3) are the most interesting. Rather than basing an estimate of the deposit rate on revenue and cost data, he attempts to estimate what rate of interest banks *would have paid* on deposits had the prohibition not been in force. Put differently, he attempts to estimate what the competitive, market determined, demand deposit interest rate would have been. He then assumes that the prohibition was, in fact, completely ineffective and that, in one way or another, the competitive rate was paid to depositors. The nature of his results is described in more detail in the following section of this article.

All three time series have a remarkable tendency to move together: remarkable given the differences in data and conceptual approaches. The simple correlation coefficient between columns 1 and 2 is .97; between columns 2 and 3 it is .93; and between columns 1 and 3 it is .88. We may not know the exact size of the implicit deposit rate, but we have a pretty clear idea of the direction in which it is moving!

### III. SOME USES OF THE CONCEPT

**The Implicit Deposit Rate and the Demand for Money** One of the most interesting recent studies in which the concept of an implicit deposit rate is given central importance is Benjamin Klein's analysis of the determinants of the demand for money [13]. The basic question he poses is this: does the inclusion of a measure of the implicit deposit rate among the determinants of the demand for money significantly improve economists' ability to explain the public's money-holding behavior over long periods of time? Conventional demand for

money functions that exclude the rate of return on demand deposits are used as benchmarks for comparison.

The most common form of the money demand function appearing in these expositions is given by the equation

$$(1) \quad M^d/P = f(r, Y)$$

where  $M^d$  is the demand for nominal balances,  $P$  is the price level,  $M^d/P$  is the demand for real cash balances,  $r$  is the rate of interest, and  $Y$  is the level of real income. Although there exist substantial variations on the theme, virtually all empirical studies of the determinants of money demand include some scale variable such as measured income, permanent income, or wealth, and some measure of the opportunity cost of holding money such as the rate of interest on other liquid assets. The latter is included to represent the sacrifice involved in holding money rather than some other asset which, unlike money, cannot be used directly to make payments but can be easily converted into money should the need arise *and* carries an explicit rate of return. Of course, it is anticipated that a rise in  $r$  will lower money demand—a proposition which is repeatedly confirmed by empirical studies.

Klein contends that the above specification of the cost of holding money is likely to be seriously misleading. Since it identifies the cost of holding money with the (usually short-term) rate of interest, this measure assumes that there is no pecuniary rate of return, explicit or implicit, to the holding of money balances. If, however, the prohibition of interest is either partially or totally evaded, then this measure will overstate the true cost of money holdings.

Klein has a second criticism, somewhat more involved, but helpful to an understanding of his empirical results. Consider the three assets listed below:

<u>Asset</u>	<u>Rate of Return</u>	<u>Opportunity Cost</u>
1. Money	$r_m$	$i - r_m = P_m$
2. Money Substitute	$r_s$	$i - r_s = P_s$
3. Long-term Bond	$i$	0

The first asset is identified as money proper: literally the medium of exchange. It bears an interest rate, denoted by  $r_m$ , that can be explicit or implicit and may or may not be equal to zero. The opportunity cost of holding money is found by subtracting  $r_m$  from the rate of return on a second asset that yields no monetary exchange services at all. This latter asset is identified in row 3 and may be visualized as a

long-term, non-marketable bond with rate of return  $i$ . The difference  $i - r_m$  is denoted by the symbol  $P_m$ . Klein refers to  $P_m$  as the "rental price" of the exchange services provided by a dollar of money holdings.

The third asset (row 2) is defined as a money substitute. It yields exchange services—at the very least, it can be quickly and easily converted into money at a very small cost—and pays an explicit rate of return denoted as  $r_s$ .  $P_s$  is its opportunity cost and is referred to as the rental price for the exchange services provided by the money substitute.

