

Berichte

On the Foundations of Financial Intermediation: A Review of the Literature

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I. Introduction

Why do we need banks, brokers, and insurance companies to satisfy our financial needs? A lot of work in the economic literature has been and is undertaken that deals with this question. This paper aims at reviewing this literature. Within industrialised as well as in developing countries, financial transactions between different kinds of households take place. International financial relations also are present, as may be evidenced by the vast amount of transactions on the euro-markets. Many specialised financial institutions have emerged that participate in these transactions. Financial intermediation is undertaken by private agents, like commercial banks and cooperative banks, and it is undertaken by public agents, like central banks and postal services. Not only banks have emerged, but also a great variety of specific types of financial intermediaries have evolved. E.g., insurance companies, investment trusts, securities houses, credit card companies, mutual funds, clearing and settlement institutions, and lease and finance companies.

Financial intermediation plays an important role in the everyday life of firms, households, and governments. Transactions in kind have to be paid for and the greater part of the value of these transactions within most economies is effected by the accounting system of financial intermediaries, especially banks. Because of the asynchronous pattern of most expenditure and income, lending and borrowing requirements do occur (*Fisher*, 1930). These requirements are to a great extent provided for by financial intermediaries. *Gerschenkron* (1962) sees bank prominence in the economic development of industrializing countries as a consequence of their economic backwardness. Scarcity of human capital and real capital within these

* I have greatly benefitted from the comments of Professor M. M. G. Fase, C. van Ewijk, and an anonymous referee, on earlier versions of this paper.

economies creates a role for banks. This perception contrasts with the views of *Gurley* and *Shaw* (1955 & 1960) and *Goldsmith* (1969), in which financial intermediation fulfills an important role in economic development. Here, specialised financial institutions emerge to smoothen the functioning of the economy. Notwithstanding the opposing views, financial intermediaries have evolved throughout economic history and many origins can be traced. Modern financial intermediaries do not only have roots in Goldsmiths as we are led to believe in many a textbook, but in merchants, manufacturers, money-changers, tax-farmers, scriveners, and notaries as well (see e.g. *Kindleberger*, 1983).

Stylised facts of financial intermediation have been observed by *Goldsmith* (1969) and by *Boyd* and *Prescott* (1986). The former concentrates primarily on macroeconomic characteristics of financial intermediation and observes that:

- a country's financial superstructure grows more regularly than the infrastructure of national product and national wealth in the course of economic development.
- the main determinant of the relative size of a country's financial superstructure is the separation of the function of saving and investing among different economic units and the groups of them.
- the share of the banking system in the assets of all financial institutions declines as economic development progresses.
- the cost of finance is distinctly lower in financially developed countries than in less developed ones.

Boyd and *Prescott* (1986) choose a more microeconomic perspective than *Goldsmith* (1969). They characterise real-world financial intermediaries by five stylised facts:

- borrowing from one subset of agents in the economy and lending to another.
- generally well diversifying on both sides of their balance sheets.
- dealing with borrowers whose information may be different from their own.
- producing costly information on the attributes of would-be borrowers.
- issuing claims with state-contingent payoffs different from claims of ultimate borrowers.

In this paper, an analysis is provided of the economic literature that focuses on the function of financial intermediaries within the economy.

Many studies dealing with financial intermediation do not give a clear definition of the object of their research. However, the answers to any questions related to the definition of financial intermediation must precede the explanation of financial intermediation and, therefore, such an investigation is inevitable. The organisation of the paper is as follows. Section II deals with the definition of financial intermediation. Here, the descriptive elements of various hypotheses on financial intermediation are analysed. Section III investigates the explanatory elements of these hypotheses. Cost structures, informational asymmetries between agents, and regulation of institutions and markets are microeconomic explanations that have been put forward as an explanation of the existence of financial intermediaries. A general evaluation of the findings is presented in section IV.

II. Definition of Financial Intermediation

Within the economic literature on financial intermediation, many descriptions have been given of financial intermediaries. Here, these descriptions are structured to provide a definition which is theoretically sound and which can be used in the construction of a theory of financial intermediation.

As to financial intermediation, a distinction must be made between self-finance, direct finance, and indirect finance (*Gurley and Shaw, 1955 & 1960*). Expenditure is self-financed by spending units with balanced budgets. Consumption is financed from income and investment is financed from internal savings. If financial assets and debt change, the changes are equal. This is called internal finance. External finance can be divided into direct finance and indirect finance. Direct finance involves lending by surplus households to deficit households. The latter issue direct debt. The former buy and hold financial assets as direct securities. Financial intermediaries issue indirect debt in collecting loanable funds from surplus units. The financial intermediaries allocate these funds among deficit units, thereby absorbing direct debt (*Gurley and Shaw, 1955*). Indivisibilities and non-convexities in transaction technologies restrict the amount of diversification and risk-sharing that is feasible under direct finance. Indirect finance allows for more, and less costly, risk diversification than direct finance (see *Hellwig, 1991*).

Financial intermediaries satisfy the portfolio preferences of borrowers, who wish to expand their holdings of real assets and the portfolio preferences of lenders who wish to hold (part of) their net worth in financial assets, as has been argued by *Tobin and Brainard (1963)*. Financial inter-

mediaries issue claims on themselves and use the proceeds to purchase other financial assets (*Pyle*, 1971 & 1972). Thus, financial intermediaries enact a transformation function within the economy, buying direct debt and issuing indirect debt, and they are involved in the (indirect) financing of activities. The transformation relates to the amount or scale, the risk, and the maturity of liabilities and assets (see *Tobin*, 1963; *Deshmukh* et al., 1983). Furthermore, the geographical dimension must not be neglected.

The assets of financial intermediaries are the obligations of the borrowers, while their liabilities are the assets of the lenders. The financial assets and liabilities of financial intermediaries are financial instruments. It are contracts which differ in important characteristics such as the nature of the owner and issuer of the contract, the duration, callability, marketability and the security of the instrument, and the level and character of the yield (*Goldsmith*, 1969). Financial intermediation involves asset transformation as well as the joining of borrowing and lending without taking risk, as is shown by *Baron* and *Holmström* (1980) and *Deshmukh* et al. (1983). Other examples of, risk-bearing, financial services are trust operations, underwriting, correspondent services, and the administration of a payments system.

Financial intermediation is generated by financial intermediaries who specialise in the production of financial goods and services. The intermediaries can be categorised according to the different products they offer their customers, i.e. by the specific sources and uses of their funds (e.g. *Goldsmith*, 1969). Financial and non-financial firms can be distinguished for the tendency of the former to acquire predominantly financial assets with the funds attracted, whereas the latter obtain mainly real assets (*Tobin*, 1987). Financial assets are claims on future money and, thus, are future purchasing power for real goods and services. *Gurley* and *Shaw* (1955 & 1960), and *Tobin* and *Brainard* (1963) have blurred the traditional distinction between banks and other financial intermediaries. These authors assume that the differences between various financial intermediaries are of degree and not of kind. However, this claim against the nonuniqueness of banks has been attacked by authors who find banks much more a potential source of cyclical instability than other intermediaries are (*Guttentag & Lindsay*, 1968; *Orgler & Taggart*, 1983). This viewpoint is criticised because it might be government regulation which structures the potential economic influence of specific financial institutions, be they called banks or otherwise (see *Tobin*, 1963; *Goodhart*, 1987). At present, the differences between the various intermediaries seem to decrease gradually (see *Baltensperger* and *Dermine*, 1987). Especially, deregulation of the financial industry has blurred

the traditional compartmentalization (*Dermine*, 1990; *Herring and Santomero*, 1990).

Financial intermediaries undertake financial activities. These activities involve the transformation of risk, maturity, scale, and place, of financial assets and liabilities of ultimate borrowers and lenders. Intangibility is an important characteristic of many of these activities. The acquiring and processing of information about economic entities, the packaging and repackaging of financial claims, and the contracting are common elements in the activities that differentiate financial intermediation from other economic activities (*Draper and Hoag*, 1978). Therefore, financial intermediation seems to have natural complementarities (*Campbell and Kracaw*, 1980). The financial intermediary may offer a specialised or a diversified array of financial goods and services, due to regulation, economies of scale, economies of scope, and economies from diversification (*Benston and Smith*, 1976). Thus, we chose the economic function of a specific economic subject as the reason for its classification instead of one that sees the regulatory framework within an economy as the discriminatory base. As a result, economic subjects that are not baptised a financial institution by the monetary and financial authorities within a specific jurisdiction can be financial intermediaries within our frame of reference. For example, many international companies have established separate finance divisions that act as financial intermediaries, the so-called near banks. Only within some jurisdictions, these institutions are being made subject to the regulatory structure of monetary and financial authorities and are seldom classified within the regulatory framework of financial institutions by the authorities (see *Pecchioli*, 1987). Financial activities frequently combine characteristics of both goods and services. Goods are objects which are appropriable and, therefore, transferable between economic units. Economics is principally concerned with scarce goods, especially their production and allocation. Bonds and equities are examples of financial goods. However, services are not objects which can be easily transferred. E.g. skilled bankers can provide specialist services, but they cannot dispose of the actual skills themselves because these cannot be transferred. According to *Hill* (1977, p. 318), a service is the change in the condition of a person or good which is brought about as the result of the activity of some other economic unit with the prior agreement of the former person or economic unit. Thus, one must distinct the process of production of a service and the output of that process. The process is the activity which affects the person or good belonging to an economic unit. The output itself is the change in the condition or good affected (*Hill*, 1977).

