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SESSION TOPIC: STUDIES IN THE ECONOMICS OF BANK REGULATION

SESSION CHAIRPERSON: MYRON SCHOLES*

A TRANSACTIONS COST APPROACH TO THE THEORY OF FINANCIAL INTERMEDIATION

GEORGE J. BENSTON AND CLIFFORD W. SMITH, JR.**

I. INTRODUCTION

IN OUR OPINION, a proper framework has yet to be developed for the analysis of financial intermediation. The traditional macroeconomic analysis views financial intermediaries as passive conduits through which monetary policy is effected.¹ Even when a more micro view is taken, though, the analyses often are restricted to studying the effect on the rate of change and allocation of money and credit of required and desired reserve ratios, ceiling rates imposed on loans and deposits, etc.²

Recent (and some past) writers criticize this approach.³ These authors point out that since financial intermediaries are firms, they should be analyzed with the microeconomic tools that have been employed to analyze other industries. Yet, in this implementation, considerable divergence in approach can be found. For example, while Pesek [1970] and Towey [1974] describe one financial intermediary, banks, as producing money by employing loans as inputs, Hyman [1972] and Melitz and Pardue [1973] describe them as producing credit with deposits as inputs. Furthermore, although most authors suggest that the intermediaries maximize something, it is sometimes profits, sometimes growth, and sometimes (rather anthropomorphically) utility (e.g., Klein [1971]). We believe that these approaches are not the most productive way to analyze financial intermediaries.

Essentially, we view the role of the financial intermediary as creating specialized financial commodities. These commodities are created whenever an intermediary finds that it can sell them for prices which are expected to cover all costs of their production, both direct costs and opportunity costs.

We see the demand for these financial commodities as a derived demand. Individuals derive utility from consumption, consumption today and consumption in the future. By acquiring financial commodities, inter-temporal and intra-temporal transfers of consumption may be achieved. Of course, there are many financial commodities other than those produced by financial intermediaries. The *raison d' être* for this industry is the existence of transactions costs.

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1. For example, neither Friedman and Schwartz [1963] nor Cagan [1965] mention bank resource costs.

2. Admittedly, if the costs of production for this industry showed little variability over the period studied, these omissions may cause little difficulty. However, with the technological advancement in such areas as electronic funds transfer, this omission may pose serious problems for subsequent research.

3. See Pyle [1972] for a comprehensive review of this literature.

Several forms of financial intermediation have arisen to reduce these costs. The most basic form of financial intermediary is the market maker. He simply provides a market-place where potential buyers and sellers come together, thus lowering relevant information costs. An example of this form of intermediary is the New York Stock Exchange. It does not create assets, it only furnishes a physical location for buyers and sellers to transact. Without this intermediary, the task of locating a potential seller (much less the potential seller with the lowest reservation price) would be much more expensive. A somewhat more sophisticated form of financial intermediation is provided by a dealer who also takes a position at his own risk in the asset transacted. A market specialist on a securities exchange exemplifies this form of intermediation. A more complex form of financial intermediation is one in which new financial commodities are produced. This form of financial intermediary is exemplified by mutual funds, banks, and consumer finance companies. Thus, mutual funds allow individuals to purchase shares in diversified portfolios of securities, in odd amounts, for indefinite lengths of time, generally at a much lower transaction cost than could be achieved through the direct purchase of the underlying securities. This intermediary has a comparative advantage over a stock exchange in serving a particular group. Therefore, it exploits the returns to scale implicit in the structure of the transactions costs of a stock exchange by purchasing large blocks of securities, packaging those securities in a form that is demanded by some individuals, and selling the package at a price which covers all its costs. These examples illustrate the essential feature of financial intermediation—reduction of the transactions costs of effecting inter- and intra-temporal consumption decisions.⁴

II. DEMAND

A basic problem in the analysis of financial intermediaries may be the lack of an appropriate analytical framework within which to analyze the demand for the financial commodities produced by intermediaries. In the general analysis of consumer demand, individuals are assumed to possess an endowment and act according to the dictates of a utility function. The endowment is expended to purchase consumption goods in such a way as to maximize utility. We assume that individuals derive utility only from consumption, where by consumption we mean consuming different goods at many points in time, allowing for different states of the world. (Note that if this restriction were not imposed, any observed activity could be trivially deduced by an appropriate insertion of that phenomenon into the utility function, thus rendering the analytical apparatus empty.)

4. One point about the aggregate supply of the financial commodities created by financial intermediaries should be noted: it is always identically zero. The total long position in mutual fund shares held by the public is exactly offset by the short position in those shares taken by the fund itself. Similarly, the total long position in the installment loan market held by the customers of a consumer finance company is exactly offset by the short position in that market assumed by the finance company itself. This general proposition, that the supply of financial commodities created by financial intermediaries is identically zero, should highlight the fact that the increase in social welfare engendered by this industry comes about only through a reduction in the relevant transactions cost.

The individual's endowment may consist of securities plus his human wealth, the present value of his earnings. If the individual's preferred inter-temporal consumption pattern differs from his time-profile of earnings, he may rearrange his consumption pattern to achieve a more desired pattern. He does so by directly or indirectly acquiring a long or short position in assets (e.g., by purchasing equities or the financial commodities issued by financial intermediaries). Therefore, an individual's asset holdings do not yield utility in themselves. Assets are held for the inter- and intra-temporal rearrangement of consumption possibilities afforded by their holding.⁵

The foregoing explains, in part, why assets are held. We now turn to the question of which assets are held, or what the motivation is for holding the financial commodities created by financial intermediaries. It should be obvious that in a *perfect* market, a market with no frictions such as transactions costs, information costs, or indivisibilities, financial intermediaries would not exist. This argument focuses explicitly on the rationale for the existence of financial intermediaries—market imperfections.

