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STUDIES IN FINANCIAL INSTITUTIONS: Commercial Banks

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FINANCIAL INSTITUTIONS
Commercial Banks

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INTRODUCTION

This book contains reprints of articles that have been previously published in the *Journal of Financial Economics*, the *Journal of Finance*, the *Journal of Monetary Economics*, the *American Economics Review*, the *Journal of Political Economy*, the *Review of Economic Studies*, the *Journal of Money, Credit and Banking*, the *Journal of Financial and Quantitative Analysis*, the *Journal of Real Estate Finance and Economics*, the *American Real Estate and Urban Economics Association Journal*, and *Financial Management*. These papers address many of the topics that are frequently discussed in courses examining the commercial banking industry. The array of journals from which this collection of articles is drawn reflects the broad range of material relevant for such courses. By bringing together these papers, we focus attention on the progress that has been achieved in deriving a more basic understanding of the function of banks and the role of the banking industry in capital markets. We have used these papers in our courses and believe that they provide a productive core body of knowledge in this area.

We have tried to structure the book so it can fill various roles. In an advanced course on commercial banking or financial institutions, it can provide the basis for organizing the entire course. It can be employed as a valuable supplement in a lower-division commercial banking course or a course in financial institutions and markets, it can also be useful in a money and banking course in which the instructor wants to emphasize micro banking issues. Finally, it can be used with its companion book, *Studies in Financial Institutions: Nonbank Intermediaries*, in a broader financial institutions course at either the advanced undergraduate or MBA levels.

We have organized the readings into five parts. At the beginning of each is an introduction that provides a brief summary of the papers in the section as well as references to related papers that are not in this book. We show the readings in this book in **bold**, while related readings are not highlighted. All references in these section introductions appear at the end of the book.

We would like to acknowledge the assistance that all the authors and publishers gave us in producing this book of readings. We hope it will help to extend the knowledge contained in these papers to a broader cross-section of students in financial economics.

Christopher M. James
Clifford W. Smith, Jr.

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CONTENTS

I

THE THEORIES OF THE BANKING FIRM

Advances in information economics, agency theory, and corporate finance have fundamentally changed the way financial economists view the role of commercial banks and other financial intermediaries in the economy. Prior to the late 1970s, the prevailing focus was on commercial banks as conduits of monetary policy. Growing out of macroeconomics, this perspective resulted from the fact that commercial banks were the only institutions that were authorized to offer checking accounts and thus played a key role in the money-supply process. As a result of this focus on banks as suppliers of liquidity, little attention was paid to the role of commercial banks in the capital acquisition process. Indeed, little attention was paid to the more fundamental question of why financial intermediaries exist.

In a competitive, frictionless capital market—that is, a market in which there are no information or contracting costs and all market participants are price takers—financial intermediaries that consume any real resources would not exist. In a frictionless capital market, individual borrowers and lenders can costlessly contract among themselves for the services that financial intermediaries provide. This argument makes clear that the *raison d'être* for financial intermediaries is the existence of frictions that make it costly to create, transfer, and enforce financial contracts.

While it may be easy to understand why the existence of financial institutions is predicated on costs, the precise nature of the costs that gives rise to financial intermediaries is less clearly understood. In the first article **Benston and Smith** (1976)[1] argue that the essential service provided by financial intermediaries is the reduction of contracting costs. Relevant contracting costs include the costs of becoming informed; costs of structuring, administering, and enforcing financial contracts (including the cost of search); and the cost of physically transferring financial claims. The demand for the products or services pro-

[1]References are listed at the end of the book.

duced by financial intermediaries, they argue, is derived from the consumer's demand to effect consumption decisions across time and goods in the least costly manner. Benston and Smith apply the contracting-cost theory of organizational development to explain the existence of financial institutions. In essence, the contracting-cost theory holds that organizations evolve to minimize the total costs of transacting. In this view, the theory of financial intermediation involves explaining why financial intermediaries have a comparative cost advantage in transacting.

