

# Pricing and the Role of the Federal Reserve in an Electronic Funds Transfer System

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The Federal Reserve is dedicated to maintaining an efficient payments system which insures maximum competition among financial institutions. In the development of electronic funds transfer systems (EFTS) these guidelines imply that all financial institutions should have direct access to the payments mechanism and that services should be provided by the organization — be it public or private — which can perform the task at the lowest social cost. If the services are provided privately, the equal access criterion implies that the organization should either be a nonprofit consortium of financial institutions or a federally regulated utility.

Developments to date indicate that the banking community and the credit card companies are going to be active participants in any electronic system. The coexistence of both Federal Reserve and nongovernment EFTS developments should prove to be very beneficial to the financial community and society in general. Nongovernmental organizations will have the option of developing alternative means of transferring funds thereby preventing exclusive dependence on a government bureaucracy. At the same time, if private costs appear too high, the Federal Reserve has the option of setting up EFTS experiments either to accelerate development or simply to lower costs.

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The Federal Reserve must charge full cost for all services provided if private organizations are to have real options of developing lower cost alternatives. If the Federal Reserve provided services free of charge, it would undermine private initiative which is so vital for increased efficiency and innovation. At the same time, only careful allocation of costs will guide the Federal Reserve to those projects which can be provided more cheaply publicly than privately. Full cost pricing will insure that the financial community will always have the option of developing an alternative way of handling transfers. Preservation of public and private options should provide insurance against the almost inevitable sluggishness which tends to develop in large service organizations.

In addition to fostering a mix of public and private participation in EFTS, pricing will also serve its traditional role of insuring an efficient allocation of resources. A charge for each transaction will avoid wasteful utilization of the Federal Reserve's resources. In addition, as checks will likely remain the mainstay of the payments mechanism for several decades, proper pricing is required to insure that the truly least-cost method of payment (paper or electronic transfer) is used for each transaction. This means that an integral part of any Federal Reserve charge scheme must be full cost pricing of check clearing services. A zero price for checks would encourage uneconomical use of seemingly cheaper paper transactions, which might retard development towards an electronic system.

While the advantages of pricing services are numerous, it would be impossible in practice for the Federal Reserve to introduce a useful pricing system given the existing member-nonmember distinction. Member banks already pay for services from the Federal Reserve in foregone interest on their reserves and it would be unfair to charge them. However, if charges were imposed solely on nonmembers, the allocative efficiency argument for pricing disappears. An equitable and efficient pricing system can be discussed only in a setting of universal reserves.<sup>1</sup> Universal reserves are also more consistent with a policy of direct access for all financial institutions.

Part II of this paper will summarize our vision of the framework for public and private participation in EFTS to provide a background for the specific pricing proposals. Part III presents general pricing principles, while Part IV describes specific charging schemes for 1) check clearing 2) transfers through automated clearing houses 3) point-of-sale transactions and 4) use of an expanded Federal Reserve wire-transfer system. Pricing is discussed for all types of EFTS projects, even though the Federal Reserve has no present plans for developing any point-of-sale projects.

<sup>1</sup>In a setting of universal reserves, reserves would be reduced from their present levels to insure no increase in member bank burden and then charges would be imposed on all banks for the services provided by the Federal Reserve.

## II. Framework for Public and Private Participation in EFTS

In the development of EFTS, the characteristics of low cost and direct access to all financial institutions are far more important than whether the project is run by the Federal Reserve or by the private sector. Furthermore, as argued in the introduction, a flexible environment that permits both public and private projects will yield the most benefits to the financial community and the general public.

The Federal Reserve Bank participates far more extensively in the check clearing and funds transfer process than any other central bank.<sup>2</sup> The origin of the Federal Reserve's extensive role lies in the large number of banks in this country and the need for a well-organized national clearing system. At the time the Federal Reserve began operations in 1914, checks were not cleared at par; rather, banks charged for remitting checks drawn on themselves and imposed a collection charge when they served as an agent.<sup>3</sup> Nonpar clearing encouraged circuitous routing of checks which restricted commerce and impeded the flow of money in the nation. In an attempt to increase the efficiency of the payments mechanism by a universal par clearance system, the Federal Reserve assumed a major role in the clearing process.

Historical analogies must be interpreted carefully when used as a precedent for defining the Federal Reserve's role in the developing electronic funds transfer system (EFTS). In 1914 the private sector showed little potential for developing adequate clearing systems. Today, on the other hand, several types of institutions are capable of receiving and transmitting funds electronically. For both automated clearing houses (ACHs) and point-of-sale (POS) systems, private alternatives to government participation have already emerged.