In the economic literature, there seems to be little disagreement about what financial intermediation is and what financial intermediaries do. In part, this results from the fact that the literature hardly provides definitions of this class of economic activities, as is argued by *Draper and Hoag* (1978). However, there are different opinions about which functions are of the greatest importance. This leads to multiple classifications of the activities of financial intermediaries, which may cause the diversity in explanations of financial intermediation. Two main approaches of the classifications can be observed where macroeconomic elements are the distinguishing feature. Firstly, e.g. *Black* (1975), *Hart and Jaffee* (1975) and *Smith* (1984) concentrate on asset transformation and brokerage activities of financial intermediaries. This classification concentrates on the indirect finance function of intermediaries. Indirect finance can involve risk for intermediaries (asset transformation) or it can be riskfree (brokerage). Money and demand deposits are treated as special assets, fulfilling an important role though not a characteristic one. Implicitly, the accounting system appears to be an interesting by-product of the indirect financing activities of the financial intermediary. Secondly, e.g. *Klein* (1971 & 1973), *Sealey and Lindley* (1977), *Fama* (1980 & 1985), and *Goodhart* (1987) regard the operation of the payment system as the central task of financial intermediation and stress the importance of outside money and demand deposits among an intermediary's activities: outside money is on net an asset to the private economy.

Integrating and structuring both these classifications, financial intermediation is defined here as the propagation of financial activities, goods as well as services, that may satisfy the financial preferences of economic subjects. The activities of financial intermediaries can be classified into four main groups:

1. the demand and supply of financial assets and liabilities (e.g. deposits, equity, credit, loans, insurance).
2. the administration of an accounting system (e.g. giro, cheque transfer, electronic funds transfer, settlement, clearing).
3. the matching of the preferences of borrowers and lenders, i.e. pure brokerage.
4. the demand and supply of non-tangible and contingent assets and liabilities, such as collateral, guarantees, financial advice, custody.

As a result of the priority we give to the economic function of agents, financial intermediaries are the economic agents that undertake such financial intermediation. This definition is not as tautological as it might seem at first, because other than functional arguments also might be adhered to

define the financial intermediary. The financial intermediary produces information and it transforms the risk, scale, place, and maturity of financial claims and obligations. Its balance sheet mainly consists of financial titles.

Defining the research object and explaining its existence are crucial in the development of a theory. As to financial intermediation, no consensus has yet been reached about these questions. The definition suggested here is that there are both financial and intermediating processes involved. Financial processes can be contrasted with real ones. Financial assets are claims on future money. The financial assets may be tangible as well as intangible and contingent. Intermediating processes must be related to transformation and distribution processes. Of course in this intermediation process, elements of consumption and production are involved too, as illustrated by the information production task of financial institutions, but the transformation element is central and crucial here. Financial intermediation is the transformation of financial assets and claims with respect to four dimensions: time, risk, amount and geography. Many hypotheses have been constructed to explain the emergence and the existence of financial intermediaries. Market imperfections, more specifically costs, asymmetric information, and regulation, are crucial in these hypotheses, as will be argued below. However, uncertainty that is inherent to an imperfect world cannot be fully resolved. Therefore, financial intermediation, responding to the world's incompleteness, will result in new imperfections and problems that call for self-regulation or government intervention. In the everchanging world, financial intermediation is a dynamic process.

Gertler (1988) as well as *Hellwig* (1991) already are very helpful reviews of the literature on financial intermediation. *Gertler* (1988) provides a chronological review of the study of the interaction between real and financial macroeconomic phenomena. *Hellwig* (1991) especially examines the role of financial institutions in the allocation of capital for investment. In *Hellwig's* (1991) view, transaction costs, asymmetric information, and ongoing relationships are regarded as the main explanations of financial intermediation. However, it is not clear if this third argument can completely be separated from the first two. Here, we concentrate on three definitely distinct causes of financial intermediation in reviewing the economic literature: cost structures, asymmetric information among agents, and the regulatory environment.

III. Causes of Financial Intermediation

Fisher (1930) suggests time preference, or impatience, may be held responsible for intertemporal financial transfers. An individual's impatience depends on four characteristics (*Fisher*, 1930, p. 71): the size of the expected income stream; its expected distribution in time; its composition; and its probability, or degree of risk or uncertainty. Time preference can be translated into portfolio preferences. According to the available technology and to uncertainty it is decided if internal finance, direct finance or indirect finance is used to satisfy preferences. Market imperfections are held responsible for the satisfaction by financial intermediaries of the portfolio preferences of lenders and borrowers (*Gertler*, 1988). Without market imperfections, economic subjects themselves would be perfectly able to lend and borrow to satisfy their financial needs: within a perfect world, no specialisation would arise. Then, intermediation is feasible if it, wholly or partially, overcomes the market imperfections with some intermediating technology.

The theory of financial intermediation investigates the causes and the consequences of the ways in which financial intermediaries operate within an economy. The use of specific intermediation technology makes specialisation potentially profitable to the financial intermediary. The financial technology will be subject to improvements and innovations, and if such technology develops, it can speed up economic growth by expediting the flow of funds from savers to investors (*Patinkin*, 1961). Given primary demand and supply, the prices of inputs to the financial industry and the state of financial technology determine the quantity of funds, securities, and claims. The quality of funds, securities, and claims, determines the interest rate (*Mangoletsis*, 1975). *Pringle* (1974) distinguishes two types of market imperfections intermediaries have to consider. First: those that a financial intermediary intends to exploit, such as the imperfect divisibility of assets, transactions costs, costs of search, acquisition and diversification by lenders and borrowers. Second: those that tend to impede competition among financial intermediaries themselves. Examples of these imperfections are the cost and regulatory barriers to entry, geographical barriers and the local nature of bank markets, psychological costs, and regulation.

Major impetus for theorising on financial intermediation was provided by the papers of *Leland and Pyle* (1977), *Bryant* (1980), and *Stiglitz and Weiss* (1981 & 1983). Almost all the modern literature on financial intermediation is related to these pioneering papers. *Leland and Pyle* (1977) examine financial intermediaries which monitor asset quality of projects with ultimate lenders. The intermediaries construct diversified packages of the assets and

sell them to investors. *Bryant* (1980) turns to the liabilities side of the financial intermediaries' balance sheets. He examines the position of deposit contracts in the relationships between intermediaries and depositors. *Stiglitz* and *Weiss* (1981 & 1983) focus on the behaviour of financial intermediaries and entrepreneurs in credit markets and investigate the efficiency of credit allocation.

According to *Diamond* (1984), financial intermediation theories are generally based on some cost advantage to the intermediary. *Draper* and *Hoag* (1978) as well as *Campbell* and *Kracaw* (1980) conclude that there is very little theory dealing successfully with the existence of financial intermediaries. *Sealey* and *Lindley* (1977) have attributed the lack of success in developing a positive theory on financial intermediation to the incomplete application of the theory of the firm to financial institutions. Intermediation develops as a response to costly market imperfections, but few theories provide a thorough explanation of the financial intermediary's function within the economy. *Campbell* and *Kracaw* (1980) suggest two approaches that may explain financial intermediation. One is an approach which relies on transactions costs, the other is based upon informational asymmetries. *Santomero* (1984) distinguishes two other explanations of the existence of banks. The first is the diversification and evaluation of assets. The second is the central role within the economy of the bank's demand deposits as a medium of exchange. *Goodhart* (1987) sees the specialisation in choosing borrowers and monitoring their behaviour as the particular function of banks. Then, the *raison d'être* lies in their investment in non-marketed assets, the existence of economies of scale, and the provisioning of safe-keeping services. However, all these classifications seem to disregard the influence of governmental regulation. *Tobin* and *Brainard* (1963) argue that regulation is a crucial factor in determining the activities of financial intermediaries.

Here, in line with these general explanations of the emergence and the existence of financial intermediaries, three types of market imperfection are distinguished: costs, asymmetric information, and regulation. Of course these types are interrelated and, to some extent, they can be regarded as mutually reinforcing. Information may be restricted on a regulatory basis, as for example is illustrated in *Barth et al.* (1983). Obtaining and dealing with information inevitably results in costs, for example the search costs as well as the costs of hedging or reducing informational asymmetries in general. Regulation imposes two types of costs on the economy (*Gowland*, 1990). First, there are the costs of putting up, putting into effect, and maintaining the rules. Second, there are costs in implementing the rules within the industry and firm as well as opportunity costs. Regulation and information

are intertwined as well, because the financial firm needs to know the extent of the rules in order to allocate their resources and to innovate their activities (Kane, 1981 & 1983). The regulatory authorities need to know the state of the financial industry, the operations of individual financial firms, and the consequences of their policy, in order to reach their goals and to adjust their policies.