Transactions Cost and Inter-Temporal Consumption

First we consider the consumer's demand for inter-temporal consumption. The well-known Sharpe-Lintner-Treynor-Mossin capital asset pricing model (CAPM) describes how the consumer can hold a portfolio of riskless and risky assets to achieve consumption patterns that maximize his utility. This model includes the essential elements appropriate to an analytical framework: consumption is the argument in the individual's preference function, at least two time periods are considered, the range of substitution involved in the portfolio decision is recognized, and risk is explicitly recognized. However, transactions costs are not incorporated.

In an earlier version of this paper, we demonstrate formally how general transactions costs can be included in Hamada's [1971] explication of the CAPM.⁶ We draw the following conclusions. First, transactions costs reduce the amount of the consumer's present and future consumption should he want to consume other than his current period income. As a consequence, consumption only of current income and next period income may dominate borrowing and lending and investing in risk-free and risky assets. This conclusion is reinforced where transactions result in differing borrowing and lending rates. Both fixed and differential transactions costs result in a tendency of the individual's consumption patterns to follow his income pattern. Second, although in a perfect market it is never optimal to hold a portfolio with no risky assets, the existence of transactions costs may result in the optimal portfolio containing only riskless assets. Third, where a consumer can achieve a higher level of utility by purchasing risky assets even though he must incur transactions costs, the nature of these costs affect his choice of portfolio. If transactions costs are proportional for all risky assets, the market

5. We include here contingent consumption possibilities as, for example, are afforded by insurance.

6. This section of the paper was omitted because of space constraints. It is available from the authors upon request.

portfolio is still the optimal portfolio of risky assets,⁷ though the amount that can be invested is reduced by the future value of the costs. However, the two fund property of the CAPM is lost virtually all other forms of transactions costs. If transactions costs are associated differentially with individual securities, the market portfolio will not be chosen. Essentially, the individual will add risky securities to his portfolio until the marginal net benefit of increased diversification is zero. The addition of more general increasing returns to scale in transactions costs will generate non-linearities in the model. Both the homogeneity properties associated with the map of the efficient frontier and the linearity of the capital market line will be lost. In particular, the consumer with a relatively small endowment and/or income may find the reduction in expected utility from paying transactions costs greater than the increase in expected utility from purchasing, borrowing or lending risky or risk-free assets.

The demand for the commodities produced by financial intermediaries, in general, is derived from the consumer's ability to achieve a higher level of utility by incurring lower levels of these transactions costs. In addition, individual specific transactions costs, such as the cost of transportation and inconvenience, also serve to reduce the consumer's consumption possibilities. These costs, we believe, are important for explaining the distribution of the consumer's demands among individual financial intermediaries. When several financial commodities can be obtained in a single location, the marginal transportation and inconvenience cost for services in addition to the first are virtually zero.⁸ However, the continuing existence of thrift institutions, unit banks, and other limited service financial institutions suggest either that these costs are not overwhelmingly large or that government regulations prevent transactions cost saving changes. (These alternatives are considered further below.)

The addition of these costs would suggest that individuals' efficient opportunity sets would differ not only with the size of their portfolios, but also with physical location and the opportunity cost of their time. Thus the demands faced by financial intermediaries are also a function of the distribution of wealth among consumers.⁹

Transactions Costs and Intra-Temporal Consumption

The demand for financial commodities, such as demand deposits, is derived from the consumer's demand to effect intra-temporal consumption decisions across commodities. Demand deposits are acquired because of transactions costs, namely costs associated with barter and with the use of government supplied money.¹⁰ Since it is costly to exchange assets for consumption goods, given some stochastic

7. Note, however, that if the individual begins with an endowment of risky securities, this property does not hold. See Zabel [1973].

8. Consequently, time deposit balances are positive in full-service commercial banks, even though thrift institutions are allowed to pay one-quarter percent more interest on their time deposits. (See Kardouche [1969]). This argument may also partially explain the observation that banks with extensive branching tend to dominate in states which permit branch banking.

9. In general, we expect that as the opportunity cost of the consumer's time increases, the value of full-service financial intermediaries to the consumer is likely to increase.

10. See Saving [1971], Feige and Parkin [1971], Brunner and Meltzer [1971] and Karni [1974] for recent analyses of the demand for money that consider explicitly the role of transactions costs.

expenditure patterns, individuals will choose to hold assets which have low transactions costs associated with conversion to consumption goods. This property of assets, the ability to be transformed into consumption goods at minimal transactions costs, is referred to as liquidity.¹¹ Given the continuum of liquidity and noting the generally negative correlation between liquidity and expected return, individuals will hold a portfolio of assets in which the marginal benefit of increased liquidity and the accompanying expected reduction in transactions costs is just equal to the marginal cost of the reduction in expected return.

Among these assets, demand deposits and loans provide liquidity at a relatively low transactions cost because they provide consumers with complete divisibility and permit him to monitor his activities at a relatively low cost. A demand deposit permits the consumer to purchase an asset or repay a debt with the exact amount required by writing a check. The cleared check provides him with a legally acceptable, validated record of the transaction. A treasury bill, on the other hand, usually must be converted to currency or a demand deposit before it can be used to effect transactions.

Loans made for the amounts and periods demanded similarly provide consumers with liquidity that obviates the need to incur the additional transactions costs of investing amounts not wanted. A debenture, on the other hand, involves a relatively large amount of funds for a relatively long period. Neither the amount nor the period may coincide with the consumption preferred by the consumer.