In the ACH area, automated clearing houses sponsored by co-operating banks are operating in California, in the Atlanta area, in New England, and in Minneapolis, and an Ohio regional clearing house, REPEX, is scheduled to open July 1975.<sup>4</sup> These ACHs however are heavily subsidized by the Federal Reserve which usually provides space and computer facilities.

Individual bank point-of-sale experiments are being operated successfully by the City National Bank and Trust Company in Columbus and by the Hempstead Bank in Long Island. New experiments are constantly appearing throughout the country. Whereas these are single bank projects,

<sup>2</sup>Benjamin H. Beckhart, *Banking Systems*, (New York: Columbia University Press, 1954.)

<sup>3</sup>W. E. Spahr, *The Clearing and Collection of Checks*, (New York: The Bankers Publishing Co., 1926.)

<sup>4</sup>Several other regional clearing houses have purchased the SCOPE software package recently and are negotiating with Federal Reserve Banks to operate ACHs.

regional and even national POS systems are possible as the result of credit card associations such as Interbank (Association of Master Charge members) which have set up national networks currently used for interregional verification, networks which could also be used for transfer of funds with the consent of participating members.

What role, then, is left to the Federal Reserve? In the field of ACHs, the Federal Reserve has assumed a peculiar role. It has heavily subsidized the clearing houses while relinquishing much of the management to groups of commercial banks. It really matters little whether the banks or the Federal Reserve operate the ACHs, but in either case they should be self-supporting in the long run. The Federal Reserve has served a useful role by participating in research and development of the software and is currently assuming virtually all the operating cost. To facilitate transfers between regional ACHs the Federal Reserve should also insure that formats are standardized.

The communication between ACHs is a natural role for the Federal Reserve to assume. This function might be one portion of a national network, perhaps an expansion of the current Federal Reserve communications system for wire transfer of funds and securities, which would also be used for the distribution of government payrolls and processing Treasury checks. By 1980, average volume from these two sources plus inter-ACH transfers should total about 44.5 million items per month.<sup>5</sup>

In POS systems, the Federal Reserve will want to insure that a national network is available to all financial institutions. Such a system would provide the technology to dramatically increase competition. It would permit small depository institutions to offer almost as much convenience for making deposits and withdrawing funds as large banks with hundreds of branches. A national network seems to be developing in the private sector through Interbank. Interbank offers direct access to all commercial banks and has recently extended access to some mutual savings banks. Membership for savings and loans is now under consideration. This organization may develop into a national network which will provide equal access to all depository institutions. In our judgment any such system should be federally regulated. If the private sector does not develop such a network, then the Federal Reserve might want to develop one of its own.

The emerging EFT system will thus include both Federal Reserve and private components. Although most of the system can be developed privately, the Federal Reserve must develop standards and perform an important regulatory role. This combined system should be flexible enough to allow the Federal Reserve to enter in the event that the private sector fails to provide essential services, while full cost pricing by the Federal

<sup>5</sup>*Communications System Development Study*, Report of the Communications System Expansion Task Force, June 1974, p. 9.

Reserve will encourage private projects. Preserving alternatives is the most important function that the Federal Reserve can perform and full cost pricing is the key to guaranteeing that alternatives will be maintained.

### III. General Pricing Policies

The various types of services, check collection, transfers through automated clearing houses, point-of-sale transactions and interregional transfers, all present different pricing problems for the Federal Reserve. There are, however, three principles that can lend consistency to various pricing schemes. First, prices for all services should be set at long-run average cost, defined as the per-item cost of operation, assuming optimal utilization of existing equipment and technology. The cost should include allowances for overhead as well as all direct expenses including a return to capital comparable to the private sector. Pricing from the beginning on the assumption of optimal utilization will avoid frequent price changes as volume increases and will provide long-run planning information to potential users. Not only is this pricing concept operationally meaningful, but it will also eventually lead to efficient allocation of resources when operations are carried out in the realm of constant average costs.<sup>6</sup> Although EFTS operations generally involve declining initial unit costs, constant costs in the long run are a realistic assumption.

The second pricing principle is to charge the party or agent of the party that initiates the transaction. This policy will confront the initiator with the real social costs of alternative methods of transferring funds, and will thus provide an economic incentive for him to select the medium which involves the least social cost.

The third pricing policy applies to new Federal Reserve EFTS operations — not to the existing check collection system. Both automated clearing houses and retail point-of-sale systems require large initial capital investment and development costs. If services were priced at average cost, assuming optimal output, these systems would initially operate at a loss when volume is low. In order to encourage EFTS development, the Federal Reserve should finance these initial losses. Such subsidies have obvious dangers, however, and the Federal Reserve must guard against continued subsidization of unproductive projects. Unless there is reasonably steady progress towards optimal utilization, the Federal Reserve should reevaluate its commitment.