1. Costs

Financial intermediaries reduce costs by exploiting returns to scale and returns to scope (see Benston and Smith, 1976). Most cost studies testing this hypothesis aim at gaining information about the precise cost structure of financial intermediaries (Gilbert, 1984). Of interest are the user or resource costs, such as dividend payments, interest payments, rents, write-downs, materials, wages and salaries (e.g. Benston, 1972; Hancock, 1985). Costs reduce the amount of present and future consumption. The nature of costs affects the portfolio choices of the economic units. The demand for financial products results from the consumer's ability to achieve a higher level of utility by incurring lower costs. The financial industry meets the demand for time-dated consumption by supplying demand deposits that can be used as units of generalised purchasing power and other claims which can efficiently be converted into products (Benston and Smith, 1976). Costs can segment markets and may result in variations in the access to credit markets among groups of lenders and borrowers. The existence of costs in transacting implies that financial intermediaries' liabilities may dominate fiat money in terms of expected return, because they arise as a means of economising on monitoring costs (Williamson, 1987a, c). For example, the limited potential for the division of assets and claims translates into a cost that reduces direct market access (Klein, 1973; Kane, 1981; Bhattacharya and Gale, 1987).

The gathering of costly information is regarded as an important function of intermediaries by Ramakrishnan and Thakor (1984), who argue that the costs of information production constitute the major component of total intermediation cost. Information that is not freely available can be acquired by spending resources. If it potentially benefits lenders, specialised organisations in gathering and selling information about assets can emerge. Nevertheless, buyers can exchange securities without knowing their precise character. Therefore, exchange costs will constitute the costs of these transactions, and information costs are not strictly necessary for specialised exchanging agents to emerge (Leland and Pyle, 1977). Because of intermedi-

ation costs, a price will not reflect all available information. If it did, those who spend resources to obtain information would not be compensated for their efforts. The diminishing of information costs will improve the information quality, but even with perfect information an equilibrium may not exist (*Grossman and Stiglitz*, 1980). The paradox can be resolved when securities prices only partially aggregate individual agents' information (see *Neave*, 1991).

Using the concept of costly credit intermediation, *Bernanke* (1983) demonstrates the relevance of the nonmonetary impact of the U.S. financial system during the Great Depression. Apart from the macroeconomic effects that stem from the traditional monetary channels, it appears that financial institutions affect the cost of transactions and thereby the specific market allocations. Financial crises translate into a reduced availability of funds as well as of investment opportunities, thereby reducing diversification opportunities for both intermediaries and investors. This results in increasing the cost of credit intermediation that, in turn, may reduce the demand for goods and services by entrepreneurs (see also *Greenwald et al.*, 1984). Here, three cost categories are examined which appear in the literature on the emergence of financial intermediaries: contract costs, exchange costs, and information costs. All technical costs can be subdivided into these categories.

a) Contract Costs

Most financial activities involve some kind of contract between the intermediary and its client. *Bryant* (1980) and *Diamond and Dybvig* (1983) illustrate the superiority of deposit contracts over *Walrasian* trading mechanisms in providing agents with insurance for risks; contracts are a means of dealing with imperfections. For example, the case for deposit insurance depends heavily on the costs of illiquidity and the signal-extraction problems of the financial intermediary. Contracts may reduce such risk elements. The issuance of claims, the making of loans, the opening of an account, all entail the signing of documents that set up the contract. Contracting costs are made up of menu costs, negotiation and renegotiation costs, costs of administration, bonding costs, etc. The behaviour of financial intermediaries and the preferences of clients depend on the uncertainties faced in the course of time as well as on the demands of shareholders and regulators. Contracts may partly reduce the uncertainty. Thus, property and contracting rights will influence the behaviour of the firm (*O'Hara*, 1981 & 1983). Contracts can be put up between intermediaries, between intermediaries and regulatory authorities, and between the client and the inter-

mediary, whereas the relationship between the shareholder and the financial intermediary already constitutes a contract on its own. *Townsend* (1979) argues that optimal contracts need to be defined in relation to a verification procedure on the initial endowments. Here, contracting costs and information costs are intertwined. *Williamson* (1987b, c) shows that debt contracts can be derived as the optimal arrangement between borrowers and lenders. Therefore, the contract serves to economise on monitoring costs. According to *Williamson* (1987b, c) and *Jacklin* and *Bhattacharya* (1988), the optimal contract will be the debt contract.

Townsend (1978 & 1979) analyses how costly state verification affects optimal implicit contracts, but he does not refer specifically to financial markets. *Stiglitz* and *Weiss* (1981 & 1983) stress the relevance of contingency contracts in financial transactions. In their analysis, an inverse relationship evolves between the interest rate charged and bank profits, which may result in credit rationing. The termination threat of contingency contracts encourages moral hazard with the principal and it avoids negative incentive and sorting effects that could result from penalising agents. *Stiglitz* and *Weiss* (1983) make a critical distinction between ex ante and ex post competition. They find limited ex post competition, in comparison with ex ante competition, essential for the intertemporal linkage of contracts between economic units. *Gale* and *Hellwig* (1985) also investigate the properties of these endogenous contracts. In their model, the optimal, incentive compatible debt contract is the standard contract. The firm observes the state of nature costless, while other agents incur costly monitoring. A lack of liquidity, resulting from the firm's limited net wealth, lies at the root of the credit rationing that is involved in their equilibrium debt contracts (*Gale* and *Hellwig*, 1985).

Thus, contracts may serve as some kind of insurance for the intermediary as well as for the client, the regulator, and the shareholder. Then, contracting costs can be regarded as an insurance premium. On the other hand, contracts seem necessary to achieve a long-term relationship between different economic units in an uncertain world. Once this relationship has been established, the intermediary can economise on other cost categories that evolve from servicing the client. In this respect, contracting costs simply are a fixed investment. The argument of long-term relationships or commitments will be elaborated upon in section III. 2.

b) Exchange Costs

Trade is a two-sided process. One side is the barter of the good or the service that is bought to satisfy needs. The other side is the exchange of the monetary equivalent, the price of the good or service that has to be paid for. Currency and demand deposits are available to enhance this exchange. *Fisher* (1983) demonstrates that exchange does not happen without costs. The exchange requires the intermediation of capital (currency) and labour, or of a resource-using financial institution. Historically, monetary systems have developed to the point where the state is a monopoly issuer of currency (*Kindleberger*, 1984). In most times and in most places, financial institutions are restricted to the provisioning of the payments system and the production of demand deposits, and are denied the issue of currency. *Tobin* (1963) suggests that demand deposits are far more convenient in the exchange process than currency itself. *Towey* (1974) illustrates this attraction of demand deposits to holders by pointing out the smaller risks in comparison with currency. Deposits are relatively free from the dangers of loss, theft, and misappropriation both during payment and storage (*Towey*, 1974). Payment orders on deposit accounts can be made in virtually any amount, while bank or depository institution statements facilitate record keeping. Furthermore, banks collect payments between distant points, issue identification cards and guaranteed payment orders, and try to be conveniently located to their account holders and other clients.

Exchange is a resource-using process. In each bilateral deal at least a fixed cost is incurred (*Townsend*, 1979). This cost-character of money and exchange is three-fold. First, there is the cost of currency production and substitution. Together with the seigniorage (see *Klein* and *Neumann*, 1990) this amounts to part of the costs of a nation's payment system. Second, there is the cost of demand deposit production. Here, the direct production cost virtually is zero. However, resource-using services and interest payments are being offered to induce the public to hold deposits, which results in a positive service cost. Cross-subsidisation also is at issue in this respect. The third constituent of exchange cost is the cost in actual dealing and paying, like the fee for accounting services, the costs of trips to the bank, the famous shoeleather costs, and the costs from loss, theft, and misappropriation and of insuring against the financial consequences of such events.

c) Information Costs

Within a risky and uncertain environment, information gathering will be necessary to improve the quality of decision making as well as to optimise the effects of the actions of economic agents. However, it may not be optimal to search for and gather all existing information, because it involves costs (*Grossman and Stiglitz*, 1980). *Ramakrishnan and Thakor* (1984) see the cost of information production as the major part of the costs of transacting. Specialisation in the search for information and/or in the production of information may lower its per unit cost if the information production technology is subject to economies of scale or scope. *Black* (1975) and *Fama* (1985) both argue that bank borrowers usually are also depositors. This can lead to a cost advantage for the intermediary in loan making and monitoring. *Townsend* (1979) sees the verification of the state of nature as a necessary and costly process. Information on the actual state may be transmitted between agents only at some cost. *Townsend* (1979) suggests that there is a fixed cost in this verification and that resources used in the verification process will vary directly with the size of insurance claims. *Barth et al.* (1983) argue that lenders will use formal credit schemes to evaluate borrower's creditworthiness. E.g. expert systems are used to screen car loans, mortgages, and loans for working capital (*Neave*, 1991).