Transactions Costs and the Demand for Financial Commodities

To summarize, financial intermediaries meet consumers' demands for time-dated consumption by supplying units of generalized purchasing power that can be converted into goods or services at minimal transactions costs in the amounts and at the times demanded.¹² Included in the price of these financial commodities are amounts that compensate the financial institution for the costs of processing the paperwork required to record the transaction, to determine the likelihood that the borrower will repay his debt, to monitor his repayment of the debt and to acquire the funds borrowed. Also included are amounts (interest) that compensate other consumers for deferring present consumption.

Similarly, consumers who wish to consume in the future may invest their funds (currently owned claims over resources) with a financial intermediary. The intermediary provides them with an expected real return for the period over which they choose to invest. Furthermore, consumers generally can invest whatever amounts they wish for whatever period they wish.

11. Pierce [1966] following Tobin demonstrates that liquidity may be measured as the amount that can be acquired (either through the sale of an asset or through borrowing) over a given time period and state of the economy relative to the maximum amount that could be realized from the sale of the asset were time not a factor. Therefore, currency, being legal tender, is perfectly liquid. However mortgage loans, which require large information costs for a prospective buyer to ascertain valuation, are generally illiquid.

12. Thus, a consumer who wishes to acquire the services of an automobile now (and over time) in exchange for reduced consumption of other goods and services at specified amounts in the future may borrow \$3800.00 and pay a bank \$183.67 a month for 24 months. A manufacturer may acquire the productive services of a machine that costs \$10,800.00, for which he contracts to return \$11,880.00 one year hence.

Financial intermediaries are organized to meet these consumers' demands at relatively low transactions costs by producing financial commodities and services. The conditions that govern this production are considered in the next section.

III. PRODUCTION

General Considerations for the Production of Financial Commodities

The market price of a financial commodity is a function of the total cost of producing the financial commodity. We begin to examine the price charged by the firm by considering the behavior of an unregulated firm. (The impact of government regulation is considered in Section V.) The price of any financial commodity in an efficient, competitive market can be conceptually separated into three parts: one part depends only on the pure riskless rate (what in a two period world would correspond to the marginal rate of substitution between current and future consumption), one represents a premium for risk, and one is a compensation for the administration, monitoring, and processing costs imposed on the producer. To examine the first two parts, it is convenient to employ the analogy suggested by Black and Scholes [1973] between the valuation of a call option and the valuation of equity.¹³ Black and Scholes demonstrate that in a frictionless world without taxes and bankruptcy costs that the value of equity (E) and debt (D) (defined as pure discount bonds) are functions of the value of the underlying assets (V), the face value of the debt (D^*), the time to maturity of the debt (T), the riskless rate of interest (r), and the variance rate on the assets (σ^2):¹⁴

$$V = E(V, D^*, T, r, \sigma^2) + D(V, D^*, T, r, \sigma^2) \quad (1)$$

where

$$\begin{array}{ll} \frac{\partial E}{\partial V} \frac{\partial E}{\partial T} \frac{\partial E}{\partial r} \frac{\partial E}{\partial \sigma^2} > 0 & \frac{\partial E}{\partial D^*} < 0 \\ \frac{\partial D}{\partial V} \frac{\partial D}{\partial D^*} > 0 & \frac{\partial D}{\partial T} \frac{\partial D}{\partial r} \frac{\partial D}{\partial \sigma^2} < 0 \end{array}$$

13. See Smith [1976] for a review of the option pricing literature and the applications of the option pricing model to value other contingent claim assets.

14. These partial effects have intuitive interpretations: An increase in the value of the underlying assets directly increases the value of the equity and increases the coverage on the debt, thereby, lowering the probability of default. An increase in the face value of the debt increases the claim on the assets by the creditors thereby increasing the current value of the debt and, since equity is a residual claim, reduces its current value. An increase in the time to maturity of the debt or an increase in the riskless rate decreases the present value of the debt obligation. Finally, an increase in the variance rate on the assets increases the likelihood of the value of the assets being less than the face value of the debt at maturity, thereby lowering the current value of the debt and increasing the current value of the equity. Furthermore, in the presence of taxes, bankruptcy costs, and other agency costs, the debt-equity ratio would be an argument in the equity and debt functions. As pointed out by Long [1974] the Black-Scholes model cannot be directly applied in the presence of tax effects or agency costs which would make the value of the firm dependent upon the debt-equity ratio. However, it seems unlikely that qualitative results in (1) will be affected.

Even in the absence of transactions costs, any economic agent who purchases or sells a financial commodity must ascertain the values of these variables. The cost of assessing the riskless rate is very low, for it is exogeneous to the process and readily observable. However, assessment of the other relevant variables may entail high information costs. This task may be trivial in the case of an investment where repayment is guaranteed by a secure insurer (such as the FDIC, FSLIC, VA, FHA or NCUA). But for other investments, the assessment of the magnitudes of the variables is costly and the agents incurring these costs must be compensated.

In providing funds to a borrower, lenders are faced with the possibility that honesty on the part of the borrower may not be his best policy. For example, if a borrower obtains a loan based on his stated intention to purchase low risk assets with the proceeds, he can increase his equity by actually using the proceeds to purchase high risk assets. If the lender does not perceive that this action is possible (and therefore charges an interest rate which assumes that this action will in fact be taken), he will suffer a capital loss: the market value of the loan will fall because the agreed rate of interest is insufficient compensation for the risk of bankruptcy. Consequently, the lender must charge a price (interest rate) sufficient to compensate him for the riskiest choice of assets that the borrower might acquire. Furthermore, if the lender sets the interest rate at that level, the borrower must acquire assets at least as risky as those the lender implicitly expects him to purchase or he will over-compensate the lender.