### IV. Charges for Specific Services

As mentioned in the introduction, a useful pricing policy cannot be implemented given the existing member-nonmember distinction. Therefore, the following discussion is based on the assumption that the Board

<sup>6</sup>This pricing rule is consistent with the traditional "marginal cost" pricing dictated by economic theory in a constant cost situation. See Appendix A.

will be successful in its drive for universal reserves and that all financial institutions will pay the same rate for each type of service. Furthermore, to insure no increase in member bank burden it is assumed that reserves will be reduced from their present levels.

Specific pricing policies will be discussed for each type of service. As mentioned earlier, charging for check collection will be an essential part of EFTS development. If the Federal Reserve subsidizes paper transaction, while charging for electronic transfers, progress will be slowed and inefficient transfer mechanisms will be employed.

The discussion of POS charges is presented only as a contingency plan in the event that the Federal Reserve should end up running some regional POS systems. Although the Federal Reserve Board has recently denied the request from the Atlanta commercial banks for the Federal Reserve Bank of Atlanta to fund and operate an experimental point-of-sale system in that city, it is possible that the Federal Reserve may in the future participate in this type of project if appropriate private initiative is not forthcoming.

### 1. Check Collection

In the check clearing process, checks move from the bank at which the check is deposited, through a clearing facility, then to the payor bank. The Federal Reserve could introduce charges at two possible points. Banks could be charged as their checks are delivered to the Federal Reserve or they could be charged as checks are presented to the payor banks for collection. In keeping with the pricing policy outlined above, the charge should be levied on the payor bank as the agent of the initiator of the transaction. If the bank, in turn, passes the charge onto its customers, this may provide some incentive for the customers to curtail their use of checks.

Charging on presentation is the first feature of the check collection proposal. The second feature is differentiation of charges based on the location and volume characteristics of the route between the payor and depository banks. Instituting a single flat charge would have unfortunate implications, as banks with high volume might withdraw their low cost items and set up direct intercity clearings. If large high volume banks were to set up their own systems for direct clearing, this would result in duplication of facilities since the Federal Reserve already provides transport for clearings between cities. A proper pricing scheme should include charges reflecting economies of scale of high volume routes, thereby discouraging such socially wasteful duplication.

<sup>7</sup>Universal reserves should be interpreted as requiring the same reserves for deposits that fulfill the same economic role. This means that whereas the required ratio of reserves to deposits may differ for time deposits and demand deposits (including NOWs), the requirements for a particular type of account will be the same for every depository institution regardless of its legal form of organization.

On the other hand, for direct clearings within cities, pricing would provide banks with the incentive to compare the costs of collection through the Federal Reserve with the cost of clearing directly with nearby banks. A decision to clear directly would coincide with the least social cost solution.

Encouragement of direct clearings is only one advantage of charging for check collection. A second benefit is the contribution towards effecting an efficient allocation of resources between paper and electronic transfer systems. Finally, if the Federal Reserve charges are passed on to customers, there is a possibility of reducing the total volume of checks written and encouraging the use of currency for small amounts where it is a logical means of making payments.<sup>8</sup>

After all is said, some caveats are in order. The Federal Reserve is limited in its ability to force individuals to confront the full cost of check services. First, Federal Reserve check clearing costs are less than 10 percent of the total cost of a check to the banking community. Second, the bulk of checking services is currently financed by the foregone interest on demand deposits. If the System places a high priority on an efficient allocation of the resources used in the payments mechanism, the logical step would be to urge the elimination of the prohibition of interest on demand deposits. This would, in turn, encourage banks to reinstitute per-item charges for checks.

## 2. Automated Clearing Houses

Electronic transfers through Federal Reserve ACHs should be priced from the outset at average cost, assuming optimal utilization of existing equipment, so that depository institutions are provided with the correct long-run incentives for choosing between paper and electronic funds transactions. Charging average cost at the outset will result in an unprofitable system in the early stages when volume is small and average cost quite high. The resulting short-term deficits should be financed by the Federal Reserve, but great care should be taken to insure that these subsidies do not extend for a long period of time.

At the present time, the Federal Reserve is assuming almost the full cost of operating the ACHs. Under this system, there is little incentive for private organizations to set up independent clearing houses. Only by forcing the ACHs to be self-supporting can the Federal Reserve preserve the incentive for a private organization or a consortium of banks to move in and set up an alternative clearing house should the Federal Reserve ACH become inefficient. Naturally, any private clearing house would have to be regulated to insure equal access to all depository institutions.