Diamond (1984) develops an interpretation of financial intermediation which is based on minimising the cost of monitoring. As will be argued below, monitoring is extremely important in resolving incentive problems between borrowers and lenders. *Diamond* (1984) distinguishes traditional information costs and delegation costs. These delegation costs result from the incentive problems to the intermediary caused by the delegated information production task (see section III. 2). The total cost of delegated monitoring is the physical cost of monitoring by the monitor plus the expected cost of providing incentives to the monitor, that is, the cost of delegation (*Diamond*, 1984). To calculate the information cost advantage, the costs of providing incentives to the intermediary need to be netted out from any cost savings in producing information. It is claimed that the particular role of financial intermediaries is the specialisation in the choice of particular borrowers and in monitoring and screening their behaviour (see e.g. *Leland and Pyle*, 1977; *Baron*, 1982; *Diamond*, 1984; *Fama*, 1985). *Williamson* (1987b) concludes that monitoring and screening costs result in an essential role for financial intermediaries within the economy. Here, intermediation arises endogenously as part of an incentive compatible contracting arrangement that economises on monitoring costs.

Uncertainty about the present and future state of the world is hard to live with, albeit inevitable. Intermediaries specialise in information production, thereby reducing this uncertainty to some extent. However, the reduction always will be incomplete. Information production involves costs, for example the cost of searching, administrating, monitoring, screening, verifying, delegating, and generating. Specialisation in information production will involve economies of scale and/or scope in the case of non-convexities in the cost structure of financial intermediaries. In economising on costs of contracting and exchanging, these economies give rise to the emergence of financial intermediaries.

2. *Asymmetric Information*

Loan valuation depends on information that is generally private with the debtor and/or between the intermediary and its borrowers. Therefore, the true asset value of the loans may be the object of uncertainty. *Leland and Pyle* (1977) argue that financial intermediation is an endogenous system-response to asymmetric information. Of central interest to the studies that regard informational asymmetries per se as the *raison d'être* of financial intermediation is the paper by *Akerlof* (1970). He argues that sellers have more knowledge of the quality of their product or their project than buyers. Good and bad products will make the same price, but this price will be lower than the true value of the good product. Thus, bad products drive out the good, so adverse selection and moral hazard may arise. In finance, these two concepts mean the following. As to adverse selection, borrowers who are most creditworthy may choose not to borrow but to rely on direct finance. This leaves the lender with less creditworthy clients. Moreover, the winner's curse is at stake (see *Broecker*, 1990): lenders with superior information may reject bad credit risks and their competitors must fear they are left with these 'lemons'. As to moral hazard, borrowers may take on riskier projects to cover the higher cost of borrowing vis-à-vis direct finance. The cost of such dishonesty, as adverse selection and moral hazard might be seen, is in the sum by which the purchaser is cheated, as well as in the loss incurred from driving legitimate business out of existence. Counteracting institutions like collateral, guarantees, reputation or brand-name, licensing, and certification may evolve to mitigate these problems, (*Akerlof*, 1970). Within the literature on financial intermediation, various aspects of asymmetric information and its assessment are being studied. In this respect, the public good character of information, monitoring, information reliability, and long-term relationships must be regarded.

Benston and Smith (1976) investigate problems with information in financial relations: the informational asymmetries in general and the public good character of information. Firstly, moral hazard hampers the direct transfer of information between market participants. The verification of the true characteristics of a project by outside parties may be costly or even impossible. As to adverse selection, there is a tendency for those economic agents to accept a contract who are the worst from the perspective of the intermediary (see also *Mankiw*, 1986). Secondly, once information is acquired, it may be reused or it may be sold to other economic units. However, because of the public good character of information, free-riding might occur. To solve these two problems, *Leland and Pyle* (1977) suggest that one of the lenders may operate as an intermediary who gathers information about borrower-quality. The intermediary purchases and holds assets on the basis of its specialised information. The public good character is circumvented because the intermediary's information is embodied in the return from its diversified portfolio, which is a private good. Ultimate lenders may also purchase the claims to the intermediary's assets. Thus, the returns to the intermediary's information gathering can be won by the increased value of its portfolio. *Leland and Pyle* (1977) suggest trustworthiness of the intermediary can be provided by signalling. The intermediary signals its informed status by investing its wealth in assets about which it has a special knowledge. Therefore, information production can be regarded as sufficient for the emergence of financial intermediaries in an otherwise perfect capital market. *Draper and Hoag* (1978) differentiate intermediation from any other economic activity by its information content: intermediaries will arise to occupy a 'shell' when there is value in producing and processing information and in rebundling firms' securities.

Campbell and Kracaw (1980) doubt the central hypothesis of *Leland and Pyle* (1977). They argue that the information producer will have to invest in the projects it has defined as good. Therefore, it is necessary that the most efficient information producer has sufficient wealth to signal his reliability. The information producer must be large enough to establish his trustworthiness which creates a barrier to entry with respect to the information production industry. Thus, despite the importance of this function, information production is not sufficient to resolve the moral hazard dilemma (*Campbell and Kracaw*, 1980). A further comment on the paper of *Leland and Pyle* is its application of the law of large amounts. The financial intermediary lends to a very large number of borrowers which might result in the equality of the expected and the realised return and which, therefore, does not result in a need to monitor the intermediary. However, applying the law of large

amounts can be fallacious because large numbers may not necessarily even out all risks. Furthermore, not all financial intermediaries serve large numbers of customers.

Diamond (1984) formalises and extends the hypothesis of *Leland and Pyle* (1977) on the endogenous emergence of intermediaries to resolve informational asymmetries. In contrast to the latter study, *Diamond* (1984) examines the ex post informational asymmetries between potential lenders and an entrepreneur with a risky project as well. Here, the feasibility of financial intermediation can be derived from the scale economies in monitoring and controlling a firm (see section III. 1). Furthermore, if the financial intermediary has a well-diversified portfolio of firms financed, the intermediary's own returns are almost riskless. Thus, *Diamond* (1984) seems to argue there is no need to monitor the monitor. Delegated monitoring is regarded as a rationale for the emergence of financial intermediaries. The alternative would seem either duplication of the efforts if each lender monitors, or free riding in which case no monitoring occurs. Delegated monitoring will lead to a capital structure which is mainly debt but the structure has a low probability of default. The intermediary's assets will be illiquid, for it is the only one to observe the loans to the borrowers. If the intermediary sells a loan, its buyer must incur the monitoring cost (*Diamond*, 1984). *Yanelle* (1989) questions *Diamond's* (1984) conclusion on competitive financial intermediation. *Yanelle* (1989, p. 300) shows that "Even though intermediation is more efficient than direct finance, it may be the case that only payoff dominant subgame perfect equilibria without active intermediation may exist". *Hellwig* (1991) argues that *Diamond's* model neglects the refinancing element in financial intermediation. Refinancing is relevant both for the borrower and the financier. Both parties must have some assurance of the availability with respect to long-term funding. *Diamond's* model does not seem to account for this aspect (*Hellwig*, 1991).

Ramakrishnan and *Thakor* (1984) demonstrate that when information producers are able to monitor each other directly and without cost, they are better off forming a large intermediary rather than operating individually, because forming of coalitions permits complete risk diversification. Here, centralisation is the explanation of the emergence of a pure broker or investment manager. Their emergence is rooted exclusively in informational asymmetries and the companion issue of information reliability. *Millon* and *Thakor* (1985) extend this analysis by relaxing the assumption of costless internal monitoring and achieve similar results, except that the resulting intermediary is of a finite size. Their model explains the formation of institutions that acquire and process information to the purpose of certify-

ing asset qualities. The institutions in these models on coalition formation do not get involved in funding activities but only provide information. These institutions are called information gathering agencies, for example rating agencies, financial newsletters, credit bureaus (*Millon and Thakor, 1985*). However, the 'financial' character of information and intermediaries is not explicitly examined. The models illustrate the endogenous emergence of intermediaries as such.

In *Boyd and Prescott (1986)*, coalitions have access to a contracting technology which precludes subsequent recontracting. An agent cannot be excluded from coalitions based upon private information about types of agents. If both adverse selection and information production by way of evaluation is allowed for, intermediary-coalitions will emerge endogenously. In *Williamson (1986)*, monitoring decisions are made ex post. Monitoring will occur only in the default state, and the probability that this monitoring occurs is determined endogenously. The endogenously arising financial intermediaries issue securities which have different payoff characteristics than those of their own securities. The intermediaries write debt contracts with borrowers, process information, hold diversified portfolios, and ration credit in equilibrium (*Williamson, 1986*). *Freeman (1988)* demonstrates that agents form intermediaries as option contracts to reduce the transaction costs associated with reselling illiquid assets.