Just as the demand for any commodity or service is a function of its price, the price of close substitutes and complements, and income, so the demand for money can be written as:

$$(2) \quad M^d/P = f(P_m, P_s, Y).$$

How is the usual specification of money demand given by equation 1 related to the very general form of equation 2? Klein points out that equation 1 implicitly assumes that it is the *difference* between the rental prices of money and money substitutes which determines the demand for money. In this case,

$$(3) \quad M^d/P = f(P_m - P_s, Y).$$

From the definitions given above, the following relationship exists:

$$(4) \quad P_m - P_s = (i - r_m) - (i - r_s) = r_s - r_m.$$

If, as in conventional money demand analysis, the implicit deposit rate is ignored, then  $r_m = 0$ ,  $P_m - P_s = r_s$ , and equation 3 reduces to the conventional equation 1.

If this seems somewhat abstract, a simple example may be helpful. Imagine it is hypothesized that the demand for butter is a function of the price of butter and the price of a close substitute such as margarine. Equation 1 implicitly asserts that it is the *difference* between the prices of butter and margarine that is relevant whereas equation 2 is more general, stating only that both prices are relevant but not imposing any particular restriction on the nature of the dependence.

Finally, as indicated in the previous section, in conducting his analysis Klein *assumes* that a competitive rate of interest was paid on deposits in spite of the prohibition. Rather than a direct calculation of costs and revenues, the implicit deposit rate is related to the rate of interest that banks could earn

Table III

### FORMS OF REGRESSIONS AND COEFFICIENT ESTIMATES

#### A. Form and Time Period of Regressions

- (A)  $\log M_2 = a_0 + a_1 \log Y + a_2 P_s + a_3 P_m$   
(1880-1970)
- (B)  $\log M_2 = a_0 + a_1 \log Y + a_2 r_s$   
(1880-1970)
- (C)  $\log M_1 = a_0 + a_1 \log Y + a_2 P_s + a_3 P_m$   
(1919-1970)
- (D)  $\log M_1 = a_0 + a_1 \log Y + a_2 r_s$   
(1919-1970)

#### B. Coefficient Estimates

Equation	Y	$P_s$	$P_m$	Y	$r_s$	Standard Error of Estimate
(A)	1.33	.33	-.34			.0773
(B)				1.52	-.06	.1207
(C)	1.56	.42	-.45			.1254
(D)				1.31	-.10	.1493

Note: All reported coefficient estimates are significant at the .99 confidence level.

Source: Adapted from Benjamin Klein [13].

on their marginal investments.<sup>2</sup> After adjustment for reserve requirements and other costs and subsidies implicit in U. S. banking regulations, a deposit rate series is constructed. The rate of return on money is then taken as a weighted average of the rates of return on the components of the money stock.

On this basis, Klein compares regression results for equations that have the general form of equation 2 above with the results for equations having the conventional form of equation 1. A summary of these results is presented in Table III. Equations A and C include the implicit rate of return on the holding of money whereas equations B and D do not. Klein shows that A and C have significantly smaller standard errors of estimate than do their counterparts. In other words, the hypothesis that the prohibition of interest payments on money has been completely ineffective has more "explanatory power" than does the alternative hypothesis that it has been completely effective.

<sup>2</sup> Designating  $r_d$  as the deposit rate,  $r_1$  as the marginal return on bank investment, and  $R/D$  as the marginal reserve to deposit ratio, then (assuming reserves earn no interest) the competitive deposit rate would be  $r_d = r_1(1 - R/D)$ .

Also notice how similar are the coefficient estimates, except for sign, of  $P_s$  and  $P_m$  in equations A and C. If, as is frequently alleged,  $P_m - P_s$  is an appropriate measure of the cost of holding money (recall that  $P_m - P_s$  is simply  $r_s - r_m$ ), the estimated coefficients of  $P_m$  and  $P_s$  in equations A and C should be identical except for sign. The actual difference between the coefficients is small enough to be attributed to random error and, therefore, the hypothesis that  $r_s - r_m$  is an appropriate measure of the cost of holding money cannot be rejected. The inclusion of a measure of the implicit rate of return on money has enhanced the explanatory power of the regression equations. Therefore, Klein concludes that the hypothesis that the prohibition of interest on demand deposits has been effectively enforced can be rejected.