<sup>8</sup>See Appendix B for a discussion of the impact of charges on checking account activity.

In accordance with charging the initiator of transactions, fees for direct deposit of payrolls should be levied on the employer's bank, the initiator of the credit transaction. The bank can, in turn, charge the firm for the ACH's services. Firms now pay for paper transactions in the form of compensating balances based on the number of checks written. When the charge for electronic transfers becomes significantly less than the cost of paper, firms will be provided with incentive to switch.

In the case of preauthorized debits, the billing company will be the initiator of the move from paper to electronic billing and therefore the billing company's banks should bear the charges for ACH transactions. The bank will then charge the company for the services. The company, in turn, will have to offer its customers some sort of discount in order to encourage them to participate.

### 3. Point-of-Sale Systems

If the Federal Reserve should operate either a regional or national POS system, it is essential that all transfers be priced at full cost for reasons of allocational efficiency and to encourage private POS projects. Furthermore, retail POS systems currently under consideration provide additional arguments for pricing. Under systems such as the one proposed in Atlanta, the Federal Reserve Bank would enter the new field of transmitting credit authorization information. This service would be provided for bank credit cards as well as cash cards and checks. Clearly, if the Federal Reserve performs this service free of charge for bank credit cards, the banks would have an unfair competitive advantage over nonbank cards. For this reason, the banks should pay the full cost of their credit authorization.

These transactions should be priced at long-run average cost as defined above and the charge should be levied on the initiator of the transfer. In the case of check authorization, the merchant is the initiator and primary beneficiary of the transaction. Therefore, the merchant's bank should bear the full burden of switching services and the additional costs incurred by the responding bank. For cash card transactions, the customer's bank should be charged.

In line with present practice, credit card authorizations through a Federal Reserve POS system should be charged to the merchant's bank, which serves as agent for the merchants making the authorization inquiry. The merchant benefits from the authorization through reduced fraud losses and increased sales. Ultimately, of course, he reimburses the bank by taking a discount on his credit card sales.

### 4. An Expanded Federal Reserve Wire Transfer

As mentioned earlier, expansion of the current Federal Reserve communications system for wire transfers of funds and securities could result in the Federal Reserve's operation of a national network servicing the Federal government and the ACHs, as well as the present wire-transfer



customers. Institutions using this service should be encouraged to economize in the number of transfers, and this can be accomplished only by instituting a per-item charge. There is evidence that a charge would control the volume of transfers. The Federal Reserve currently charges \$1.50 for transfers of less than \$1,000 and this charge has been very effective in eliminating small-dollar transactions.

In summary, pricing of all Federal Reserve transfer services is both essential and feasible. Unless the Federal Reserve charges full cost for services, private initiative will be stifled. Furthermore, charging for check clearing is essential to avoid subsidizing paper at the expense of electronic developments.

### *Summary*

It is clear that the evolving EFT system will include both Federal Reserve and private components. Banks and credit card companies are already actively involved in EFTS experiments. The Federal Reserve role should be to insure that all financial institutions have equal access to EFT systems and to insure that the nation's payments mechanism functions efficiently.

There is much to be gained from preserving the possibility for private as well as public initiative. Each can act as a check on the other's potential inefficiencies. To encourage private participation, the Federal Reserve must price all services. Both the development of rational pricing schemes and the assurance of direct access are hindered by the current member-nonmember distinction. Universal reserves as well as pricing must be an integral part of the Federal Reserve's future in the payments mechanism.

## Appendix A

The pricing policies discussed in the text were developed within a particular time and cost framework. The time period assumed and described as "long run" was approximately five years, which represents the average useful life of a given generation of computers. The idea was rejected of dealing with truly long-run costs, which would involve changing technologies and perhaps decreasing minimum average costs over several decades. It would be too difficult to construct a meaningful pricing scheme on the basis of forecasted technological innovations, and consequently the charges for services would be subject to arbitrary decisions and pressures.

With given technology and a five-year horizon, it was assumed that the cost curve declined sharply during the initial period when volume was limited, but that after the initial decline the costs of producing further units were constant. Operations people at the Federal Reserve Bank of Boston agreed with these assumptions.