As pointed out by Jensen and Meckling [1975], the cost of this conflict of interests between the borrower and the lender can be reduced by placing a restrictive covenant into the credit agreement. This covenant contractually limits the activities of the borrower and therefore allows the lender to offer a lower rate of interest on the loan. However, there are other methods which can be used to minimize this problem, specifically the pledging of collateral. If collateral is included in a credit agreement, then the information costs imposed on the lender may be significantly lowered. Instead of calculating the appropriate rate of interest based on the least favorable available action to the borrower, given the covenants in the instruments, the lender can base the rate on his estimate of the risks associated with the collateral. This procedure may be much less expensive to administer and monitor than the procedure of employing general, restrictive covenants.

Of course, in the case of financial commodities such as loans, trade-offs exist between these various ways of protecting one's self as a lender. Increasing the down payment required, pledging collateral, and inserting restrictive covenants into the credit agreements imply different combinations of information and monitoring costs over the life of the loan. It is expected that the combination of these instruments chosen would be such that the marginal reduction in expected costs would be equal for all instruments employed.

It also appears that, for certain types of loans, the information costs associated with ascertaining the magnitudes of the arguments in (1) are so high that it is preferable to employ instrumental variables instead. Consequently, financial intermediaries generally gather, check, and update information about borrowers, for frequently the historical record of past obligations is a good source of information

about the likelihood of repayment. This information also may be quantified and summarized with the aid of credit scoring techniques and financial statement analysis.

The considerations discussed above are not specific to financial intermediaries—they are relevant to all financial commodities produced by economic agents. Now we turn to the question of why financial intermediaries usually perform these services rather than other services.

The Costs of Producing Financial Commodities

The production of financial commodities, like the production of any other good, requires the use of various forms of labor and capital goods. In the production of financial commodities, these inputs are more extensively employed in tasks of documentation, information and monitoring. Extensive documentation is necessary because financial commodities are claims that can be easily converted into generalized purchasing power or consumption goods by the holder with small transactions costs. Therefore, there must be little question that these claims are legally enforceable—so little question that the high legal costs associated with government enforcement of these contracts will be rarely employed.¹⁵

As suggested above, information costs are often relatively large for the production of financial commodities, especially for those that entail a promise to repay funds at a later date (e.g., loans). Where collateral is required to secure a loan, its value must be ascertained and kept current. This task is not difficult for assets that are continuously traded, such as listed securities; however, determination of the value of other assets may require specialized expertise. Though information and monitoring may be most useful for such financial commodities as loans; deposits and other commodities require these aspects of production to reduce frauds, litigation, and misunderstandings which are expected to be more costly. Financial intermediaries create financial commodities which require the performance of these tasks because they have a comparative advantage in processing documents, in acquiring information about borrowers' ability to repay debts, and in monitoring instruments that can be easily converted into generalized purchasing power.

Three sources of this comparative advantage may be delineated. First, the intermediary is able to achieve economies of scale as a consequence of specialization. Thus, routines designed for and information received about a consumer or types of consumers can be used to process other consumers;¹⁶ further, specialized machinery and forms may be developed and designed.¹⁷ Economies of specialization may make it cost-effective for some institutions to specialize in providing a single type of financial commodity to a specific group of customers (e.g., consumer

15. To reduce these enforcement costs and to minimize monitoring costs for the intermediary financial commodities are sometimes negotiable: a holder of a financial claim need prove only that he is a holder in due course, having not obtained the claim through fraud or theft. Consequently, negotiable commodities require extensive control and monitoring by the holder, since it is very difficult to prove that the bearer of such an instrument is not a holder in due course. Therefore, these transactions costs can be shifted directly from the issuer to the bearer.

16. Credit scoring for screening consumer loans and lending by bank officers who specialize in specific industries or types of real estate are examples.

17. Check sorting machines and loan forms and routines are examples.

finance companies), while others carry a limited line of related financial commodities (e.g., wholesale commercial banks, thrift institutions, and investment companies), and others are virtually financial department stores (e.g., full-service commercial banks).¹⁸ Second, some important information, such as details about a borrower's financial condition, can be obtained by a financial institution at much lower cost than by others because the financial institution is expected to exhibit, and therefore can more easily acquire a reputation for exhibiting, discretion with that type of information.¹⁹ Third, financial institutions can reduce the transactions costs associated with search. An individual who wishes to lend can search for another person who wishes to borrow, but this process is generally more expensive than having a market through which these transactions can be accomplished. (Note, however, that the process does not require a matching of borrower and lender, even within the same institution.)

Specialization and Diversification in the Production of Financial Commodities

It is generally the case (for reasons that are discussed below) that financial intermediaries tend to produce more than one kind of financial commodity. They tend to have many sources and uses of funds. They can obtain funds through equity, borrowing, accepting deposits of various kinds, etc. They can employ these funds by making loans, purchasing securities, building offices, buying equipment, etc. In equilibrium, the total cost of obtaining another dollar from any of these sources should be equal. In equilibrium, the total return from employing another dollar in any of these uses also should be equal. Consequently, financial intermediaries should not necessarily associate sources and uses of funds.