Benston and Smith suggest that financial intermediaries potentially have a comparative cost advantage for several reasons. First, financial intermediaries are able to achieve scale economies as a consequence of specialization. Second, financial intermediaries' continued presence in a market allows the development of reputational capital that allows them to demand proprietary information useful in assessing the borrower's credit risk while credibly promising to keep the information confidential. Finally, financial intermediaries can reduce search costs through economies associated with centralized information production. For example, a market maker matching buy and sell orders reduces search costs for both potential purchasers and sellers of a security.

Black (1975) discusses how information and transaction costs affect the nature of commercial bank loan and deposit services. Black explores the implications a competitive and informationally efficient market for financial services has for bank funds-management decisions (that is, bank asset allocation, pricing, and financing decisions) and bank regulation. In his view, banks serve to reduce transaction costs for both depositors and loan customers essentially by serving as a clearinghouse for transactions. Specifically, the information that the bank acquires as part of an ongoing deposit relationship with a customer provides the bank with a comparative cost advantage in originating and monitoring commercial loans.

Black's analysis is useful because it highlights the importance of market contracting costs in shaping the banking industry. Just as our understanding of the factors affecting corporate capital-structure choices is enhanced by first examining financing decisions in the context of complete and frictionless markets, our understanding of the role of banks in the economy is enhanced by examining the role these institutions play in informationally efficient and relatively frictionless markets.

The Black and Benston and Smith analyses show that contracting costs are central to the theory of financial institutions. More recent work on the theory of financial intermediation focuses on a specific set of contracting costs: those involved in information production and monitoring. This research discusses why financial intermediaries have lower costs of producing precontract information and lower costs of monitoring borrowers after a loan is made.

The focus on the role of financial intermediaries in producing information and in monitoring the activities of borrowers results from the recognition that information asymmetries between borrowers and lenders can create significant adverse-selection and moral-hazard problems in financial transactions. [See, for example, Jensen and Meckling (1976) and Leland and Pyle (1977).] Information-based theories of financial intermediation focus on how intermediaries mitigate or resolve these information problems that are inherent in financial transactions. Adverse-selection problems arise from precontractual information asymmetries. The term "adverse selection" was coined in the insurance industry to refer to the situation where individuals with private information that they are above-average risks purchase the most insurance. Moral-hazard problems are problems that arise from post-

contract information asymmetries. Specifically, "moral hazard" refers to the alteration of behavior after insurance is purchased or a loan is made.

The readings by **Campbell and Kracaw** (1980) and by **Diamond** (1984) focus on the role of financial intermediaries in reducing contracting costs arising from information asymmetries. Campbell and Kracaw examine the role of financial intermediaries in resolving free-rider or appropriability problems in information production. The appropriability problem in information production arises from the fact that once private information is disseminated, the producer is no longer able to profit from its use. For example, producing information that identifies mispriced securities is of little value if the information is immediately reflected in security prices. The direct sale of information is therefore limited by this appropriability problem. One way to avoid this problem is for the intermediary to sell information indirectly through selling claims on an income stream arising from the use of the information. (This assumes of course that investors cannot observe the portfolio the intermediary acquires with the private information that it produces.)

The indirect sale of information creates a potential moral-hazard problem. Without actually observing the information produced by the intermediary, one has difficulty evaluating the quality of that information. Indeed, the customer cannot be certain that the intermediary actually engages in costly information production. One mechanism for controlling this moral-hazard problem is for the intermediary to post a bond in the form of an equity investment, the value of which depends upon the quality of information produced. However, as Campbell and Kracaw indicate, in their model there is nothing intrinsic in the intermediation process itself that resolves appropriability and moral-hazard problems. For example, individual entrepreneurs bond the quality of information about the projects for which they seek funding by retaining a large equity stake in the corporation.

Diamond focuses on the question of whether there is something intrinsic in the intermediation process itself that serves to resolve the moral-hazard problem associated with the indirect sale of information. In his model, financial intermediaries serve to monitor the performance of borrowers after a loan is made. Suppose, however, that depositors cannot directly observe whether the intermediary actually monitors; specifically, suppose that even with efficient monitoring there is some uncertainty about the outcome of an individual investment project. As a result, observing a default on an individual transaction is difficult to interpret. The default on a particular loan may be the result of negligent monitoring or bad luck. Diamond shows that diversification across a large number of loans can resolve the moral-hazard problem.[2] In the limit, if the returns on the loans being monitored are independent, the uncertainty of the portfolio's cash flows is eliminated, allowing investors to infer the quality of monitoring that has occurred. Diamond thus demonstrates that there are economies of scale in information production intrinsic to the process of intermediation. Boyd and Prescott (1986) argue that coalitions of monitors also can control moral-hazard problems through a similar process of diversification.