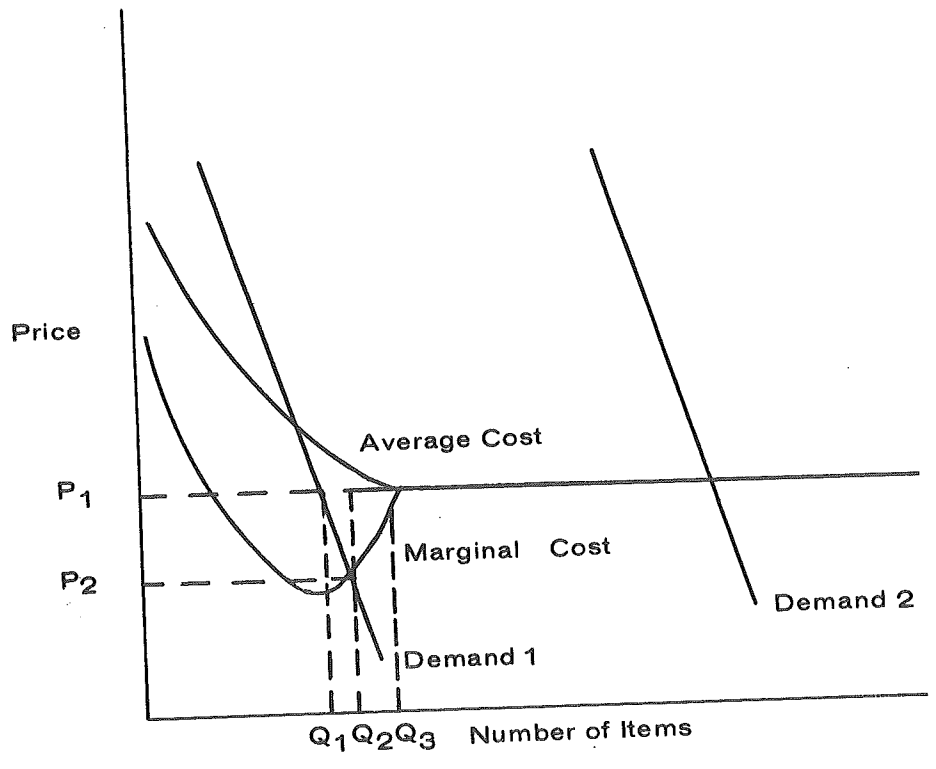
Given these assumptions, strict adherence to the "marginal cost" pricing rule would result in an initial charge of  $P_2$ , the incremental cost of processing an additional item when demand is  $D_1$ , was based on practical considerations. First, pricing at marginal cost during the initial period would require frequent price changes, downward and then upward as demand shifted gradually to the right. Second, marginal cost is an ambiguous concept and difficult to estimate, whereas minimum average cost with a given technology is a considerably easier figure to calculate. Finally, setting the price initially at the long-run level would provide longer-range information to the firms for planning and investment. In short, given the technology and a five-year time horizon, pricing at minimum average cost is a workable and efficient solution.

The major shortcoming of pricing initially at  $P_1$  is that processing will be restricted below its optimal level. When demand is  $D_1$ , the quantity demanded would be  $Q_2$  following the marginal cost pricing rule, whereas with the higher price  $P_1$  the number of items demanded will be cut back to  $Q_1$ .

If in any given year the volume were less than  $Q_3$ , the project would run a deficit, inasmuch as average cost per unit would be greater than the price  $P_1$ . This deficit would be financed by the Federal Reserve under the schemes discussed in the text.

Figure A-1

COST CURVES FOR FIVE YEAR PERIOD



## Appendix B

### The Impact of Charges on Debit Activity

The early experience of NOW accounts in Massachusetts and New Hampshire and a survey undertaken in 1973 by a large Boston city bank suggest strongly that there is a relationship between the marginal cost to a consumer of writing a check and the volume of checks he is willing to write. These two pieces of evidence show that service charges do seem to lower checking account debit activity.

#### *NOW Account Activity*

The following discussion refers to the late 1973 and early 1974 NOW account experience in Massachusetts and New Hampshire. Although NOW accounts in these two states are becoming more similar, in the winter of 1973-74 the characteristics of Massachusetts and New Hampshire NOWs differed substantially. At that time Massachusetts savings banks paid 5 percent interest on NOW accounts, only slightly less than the rate on regular savings accounts, but there was a service charge of 10¢ or 15¢ on each draft. In New Hampshire, on the other hand, NOW accounts paid only 2-4 percent, but there was no per-item charge for a withdrawal order.

If consumers were sensitive to charges for checks, one would expect NOW accounts in Massachusetts to have been considerably less active than the free accounts offered in New Hampshire. This was true, as the average number of drafts per account during February of 1974 (the latest period for which data are available) was 6.6 in Massachusetts and 11.4 in New Hampshire. Only 17 percent of Massachusetts accounts showed more than 9 withdrawals that month, compared to over 45 percent in New Hampshire.