That financial intermediaries should not associate sources and uses of funds does not imply that the two sides of the balance sheet involve independent and separable decisions. As long as bankruptcy costs are positive, the structure of the two are related. For instance, real estate investment trust companies generally borrowed in the short term credit market and loaned in the intermediate or long term credit market. This practice exposed these trusts to interest rate risk which could have been hedged by matching the maturity structure of the assets and liabilities. When interest rates rose, the value of their assets fell by a much greater amount than did the value of their liabilities. This resulted in great financial difficulty for many of the trusts. Similarly, government regulations that essentially restrict thrift institutions to mortgage loans and savings deposits expose them to a higher probability of bankruptcy. Thus, a hedging of risks appears desirable. But it need not be achieved (and may not be achievable) by matching deposits from and loans to individuals (or any other group or type of consumers). What, then, determines whether and how financial institutions offer a specialized or diversified array of financial commodities and services?

18. Available evidence indicates that many financial institutions (such as thrift institutions) have achieved virtually all economies of scale available through specialization and consequently might benefit from economies of diversification were they not prohibited by law from producing additional financial commodities. (See Benston [1972].) These issues are considered further, below.

19. Private individuals may be denied access to this information for fear that it may be made available to competitors or others.

Financial intermediaries, as they presently are organized, offer a wide variety and combination of financial commodities and services. Aside from laws and government regulations (which, as we discuss in section V, are a principle determinant), several factors may account for this diversity. Among these are economies of scale from specialization, economies from diversification, economies to customers from purchasing financial commodities and services at a single location or from a single institution, and reduction of the probability of incurring bankruptcy costs. The available empirical evidence suggest that there exist economies of scale in the production of financial commodities. However, the financial intermediaries studied are sufficiently large to have achieved most of these economies with respect to the production of relatively homogeneous financial commodities.²⁰ Additionally, there appear to be some economies of scale from diversification.²¹ Diversification also may be valued because it lowers the probability (and hence the expected cost) of bankruptcy. This occurs because the returns from investments in different types of loans, customer services, locations, etc., over different states of the world (such as general and local economic depressions, inflation, changes in consumers' tastes and preferences, changes in laws, and changes in the enforcement of regulations) are likely to be imperfectly correlated. Of course, it is expected that institutions will equate the marginal advantage from diversification with the marginal cost of less specialization.

A combination of economies from joint production and lower consumer-borne transactions costs, may explain why specific commodities and services generally are produced by financial intermediaries.²² Reduced customer transactions costs also explains the offering of these services by many financial institutions. However, specialized financial intermediaries may have some comparative advantages over department store types of institutions.²³ But, as we discuss in section V, outdated laws and regulations may prevent change from occurring. First we consider the pricing of financial commodities and services.

IV. PRICING OF FINANCIAL COMMODITIES AND SERVICES

Several studies have suggested that, in the absence of government regulation and in the presence of efficient markets, financial institutions would unbundle charges for their products.²⁴ In equilibrium, given competitive markets, financial institutions would charge consumers the marginal cost of producing the commodities and

20. See Benston [1970], [1965], [1974], Bell and Murphy [1968], Longbrake and Haslem [1975], and Halpern and Mathewson [1975].

21. See Benston [1972], [1974], [1975], Halpern and Mathewson [1975], and Bell and Murphy [1968].

22. Safe deposit boxes, for example, require investments in vaults, alarm systems and guards. These also are required for safeguarding the currency and negotiable instruments used for fund transfers, deposits and loans.

23. For example, given the laws and consumers' tastes, specialized small loan companies may be able to supply high risk consumer cash loans at a lower transactions cost than can commercial banks. Changed conditions (such as changes in consumers' tastes and effective reductions in graduated legal ceiling rates on small loans as a consequence of inflation) may reduce the advantage of specialization to the point where the advantages from diversification dominate.

24. See, for example, Black [1975] and Knight [1975].

services demanded. Similarly, consumers would be rewarded according to the marginal value of the resources they made available to the intermediary. Thus charges would be levied for each check processed, each deposit made, each statement prepared and mailed, each note collected, each installment payment rendered, etc.

However, this analysis neglects the transactions cost of accounting for transactions. It is clear that, were it not for the prohibition of interest on demand deposits, we would observe direct interest payments rather than “free” checking or lower rates charged on loans to depositors, etc. But the cost of accounting for each service demanded by consumers might prevent complete unbundling from being cost-effective. Rather it seems likely that for some financial commodities financial institutions would estimate the average cost of processing a given type of account and pay (or charge) an interest rate and/or overall service charge that covers expected costs. This procedure would permit dispensing with the monitoring and accounting system required for the explicit charge system.²⁵ The issue, of course, is essentially an empirical one—which charging system (or combination of systems) requires the smallest costs net of benefits. However, government regulations impinge on the choice of method and on the ability of financial institutions to repackage and alter their commodities as technology and consumers’ tastes change. We turn, next, to this question.

V. GOVERNMENT REGULATION

It is clear that any government regulation presents a constraint on those regulated that reduces aggregate welfare, with four possible exceptions: the constraints are not binding, there are externalities, the cost of government administration is reduced, and resources are redistributed among persons so that someone’s welfare is increased. The following discussion is limited to considering the effect of specific regulations on the ability of financial institutions to meet consumers’ demands efficiently. In general, we do not consider the welfare effects of these regulations on individuals (in part because we believe these to be unimportant).

Government regulations on financial intermediaries may be grouped as follows: (1) licensing, (2) price control, (3) credit allocation and (4) supervision. Each is discussed in turn.

First, unlike most other enterprises, financial intermediaries generally cannot be established without permission from some regulatory agency. In addition, bank-type financial institutions require regulatory permission to expand via branching, a method that is prohibited or restricted by many states, with expansion across state lines being generally prohibited. Financial intermediaries also are prohibited or restricted from offering specific financial commodities and services.²⁶ Licensing

25. It should be noted that before the prohibition of interest payments on demand deposits (in 1933), banks generally paid interest only on large account balances and generally did not charge for individual services rendered.