Allen (1990) analyses how information sellers ensure they do have superior information. He constructs a model where the resale of information can occur, in contrast to the earlier studies where part of the justification for the endogenous emergence of intermediation follows from the prevention of the resale of information. He argues that an information seller can capture only a portion of the value of his information if it cannot be directly verified and if risk aversion is unobservable. Intermediaries profit because they can capture some of the remaining value. If buyers have sufficient time before asset markets meet to resell the information, they become intermediaries and may obtain some of the value of the information that the seller is unable to extract. In *Allen (1990)*, the financial intermediary is an agent that intermediates between an initial seller of information and its ultimate buyer, unlike *Ramakrishnan and Thakor (1984)* where the intermediary is a coalition of agents. *Allen (1990)* argues that if the contract used by the original seller and his announcements are observable to second-stage buyers, an intermediary can use this to certify that the information he or she sells is credible. Therefore, there is no need for the intermediary itself to build a portfolio signalling its informed status but it can charge a fixed fee. If the contract and the announcement cannot be observed by second-stage buyers

the intermediary has to certify the credibility of his information and, as the original sellers, he or she will be better off selling his information rather than trading on his own account (*Allen*, 1990).

Seward (1990) analyzes financial contracts when there are two forms of moral hazard. In his model, the financiers cannot monitor the actual investment allocation of the borrower and they can only partially observe actual cash flows. *Seward* (1990) motivates the complementarity between direct finance and intermediated finance. A borrower may mitigate the two forms of moral hazard by simultaneously issuing debt and taking loans.

A further type of explanation for financial intermediation is the mechanism of commitment to a long-term relationship between borrower and lender (e.g., *Gorton and Haubrich*, 1987; *Mayer*, 1988; *Haubrich*, 1989). *Hellwig* (1991) finds several problems with contracts; complete contracts are difficult to write, contract enforcement is not ensured, and contract-renegotiation may be attractive. A close relation between lender and borrower is an alternative to long-term contracting (see *Mayer*, 1988). In establishing long-term relationships, the financial intermediary acquires more and probably better information about the lender than other lenders. In *Gorton and Haubrich* (1987) it is too costly for ultimate investors to learn all there is to know about all aspects of the firm's real activities. Then, firms precommit to monitoring by a financial intermediary by taking an appropriate level of bank debt (*Gorton and Haubrich*, 1987). The long-term relationships between the financial intermediary and its client open the potential for contracts that let the intermediary produce information and enforce compliance more easily than direct monitoring or than the firm's issuing of securities to many investors (see *Haubrich*, 1989).

To conclude, the asymmetric information structure among economic subjects results in profitable opportunities as well as in costly problems for financial intermediaries. Asymmetric information offers a rationale for their emergence because it can partly overcome the informational asymmetries by signalling and by writing contracts. Borrowers diversify on the liability side and lenders on the asset side to mitigate informational asymmetries. Long-term relationships and contracts are alternative means to reduce the problems that arise from these asymmetries. However, there seems to have not yet evolved a mechanism which completely eliminates asymmetric informational distortions. Thus, moral hazard and adverse selection in financial intermediation still do actually remain. Generally, these dangers are put forward to rationalize the intense regulation of the financial industry.

3. Regulatory Environment

In the literature on financial intermediation, regulation seldom is explicitly seen as an explanation of the emergence and the operation of specific financial intermediaries. However, especially the legal system and property rights are a frame of reference for the operations of these economic units. Furthermore, the supervision of the financial system and the individual institutions is relevant. *Tobin* (1963) argues that it is governmental guarantees of the liabilities of financial institutions and other provisions designed to assure the solvency and the liquidity of these institutions that can be held responsible for the provision of the payments' system and the transformation of risk, scale, place, and maturity undertaken by financial institutions. In contrast, *Guttentag* and *Lindsay* (1968) and *Fama* (1980) argue that banks are intensely controlled because they actually differ from other financial institutions. *Mankiw* (1986) demonstrates governmental intervention can improve the equilibrium in an unimpeded market, even if the government has no informational advantages over lenders. However, government regulation, like free markets, has its limitations as to their effect on the welfare of the public. Moreover, government institutions may not be very capable to perform the functions of financial intermediaries themselves (*Stiglitz*, 1991). *Kane* (1981 & 1983) shows how financial intermediaries may react in response to regulation. He constructs the concept of regulatory dialectic. Here, the imposition of governmental rules leads to efforts by intermediaries to invent and market new financial products that circumvent the rules. Due to time lags in the regulation process, some unregulated activities and unregulated risks will remain and new activities are bound to emerge because of the innovative capacities of the financial intermediary. *Williamson* (1963) argues that regulatory constraints are generally apt to produce manifestations of non-profit maximising behaviour. This may be the result because the regulation of the financial industry can be seen as some kind of taxation and thus regulation involves a cost (*Kane*, 1981). Information about the regulations and their consequences is of importance too (*Orgler* and *Taggart*, 1983): the financial intermediaries make costs to learn about the character and the impact of regulations in order to respond adequately. As to the *Baumol et al.* (1982) framework of contestable markets, regulation inhibits perfect competition because it results in entry and exist costs to the industry.

The motives of the authorities to regulate the financial industry are manyfold (see e.g. *Merrick* and *Saunders*, 1985; *Gowland*, 1990): The financial industry serves as a means by which stabilisation policy is transmitted to the economy at large. Another goal of authorities is the promotion of an orderly

financial system in such a way that allocative, distributive, and technological ends are achieved. The moral hazard dilemma, occurring from the existence of a lender of last resort, is a further motive for prudential supervision of the financial system. The operating of a smooth functioning payments' system and the protection of depositors and investors also must be mentioned as important reasons to regulate financial intermediaries. Among others, credit ceilings, exchange control, reserve requirements, interest caps, capital adequacy rules, a lender of last resort facility, deposit insurance, compartmentalisation, and entry requirements, all instruments are to regulate the financial industry (*Baltensperger and Dermine, 1987; Pecchioli, 1987; Gowland, 1990*).

The combination of the nominal convertibility guarantee of the bank as to its deposits together with the uncertainty of the depositors about the true value of the bank's assets leads to the possibility of bank runs and of individual or systematic crises (*Goodhart, 1987; Kindleberger, 1989*). According to *Aharony and Swary (1983)*, failures resulting from specific problems with a bank very seldom have had contagion effects on the industry. *Smith (1984)* and *Stiglitz (1991)* argue that the instability of the financial system can arise despite the presence of a lender of last resort who provides the threatened intermediary with funds to satisfy the unexpected withdrawals of its depositors. Stability problems may be created by competition for deposits of a heterogeneous group of agents who value consumption streams similarly but vary in terms of their probability distributions over dates of withdrawal from their respective banks. According to *Smith (1984)*, it is the competition for depositors of particular types coupled with private information which is the source of potential problems that constitute a rationale for regulation. Contagious runs may lead to wealth losses to depositors, the dislocation of the payments' system, and repayment and capital access problems of borrowers as well as to monetary effects (*Bernanke, 1983; Goodhart, 1987*). The underinvestment and rising costs of credit intermediation that result from runs are of concern to the policy makers (*Merrick and Saunders, 1985*). *Bhattacharya and Gale (1987)* focus on problems faced by intermediaries when their demand for liquidity is uncertain. They investigate central bank policy as a cross-sectional coordination device. Interbank coordination, as put into effect by contracts, offers some scope for insurance against unexpected liquidity needs.

Financial intermediaries' contracts transform illiquid asset-payoff streams into more liquid liability-payoffs. Therefore, the interim private information about the payoffs on the part of the depositor can be seen as a primary source of bank runs (*Jacklin and Bhattacharya, 1988*). The maturity

transformation creates potential risks of runs by depositors withdrawing their claims on the intermediary. This argument has been put forward by *Bryant* (1980), who argues that the liquidity demand derived from asymmetric information structures may result in an optimal contract with banks. However, the insurance contract does not necessarily keep a bank run from occurring. If depositors find the bank to have low liquidity or low solvency they may withdraw, which, in turn, may lead to a bank run and to complex risk redistributions among agents. The backing of demand deposits by fractional currency reserves and public insurance can be beneficial, because it imposes a cost that is inherent of the illiquid and private character of information (*Bryant*, 1980).

The reaction of the private sector to deposit insurance influences the redistributive effects of insurance schemes. *Diamond* and *Dybvig* (1983) demonstrate that it can even be an expectation about the illiquidity of the financial intermediary which triggers off a bank run. Depositors will anticipate on the expected illiquidity by withdrawing their deposits. This results in de facto illiquidity and, thus, the prophecy is fulfilled (*Diamond* and *Dybvig*, 1983). They also show that the demand deposit contract can improve the allocation of capital on a competitive market, and that there are many equilibria within such a market, one of them being a bank run. In order to reduce the potential for bank runs, *Diamond* and *Dybvig* (1983) suppose to select an equilibrium which depends on a publicly observable variable. *Postlewaite* and *Vives* (1987) provide a somewhat different example of a positive probability of a bank run in a unique equilibrium. Their demand deposit contract is not optimal in general since it induces a prisoner's dilemma. *Chari* and *Jagannathan* (1988) combine the ideas on shocks and withdrawals in *Bryant* (1980) and *Diamond* and *Dybvig* (1983) respectively. They construct a model which incorporates information about the intermediary's asset returns and random withdrawal preferences. Here, the unique equilibrium can be one of panic. Furthermore, they show that measures restricting permitted withdrawals may improve agents' expected utility.