It is not legitimate to attribute the entire difference in activity levels between the two states to the existence of per-item charges, however, since other factors such as consumer attitudes towards the accounts may also influence the average number of drafts. Since New Hampshire customers forfeited substantial interest to hold a NOW account, it is possible that they viewed NOWs primarily as alternatives to checking accounts rather than savings accounts. In Massachusetts, though, only a very minimal sacrifice was required on the part of the NOW account holder; therefore Massachusetts customers may have regarded their accounts as savings account substitutes. While this difference in attitudes could explain some of the difference in account activity, the existence of per-item charges has probably also had a significant impact.

#### *Checking Account Activity*

Further evidence that charges have a dampening effect on check writing is offered by a large Boston city bank's examination of debit activity for its four types of accounts. The checking accounts offered are:

- 1) "Prepaid" accounts which carry a fixed charge of 12-1/2¢ per check;
- 2) "Analysis charge" accounts in which the amount of the service charge is inversely related to the size of the account balance;
- 3) "Minimum balance" accounts which offer free checking above a \$100 balance but impose a high penalty charge for checks written below that amount;
- 4) "Analysis no-charge" accounts which are free at all balances for customers whose checks are deposited directly by their employers.

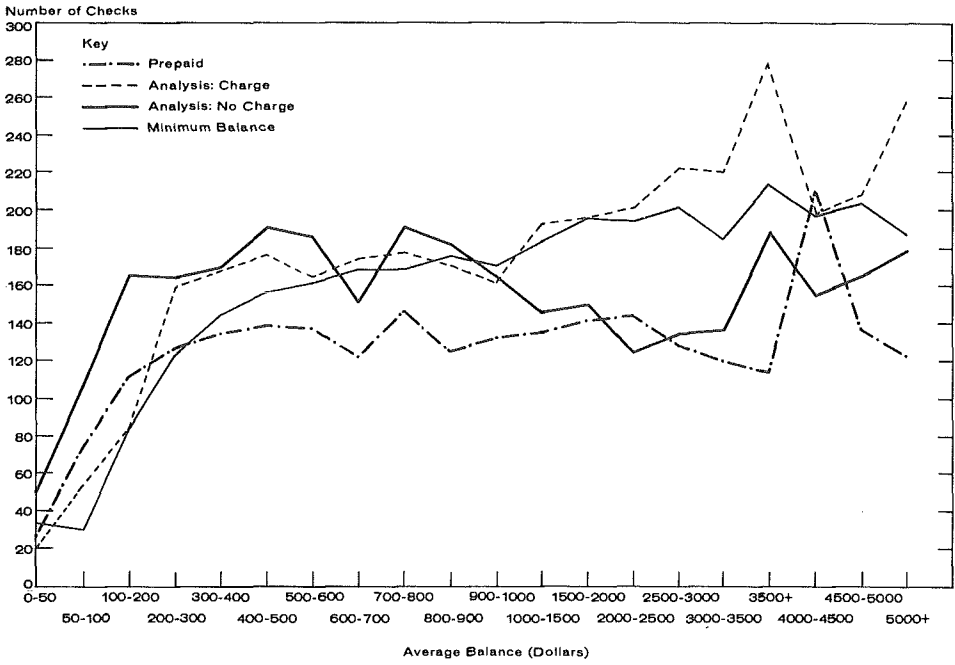
The data presented in Figure B-1 show the number of checks written in each type of account, grouped by average balance. The data were derived from a six-month base period and annualized. A quick look at the chart reveals that throughout the average balance spectrum, either analysis no-charge accounts (cost-free) or analysis charge accounts (cost-free at high balances) exhibited the most activity. Prepaid accounts (12-1/2¢ per check) were generally the least active, except at average balances of \$0 - \$300, where the minimum balance accounts were least active. In this range, the check-writer is in danger of having his balance fall below the \$100 minimum and incurring either a significant service charge or the penalty fee for an overdraft. At a low balance, therefore, the *only* accounts which offer totally free checking are the analysis no-charge, and those accounts did exhibit the most activity.

While it could be argued that the account categories are self-selecting (for instance, that those customers who expect to write fewer checks choose pre-paid accounts), the breakdown by average balance does somewhat standardize the type of customer across account type. In addition, the data include analysis no-charge accounts, which are free accounts opened by employees' wages. This authorization category of free checking which is not self-selecting shows the highest activity at average balances of up to \$900. At higher balances the type of customer enjoying an analysis no-charge account changes to individuals maintaining compensating balances for commercial loans; and, as might be expected, account activity falls.