26. For example, only commercial banks can offer demand deposits. Thrift institutions cannot offer non-real estate related commercial loans. Consumer cash loans (except for real estate related and student loans) cannot be offered by thrift institutions in most states. Commercial banks cannot make equity investments or offer equity investment services to consumers.

regulations also may prevent financial intermediaries from organizing production of financial commodities and services in efficient ways. Restrictions on the intermediaries' ability to jointly produce and offer their output at locations of their choosing necessarily increases the transactions costs (including inconvenience costs) that some consumers must bear.

Second, control over the prices received and paid by financial intermediaries are imposed by the states and the federal government. State imposed usury laws place ceilings on the amounts that intermediaries can receive on loans.²⁷ As is the case for price controls generally, interest rate restrictions tend to misallocate resources. When they are effective, usury laws result in restricted availability of riskier and operationally more costly loans as financial intermediaries shift their funds to loans whose net yields are within legal limits. Since the ceilings are stated as rates per dollar and rarely are changed, inflation increases the effectiveness of the ceilings as the premium for inflation increases to the point where loans are not as profitable as other investments. Larger business loans are made in preference to smaller loans since, generally, larger loans require lower operating expenses per dollar loaned. Tie-in arrangements, such as compensating balances, are used which effectively increase the rate of interest charged. Smaller consumer loans are not offered, except as "loss leaders." (Bowsher [1975] and Benston [1975].) If the ceilings become sufficiently restrictive, consumers cease using the services of regulated financial intermediaries and, where the law permits, direct loans and other forms of disintermediation take their place. The net result seems to be a decline in welfare.

Ceilings on deposit payments similarly have dysfunctional effects. The argument that prohibiting interest payments on demand deposits is necessary to keep banks from making risky loans in an effort to offset the interest expense has been shown to be false (Benston [1964]). Rather the prohibition has the effect of a government administered oligopolistic cartel price enforcement. Ceilings on the rates paid on time and savings deposits also have the effect of raising transactions costs, as financial intermediaries and consumers attempt to evade the restrictions. Premiums and promotions are less valuable to consumers than their cash equivalents and disintermediation is generally more costly than intermediation. However, the cost to consumers of disintermediation may exceed the benefits (which appears to be the case for holders of smaller savings accounts).²⁸ The effect, then, of ceilings on the prices financial intermediaries may charge and pay for funds is to increase transactions costs (borne by the intermediaries and consumers) and misallocate resources.²⁹

The third form of government regulation, control or credit allocation, takes at least four forms: (1) mortgage lending is encouraged by a variety of subsidies; (2) loans made to finance purchases of securities are discouraged by margin require-

27. See Bowsher [1975], pp. 20–21, for a table that summarizes the usury rates state by state.

28. See Pyle [1974] for an estimate of the opportunity losses incurred by savers from interest rate regulation.

29. The ceilings have been defended as necessary for the continued viability of specialized thrift institutions and beneficial to deserving groups (such as the housing industry, in the belief that the intermediaries' reduced cost of funds necessarily will be passed on to mortgages and that an interest rate

ments that call for relatively large amounts of collateral; (3) small consumer cash loans are limited by state imposed limitations on maturities and interest rate ceilings; and (4) mandatory credit allocation to groups and areas which presumably have been discriminated against have been proposed. Other controls have been attempted in the past, such as "moral suasion" by the Federal Reserve to discourage banks from making foreign and other undesirable loans and wartime controls on consumer loans and mortgages.³⁰

Although there is doubt that subsidies on mortgage loans actually increase the stock of housing (Jaffee [1975] and Meltzer [1974]), there seems little doubt that controls reduce some forms of lending by financial intermediaries. In the short-run, such controls as margin requirements for loans to purchase securities can reduce the amount of funds allocated for this purpose. But, as Mayer [1975] concludes after an extensive review of the literature and analysis of credit allocation schemes: "...credit allocation is not an efficient system. The shifts in the distribution of credit which it tries to bring about are of doubtful value, and, in any case, credit allocation would be ineffective in the long run. But this would not prevent it from imposing substantial costs on the economy." (p. 91)³¹

Efforts of authorities to force or encourage financial intermediaries to lend specific groups or in specific areas also have been proposed.³² It is possible that these efforts will succeed, particularly if the institutions have not been making loans as a consequence of misinformation or prejudice. However, if past experience is a guide, the net effect is likely to be the imposition of additional transactions costs with little effect on the allocation of credit.

Finally, financial intermediaries have almost always been subjected to rather close supervision by governmental authorities. This supervision takes the form of detailed reporting requirements (i.e., quarterly call reports by banks, monthly reports by savings and loan associations, annual statutory reports by life insurance companies, etc.) and (for bank-type intermediaries) direct examination. Several reasons explain this type of supervision: (1) the public-facility nature of most intermediaries, wherein the general public believes or is encouraged to believe that funds deposited in a financial intermediary are "safe," (2) the fact that the assets held by financial intermediaries can be misappropriated relatively easily if controls are not maintained, (3) the externalities that are believed to exist, wherein

differential in favor of thrift institutions will favor allocation of credit to mortgage loans). Even assuming that savers who find it too costly to disintermediate should (and do) support home builders and buyers, the effectiveness of this form of subsidy has been questioned by a large number of studies (see Meltzer [1974] and Jaffee [1971]). Since this argument explicitly assumes intermediaries associate sources and uses of funds, it is highly doubtful that this rationale is valid. The continued viability of financial intermediaries who are required by regulations to concentrate on mortgage loans and savings and time deposits, though, is in question as continued inflation increases the effectiveness of interest rate ceilings.