The financial institution which faces a lender of last resort or which participates in an insurance scheme is certain to be bailed out if its illiquidity or its insolvency might arise. Therefore, the lender and the scheme provide the intermediary with an incentive to collect deposits and to produce loans without careful monitoring and screening: a typical example of moral hazard. Many profits will be earned by the intermediary, the burden of any losses must be shared among the financial industry or by the tax-payers. These built-in risk-taking incentives may serve to exacerbate any tenden-

cies toward the financial industry's instability. As a result, the regulator needs to ensure sound practices in financial intermediation as well. *Kahane* (1977) illustrates that constraining the portfolio composition of the intermediary cannot generally be regarded as an effective means for limiting a firm's probability of ruin, nor can the minimum capital requirement. A combination of these practices on the other hand might cause the desired effect (*Kahane*, 1977). However, a higher capital-asset ratio may have ambiguous results in terms of the average probability of failure, and the intra-industry dispersion of the probability of failure may increase (*Koehn* and *Santomero*, 1980). Because of the private character of asset quality information, a high capital-asset ratio of a firm, in comparison with other firms within the industry, may signal a risky asset portfolio or a high solvency. Therefore, the interpretations resulting from high capital-asset ratios may lead to quite different reactions with the principal. Furthermore, regulatory policies are apt to influence the private incentives to augment capital (*Taggart* and *Greenbaum*, 1979). Hence, *Bernanke* and *Gertler* (1987) think that public auditing is necessary to resolve otherwise private information to potential clients. *Freeman* (1988) views the requirement of reserves of liquid assets and the limits on the rates of return as a reaction to the regulatory authorities' imposition on the financial industry to deal with the moral hazard dilemma that results from deposit insurance.

Apart from the lender of last resort and deposit insurance that may incur moral hazard, some other regulations may prove to be counterproductive too, at least partially. Regulations which restrict the information used can produce undesirable credit supply results because of adverse selection (*Barth et al.*, 1983). If there are other financial intermediaries besides the ones that are regulated and supervised, a mitigation of the effects of regulation will result (*Hörngren*, 1985). Furthermore, *Hörngren* (1985) demonstrates that the regulatory authorities cannot fully control the way regulated institutions meet a change in the required ratios. *Black* (1975) suggests that non-deposit liabilities allow banks to avoid regulation of the total amount of their loans. According to *Kane* (1981), circumvention occurs by product substitution, and by rearranging operative financial contracts or systems for delivering services.

Thus, regulation is seen as a market imperfection that is responsible for the emergence of financial intermediation. Of course, it is not the regulation by itself, but the special interrelationship and the interactions between the rules, the regulator, the intermediary, and their activities that offers a rationale for the emergence of specialized financial institutions.

IV. Evaluation

In this study, the heterogeneous literature on financial intermediation has been structured as to the descriptions of the behaviour and functions of the financial intermediary and to the explanations of its *raison d'être*. No clear-cut theory of financial intermediation appears to be available yet to analyse its stylised facts. The theory of financial intermediation is still incomplete. However, the many hypotheses within the tradition of the literature on financial intermediation offer a thorough understanding of many aspects of the behaviour of financial intermediaries.

The literature provides a list of goods and services that are being produced by financial intermediaries. Here, they are split up into four distinct groups: the supply of financial assets, the administration of a payments system, brokerage, and the supply of non-tangibles. A characteristic of financial intermediaries is that their balance sheet on both sides mainly consist of financial assets instead of real assets. Opinions vary as to what characterises financial intermediaries and as to what makes them differ from other economic agents. Within the literature, two approaches have developed. One group of authors stresses the importance of the intermediary in satisfying liquidity preferences. Here, indirect financing is thought to be the core function of the financial intermediary. The other group concentrates on the setting up and maintaining of an accounting system by financial intermediaries. Here, exchange is thought to be the key function of the intermediary. Furthermore, some authors suggest it is the specific combination of indirect financing and facilitating exchange that characterises the financial intermediary.

The inability to reach consensus also appears in the literature that is concerned with explaining the emergence of financial intermediaries. Of course, this is not surprising because the subject of why financial intermediation occurs is intensely related to the subject of what financial intermediaries actually produce. The literature that aims at explaining the emergence of financial intermediaries concentrates on market imperfections. Three types of imperfections can be distinguished: costs, information, and rules. Naturally, all market imperfections translate into some cost, but here the aim is to investigate further into those imperfections. Firstly, the literature that suggests costs, like those of contracting, information gathering, and exchanging, are responsible for the emergence of financial intermediation, argues that the production technology of the intermediary is subject to some kind of economies of scale or scope. Specialisation or cooperation, therefore, can be potentially profitable. Secondly, the literature that concentrates on

information argues it is asymmetric information that makes specialisation profitable and sometimes even necessary in financial information production. Intermediaries can diversify among various financial claims and obligations, and they can specialise in evaluating clients. However, most literature in the latter tradition does not really seem to explain why financial intermediaries exist. It provides a far more general explanation by demonstrating how information production arises. The financial character of such information is not always explicitly elaborated on. Thirdly, the regulation of the financial industry. Regulation is regarded both a cause and an effect of the emergence and the operation of the specific categories of financial intermediaries. Governmental regulation primarily aims at prohibiting or mitigating the economic consequences of runs. Regulation structures the activities of financial intermediaries and may lead to innovative responses.

The explanations of financial intermediation appear to be related to the way in which the activities of financial intermediaries have been characterised. The authors who suggest regulation may be held responsible for the emergence of financial intermediaries overlap with those who argue it is the administration of the payments system that is the essential function of the financial intermediary. Authors who put forward costs and asymmetric information as an explanation appear to be mainly concerned with the portfolio management that is effected by the financial intermediary.

Financial intermediaries develop intermediating technologies to overcome market imperfections. The specific financial intermediation technology makes specialisation potentially profitable to the financial intermediary. In tackling the market imperfections, the financial intermediary does not succeed completely. It is impossible to make an imperfect world completely perfect from within such a world. Cost reductions may occur by specialisation, cooperation and internalisation, but costs do remain. Asymmetric information can be dealt with in contracts but gives rise to moral hazard and adverse selection. Rules can be circumvented, which is costly, or one can keep peace with them and limit the scope of activities. However, the dangers of moral hazard, adverse selection and free riding will remain. In all, financial intermediation seems to succeed in reducing various risks but uncertainty remains. Therefore, the case for financial intermediation remains though the specific structure of the financial system is bound to change in reaction to the everchanging quantity and character of market imperfections.