The analysis charge accounts show an interesting pattern of activity. At low balances where charges are incurred for check-writing, these accounts are less active than both the prepaid and the analysis no-charge accounts. However, near the balance range of \$500, these accounts become in practice charge-free, and activity moves closer to or rises above that of the free minimum balances and analysis no-charge accounts. In summary, the data imply that the number of checks written in an account is related to the presence or absence of service charges.

Figure B-1

RELATIONSHIP BETWEEN DEBIT ACTIVITY AND TYPE OF CHECKING ACCOUNT BY AVERAGE BALANCE



## *Discussion*

### Almarin Phillips

I like the idea proposed by the Eisenmenger-Munnell-Weiss paper of providing opportunities for entry by private enterprises into the EFT system. I like the idea of interest payments on demand deposits. I even toy with the idea of having interest paid on bank reserves that are held in the Federal Reserve System.

There are, however, some basic worries. One is about the cost configuration of the networks of EFTS. The truth of the matter is that we do not know very much about the economics of network costs and whether they operate with declining or increasing cost characteristics. If you want to have two-way communications between two people or two nodes, one wire will do it. If you want to have direct two-way communications among three people or nodes, it takes three. Among four, it takes six wires, and so on up. The switching gear gets very complex when there are large numbers of nodes in the system. The consequence — and we see it in the telephone industry — is that rather than trying to have direct two-way communications among all nodes, switching gear — exchanges — are set up. When that gets too complicated to handle easily, another tier of exchanges is set up and we have exchanges on top of exchanges. Whether such a system is a natural monopoly in the sense that it exhibits decreasing average costs is difficult to assess, but it is fairly clear that it is a natural monopoly in the sense that parallel systems would add to social cost. This aspect of communications and information exchange systems does raise the question of whether, despite how much we might all like to have large numbers of independent entrepreneurs being able to come into the system, they can in fact do so.

The authors do not insist that the Federal Reserve get into the EFTS. On the other hand, as I read the paper, there is an inclination to the view that the Federal Reserve should expand in that direction. This raises a fundamental question. Why does the Fed have to have anything to do with the system operations? I see no reason to deny them operating responsibility any more than I would deny that opportunity to private individuals. It is perfectly clear that the Fed has to tie into the system. It has

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to tie into it for transfers to and from the Federal Reserve, including open market operations, but so far as having exclusive responsibility for establishing prices or really operating the system, aside perhaps from setting some uniform quality standards and things of that sort, I see no reason to select the Fed for operating responsibility.

Beyond that, I have to raise questions about the need for universal reserves to make a system like this operate. With interest on demand deposits and interest on reserve accounts at the Fed, I see no reason why non-members cannot tie into the system, whether it is operated by a public authority or by private arrangements. Non-members would pay the same prices that others pay, with opportunities to work through an analogue of the correspondent banking system. If they wish to belong to the Fed for reasons of their own — clearing purposes, getting access to the window — let them join. If they do not, there is no obvious monetary policy reason to force them to do so. The same thing, I think, holds for the thrift institutions. The equal treatment/equal pay, interest on demand deposits and the universal issues, as presented in this paper, ignore the whole correspondent system that currently exists between smaller banks and their larger city neighbors. I would expect that as EFTS develops, a lot more corresponding will be done by wire data signals rather than by paper and verbal signals as in the current system. This is perfectly compatible with EFTS and with explicit pricing, with no mandatory membership requirements.

I do not understand what the authors mean by a regional or national POS system. EFTS, as I see it, is going to have large numbers of businesses of many kinds connected into the system and with their banks. There will be many kinds of terminal facilities. POS is one kind of terminal facility for one kind of business, but insurance companies are going to be tied into it, as are savings and loans, manufacturing organizations, and even perhaps members of the public. Once these are hooked into the system, when funds transfer messages from the terminals get into the transfer system, from there on there is nothing about POS as a national or regional system that is anything other than bank-to-bank kinds of information transfers. While the structure and operation of charge card systems cannot be ignored, we will not have a regional or national POS system, as I see it. It should be a particular kind of terminal operation.

The specific pricing proposals in the paper can be addressed at two levels: one, theory and the other, practicality. When we are all wired up in EFTS, with the various kinds of businesses, including the banks, using the system, it is bound to display — as the telephone system does, and that is a big part of what we will be working with — peak and off-peak demands. There are going to be hours when the system is under-utilized, and hours when the system is over-utilized. There are going to be Saturdays when banks will be off it and pro football will be on it, in effect. The suggestion of charging flat average costs to everybody, regardless of time, will not provide the incentives to use the system during the period when there is excess capacity. As a consequence, average cost pricing



tends to cause over-investment in the system. Whatever pricing is established should provide the possibility of charging different prices at different times, depending upon the degree of utilization of the system.