30. We also should mention that non-interest bearing required reserves in effect allocate resources from users of deposits to the federal government.

31. Also see Benston [1975] for an example of the effect of state imposed restrictions on driving almost all of the consumer finance companies in Maine out of business.

32. These proposals include mandatory mortgage loans in sections of a city presumably discriminated against (anti-red-lining), loans to black-owned businesses, loans to women, etc.

the failure of one intermediary affects others (bank-runs) and the economy in general, and (4) deposits are insured by government agencies (FDIC, FSLIC, NCUA).³³

One important effect of close supervision is increased transactions costs. The supervised financial intermediaries must bear the direct cost of assessments and examination fees. They also absorb the costs of meeting the examiners' and supervisors' requests for data and the opportunity cost of complying with their orders. In equilibrium, these costs are borne by the purchasers of their output. However, the benefits from examination should be deducted from the costs. The principal benefit is the savings by consumers of the information and insurance costs that they otherwise would have to bear were the FDIC, FSLIC and NCUA not examining the institutions and insuring deposits and shares. These cost savings would appear to be relatively greater for holders of small deposits, since much of the cost of information about the operations of an institution is fixed with respect to the amount deposited. Borrowers, on the other hand, have much less interest in the safety of their creditors.

Conclusions on Government Regulation and Financial Intermediation

Government regulation increases the transactions costs of financial intermediation principally by restricting financial intermediaries from operating as efficiently as they otherwise would. Licensing restrictions increase the costs. Obviously, these restrictions increase the transactions costs of financial intermediation. Furthermore there appear to be few offsetting benefits for consumers, other than some reduction in information costs derived from the knowledge that the regulatory authorities can punish a poorly or fraudulently run intermediary by removing its license or refusing it permission to expand. Controls on interest payments and charges, mandatory credit policies and close supervision also result in higher transactions costs and asset misallocations. Only examination and deposit insurance appear to reduce some information and insurance costs that consumers otherwise would incur.

On the other hand, government regulations may benefit existing financial institutions at the expense of consumers and of would be competitors. This conclusion would be consistent with the capture hypothesis of regulation.

However, a mitigating factor should be mentioned. There is considerable contemporary evidence that financial institutions, acting in their own self-interest, have and are breaking down the regulatory barriers. The prohibition of interest payments on demand deposits is violated by "free" checking and, most recently, by negotiable orders of withdrawal (NOW) accounts and other demand deposit-like systems offered by thrift institutions. Automatic shifts between checking and savings deposits in commercial banks and the establishment and growth of money management funds also are examples of institutional methods of effectively paying interest on demand deposits. Place-of-business funds transfer terminals, located in food and other stores by savings and loan associations, are permitting them to offer demand deposit-like services at remote locations in unit banking areas. Approval of

33. These reasons are analyzed in Benston [1973] and, with the exception of the last reason, are found generally not to be valid.

these systems by the Federal Home Loan Bank Board in January 1974 led to the Comptroller of the Currency's approval in December 1974 of similar customer-bank-communication-terminals (CBCTs). These, in turn, are forcing a number of state authorities in unit banking states to approve their use by state banks.³⁴ Thus, the higher opportunity value of deposits appears to have made the same existing electronics technology economically feasible. The regulatory barriers are being breached. But, of course, the price paid by consumers is greater than had the barriers not initially existed.

V. CONCLUSIONS

In this paper we have tried to show that the analysis of transactions costs is central to the theory of financial intermediation. Financial intermediaries produce financial commodities which can be used to effect consumers' inter-temporal, intra-temporal and state determined consumption decisions. Changes in technology and in consumer borne transactions costs alter the types of financial commodities produced, the way in which they are packaged, and the institutions that produce and sell them to consumers. Furthermore, government regulation essentially restricts financial intermediaries from changing the specific commodities they produce to meet changes in technology and consumer tastes. We believe a more complete analysis would show the relationship between specific types of transactions costs and the type of financial intermediary and financial commodity that should arise to reduce these costs. We feel that this approach represents an appropriate direction for future analysis.

REFERENCES

- Bell, Frederick W. and Murphy, Neil B., *Costs in Commercial Banking: A Quantitative Analysis of Bank Behavior and Its Relations to Bank Regulation*, Research Report No. 41, Boston: Federal Reserve Bank of Boston, 1968.
- Benston, George J., "Interest Payments on Demand Deposits and Bank Investment Behavior," *Journal of Political Economy*, LXXII, October 1964, pp. 431-449.
- . "Economies of Scale and Marginal Costs in Banking Operations," *The National Banking Review*, 2 June 1965, pp. 507-549.
- . "Cost of Operations and Economies of Scale in Savings and Loan Associations," in *Study of the Savings and Loan Industry*, Federal Home Loan Bank Board, Washington: U.S. Government Printing Office, 1970, pp. 971-1209.
- . "Savings Banking and the Public Interest," *Journal of Money, Credit and Banking*, IV, February 1972 (Part II), pp. 131-226.
- . "Bank Examination," *The Bulletin*, New York University, Institute of Finance, Nos. 89-90, May 1973, p. 73.
- . "The Costs to Consumer Finance Companies of Extending Consumer Credit," in *Technical Studies Volume II*, National Commission on Consumer Finance, U.S. Government Printing Office, Washington, D. C.: 1974, pp. 1-158.
- . "State Controls on Consumer Finance Company Loans: The Case of Maturity Regulation in Maine," in *Government Credit Allocation: Where Do We Go From Here?*, Institute for Contemporary Studies, San Francisco, California and the Center for Research in Government Policy of the Graduate School of Management, The University of Rochester, New York, 1975, pp. 181-208.