In addition to providing an imaginative approach to the measurement of the implicit deposit rate, Klein's work is important because it suggests that regulatory policies affecting the payment of interest on demand deposits may have significant *macroeconomic* implications. When market interest rates rise, there will be an associated increase in the implicit return to holding money. This results from the increased competition among banks for deposit funds. Klein's results imply that this rise in the deposit rate will reduce the impact of a given rise in the market interest rate on the demand for money. Thus the observed change in the demand for money is smaller than it would have been if deposit interest prohibition had been effectively enforced.

Imagine that deposit interest prohibition is repealed and that an explicit, competitively determined deposit interest rate replaces the implicit rate. Assume, as seems likely, that the explicit rate can be adjusted more quickly and, perhaps, to a greater degree in response to a change in market interest rates than could the implicit deposit rate. It would then follow that a change in the market interest rate would induce a smaller change in the demand for money than it does under present conditions.

The macroeconomic implications of this depend, of course, on the particular macroeconomic model used. In terms of the well known IS-LM model, this reduction in the sensitivity of the demand for money to the market interest rate would make the LM curve more nearly vertical. This has the effect of reducing the expansionary impact of a rise in government spending financed by either taxes or the issuance of bonds. At the same time, the impact of a change in the money supply would be correspondingly increased.

## Disaggregating the Money Demand Function

Benjamin Klein's work relates the rate of return on money to the demand for money. But even the narrowest definition of the money stock commonly used ( $M_1$ ) consists of currency held by the public as well as demand deposits. Since an implicit return is paid only on demand deposits, the question arises as to how the demands for currency and demand deposits individually respond to a change in the implicit deposit rate.

Although a number of studies of the public's currency holding behavior exist, the only recent study which makes the implicit demand deposit rate central to both the theoretical and empirical analysis is that of William Becker [2], whose estimates of the implicit demand deposit rate were encountered in Section II. Becker relates the demands for currency and demand deposits to the implicit demand deposit rate as well as to the rates of interest on time deposits and open-market assets. To represent the latter, the 4-6 month commercial paper rate was used. He found that although the demand for demand deposits was sensitive to all three interest rates, currency holdings were not significantly influenced by any interest rate variable.

These findings tend to substantiate a previous study by Alan Hess [10]. Hess did not include the rates of return on time and demand deposits in his currency demand function and measured the cost of holding currency exclusively by the 4-6 month commercial paper rate. As did Becker, he found that demand deposit holdings were sensitive to variations in the rate of interest whereas currency holdings were not.

In contrast, theoretical models of household money demand strongly suggest that a rise in the rate of interest on demand deposits should lead to a fall in desired currency holdings. For example, two recent models treat the household's decision problem as one of financing a flow of expenditures over an interval of time in a cost minimizing manner. In one model [1], the household has a choice of three assets to hold: currency, demand deposits, and liquid, interest-bearing assets. In the other model [14], the asset list is extended to include inventories of commodities. In both models, the demand deposit interest rate affects the optimal currency holdings of the household—a rise in the former being associated with a fall in the latter.

If theoretical analysis repeatedly indicates the importance of the demand deposit rate to the demand for currency, why hasn't this relationship been uncovered by the empirical analysis? Utilizing a theoretical model of transactor behavior [14], it can be

Table IV

**OUTSTANDING NOW ACCOUNT BALANCES IN MASSACHUSETTS  
BY TYPE OF ISSUING INSTITUTION**

(thousands of dollars)

Month Ended	Total		Commercial Banks		Mutual Savings Banks		Savings and Loans	
	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Sept. 1972	11,094	100			11,094	100.0		
Dec. 1972	44,522	100			44,522	100.0		
Dec. 1973	138,028	100			138,028	100.0		
Dec. 1974	286,819	100	56,989	19.9	200,083	69.8	29,747	10.4
Dec. 1975	742,516	100	302,029	40.7	356,319	48.0	84,168	11.3
Dec. 1976	1,439,559	100	807,277	56.1	497,071	34.5	135,211	9.4
Nov. 1977	1,852,491	100	1,051,351	56.8	627,708	33.9	173,432	9.4
Jan. 1978	1,915,409	100	1,097,545	57.3	636,537	33.2	181,327	9.5

Note: Sums may not add to 100 due to rounding errors.