References

- Aharony, J., Swary, I., 1983, Contagion Effects of Bank Failures: Evidence from Capital Markets, *Journal of Business*, Vol. 56, pp. 305 - 322. – Akerlof, G. A., 1970, The Market for "Lemons": Quality Uncertainty and the Market Mechanism, *Quarterly Journal of Economics*, Vol. 84, pp. 488 - 500. – Allen, F., 1990, The Market for Information and the Origin of Financial Intermediation, *Journal of Financial Intermediation*, Vol. 1, pp. 3 - 30. – Baltensperger, E., Dermine, J., 1987, Banking Deregulation in Europe, *Economic Policy*, Vol. 4, pp. 63 - 109. – Baron, D. P., 1982, A Model of the Demand for Investment Banking Advising and Distribution Services for New Issues, *Journal of Finance*, Vol. 37, pp. 955 - 976. – Baron, D. P., Holmström, B., 1980, The Investment Banking Contract For New Issues Under Asymmetric Information: Delegation And The Incentive Problem, *Journal of Finance*, Vol. 35, pp. 1115 - 1138. – Barth, J. R., Cordes, J. J., Yezer, A. M. J., 1983, An Analysis of Informational Restrictions on the Lending Decisions of Financial Institutions, *Economic Inquiry*, Vol. 21, pp. 349 - 360. – Baumol, W. J., Panzar, J. C., Willig, R. D., 1982, Contestable Markets and the Theory of Industry Structure, Harcourt Brace Jovanovich, New York. – Benston, G. J., 1972, Economies of Scale of Financial Institutions, *Journal of Money, Credit, and Banking*, Vol. 4, pp. 312 - 341. – Benston, G. J., Smith Jr., C. W., 1976, A Transactions Cost Approach to the Theory of Financial Intermediation, *Journal of Finance*, Vol. 31, pp. 215 - 231. – Bernanke, B. S., 1983, Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression, *American Economic Review*, Vol. 73, pp. 257 - 275. – Bernanke, B. S., Gertler, M., 1987, Banking and Macroeconomic Equilibrium, in: Barnett, W. A. and Singleton, K. J. (eds.), *New Approaches to Monetary Economics*, Cambridge University Press, Cambridge, pp. 89 - 111. – Bhattacharya, S., Gale, D., 1987, Preference Shocks, Liquidity, and Central Bank Policy, in: Barnett, W. A. and Singleton, K. J. (eds.), *New Approaches to Monetary Economics*, Cambridge University Press, Cambridge, pp. 69 - 88. – Black, F., 1975, Bank Funds Management in an Efficient Market, *Journal of Financial Economics*, Vol. 2, pp. 323 - 339. – Boyd, J. H., Prescott, E. C., 1986, Financial Intermediary-Coalitions, *Journal of Economic Theory*, Vol. 38, pp. 211 - 232. – Broecker, T., 1990, Credit-Worthiness Tests and Interbank Competition, *Econometrica*, Vol. 58, pp. 429 - 452. – Bryant, J., 1980, A Model of Reserves, Bank Runs, and Deposit Insurance, *Journal of Banking and Finance*, Vol. 4, pp. 335 - 344. – Campbell, T. S., Kracaw, W. A., 1980, Information Production, Market Signalling, and the Theory of Financial Intermediation, *Journal of Finance*, Vol. 35, pp. 863 - 882. – Chari, V. V., Jagannathan, R., 1988, Banking Panics, Information, and Rational Expectations Equilibrium, *Journal of Finance*, Vol. 43, pp. 749 - 761. – Dermine, J., 1990, The Specialization of Financial Institutions: The EC Model, *Journal of Common Market Studies*, Vol. 28, pp. 219 - 233. – Deshmukh, S. D., Greenbaum, S. I., Kanatas, G., 1983, Interest Rate Uncertainty and the Financial Intermediary's Choice of Exposure, *Journal of Finance*, Vol. 38, pp. 141 - 147. – Diamond, D. W., 1984, Financial Intermediation and Delegated Monitoring, *Review of Economic Studies*, Vol. 51, 1984, pp. 393 - 414. – Diamond, D. W., Dybvig, P. H., 1983, Bank Runs, Deposit Insurance and Liquidity, *Journal of Political Economy*, Vol. 91, pp. 401 - 419. – Draper, D. W., Hoag, J. W., 1978, Financial Intermediation and the Theory of Agency, *Journal of Financial and Quantitative Analysis*, Vol. 13, pp. 595 - 611. – Fama, E. F., 1980, Banking in the Theory of Finance, *Journal of Monetary Economics*, Vol. 6, pp. 39 - 57. – Fama, E. F., 1985, What's Different About Banks?, *Journal of Monetary Economics*,

Vol. 15, pp. 29 - 39. – *Fischer, S.*, 1983, A Framework for Monetary and Banking Analysis, *Economic Journal*, Vol. 93, pp. 1 - 16. – *Fisher, I.*, 1930, *The Theory of Interest*, MacMillan, New York [reprint Kelly, New York, 1970]. – *Freeman, S.*, 1988, Banking as the Provision of Liquidity, *Journal of Business*, Vol. 61, pp. 45 - 64. – *Gale, D., Hellwig, M.*, 1985, Incentive-Compatible Debt Contracts: The One-Period Problem, *Review of Economic Studies*, Vol. 52, pp. 647 - 663. – *Gerschenkron, A.*, 1962, *Economic Backwardness in Historical Perspective. A Book of Essays*, The Belknap Press of Harvard University, Cambridge, Mass. – *Gertler, M.*, 1988, Financial Structure and Aggregate Economic Activity: An Overview, *Journal of Money, Credit, and Banking*, Vol. 20, pp. 559 - 588. – *Gilbert, R. A.*, 1984, Bank Market Structure and Competition – A Survey, *Journal of Money, Credit, and Banking*, Vol. 20, pp. 617 - 660. – *Goldsmith, R. W.*, 1969, *Financial Structure and Development*, Yale University Press, New Haven and London. – *Goodhart, C. A. E.*, 1987, Why do Banks Need a Central Bank?, *Oxford Economic Papers*, Vol. 39, pp. 75 - 89. – *Gorton, G., Haubrich, J.*, 1987, Bank Deregulation, Credit Markets, and the Control of Capital, *Carnegie-Rochester Conference Series on Public Policy*, Vol. 26, pp. 289 - 334. – *Gowland, D.*, 1990, The Regulation of Financial Markets in the 1990s, Edward Elgar, Aldershot. – *Greenwald, B., Stiglitz, J. E., Weiss, A.*, 1984, Informational Imperfections in the Capital Market and Macroeconomic Fluctuations, *American Economic Review*, Vol. 74, pp. 195 - 195. – *Grossman, S. J., Stiglitz, J. E.*, 1980, On the Impossibility of Informationally Efficient Markets, *American Economic Review*, Vol. 70, pp. 394 - 408. – *Gurley, J. G., Shaw, E. S.*, 1955, *Financial Aspects of Economic Development*, The American Economic Review, Vol. 45, pp. 515 - 538. – *Gurley, J. G., Shaw, E. S.*, 1960, *Money in a Theory of Finance, with a Mathematical Appendix by A. C. Enthoven*, The Brookings Institution, Washington D.C. – *Guttentag, J. M., Lindsay, R.*, 1968, The Uniqueness of Commercial Banks, *Journal of Political Economy*, Vol. 71, pp. 991 - 1014. – *Hancock, D.*, 1985, The Financial Firm: Production with Monetary and Non-monetary Goods, *Journal of Political Economy*, Vol. 93, pp. 859 - 880. – *Hart, O. D., Jaffee, D. M.*, 1974, On the Application of Portfolio Theory to Depository Financial Intermediaries, *Review of Economic Studies*, Vol. 41, pp. 129 - 147. – *Haubrich, J. G.*, 1989, Financial Intermediation – Delegated Monitoring and Long-Term Relationships, *Journal of Banking and Finance*, Vol. 13, pp. 9 - 20. – *Hellwig, M.*, 1991, *Banking, Financial Intermediation, and Corporate Finance*, in: *Giovannini, A. and Mayer, C.* (eds.), *European Financial Integration*, Cambridge University Press, Cambridge, pp. 35 - 63. – *Herring, R. J., Santomero, A. M.*, 1990, The Corporate Structure of Financial Conglomerates, *Journal of Financial Services Research*, Vol. 4, pp. 471 - 497. – *Hill, T. P.*, 1977, On Goods and Services, *Review of Income and Wealth*, Vol. 23, pp. 315 - 338. – *Hörngren, L.*, 1985, Regulatory Monetary Policy and Uncontrolled Financial Intermediaries, *Journal of Money, Credit, and Banking*, Vol. 17, pp. 203 - 219. – *Jacklin, C. J., Bhattacharya, S.*, 1988, Distinguishing Panics and Information-based Bank Runs: Welfare and Policy Implications, *Journal of Political Economy*, Vol. 96, pp. 568 - 592. – *Kahane, Y.*, 1977, Capital Adequacy and the Regulation of Financial Intermediaries, *Journal of Banking and Finance*, Vol. 1, pp. 207 - 218. – *Kane, E. J.*, 1981, Accelerating Inflation, Technological Innovation, and the Decreasing Effectiveness of Banking Regulation, *Journal of Finance*, Vol. 36, pp. 355 - 367. – *Kane, E. J.*, 1983, Policy Implications of Structural Changes in Financial Markets, *American Economic Review*, Vol. 73, pp. 96 - 100. – *Kindleberger, C. P.*, 1983, International Banks as Leaders or Followers of International Business, *Journal of Banking and Finance*, Vol. 7, pp. 583 - 595. – *Kindleberger, C. P.*, 1984, *A Financial History of*