34. See Lovati [1975] for a review of these developments.

- Black, Fischer, "Bank Funds Management in an Efficient Market," *Journal of Financial Economics*, 2, December 1975, pp. 323-339.
- and Scholes, Myron, "The Pricing of Options and Corporate Liabilities," *Journal of Political Economy*, 81, May-June 1973, pp. 637-659.
- Bowsher, Norman N., "Usury Laws: Harmful When Effective," *Review*, Federal Reserve Bank of St. Louis, 56, August 1974, pp. 16-23.
- Brunner, Karl and Meltzer, Allan H., "The Uses of Money: Money in the Theory of an Exchange Economy," *American Economic Review*, LXI, December 1971, pp. 784-805.
- Cagen, Phillip, *Determinants and Effects of Changes in the Stock of Money*, New York, 1965.
- Feige, Edgar L. and Parkin, Michael, "The Optimal Quantity of Money, Bonds, Commodity Inventories, and Capital," *American Economic Review*, LXI, June 1971, pp. 335-349.
- Friedman, Milton and Schwartz, Anna J., *A Monetary History of the United States, 1867-1960*, Princeton, 1963.
- Halpern, Paul J. and Mathewson, G. Frank, "Economies of Scale in Financial Institutions: A General Model Applied to Insurance," *Journal of Monetary Economics*, 1, 1975, pp. 203-220.
- Hamada, Robert, "Investment Decision with a General Equilibrium Mean-Variance Approach," *Quarterly Journal of Economics*, LXXXV, November 1971, pp. 667-683.
- Hyman, David, "A Behavioral Model for Financial Intermediation," *Economic and Business Bulletin*, Vol. 24, Spring-Summer 1972.
- Jaffee, Dwight M., *Credit Rationing and The Commercial Loan Market*, New York: John Wiley and Sons, 1971.
- . "Housing Finance and Mortgage Market Policy," in *Government Credit Allocation: Where Do We Go From Here?*, Institute for Contemporary Studies, San Francisco, California and the Center for Research in Government Policy and Business of the Graduate School of Management, The University of Rochester, New York, 1975, pp. 93-122.
- Jensen, Michael and Meckling, William, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," Working Paper, The Graduate School of Management, The University of Rochester, New York.
- Kardouche, George K., *The Competition for Savings*, New York: The Conference Board, 1969.
- Karni, Edi, "The Value of Time and the Demand for Money," *Journal of Money, Credit and Banking*, VI:1, February 1974, pp. 45-64.
- Klein, Michael, "A Theory of the Banking Firm," *Journal of Money, Credit and Banking*, III:2 (Part 1), May 1971.
- Knight, Robert E., "Customer Profitability Analysis, Part II: Analysis Methods at Major Banks," *Monthly Review*, Federal Reserve Bank of Kansas City, October 1975, pp. 11-23.
- Long, John, "Comment on the Pricing of Corporate Debt: The Risk Structure of Interest Rates," *Journal of Finance*, 29, May 1974.
- Longbrake, William A. and Haslem, John A., "Productive Efficiency in Commercial Banking: The Effects of Size and Legal Form of Organization on the Cost of Producing Demand Deposit Services," *Journal of Money, Credit and Banking*, VII, August 1975, pp. 317-330.
- Lovati, Jean M., "The Changing Competition Between Commercial Banks and Thrift Institutions for Deposits," *Review*, Federal Reserve Bank of St. Louis, July 1975, pp. 2-8.
- Mayer, Thomas, "Credit Allocation: A Critical View," in *Government Credit Allocation: Where Do We Go From Here?*, Institute for Contemporary Studies, San Francisco, California and the Center for Research in Government Policy of the Graduate School of Management, The University of Rochester, New York, 1975, pp. 39-92.
- Melitz, Jacques and Pardue, Morris, "The Demand and Supply of Commercial Bank Loans," *Journal of Money, Credit and Banking*, V:2, May 1973, pp. 669-692.
- Meltzer, Allan H., "Credit Availability and Economic Decisions: Some Evidence from the Mortgage and Housing Markets," *Journal of Finance*, XXIX:3, June 1974, pp. 763-777.
- Pesek, Borris P., "Bank's Supply Function and the Equilibrium Quantity of Money," *Canadian Journal of Economics*, III:3, August 1970, pp. 357-383.
- Pierce, James L., "Commercial Bank Liquidity," *Federal Reserve Bulletin*, 52, August 1966, pp. 1093-1101.

- Pyle, David H., "Descriptive Theories of Financial Institutions," *Journal of Financial and Quantitative Analysis*, December 1972, pp. 2009–2029.
- . "The Losses on Savings Deposits from Interest Rate Regulation," *The Bell Journal of Economics and Management Science*, 5:2, Autumn 1974, pp. 614–622.
- Savings, Thomas R., "Transactions Costs and the Demand for Money," *American Economic Review*, LXI, June 1971, pp. 407–420.
- Smith, Clifford, "Option Pricing: A Review," *Journal of Financial Economics*, 3, January/March 1976.
- Towey, Richard E., "Money Creation and the Theory of the Banking Firm," *Journal of Finance*, XXXIX, March 1974, pp. 57–72.
- Zabel, Edward, "Consumer Choice, Portfolio Decisions, and Transactions Costs," *Econometrica*, XXXXI, March 1973, pp. 321–335.