Source: Federal Reserve Bank of Boston Statistical Release.

shown that a rise in the implicit deposit rate (brought about, for example, by a fall in service charges as a result of a new entrant into a banking market) will induce transactors to increase their average holdings of demand deposits at the expense of *both* currency and commodity inventories. Thus, the magnitude of the effect of a change in the deposit interest rate on demand deposit holdings is expected to be substantially larger (and, of course, in the opposite direction) than its impact on currency holdings.

The discussion of Section II revealed that there is no generally accepted method of measuring the implicit deposit rate. It is possible that conceptual difficulties in measurement reinforce the theoretical implication that currency holdings are less sensitive than are desired demand deposit holdings to variations in the implicit deposit rate. This theme is taken up again in the concluding section of the article.

#### IV. THE SUBSTITUTION OF EXPLICIT FOR IMPLICIT PAYMENTS ON DEPOSITS

**Private Financial Innovation** The decade of the 1970's has already witnessed profound changes in the nature of the services offered by non-bank thrift institutions. These changes have affected the competitive relationship between banks and thrift institutions and promise to generate an intensive and far-reaching reexamination of the regulatory and structural environment confronting various classes of depository institutions. Thrift institutions will al-

most certainly continue their efforts to attract depositors by offering transactions instruments that bear explicit interest. In this context, the question of whether explicit interest payments should continue to be prohibited on some transactions balances will be under continuous reevaluation.

A financial history of this period will undoubtedly cite the introduction of negotiable orders of withdrawal—NOW accounts—as the primary catalyst for these changes. After a two year court battle, NOW accounts were first offered by the Consumer Savings Bank of Worcester, Massachusetts, on June 12, 1972.<sup>3</sup> The NOW account is simply a method of withdrawing funds from an interest-bearing savings account by means of a negotiable instrument payable to third parties.

By the end of that year, 22 other mutual savings banks in Massachusetts had adopted NOW accounts and the development began to spread to New Hampshire where state laws governing savings banks are similar to those of Massachusetts. Commercial banks were excluded from this development because Federal Reserve and FDIC regulations prohibited the execution of third-party payments from savings accounts. Federal Reserve Board estimates of the proportion of NOW balances attracted from commercial bank demand deposits suggest 80 percent as a reasonable approximation [16]. Clearly, the competitive position of banks in these states was rapidly becoming untenable.

<sup>3</sup> A good survey of these developments is found in [11].

The result was the passage of Public Law 93-100 on August 16, 1973, which permitted commercial banks in these states to begin offering NOW accounts in January 1974. Table IV recounts the growth of NOW accounts in Massachusetts and its breakdown between depository institutions.

The pricing of NOW accounts is interesting both in its own right and because it is at least indicative of pricing responses to be expected in a variety of alternative contexts. Although the maximum rate of interest payable on NOW accounts is determined by regulation rather than the market, the NOW experiment is a vivid example of the substitution of explicit interest payments for implicit payments on transactions balances.