Western Europe, George Allen & Unwin, London. – *Kindleberger, C. P.*, 1989, *Manias, Panics, and Crashes*, MacMillan, Basingstoke and London. – *Klein, M. A.*, 1971, A Theory of the Banking Firm, *Journal of Money, Credit, and Banking*, Vol. 3, pp. 205 – 218. – *Klein, M. A.*, 1973, The Economics of Security Divisibility and Financial Intermediation, *Journal of Finance*, Vol. 28, pp. 923 – 931. – *Klein, M., Neumann, M. J. M.*, 1990, Seigniorage: What is it and who gets it?, *Weltwirtschaftliches Archiv*, Vol. 126, pp. 205 – 221. – *Koehn, M., Santomero, A. M.*, 1980, Regulation of Bank Capital and Portfolio Risk, *Journal of Finance*, Vol. 35, pp. 1235 – 1244. – *Leland, H. E., Pyle, D. H.*, 1977, Informational Asymmetries, Financial Structure, and Financial Intermediation, *Journal of Finance*, Vol. 32, pp. 371 – 387. – *Mangoletsis, I. D.*, 1975, The Microeconomics of Indirect Finance, *Journal of Finance*, Vol. 30, pp. 1055 – 1063. – *Mankiw, N. G.*, 1986, The Allocation of Credit and Financial Collapse, *Quarterly Journal of Economics*, Vol. 101, pp. 455 – 470. – *Mayer, C.*, 1988, New Issues in Corporate Finance, *European Economic Review*, Vol. 32, pp. 1167 – 1183. – *Merrick Jr., J. R., Saunders, A.*, 1985, Bank Regulation and Monetary Policy, *Journal of Money, Credit, and Banking*, Vol. 17, pp. 691 – 717. – *Millon, M. H., Thakor, A. V.*, 1985, Moral Hazard and Information Sharing: A Model of Financial Information Gathering Agencies, *Journal of Finance*, Vol. 40, pp. 1403 – 1422. – *Neave, E. H.*, 1991, *The Economic Organisation of a Financial System*, Routledge, London and New York. – *O'Hara, M.*, 1981, Property Rights and the Financial Firm, *Journal of Law and Economics*, Vol. 24, pp. 317 – 332. – *O'Hara*, 1983, A Dynamic Theory of the Banking Firm, *Journal of Finance*, Vol. 38, pp. 127 – 140. – *Orgler, Y. E., Taggart Jr., R. A.*, 1983, Implications of Corporate Capital Structure Theory for Banking Institutions, *Journal of Money, Credit, and Banking*, Vol. 15, pp. 212 – 221. – *Patinkin, D.*, 1961, Financial Intermediaries and the Logical Structure of a Monetary Theory, *American Economic Review*, Vol. 51, pp. 95 – 116. – *Pecchioli, R. M.*, 1987, Prudential Supervision in Banking, OECD, Paris. – *Postlewaite, A., Vives, X.*, 1987, Bank Runs as an Equilibrium Phenomenon, *Journal of Political Economy*, Vol. 95, pp. 485 – 491. – *Pringle, J. J.*, 1974, The Capital Decision in Commercial Banks, *Journal of Finance*, Vol. 29, pp. 779 – 795. – *Pyle, D. H.*, 1971, On the Theory of Financial Intermediation, *Journal of Finance*, Vol. 26, pp. 737 – 747. – *Pyle*, 1972, Descriptive Theories of Financial Institutions under Uncertainty, *Journal of Financial and Quantitative Analysis*, Vol. 7, pp. 2009 – 2029. – *Ramakrishnan, R. T. S., Thakor, A. V.*, 1984, Information Reliability and a Theory of Financial Intermediation, *Review of Economic Studies*, Vol. 51, pp. 415 – 432. – *Santomero, A. M.*, 1984, Modelling the Banking Firm – A Survey –, *Journal of Money, Credit, and Banking*, Vol. 16, pp. 576 – 616. – *Sealey Jr., C. W., Lindley, J. T.*, 1977, Inputs, Outputs, and a Theory of Production and Cost at Depository Financial Institutions, *Journal of Finance*, Vol. 32, pp. 1251 – 1266. – *Seward, J. K.*, 1990, Corporate Financial Policy and the Theory of Financial Intermediation, *Journal of Finance*, Vol. 45, pp. 351 – 377. – *Smith, B. D.*, 1984, Private Information, Deposit Interest Rates, and the 'Stability' of the Banking System, *Journal of Monetary Economics*, Vol. 14, pp. 293 – 317. – *Stiglitz, J. E.*, 1991, Government, Financial Markets, and Economic Development, NBER Working Paper No. 3669. – *Stiglitz, J. E., Weiss, A.*, 1981, Credit Rationing in Markets with Imperfect Information, *American Economic Review*, Vol. 71, pp. 393 – 410. – *Stiglitz, J. E., Weiss, A.*, 1983, Incentive Effects of Terminations: Applications to the Credit and Labor Markets, *American Economic Review*, Vol. 73, pp. 912 – 927. – *Taggart Jr., R. A., Greenbaum, S. I.*, 1978, Bank Capital and Public Regulation, *Journal of Money, Credit, and Banking*, Vol. 10, pp. 158 – 169. – *Tobin, J.*, 1963, Commercial Banks as Creators of

"Money", in: *Smith, W. L. and Teigen, R. L. (eds.), Readings in Money, National Income, and Stabilization Policy*, Richard D. Irwin, Homewood, Illinois, 1965, pp. 156 - 163 [reprint from: *Commercial Banks as Creators of 'Money'*, in: *Banking and Monetary Studies*, (ed. D. Carson), Richard D. Irwin, Homewood, Illinois, 1963, pp. 408 - 419]. – *Tobin, J.*, 1987, *Financial Intermediaries*, in: *Eatwell, J., Milgate, M., Newman, P. (eds.), The New Palgrave, Money*, MacMillan, London and Basingstoke, pp. 157 - 174. – *Tobin, J., Brainard, W. C.*, 1963, *Financial Intermediaries and the Effectiveness of Monetary Controls*, *American Economic Review*, Vol. 53, pp. 383 - 412. – *Towey, R. E.*, 1974, *Money Creation and the Theory of the Banking Firm*, *Journal of Finance*, Vol. 29, pp. 57 - 72. – *Townsend, R. M.*, 1978, *Intermediation with Costly Bilateral Exchange*, *Review of Economics Studies*, Vol. 45, pp. 417 - 425. – *Townsend, R. M.*, 1979, *Optimal Contracts and Competitive Markets with Costly State Verification*, *Journal of Economic Theory*, Vol. 21, pp. 265 - 293. – *Williamson, O. E.*, 1963, *Managerial Discretion and Business Behavior*, *American Economic Review*, Vol. 53, pp. 1032 - 1057. – *Williamson, S. D.*, 1986, *Costly Monitoring, Financial Intermediation, and Equilibrium Credit Rationing*, *Journal of Monetary Economics*, Vol. 18, pp. 159 - 179. – *Williamson, S. D.*, 1987a, *Transaction Costs, Inflation, and the Variety of Intermediation Services*, *Journal of Money, Credit, and Banking*, Vol. 19, pp. 484 - 498. – *Williamson, S. D.*, 1987b, *Financial Intermediation, Business Failures, and Real Business Cycles*, *Journal of Political Economy*, Vol. 95, pp. 1196 - 1216. – *Williamson, S. D.*, 1987c, *Costly Monitoring, Loan Contracts, and Equilibrium Credit Rationing*, *Quarterly Journal of Economics*, Vol. 101, pp. 135 - 145. – *Yanelle, M. O.*, 1989, *The Strategic Analysis of Intermediation*, *European Economic Review*, Vol. 33, pp. 294 - 301.

Summary

On the Foundations of Financial Intermediation: A Review of the Literature

In this paper, the literature on the role of the financial intermediary within the economy is reviewed and structured. The financial intermediary transforms financial assets and claims as to maturity, risk, scale, and place. Market imperfections are responsible for the emergence of the financial intermediary: cost, asymmetric information, and regulation structures give rise to specialisation in financial intermediation. In specialising, the intermediaries aim at mitigating the effect of market imperfections. They cannot succeed completely: the everchanging environment is accompanied by changing imperfections and thus provides a continuous rationale for the existence and emergence of financial intermediaries.

Zusammenfassung

Zu den Grundlagen der Geld- und Kapitalvermittlung – Überblick über die Literatur –

Dieser Beitrag durchleuchtet und strukturiert die Literatur zur Rolle der Geld- und Kapitalvermittler in der Volkswirtschaft. Geld- und Kapitalvermittler verändern die Fälligkeiten, Risiken, den Umfang und den Erfüllungsort von finanziellen Vermögenswerten und von Forderungen. Unvollkommenheiten der Märkte erklären die Entstehung des Berufs des Geld- und Kapitalanlegers: Kosten, asymmetrische Informationen und Regelungsstrukturen sind Anlaß zur Spezialisierung in der Geld- und Kapitalvermittlung. Durch ihre Spezialisierung wollen die Geld- und Kapitalvermittler eine Milderung der Auswirkungen unvollkommener Märkte bewirken. Dies kann ihnen jedoch nicht voll gelingen: Ein sich in stetem Wandel befindliches Umfeld geht mit wechselnden Unvollkommenheiten der Märkte Hand in Hand und liefert somit stets einen Grund für die Existenz von Geld- und Kapitalanlegern.

Résumé

Les bases de l'intermédiation financière: un examen critique de la littérature

L'auteur du présent article passe en revue la littérature sur le rôle des intermédiaires financiers dans l'économie et en propose une classification. Les intermédiaires financiers transforment les actifs et passifs financiers en fonction de leur échéance, risque, rendement et place. Les imperfections du marché sont responsables de l'émergence des intermédiaires financiers: les coûts, les informations asymétriques et les structures de régulation entraînent la spécialisation dans l'intermédiation financière. En se spécialisant, les intermédiaires visent à atténuer l'impact des imperfections du marché. Ils ne peuvent réussir entièrement: le changement perpétuel de l'environnement va de pair avec le changement des imperfections et ceci permet de justifier continuellement l'existence et l'émergence d'intermédiaires financiers.