The remaining readings in this part examine the implication of contracting costs for the pricing and portfolio decisions of commercial banks. The paper by **Santomero** (1984) provides a review of microeconomic models of the portfolio-allocation and capital-structure decisions commercial banks make. Santomero points out that the determinants of banks' portfolio and financing choices are inextricably linked to the nature of the markets in which banks operate and the nature of the contracting costs that give rise to financial institutions.

[2]Diamond assumes that there is a nonpecuniary penalty associated with default. This insures that the intermediary will make payment to investors when it has sufficient funds to do so.

The models of asset choice reviewed by Santomero generally assume that banks have some degree of market power in at least some of their loan markets. Given this assumption, the bank's asset portfolio choice is modeled as a discriminating monopolist choosing the optimal quantity of loans to supply in various markets. As Santomero points out, these asset-choice models provide little motivation for why bank loan markets should be viewed as imperfectly competitive. One fruitful area of recent research has been to distinguish between the degree of ex ante competition (that is, prior to the establishment of a lending relationship) and ex post competition (that is, after a relationship is established). If there are significant fixed costs associated with establishing a lending relationship, then it is costly for borrowers to switch banks. These sunk costs provide a potential cost advantage for the lending bank. [Additional implications for the borrower's choice between public debt and bank loans is discussed in the article by **Rajan** (1992) in Part II.]

Models of bank liability choice focus primarily on what determines the mix between deposit and equity financing. Again, the optimal scale and financing mix is inextricably linked to the assumed cost advantage that motivates the existence of financial institutions. For example, consider the choice between deposit and equity financing. In a frictionless capital market, the Modigliani and Miller (1958) capital-structure irrelevance proposition implies that bank value is unaffected by this choice. However, if banks provide transaction services that are bundled with the provision of deposits, then the bank's capital-structure decision is determined in part by the production technology used to produce intermediation services such as check processing and record keeping.

Another factor affecting the capital-structure decision in banking is deposit insurance. If the government insures bank deposits at less than actuarially fair rates, the market value of the bank depends on the subsidies obtained through underpriced insurance. As articles in Part IV of this book discuss, the value of the subsidies received from mispriced deposit insurance is a function of the bank's capital-structure decision.

Fama (1985) examines the incidence of the reserve-requirement tax on large negotiable certificates of deposit issued by commercial banks. Reserve requirements raise the cost of deposit financing to commercial banks by requiring banks to hold a portion of the deposit in non-interest-bearing cash or deposits at a Federal Reserve Bank.[3] Whether depositors pay this tax in the form of a lower interest rate on their deposits or borrowers pay the tax in the form of higher bank loan rates depends on the nature of nonbank substitutes for bank deposits and bank loans. Fama argues that since there exist close substitutes for bank certificates of deposit, depositors will not pay the tax. As a result, bank loan customers must pay the tax in the form of higher loan rates. However, the reserve tax can only be extracted from bank loan customers if there is something special or unique about bank loans relative to other forms of financing.

What is special about bank loans? Fama argues that bank loans are a form of debt in which the lender obtains information about the firm not available publicly. More important, bank access to this information serves to reduce information costs other creditors incur, as other creditors can free-ride on the information banks produce. Banks have a comparative advantage in making and monitoring loans, Fama argues, because of the information generated from a deposit relationship with a borrower. Fama's conjecture concerning the uniqueness of bank loans has spawned a large number of empirical studies directed at testing whether the identity of the lender is important. These studies are summarized in Part II.

[3]Reserve requirements on all time deposits were removed in 1990; however, they continue on transaction accounts.

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 anthropomorphicly) 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.

THE JOURNAL OF FINANCE, Vol. 31, No. 2, May 1976, pp. 215-231.

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 securites. 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.