As of September 30, 1977, 112 commercial banks were offering NOW accounts in Massachusetts. Of these, 108 were paying the maximum legal interest rate of 5 percent although a wide variety of methods of calculating interest and different frequencies of compounding were used. Perhaps more interesting is the diversity of approaches used in pricing transactions services. Only 19 banks offered unlimited free drafts; 5 banks charged \$.10 per draft; 7 charged \$.15 per draft; and 81 are classified as "other" by the Boston Federal Reserve.<sup>4</sup> This last category includes banks using a combination of free drafts plus a charge for each draft in excess of a specified number. Furthermore, there is evidence [3] that when the NOW experiment was extended to the remaining New England states in March 1976, there was a substantial drop in the percentage of institutions of all types offering unlimited free drafts. Thus, the payment of explicit interest appears to have been accompanied by the pricing of transactions services more nearly in accordance with the private and social cost of providing them.

A clear analysis of the efficiency implications of the substitution of explicit for implicit pricing is found in Harry Johnson [12]. Johnson defines a socially efficient monetary system as one in which competition between banks forces the payment of a competitive, explicit rate of return on the holding of a *stock* of deposits. At the same time, banks charge for their payments services in a competitive fashion; that is, in a manner that reflects the private and social costs of the resources allocated to the production of those services. In this fashion, the public will hold

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<sup>4</sup> The Statistical Section of the Research Department of the Federal Reserve Bank of Boston publishes data pertaining to NOW accounts in New England on a monthly basis. All NOW account data used in this article are from that source.

the socially optimal quantity of money and will also consider the correct opportunity cost of the resources used in providing payments services in their decisions as to how intensively to use the bank payments mechanism.

In contrast, the prohibition of explicit interest payments provides the wrong signals to depositors. The nonpayment of explicit interest induces households and business firms to economize on their holdings of cash balances when there is no social need to do so. At the same time, implicit payments—such as service charges set below the cost to a bank of providing the services of the payments mechanism—encourage excessive utilization of that mechanism. There is, therefore, a resulting increase in the value of society's resources allocated to the provision of payments services.

A second reason for the importance of NOW accounts is that these accounts can be issued—indeed were initiated—by non-bank financial intermediaries. Thus a degree of functional specialization hitherto existing between deposit-type institutions has been significantly eroded. Such specialization has historically been encouraged or required by regulatory policy through limitations on asset acquisition and liability issuance of different institutions. Financial innovation such as the NOW account may suggest that the degree of regulatory-induced specialization is neither socially nor privately optimal. Perhaps more fundamentally, competitive pressures toward financial innovation in conjunction with advances in payments technology may render it impossible to maintain through regulation a non-interest-bearing transactions instrument. As a result, the traditional demand deposit may have to adapt to changed circumstances or face extinction.<sup>5</sup>

Finally, the implications of the substitution of explicit for implicit payments deserve careful study because the potential domain of applicability of this structural change goes well beyond the NOW experiment itself. In late June 1978, the Federal Reserve Board made public a proposal for the payment of interest on reserves combined with explicit pricing of Federal Reserve services. In other words, it proposed a substitution of explicit for implicit pricing in its relationship with its member banks. The following section examines the background to and justification for the proposal.

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<sup>5</sup> Evolution is the likely alternative. On May 1, 1978, the Board of Governors approved a plan that will permit individual customers of member banks to transfer funds automatically from their savings to their checking accounts beginning November 1, 1978.

**The Federal Reserve's Reform Proposal** Member banks of the Federal Reserve System are required to hold non-interest-bearing deposits at the Federal Reserve. As a benefit of membership in the System, banks are provided a variety of "correspondent" services by the Federal Reserve. These services include the clearing and collection of checks, currency shipments, wire transfer of funds, security safekeeping, and others. Although the Federal Reserve provides some services to nonmember banks, these banks usually utilize the correspondent services of other (generally larger) banks.

When one bank provides correspondent services to another bank, the recipient (or respondent) bank "compensates" the providing (or correspondent) bank by holding non-interest-bearing demand balances with it in lieu of direct charges for the services of the correspondent. There is evidence that direct user fees [7] are currently being assessed with greater frequency than in the past for a variety of correspondent services. But the general picture remains: in exchange for a flow of correspondent services, non-interest-bearing deposits are held with the providing bank. Equivalently, correspondent banks pay an implicit return on the correspondent balances they hold, just as banks in general pay an implicit return to their demand depositors.