There is another problem in theory. There may be externalities. An externality is either a benefit or a cost that accrues to one person because of the actions of others. Again, let me use the telephone illustration. If I am the only one who has a telephone, it is worthless to me. The more people that the telephone connects with, the more valuable it is to me, regardless of the actual cost of my own telephone and my own use of it. The value that I get depends on whom it is hooked up to, what the range of services is, what the quality is, and so forth. If the social value of the system is different from the value as expressed by individuals, then the requirement of covering full cost is theoretically incorrect.

Let me use another illustration from my telephone. If I do not make a call at all for a month, there is a certain value to me of having the telephone there in case I wanted to. If we take accounting costs of use, direct cost, and so forth, the price on a full cost basis, the price fails to cover the benefits of just being connected to the system.

Much more practically, the paper suggests the use of average cost per item, or average cost per unit of output. Now I ask, what is the unit of output of an EFTS system? In what units do you measure output? In terms of the number of transactions? In terms of the number of bits of information that are transferred? Is it in terms of whether the communication is one-way versus two-way? Does the output have anything to do with service quality, including reliability and how often the system is down and things of that sort? I think it does. The output of an airline is not just a number of air miles from New York to Los Angeles. A whole lot of quality aspects have to enter into it. It is a multi-dimensional output unit. It makes a difference whether I get there in 14 hours or in 5 hours and a variety of things of that sort. Defining the unit of output — whether we do it on a marginal cost pricing basis or an average cost pricing basis — will be a very difficult thing to work out practically.

There is another practical problem. Suppose that I have a public body like the Fed operating some part of the system and charging — if somebody can measure it — average unit cost for the service. Other people connected with it are going to be selling bundles of services. The economic characteristics of the bundles will differ. Some service demands are going to be more elastic or less elastic than others. The incremental cost for some is going to be different from others. The tendency in the real world as this occurs is, rather than developing a specific pricing system, to bundle a whole lot of things together in ways that take account of the different economic characteristics of the items in the bundle, and sell it as a bundle. It is just possible that if the Fed were charging average total cost, some private users would come in and we would get to the old arguments of MCI versus AT&T. Some may tend to “skim the cream” of particular services. The use of the average cost pricing could be an inducement for bundling to occur.

Let me get back to accentuating the positive again. I do like the idea of specific charges for specific services, including specific charges on checking accounts. I think the possibility of having them in a world in which interest is paid on demand deposits is much greater than at present. The prohibition of interest on demand deposits, in fact, means that some attempt at bundling of services is made to collect the interest in other ways. Notice, though, some hidden problems. Suppose that the prohibition of interest on demand deposits is not removed. With EFTS, demand deposits can rapidly become an "inferior good." I can see the possibility of my instructing a broker, a commercial paper dealer, or a savings and loan association to transfer funds into my bank checking account so I can make some kind of a third-party payment, but transferring it just at the time that I require fund transfers. The EFTS moves what was an interest-bearing asset for me over into the account of a payee who, in turn, has a standing order to transfer his balance to some kind of an asset which is also interest-bearing. The velocity of turnover on demand deposits can rise precipitously. At the limit, the velocity of demand deposits may approach infinity. That raises some other problems that ought to make Milton Friedman very sad, because M-1 just disappeared as a meaningful monetary aggregate.

EFTS raises problems about Regulation Q. It will be easier to disintermediate. So, there has to be a rethinking at the Fed of deposit classifications, reserve requirements, and other regulations that goes further than anything we have heard of here. EFTS and interest on demand deposits mean that savings accounts, passbook-type savings accounts, day-of-deposit to day-of-withdrawal accounts and demand deposits are the same. There will be no need to distinguish between savings deposits and demand deposits in that kind of a world, and what are now savings deposits are going to become part of people's transaction balances.

I come away with a feeling that pricing is important, and resource allocation is important, but a stronger feeling that more does need to be done. If you want an illustration from a different industry, look at CATV. CATV started out as being a community antenna; it moved from that to cable television, and from that to the concept of a wired city. The regulation of wired cities has been just a hodgepodge. Different cities have different kinds of franchises; some of them divide them up into various regions and have one company doing it here and one company doing it there. They charge different ways. Because of a lack of forethought, public policy with respect to CATV has been very bad. In my practical mood, my guess is that we will blunder through with EFTS in the same way that we have blundered through with CATV. But I really do encourage people like Eisenmenger, Munnell and Weiss to keep working on the problem. Maybe some light can be shed on it.