The Federal Reserve's provision of services to its member banks approximates, at least in form, the correspondent arrangements between private commercial banks. The Federal Reserve provides services to its members similar to those provided by correspondent banks to their customers and member banks hold non-interest-bearing deposits at the Federal Reserve.

If this is so, why is the Federal Reserve proposing a fundamental reform of the system? The Board's proposal could be justified in terms of the efficiency argument presented in the previous section of this article. One important element of Professor Johnson's thesis is that the Federal Reserve should pay interest on reserves and charge for its services. The nonpayment of interest on reserves is viewed as a tax, the burden of which falls primarily on the deposit-holding public.

The Federal Reserve Board's stated justification for the reform is different. The reform is designed "to promote equality among member banks and other financial institutions and to encourage membership in the Federal Reserve System." To understand the problem that implicit pricing poses for the Federal Reserve, a simple example may be helpful.

Imagine there are two comparably sized nonmember banks, Bank A and Bank B, both served by a correspondent bank, Bank C. Assume that their demands for correspondent services differ substantially. In particular, Bank A requires fewer check-clearing services than does Bank B. Bank C, the correspondent bank, will require Bank B to pay for the additional check-clearing services by requiring it to hold a larger deposit balance than it requires from Bank A. In this way, the private market can flexibly adjust the costs of correspondent services to the benefits received by the respondent bank.<sup>6</sup>

In contrast, the balance held by an individual member bank at the Federal Reserve bears no direct relationship to the flow of Federal Reserve services received by the bank. Instead, these balances are determined by reserve requirement ratios. A member bank that uses relatively few Federal Reserve services cannot, for that reason, reduce its reserve balance below that of another comparably sized member bank that utilizes these services intensively. It follows that the implicit rate of return on member bank reserves varies directly with the utilization of Federal Reserve services.

Member banks differ substantially in their utilization of Federal Reserve services. Two recent studies are indicative. In one [8], R. A. Gilbert surveyed 233 member banks in the Eighth Federal Reserve District. Banks were ranked by size of assets and divided into 11 groups of 20 banks each plus a remaining group consisting of the 13 largest banks in the survey. The percentage of banks in the various groups that cleared six or more checks through the St. Louis Federal Reserve Bank during January 1977 ranged from zero in the second group (average asset size of \$7.2 million) to 92 percent in the largest bank group (average asset size of \$425 million). Using a method similar to Becker's procedure for calculating the implicit return on deposits, Gilbert estimates that the implicit return on reserves is approximately one-half of one percent for small banks and 1.7 percent for the large banks surveyed.

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<sup>6</sup> This argument is subject to a qualification imposed by the existence of state reserve requirements. If state reserve requirements forced nonmember banks to hold correspondent balances in excess of those which would be required to compensate the providing bank for its provision of correspondent services, the adjustment process described above would be retarded. However, nonmember banks appear to hold cash assets significantly in excess of the amount required to satisfy state reserve requirements [4, Appendix A] although one study [9] did find a relationship between the level of state reserve requirements and the amount of cash assets held by nonmember banks.



Table V

**NUMERICAL SUMMARY OF COMMERCIAL BANKS  
BY MEMBERSHIP-SERVICE USE COMBINATION**

Fifth District States - January 1978

State	Deposit Size Groups							
	\$0-25M		\$25-50M		\$50-100M		All Banks \$0-100M	
	MU	MN	MU	MN	MU	MN	MU	MN
Maryland	2	16	7	5	5	3	14	24
North Carolina	8	6	5	1	1	1	14	8
South Carolina	8	8	4	1	1	0	13	9
Virginia	20	68	16	30	5	6	41	104
West Virginia	9	57	7	20	9	5	25	82
Total	47	155	39	57	21	15	107	227

Note: MU = Member user; MN = Member nonuser.

Source: Bruce J. Summers [17].

A study of the Fifth Federal Reserve District by Bruce Summers [17] classified member banks as users and nonusers of system services. Basically, member nonusers (MN) made no use whatever of Federal Reserve check clearing services whereas banks classified as member users (MU) cleared checks "in volume" through the Federal Reserve Bank of Richmond and used two additional services such as money transfer, security safekeeping, and wire transfer of funds. His results for all member banks up to \$100 million in deposits are presented in Table V.

The Federal Reserve could approach this problem in a number of ways. For example, it could make the reserve requirement ratio applicable to a bank depend upon the degree of utilization of its services by that bank. Banks that used those services intensively would be subject to correspondingly higher reserve requirement ratios. Although this would approximate in form the arrangement existing in the private correspondent market, it seems impractical and difficult to implement.

A second possibility is to permit member banks to use some fraction of their correspondent balances to satisfy Federal Reserve reserve requirements. To some extent, this is already being done since the required reserves of a bank are based on its net demand deposits. In calculating its net demand deposits, a bank subtracts its balances at a correspondent from its total demand deposits. This is equivalent to using a fraction of its correspondent balances to satisfy the reserve requirement. But the current "offset" is much smaller than would be re-

quired to equalize the implicit return on reserves among member banks.

Instead, the Federal Reserve has proposed to substitute explicit for implicit pricing. By paying an explicit rate of return on reserves and charging for Federal Reserve services, the link between a member bank's utilization of those services and the return that bank receives on its deposits at the Federal Reserve would be broken. Simultaneously, the cost of the resources used in the provision of those services would be reflected in decisions concerning their utilization. As a result, the allocation of resources would be improved.

## V. SUMMARY AND CONCLUSIONS

Although the implicit deposit rate concept can be productively used in a variety of applications, it is subject to certain limitations. It conceals information and, to some extent, provides false information. The statement that an explicit rate of return of 5 percent per annum is paid on deposits has a clear, unambiguous meaning: the deposit of an additional dollar will generate a marginal pecuniary return to its holder of 5 cents per annum—a return which is explicit and not dependent on the characteristics of the individual depositor.

No such information is provided by the assertion that the implicit deposit rate is 5 percent. Indeed, no direct marginal pecuniary or nonpecuniary return may be involved at all. Unless the additional deposit enables the depositor to avail himself of additional bank services at subsidized rates, the marginal return is zero no matter what the average return is calculated to be.

Moreover, any calculated average implicit return can conceal enormous differences between the rates paid to different depositors. Depositors who make relatively heavy use of subsidized services receive a correspondingly higher implicit return unless minimum required deposit levels are continuously adjusted for the level of utilization of bank services.

The fact that the implicit deposit rate is not a direct market signal restricts its usefulness for analytical purposes. For example, a rise in bank costs of providing payments services will inflate the estimates of the implicit deposit rate as constructed by Becker or Gilbert and yet private decision-makers would not alter their behavior unless the rise in costs is translated into a change in a market price such as the service charge rate. Thus, the implicit deposit rate can change with no effect on behavior and conversely. In response to these analytical difficulties, a

recent study of household demand for checking account money by John Boyd [5] made no attempt whatever to define a single interest rate as the rate of return on demand deposits. Instead, household behavior was related directly to the monthly service charge rate and the minimum balance requirements imposed by banks.

In this article, several methods of measuring the implicit deposit rate have been examined. The use of the concept in recent research on the demand for money has been explored. In the process, it was shown that a link exists between the form and effec-

tiveness of price regulation in the financial markets and the behavior of the macroeconomy. Finally, two examples of the substitution of explicit for implicit pricing were discussed: the evolution of the NOW account and the Federal Reserve Board's proposal for the payment of interest on reserves. There is a strong presumption in economic theory in favor of explicit pricing. This presumption applies to the relationship between a commercial bank and its depositors. It applies with equal force to the relationship between the Federal Reserve and its member banks.

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